



# 4.6 UTILITIES

## ENERGY



### ELECTRICITY

There are three electricity operators within Kent. Electricity is transmitted through the National grid. The Electricity distribution company is UK Power Networks (UKPN) and the Electricity Distribution Network is South East Distribution Network (SEPN). Due to the lack of information available from utility providers, AECOM are not able to provide the current capacity through the county.

### HEADLINES

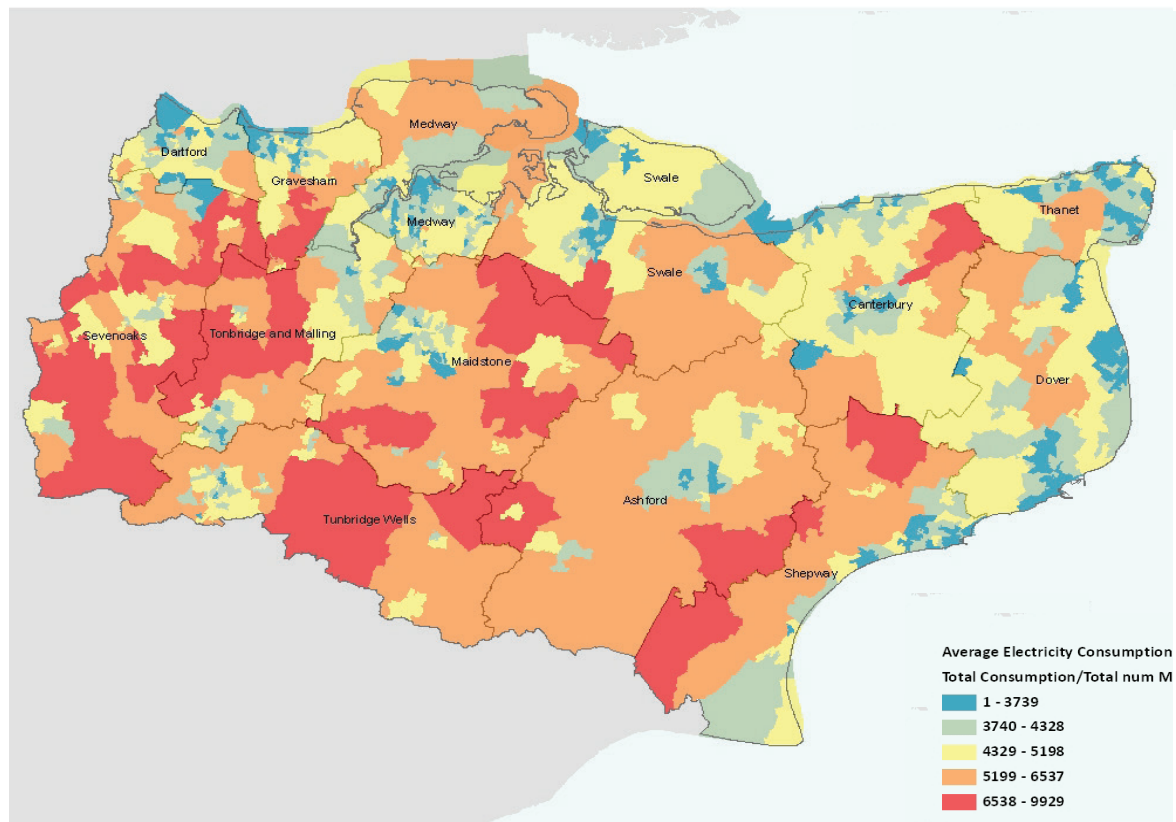
There are 2,308,609 SEPN customers in the South East of England including Kent and Medway.

Electricity is transmitted through a national network of electricity lines operating at 275 kv and 400kv before connecting to local networks owned by distribution companies

<b>Kent and Medway</b>	<b>Kent and Medway</b>	<b>Kent and Medway</b>
<b>92%</b>	<b>3,672MW</b>	<b>175MW</b>
of customers are domestic, with 8% on commercial premises	estimated power consumption for SEPN area	Pro-rata consumption for Kent

Figure 4.14 Kent & Medway

## Existing Domestic Electricity Consumption



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### KEY SHORT TERM ELECTRICITY INVESTMENT PLANNED FOR KENT AND MEDWAY:

The Long Term Development Statement for the South East (SEPN):

- Demand modelled on an annual basis on 'natural growth' in energy demand
- Estimates future loads within the network and identifies future requirements
- Focuses on growth to 2023, but not beyond
- Indicative planning and construction timeframes of local distribution to take up to 2 years for the larger Kent developments

### FUNDING OF ENERGY FOR NEW HOMES

Distributor companies are not allowed to use revenues from existing customers to pay for infrastructure and serve new development; therefore it is usual for Developers to pay for the necessary new or upgraded infrastructure.

