

5.5 UTILITIES

ENERGY

CURRENT ENERGY CONSUMPTION

Gas and electricity combined account for approximately 54% of total fuel consumption. Petroleum products account for 41% of total consumption, the large majority of which is associated with road and rail transportation. Bioenergy and waste, manufactured fuels, and coal combined account for just over 4% of total fuel consumption.

HEADLINES

Total fuel consumption for Kent and Medway in 2015 is shown in Figure 5.6 by fuel type and by district in Figure 5.9. Figure 5.8 shows the breakdown of fuel use by sector.

- Since 2012, gas consumption has fallen by 10% and electricity by 20%, across Kent and Medway;
- There is a greater need for dispersed, low-carbon power sources and battery storage;
- There is 187.9 MW of proposed large-scale renewable energy projects in Kent and Medway (majority solar projects).

PREDICTED ENERGY CONSUMPTION TO 2031

Figure 5.7 shows the projected annual gas and electricity sales from 2014/15 to 2030/31, for current dwellings and projected new dwellings in Kent and Medway.

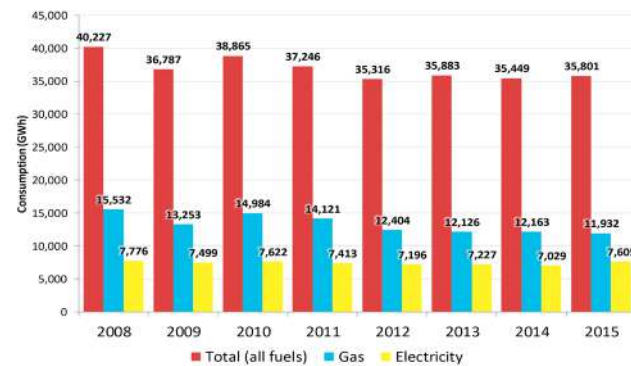


Figure 5.6: Total fuel consumption in Kent and Medway 2015

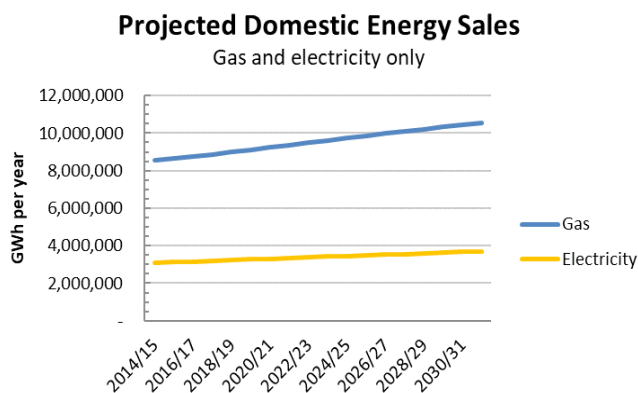


Figure 5.7: Project domestic energy sales in Kent and Medway to 2031

Over this period of time, gas demand in Kent and Medway is expected to increase by approximately 23% (from 8,556 GWh per year to 10,550 GWh per year) and electricity demand is expected to increase by approximately 19% (from 3,101 GWh per year to 3,699 GWh per year).

By 2031/32, nearly one in five homes is likely to have been built after 2015. Therefore, the rate at which Kent and Medway minimise energy demands in the domestic building sector is likely to be highly sensitive to the energy efficiency of those new buildings.

FUTURE REQUIREMENTS

The energy system in the UK and Kent is changing. Two-thirds of the UK's existing coal, gas and nuclear power stations are set to close by 2030 and any future power stations must be largely decarbonised if the UK is to achieve its legally binding targets of cutting CO2 emissions by 80% by 2050.

To meet the rising pressure on energy demand, new and more diverse sources of electricity generation will need to develop. There will be a need for an increased number of smaller, dispersed, low-carbon-generation power sources, often located near to people's homes and businesses. Due to the variable nature of this generation, there will also be an increased need for technologies, such as battery storage, to manage seasonal and diurnal variations.

Demand for electricity is also changing and increasing; for example, as a result of the electrification of heat and transport, as highlighted in the 2050 chapter of the GIF.

Changing supply and demand, though an enormous opportunity, also presents significant challenges to our existing system nationally and locally. It will require large amounts of investment in infrastructure and the transmission and distribution networks.

NEW GENERATING CAPACITY

Renewable energy generation in Kent has increased significantly since 2012, with the currently installed capacity of solar, wind, waste and CHP being over 1,800 MW, compared to approximately 230 MW in 2012. The majority of the capacity has been delivered through solar and wind installations, with wind contributing over 1,000MW and solar over 450MW.

FUEL CONSUMPTION (GWH)	NON-DOMESTIC	DOMESTIC	ROAD TRANSPORT	RAIL	BIOENERGY & WASTE	TOTAL BY FUEL TYPE
Gas	3,376	8,556	-	-	-	11,932
Electricity	4,504	3,101	-	-	-	7,605
Bioenergy & Waste	-	-	-	-	897	897
Coal	455	53	-	9	-	517
Manufactured fuels	41	16	-	-	0	57
Petroleum products	1,102	609	13,034	43	0	14,788
Total by sector	9,477	12,335	13,034	51	897	35,794

Figure 5.8: Total fuel consumption by fuel type in Kent and Medway 2015

Wind energy capacity is mostly from large-scale installations, although there is a small amount of small-scale wind energy delivering 5.5MW of installed capacity in Kent.

Proposed scale renewable energy projects could make up 187.9MW. The majority of these are for solar projects (small-scale projects have not been accounted for in these figures as the data is not freely available at this time).

CONSTRAINTS AND FUTURE INVESTMENT

Energy security is vital to the development and growth of Kent and Medway in the coming years. However, much of the County is subject to electricity grid network constraints, which can inhibit supply and demand.

The push to 'decarbonise' energy, as we see more heat generated by electricity, greater numbers of electric cars and the associated energy infrastructure, will lead to an increased demand on the electricity grid.

A drive towards local generation of renewable energy will further ramp up pressure on the grid network. It will be essential to map existing electricity and gas grid constraints against future development to identify potential issues early, as well as potential local generation solutions such as district heating systems.

Looking forward, the County could consider an integrated circular energy 'system' that is balanced and provides energy that is affordable, environmentally sustainable and secure. A smart and flexible system will provide and use energy only when it is needed and as close to the customer as possible to minimise transmission waste and maximise use of waste heat.

Summary of total costs/funding for energy projects (2017-2031)