Where this infrastructure is used solely to supply a specific development, the developer will usually pay the whole cost, whereas if a development triggers the need for a piece of infrastructure which is required to serve an area larger than just the development, the developer will be expected to pay a fair proportion of the cost of provision, with the remainder funded by subsequent developments or the distributor company.

Table 4.12 Kent & Medway

### UKPN Long Term Development Strategy (fully funded)

DISTRICT	UKPN AREA	PLANNED SPEND ON REINFORCEMENTS & ASSET REPLACEMENTS BY 2023
Ashford	Canterbury Sellindge	£15,350,000
Canterbury	Canterbury Sellindge	£26,120,000
Dartford	Dartford	£43,660,000
Dover	Canterbury Sellindge	£7,850,000
Gravesham	Northfleet	£8,430,000
Maidstone	Canterbury Sellindge	£1,160,000
Medway	Kingsnorth	£6,810,000
Sevenoaks	Northfleet	£7,020,000
Shepway	Canterbury Sellindge	£9,520,000
Swale	Kemsley	£11,740,000
Thanet	Canterbury Sellindge	£8,870,000
Tonbridge & Malling	Northfleet	£3,140,000
Tunbridge Wells	Northfleet	£4,950,000
<b>Kent &amp; Medway</b>		<b>£154,630,000</b>

SOURCE: UKPN RII0-ED1 VERSION 1.5, 2014

### RENEWABLE ENERGY

Kent is committed to reducing greenhouse gas emissions by 24% by 2020 and 60% by 2030. 10% reduction in carbon emissions through renewable energy is deliverable in Kent by 2020

#### HEADLINES

Kent and Medway

**57%**

of renewable energy generated by energy from waste in Maidstone

Kent and Medway

**15%**

of renewable energy generated by the Shepway Wind Farm

Kent and Medway

**54**

locations supply or are capable of supplying electricity back to the grid

Kent and Medway currently generate over 640 GWh of renewable energy annually, with power production ranging from 1.0MW to 390MW. There are currently 6 types of renewable energy operating within Kent: PV, Biogas, Biomass, Landfill Gas, CHP and Wind. Nine of the Kent and Medway authorities operate biomass schemes (mostly small scale).

In the context of planned growth across Kent, additional low carbon and renewable energy infrastructure, along with increased uptake of energy demand reduction initiatives, will be needed if the county is to play a proportionally representative role in meeting the UK's carbon reduction target and renewable energy generation target of 15% by 2020.

The Renewable Energy Kent Action Plan (2012) sets out opportunities and actions for delivering low carbon and renewable energy infrastructure in order to meet the priorities set out in the Kent's Environment Strategy.

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## **GAS SUPPLY**

There are three gas operators within Kent. Gas is transmitted through a National Transmission System (NTS), in which it is then supplied to towns and villages through Local Distribution Zones (LDZ). The Gas Distribution Network Operator for Kent is Scotia Gas Networks (SGN).

### **HEADLINES**

#### **National Transmission System:**

- Up to 20% of UK gas enters the National Grid via the LNG terminal at Grain.
- SGN has a duty to extend or improve the NTS, where necessary, to ensure an adequate and effective network for the transportation of gas. No specific upgrades have been identified within the county but future works may be required to respond to the wider demand for gas.

#### **Local Distribution Zone:**

- Installation of infrastructure on a speculative basis to serve potential development areas is not supported by regulator OFGEM.
- Reinforcement projects for the LDZs are planned for on a reactive basis, Network reinforcement is determined on an application by application basis when new loads connect to the network, rather than planned for in advance.
- Agreements need to be reached with developers prior to investment in new infrastructure being made.
- It cannot be assumed that the existing network has sufficient capacity to supply all proposed development proposals across Kent. It can however be assumed that the necessary capacity will be developed on a reactive basis by the gas Distribution Network Operator.
- Not possible for the G&I Framework to determine reinforcement costs at this time.