Total Cost = £423,511,000

Total Funding = £423,511,000

Secured Funding = £100,187,000

Expected Funding = £323,324,000

Funding Gap = £0



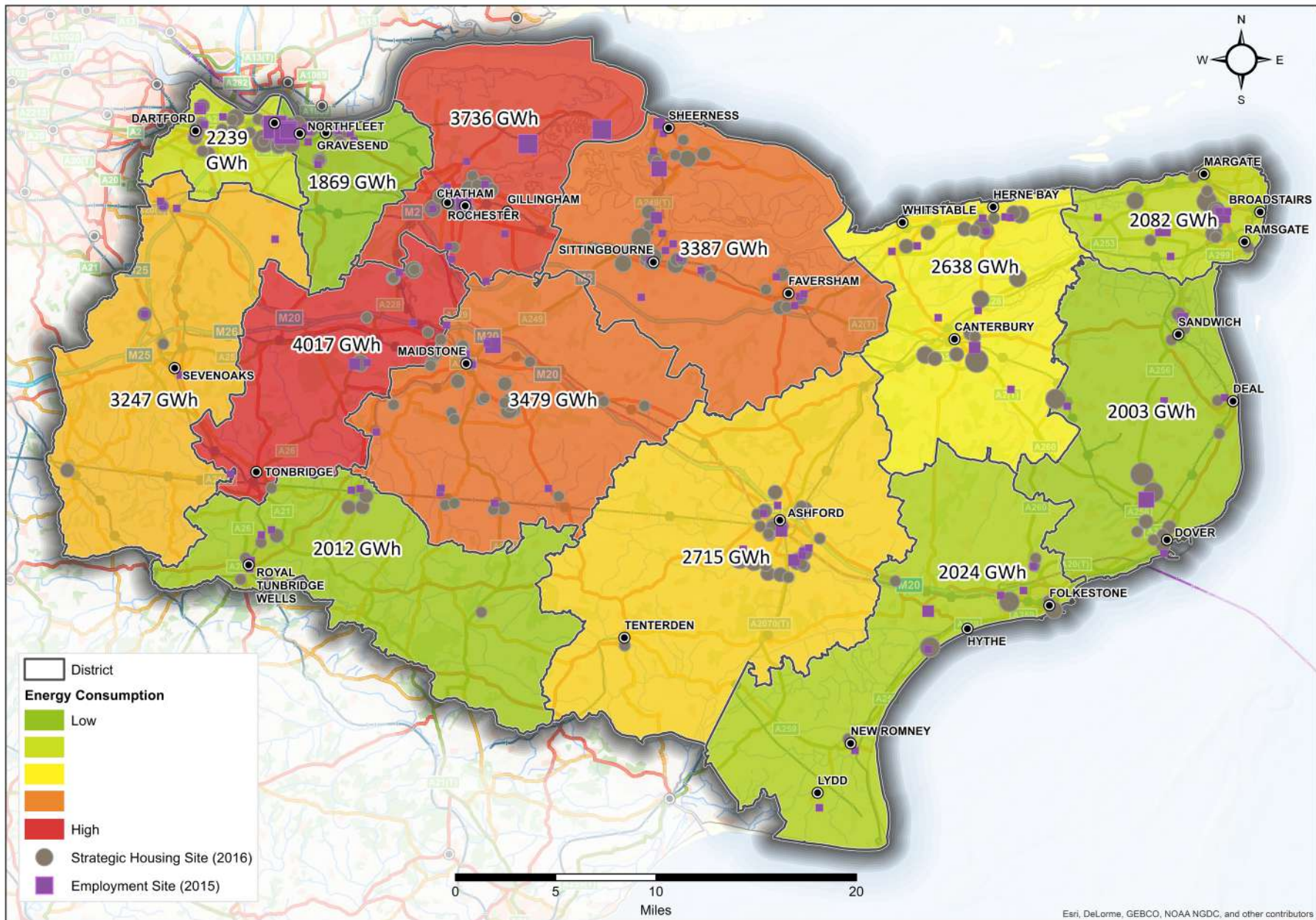


Figure 5.9: Energy consumption per district (2014 statistics); (Source: Department of BEIS; total final energy consumption at regional and local authority level)

BROADBAND

CURRENT SITUATION

Broadband Delivery UK (BDUK), part of the Department for Culture, Media and Sport, has set targets for 95% of properties in the UK to have access to superfast broadband by 31 December 2017.

The target is being delivered through a combination of:

- Market-led investment by broadband infrastructure providers (e.g. BT Openreach, Virgin, Gigaclear); and
- Programmes funded by BDUK and KCC to upgrade areas of market failure (i.e. where there are no plans for market-led investment) by retrofitting superfast broadband provision into existing business and residential premises.

The investment has already meant that 94.5% of homes and businesses across Kent and Medway can now access superfast broadband of at least 24mbps. The current Kent and Medway BDUK project is aiming to bring superfast broadband to 95.7% of homes and businesses by September 2018.

HEADLINES

- Too many homes are being built without access to decent, high-quality broadband, which is inconsistent with Government's policy of extending the availability of full-fibre connections to meet future needs.
- Opportunities are being missed to install 'future-proofed' fibre-to-the-premises broadband at a minimal cost.
- The failure to plan for broadband connectivity in many new developments is creating distress for new occupants, as well as new areas of market failure. This is due to:
 - A general reluctance of broadband infrastructure

providers to invest their own funds in retrofitting new sites;

- A general reluctance of developers to pay for retrofit costs where issues around poor connectivity have been identified by residents.

FUTURE REQUIREMENTS

It is essential that new-build properties are able to access high-quality and 'future-proofed' broadband connectivity. In contrast to the retrofit process, ultra-fast fibre-to-the-premises connectivity can be easily installed at the point of build, offering homes and businesses 'future-proofed' broadband speeds of over 300mbps.

To prevent areas of market failure and lack of connectivity, national regulation is required to deliver this. However, there is currently little incentive for developers to guarantee such connectivity. Buyers often assume that this infrastructure is included and therefore there is little additional return for a developer that invests in the additional infrastructure from the outset. Latest analysis for Kent new builds show that approximately 40% of new homes are being delivered with sub-superfast broadband connections.

Digital infrastructure will form the bedrock for driving Kent's prosperity and supporting innovation and smart infrastructure to 2050. There is a need to implement stronger incentives and regulations to ensure that new development is taking this new connectivity into account and driving innovation in the provision of digital connectivity.

If broadband connectivity is not installed at the point of build, it is estimated that the costs of retrofitting these new residential properties from 2017-2031 would be:

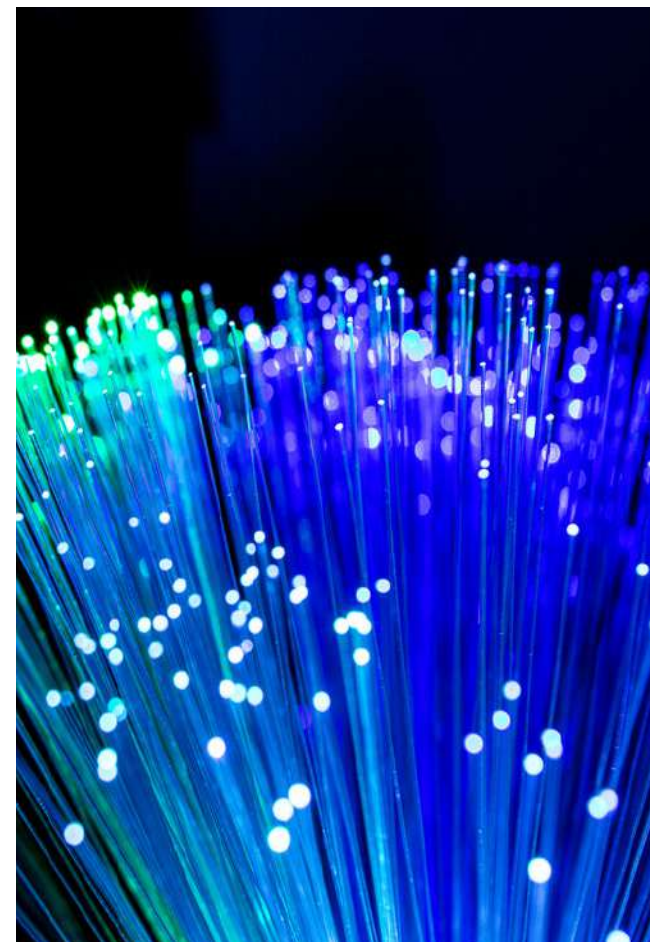
Total Cost = £18,259,000

Total Funding = £0

Secured Funding = £0

Expected Funding = £0

Funding Gap = £18,259,000



WATER AND WASTE WATER

CURRENT SITUATION

The provision of new housing, jobs and associated infrastructure presents challenges to the water environment through the need to provide clean water supplies and to manage increased amounts of waste water. Additional demand needs to be met from the abstraction of existing groundwater or surface water resources, or through the development of new resources. Kent and Medway is already in an area of serious water stress.