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## **FUTURE REQUIREMENTS FOR ENERGY**

UKPN strategic Investments to 2023 have been taken into account but no strategic Gas Network investment data has been made available to this study.

AECOM are considering the whole cost of utilities and have therefore also considered the cost of connecting the planned housing and employment sites to the existing network.

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### **COST OF CONNECTING THE GROWTH SITES**

AECOM have undertaken development based utility costings to establish the potential scale of cost associated with connecting the proposed housing and key employment sites to the existing energy network.

Per dwelling and commercial floorspace benchmark energy connection costs have been applied to the growth forecasts and based on these assumptions, AECOM estimates the following costs associated with energy provision to support growth across Kent and Medway to 2031

**Cost = £433,010,000**

**Secured Funding = £157,130,000**

**Expected Funding = £275,880,000**

**Funding Gap = £0**

It is assumed that these costs will be borne by the developer and service providers.

Costing caveats apply to all AECOM estimates presented within this document. See Costing assumptions at end of document

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## BROADBAND



Kent

95%

Of properties to have  
Superfast Broadband  
by end of 2017

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### CURRENT SITUATION

Broadband Delivery UK (BDUK) have set 95% provision of superfast broadband to all UK premises, including universal access to basic broadband. Within Kent and Medway this should be provided by the end of 2017.

### BROADBAND DELIVERY UK (BDUK) - SUPERFAST BROADBAND PROGRAMME

- The ambition is to provide superfast broadband (speeds of 24Mbps or more) for at least 95% of UK premises and universal access to basic broadband (speeds of at least 2Mbps).
- This work is focusing on those areas which commercial infrastructure providers have deemed either too expensive or difficult to serve under their own investment programmes

The programme is being delivered in three phases:

- Phase 1 aims to provide superfast broadband to 90% of premises in the UK
- Phase 2 will seek to further extend coverage to 95% of the UK
- Phase 3 will test options to roll out superfast broadband beyond 95%.

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### BDUK IN KENT AND MEDWAY

#### Broadband Delivery UK (BDUK) Phase 1 programme:

- Provide superfast broadband to 91% of premises in Kent and Medway by the end of 2015
- Over £20 million Government and KCC Funding

#### Broadband Delivery UK (BDUK) Phase 2 programme:

- Provide superfast broadband to 95% of premises in Kent & Medway by the end of 2017
- An additional £11.2 million of KCC and Government funding to support project.

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### REACHING THE REMAINING 5% OF PROPERTIES THAT DO NOT HAVE BROADBAND

- BDUK is leading 6 small scale field trials across the UK of new technological approaches for delivering superfast broadband services in the 'final 5% areas'.
- We understand the findings of this work will be used by BDUK to inform the development of a new national programme for the 'final 5% areas'.
- It is anticipated that this programme will focus on alternative technologies in recognition of the challenges of deploying wired solutions in hard to reach areas.

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### COST OF CONNECTING THE GROWTH SITES

Per dwelling and commercial floorspace benchmark communication connection costs have been applied to the growth forecasts and based on these assumptions, AECOM estimates the following costs associated with broadband provision to support growth across Kent and Medway to 2031:

**Cost = £214,360,000**

**Secured Funding\* = £32,660,000**

**Expected Funding\*\* = £81,700,000**

**Funding Gap = £100,000,000**

\*Secured funding figure refers to public funding only

\*\* Expected funding from developers/infrastructure providers

The identified funding gap for superfast broadband connection is estimated on the assumption that not all developers will provide the necessary connectivity to new development and there will be requirement for publicly funded retrofit.

# WATER & WASTE WATER



## CURRENT SITUATION

There are currently five water supply and waste water companies operating in Kent. These are Affinity Water, South East Water, Southern Water, Sutton and East Surrey Water and Thames Water. The distribution of water companies across Local Authority area is shown in Table 4.13. Southern Water are the waste water authority for most of Kent with the exception of Dartford and Sevenoaks which is also covered by Thames Water.