KCC commissioned a study - Water for Sustainable Growth (WfSG) - to assess the impact of growth on the water environment and to identify sustainable measures required to manage water environment impacts to 2031. The study aims to support spatial planning decisions, as well as the strategic planning of water service infrastructure in the medium to long term.

HEADLINES

The WfSG study indicates the following current pressures on water and waste water provision:

- Long-term groundwater abstraction pressures from the chalk affecting the Darent Catchment;
- Significant pressure from waste water discharges in the Medway catchment;
- Abstraction and discharge pressures within the Stour and Rother Management Catchments;
- Concerns for investment at the waste water treatment works at Paddock Wood, Tunbridge Wells, Leeds, Edenbridge and Biddenden, and for the phasing of growth within the catchments of these.

Waste water generated by new development needs to be treated and returned to the environment without impacting

the water quality and ecosystems of water bodies. At present, there is no consistent approach to the management of waste water, in particular for waste water treatment, discharge and the planning of environmental capacity within the water environment.

FUTURE REQUIREMENTS

The WfSG study identifies three key drivers that Kent and Medway will have to plan for, to 2031:

1. Water availability: changes in land use, climate change and population growth are all likely to exacerbate water availability and increase the economic impact of water scarcity;
2. Legislative Compliance: water abstraction and waste water discharges can impact the status of water bodies and water-dependent ecological sites;
3. Strategic Planning: early steps can be made in the spatial planning process and planning of water services infrastructure to jointly deliver sustainable solutions.

Without significant investment by 2030/31, all except one Water Resource Zone (WRZ) in Kent and Medway are predicted to have a negative supply and demand balance; largely as a result of increased demand from a growing population, but also climate change effects leading to more extreme weather events.

Figure 5.11 demonstrates the supply and demand balance to 2031, before any measures are included to balance the deficit or surplus of water supply.

There are already significant abstraction pressures on the

water resources in Kent and Medway and the need to provide further resource presents a significant challenge to the water companies.

Medway has carried out an initial assessment of infrastructure needs and produced an Infrastructure Position Statement in 2017. Part of this work examined water supply and waste water treatment. The findings from this work suggest that supply is balanced until 2021-22 and then a deficit will emerge.

The WfSG study sets out recommendations for different stakeholder partners to undertake, in order to address the challenges and demands:

- Water companies operating in Kent and Medway should ensure that population growth is taken into account in the 2019 Water Resource Management Plan updates;
- All Local Planning Authorities should consider adopting the Building Regulations optional standard for water use as the preferred policy target for new development (with respect to water efficiency); and
- Water supply companies should consider enhanced programmes of retrofit of existing properties with water-efficient fixtures and fittings.

Summary of total costs/funding for water and waste water projects (2017-2031)

(These are based on average connection costs for new dwellings plus costs identified by the WfSG study for overcoming locally specific waste water constraints)

Total Cost = £332,600,000

Total Funding = £332,600,000

Secured Funding = £2,320,000

Expected Funding = £330,280,000

Funding Gap = £0

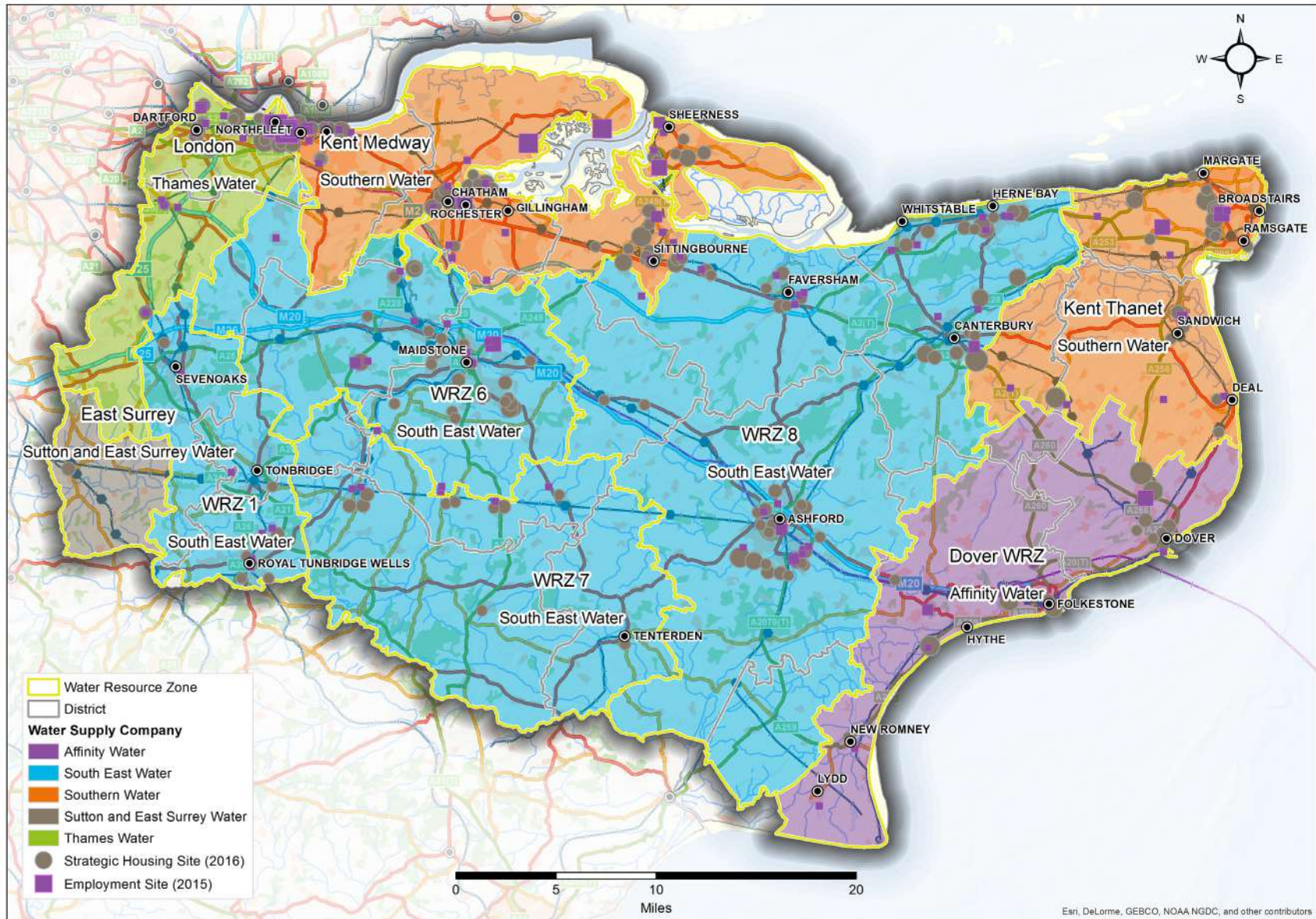


Figure 5.10: Water supply companies in Kent and Medway

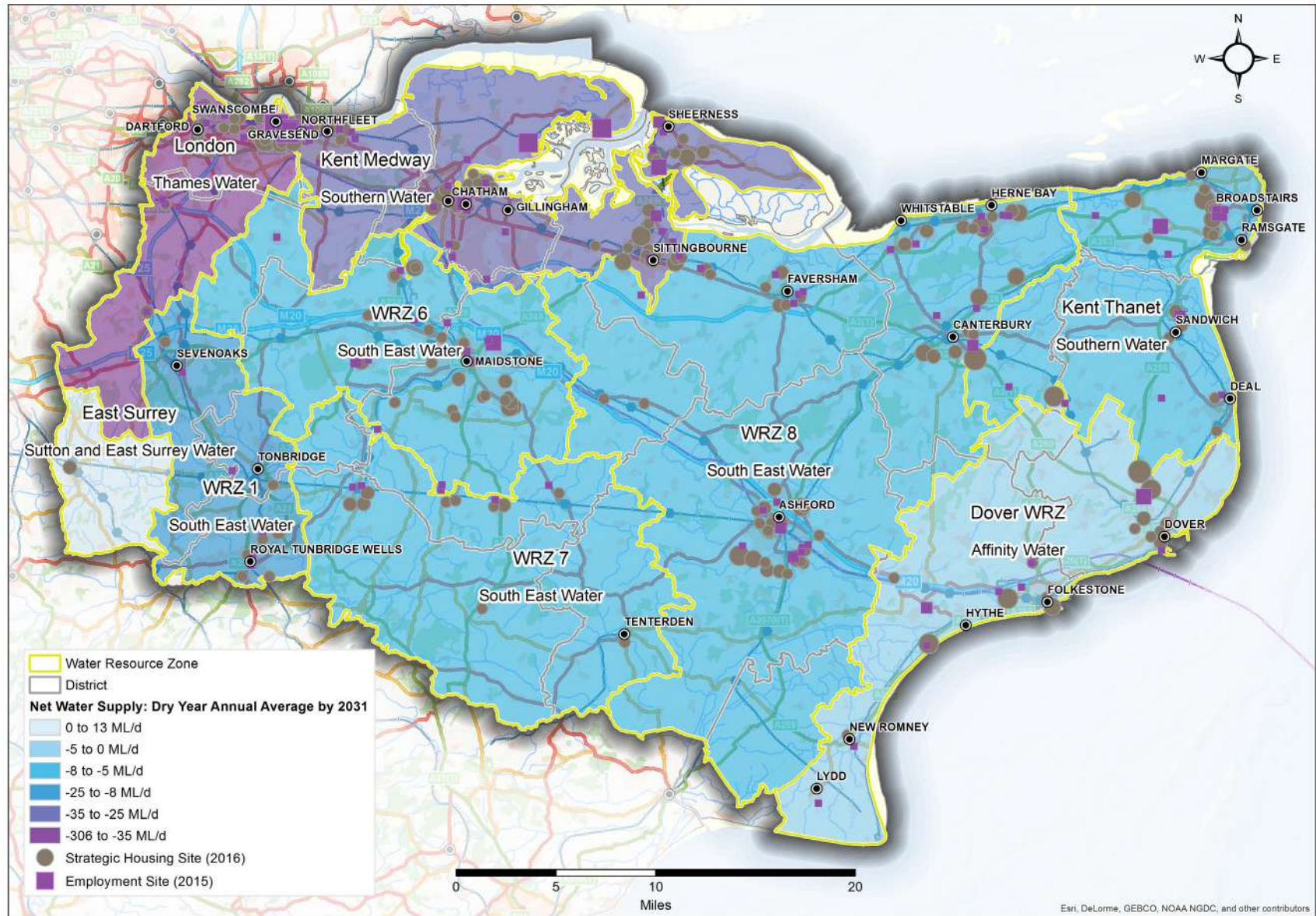


Figure 5.11: Net water supply: Dry year annual average by 2031

HOUSEHOLD WASTE

CURRENT SITUATION

Kent County Council Waste Management operates as the Waste Disposal Authority (WDA). KCC currently provides eighteen household waste recycling centres (HWRC). These sites provide facilities for reuse, recycling and safe disposal for a range of materials delivered by Kent residents.

Co-located at six of these sites are Waste Transfer Stations (WTSs) for the deposit and bulk loading of waste collected by the district/ borough councils. There are also two transfer stations contracted at Allington and Hersden. KCC also manages and maintains nineteen closed landfill sites, to ensure that they comply with environmental standards.

Medway provides three HWRC and has responsibility for the collection, treatment and disposal of municipal waste in Medway. Medway Council must also sustainably plan for the capacity necessary to process other waste streams in the area, including commercial and industrial waste, construction, demolition, excavation waste and hazardous waste.