Table 4.13 Kent & Medway

### Water Supply and Waste Providers

	AW	SW	SEW	TW	SESW
Ashford		WW	W		
Canterbury		WWW	W		
Dartford		WW	W	WWW	
Dover	W	WWW			
Gravesham		WW	W		
Maidstone		WW	W		
Medway		WWW			
Sevenoaks		WW	W	WWW	W
Shepway	W	WWW			
Swale		WW	W		
Thanet		WWW	W		
Tonbridge+Malling		WW	W		
Tunbridge Wells		WW	W		

AW - AFFINITY WATER / SW - SOUTHERN WATER

SEW - SOUTH EAST WATER / TW - THAMES WATER

SESW - SUTTON & EAST SURREY WATER

W - WATER SUPPLY / WW - WASTE WATER / WWW - WATER SUPPLY & WASTE

## HEADLINES

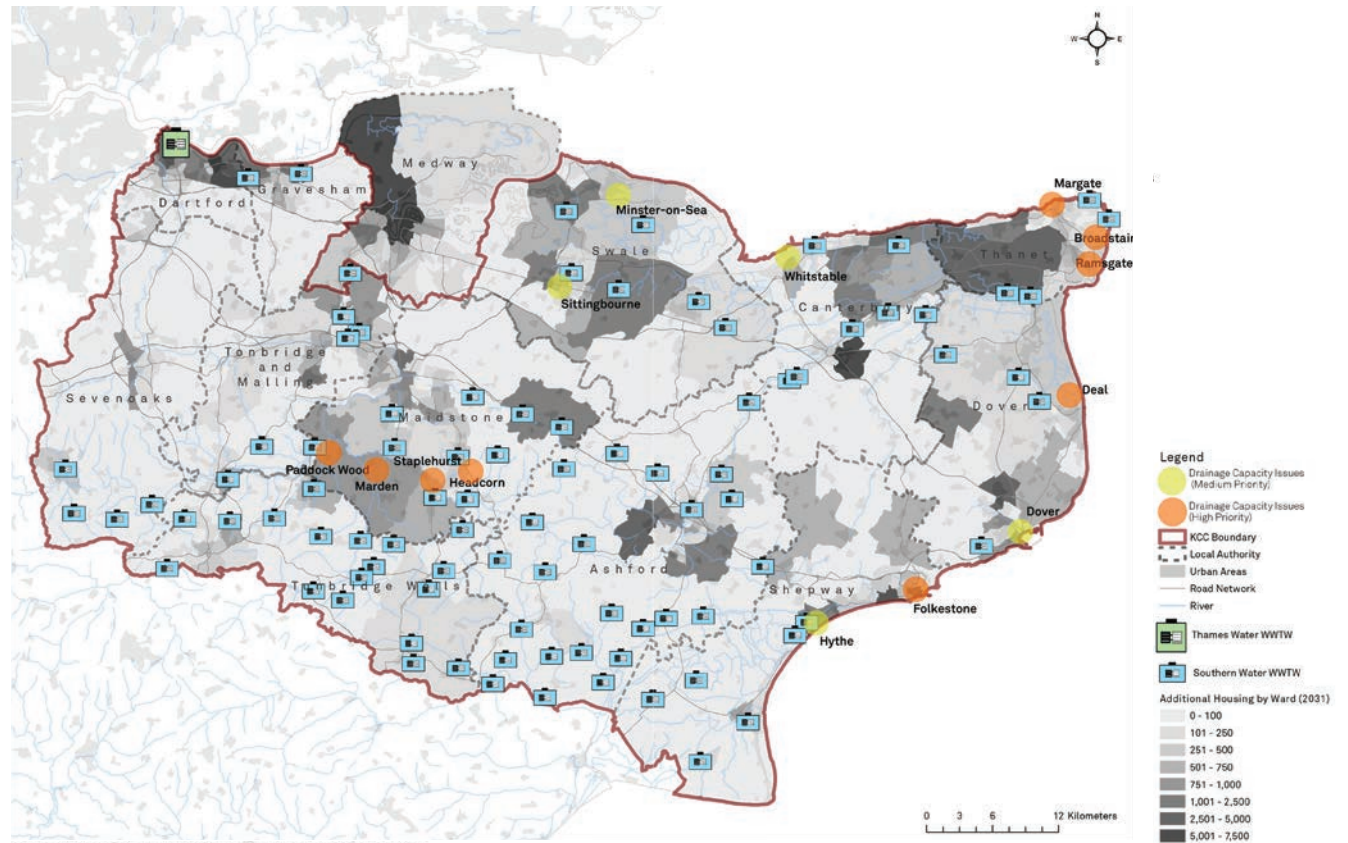
### Water and waste water capacity

- The existing supply infrastructure serving the county is should meet demand up to 2035, however increasing pressures in the longer term is likely to require strategic interventions
- There is a significant deficit in the London area driven largely by a combination of population growth and the impact of climate change (Affecting Thames Water – therefore Sevenoaks and Dartford)

- Water Cycle Studies are in place in Ashford, Dartford, Dover, Gravesham, Maidstone and Shepway.
- There are 93 waste water treatment plants across local authorities in Kent as shown in the figure 14.5.
- Limited capacity within existing drainage infrastructure (be it surface water or combined systems) in some urban areas as illustrated on figure 4.14 as high and medium priority areas.