HEADLINES - KEY FACTORS AFFECTING DELIVERY

- Waste growth - as housing growth and population increases, there will be a rise in waste volume. Projections suggest an increase of 20% in household waste by 2031.
- Market provision - the waste collection and disposal service is becoming more commercially volatile.
- Legislation and performance targets - waste services are currently influenced primarily by legislation, targets and re-

quirements that are passed down from the European Union and transposed into national law, policies, and strategies. The future of waste legislation performance targets will be part of Brexit. Existing EU recycling targets will continue to apply once the UK has left the EU. The Government may consult on changes to regulatory frameworks in the future.

Whilst Kent currently achieves self-sufficiency for each of the waste streams, new facilities will need to be developed for each stream if it is to remain net self-sufficient throughout the Minerals and Waste plan period to 2030.

ACTIVITY SINCE LAST YEAR

- The redevelopment of Sittingbourne Waste Transfer Station, including the introduction of a food waste compactor and a second weighbridge and new site offices.
- Lowering of the carriageway under Gas Road Bridge on the approach to Sittingbourne Household Waste Recycling Centre (HWRC) and Waste Transfer Station (WTS) to allow for the entry of haulage vehicles servicing the facility.
- Re-engineering of the river embankment along Richborough closed landfill site.
- Upgraded maintenance to the gas control system at Cryalls Lane closed landfill site.

KEY DELIVERABLES FOR THE NEXT FIVE YEARS

Alongside municipal waste, Medway Council must also sustainably plan for the capacity necessary to process other waste streams in the area, including: commercial and industrial waste, construction, demolition and excavation waste and hazardous waste. At present the service has not identified any capacity is-

ues or infrastructure improvements are needed other than routine maintenance in the short term. However, in the long term, waste services will review the capacity of HWRC sites to cope with the potential increased demand resulting from development.

KCC Waste Management is in the process of undertaking a Household Waste Recycling Centre and Waste Transfer Station Infrastructure Review, to determine the requirement of sites to ensure strategic location and capacity (based on waste growth) in a phased approach at 2020, 2025, and 2030.

Consideration will need to be given to retaining the eighteen Household Waste Recycling Centres and six Waste Transfer Stations, as well as increasing Waste Transfer Station provision in East and West Kent, and increasing Household Waste Recycling Centre provision in West Kent.

The key infrastructure projects for 2017/18 are:

- Tunbridge Wells (North Farm) Household Waste Recycling Centre (HWRC) and Waste Transfer Station (WTS) – permanent repair to the WTS following fire damage in 2016 and upgrades to infrastructure including building/ site drainage and replacement of the concrete base used for waste handling and storage;
- Re-engineering and repair works to the Gas Control and Ground Water protection systems at Cryalls Lane closed landfill site;
- Works to upgrade the environmental performance of the leachate treatment plant at Sturry Road (Canterbury), a closed landfill site.

FUTURE REQUIREMENTS

- Based on household numbers alone, the tonnage accepted at every Waste Transfer Station is predicted to increase by 2030.
- The contract with Kent Enviropower Limited for the Allington Waste for Energy contract runs until 2030, meaning that there is provision for the recovery of energy from waste until the end of the GIF period.
- KCC Waste Management will undertake a review of provision of onwards waste disposal infrastructure for household waste in 2018/19.
- Lack of investment or recycling infrastructure in parts of Mid Kent and all of East Kent results in high haulage costs and highway network congestion. In these regions of Kent, there is a need for materials recycling facilities, food processing and composting facilities.
- Environmental permitting changes have added pressure to new construction and existing infrastructure.
- The UK has to find different markets or ways to deal with waste, either through increasing recycling or by sending more waste to energy recovery in the UK.



Figure 5.12: KCC and Local Authority Waste Recycling Centres

Summary of total costs/funding for household waste projects and mineral and waste projects (2017-2031)

Total Cost = £252,900,000

Total Funding = £238,125,000

Secured Funding = £0

Expected Funding = £238,125,000

Funding Gap = £14,775,000