Figure 4.15 Kent County

## Water Treatment & Drainage against Housing Growth



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## INFRASTRUCTURE REQUIRED TO SUPPORT GROWTH

### Water Supply - Water Resource Management Plans

All five water companies have prepared Water Resource Management Plans (WRMPs) for 2015 to 2040. These are updated every five years with the current review completed in 2014. These seek to accommodate the potential increase in demand from new development, manage the existing supply of water and take account of likely future changes due to climate change.

Key actions to 2031 as highlighted in each plan are shown in Table 4.14..

### Waste Water - Water Treatment Plans to support growth

Examples of planned improvements to treatment works in order to facilitate growth have been identified below and show the planned upgrade requirements as follows:

#### Ashford – Ashford waste water treatment works (Southern Water)

- £12.6m investment to modify the process units to support population to 2020.

#### Dartford - Long Reach sewage treatment work (Thames Water)

- Extension of the existing Activated Sludge Plant, additional Final Settlement Tanks; Modifications to Return Activated Sludge and Surplus Activated Sludge pumping; Additional blowers and ancillaries.

#### Gravesham - Northfleet sewage treatment works (Southern Water)

- Possible re-siting depending on exact growth in area. 2009 Cost estimates range from £7.8m for like for like replacement to £34.5m for 50% growth and tighter consents.

#### Gravesham - Gravesend sewage treatment works (Southern Water)

- Capacity for future new development will be required and will be progressed through the current Periodic Review process.

Table 4.14 Kent & Medway

### Water Supply Provider Plans

PROVIDER	INFRASTRUCTURE INVESTMENT PLANNED	TIME FRAME
Affinity Water	Reductions in network leakage	2015-2020
	Universal metering programme;	2015-2020
	Implementation of water efficiency	2015-2020
	Increased water abstraction;	2015-2020
	Increase in bulk transfer of water.	2015-2020
South East Water	Developing groundwater source at Maytham Farm	2015-2020
	Developing a water re-use scheme at Aylesford (37.5 ML/d)	2020-2030
	Building a new reservoir at Broad Oak (13.5 ML/d)	2030-2035
	Developing six water transfer schemes to share water with adjoining areas	2020-2040
	Creation of 3 new WRZ transfers.	-
Southern Water	Additional leakage reduction required over the planning period.	-
	Water reuse scheme to commence	2027-2028
	Two desalination schemes	2027-2028
Sutton & East Surrey Water	Selective Metering across East Sutton & Surrey	2015-2020
	Increase Water Treatment Works capacity	2021-2030
	Leakage reduction measures	2015-2020
Thames Water	Commencement of 'full' metering programmes to households (70% of households by 2025)	2015-2020
	New groundwater schemes providing additional water supply	2015-2020
	Promotion of water efficiency	2015-2020
	Rollout innovative tariffs to promote water efficiency	2020 +
	Further development of small groundwater schemes	2020 +
	Larger scale projects to secure long-term resilience including 150 ML/d wastewater re-use scheme	2020 +

### Key Issues / Recommendations

- Service providers conclude there are no key issues regarding water supply for the proposed growth to 2030 in Kent, however it will be important that local authorities are involved in updating local plans.
- Further modelling work is being undertaken across the south east to determine cumulative pressures on water resources and to identify strategic options for longer term water management plans.
- Opportunities for sharing existing and new water resources across resource zones.
- Options being considered for a potential regional water resource strategy.
- Wastewater network and treatment capacities cannot be confirmed past the current AMP6 period (2015-2020).
- Further discussions required with Thames Water, Southern Water and OFWAT - Essential to provide certainty on development outside existing sewer networks and agree future capacity requirements.
- Waste Water capacity issues highlighted for Maidstone by recent Halcrow /Amey study.

### COST OF CONNECTING THE GROWTH SITES

Per dwelling and commercial floorspace benchmark water supply and waste connection costs have been applied to the growth forecasts and based on these assumptions, AECOM estimates the following costs associated with provision to support growth across Kent and Medway to 2031:

**Cost = £410,710,000**

**Secured Funding = £2,520,000**

**Expected Funding = £408,190,000**

**Funding Gap = £0**

These costs are assumed funded by the developer and service providers.

## WASTE



Kent and Medway

**229**

Waste treatment sites across Kent (Exc waste water treatment sites)

Kent and Medway

**21**

Household waste facilities operated by Kent County Council & Medway Council

### CURRENT SITUATION

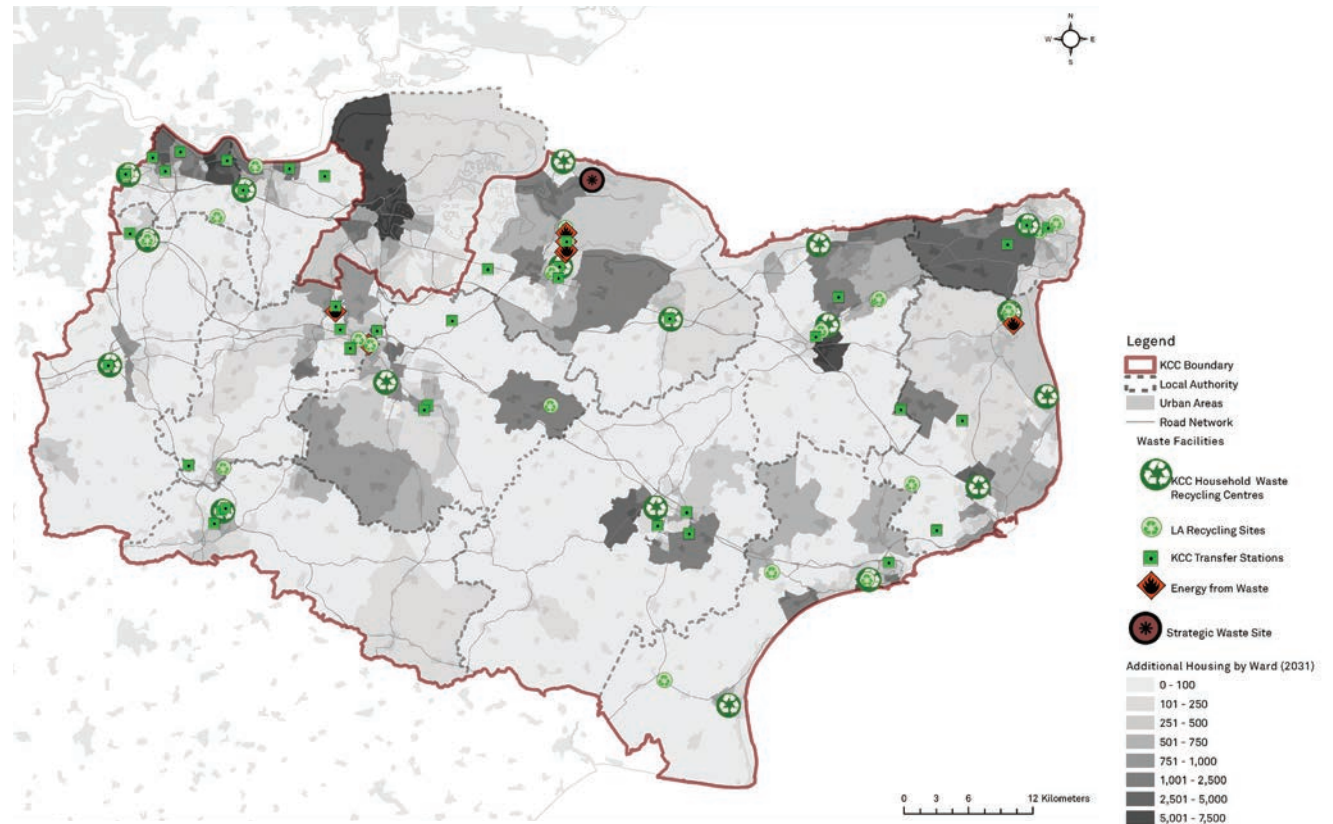
Kent currently achieves self-sufficiency in waste management, with some spare capacity, such as Allington EfW and Sittingbourne recycling facility which import waste, including from London. This is not however the case in Medway. To 2031 there will be no capacity issue for recycling and non-hazardous waste, but general waste capacity is nearing its limit.

### HEADLINES

- 450KG of waste generation in Kent per person per year
- 229 waste treatment sites across Kent (Council & Commercial) (excluding waste water treatment sites).
- 18 household waste facilities operated by Kent County Council and 3 operated by Medway Council
- 6 waste transfer stations operated by Kent County Council
- Allington EfW facility is a large scale Energy from Waste Plant
- 540,900 tonnes of waste collected by Kent District Councils in 2014/15
- 172,000 tonnes of waste collected by Kent Household Waste Recycling Centres in 2014/15
- 40.7% of Kent County municipal waste was converted to energy in 2014/15
- 48.4% of Kent County municipal waste was recycled and composted in 2014/15. 70.5% of waste is recycled and composted at household waste recycling centres.

Figure 4.16 Kent County

## Waste Capacity against Housing Growth



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Table 4.15 Kent & Medway

**Existing KCC & Medway Waste Sites**

	HOUSEHOLD WASTE RECYCLING CENTRE	WASTE TRANSFER STATIONS
Ashford	1	1
Canterbury	2	
Dartford	2	1
Dover	3	1
Gravesham		
Maidstone	1	
Sevenoaks	2	1
Shepway	2	
Swale	3	1
Thanet	1	
Tonbridge & Malling		
Tunbridge Wells	1	1
<b>KENT</b>	<b>18</b>	<b>6</b>
Medway	3	
<b>KENT &amp; MEDWAY</b>	<b>21</b>	<b>7</b>

Waste facilities are well distributed across the County including areas forecast for major growth, with a significant concentration of waste-to-energy facilities in Maidstone and Swale.

**KEY CAPACITY POINTS:**

- Kent achieves Net Self Sufficiency in Waste Management
- Allington EfW facility and the Sittingbourne recycling facility have spare capacity which is used by waste imported to Kent
- Construction waste comes into the county from London for disposal in inert landfill sites.
- Waste Capacity across KCC is at its limits currently
- Dartford, Gravesham and Ashford currently experiencing greatest pressure on HWRC capacity

- Medway is shortly to undertake a review of its Municipal Waste Strategy and it is anticipated that this will flag up a number of capacity/provision issues

**SHORT /MEDIUM TERM PROPOSALS IN THE MINERALS WASTE LOCAL PLAN:**

**Strategic Sites for Waste**

- Isle of Sheppey - Proposed extension areas for Norwood Quarry and Landfill Site

**Household Waste Recycling Centres (HWRC)**

KCC is currently reviewing its portfolio of HWRCs with a view to consolidate and potentially provide fewer, better sites. No finalised plans are available at this point.

The Local Plan Policy CSW 7 (Minerals and Waste Local Plan 2013-20) presents the following analysis of potential sites for waste.

**Replacement of HWRCs at:**

- Folkestone - Shornecliff HWRC
- Dartford - Dartford Heath HWRC
- Swale (Sittingbourne) - Church Marshes HWRC and waste transfer station
- Sevenoaks - Dunbrik HWRC and waste transfer station

**New Facilities at:**

- Tonbridge and Malling – Site not defined as yet.
- Maidstone – Additional Site required – Site not defined as yet.

**FUTURE REQUIREMENTS IN CAPACITY**

Local Plan Policy CSW 8 (Minerals and Waste Local Plan 2013-20) presents the identified need for additional Waste management Capacity as follows:

- New Facilities for Recovery: **3 to 4 additional Energy from Waste facilities** by 2031 (Up to 140,000 tonnes per annum recovery capacity for each facility) (Designed and constructed to operate as recovery processes producing or capable of producing both heat and power).
- New Facilities for Composting: **3 additional composting facilities** by 2031 (Approximately 20,000 tonnes per annum treatment capacity for each facility, Green and Kitchen Waste)

Based upon the facilities set out as required within the Kent Minerals and Waste Local Plan, AECOM have provided cost estimates for facilities of the capacity required above. These result in the the following cost and funding estimates:

**Cost = £333,110,000**  
**Secured Funding = £10,000**  
**Expected Funding = £249,430,000**  
**Funding Gap = £80,670,000**