

Capabilities on project:
Building Engineering - Sustainability

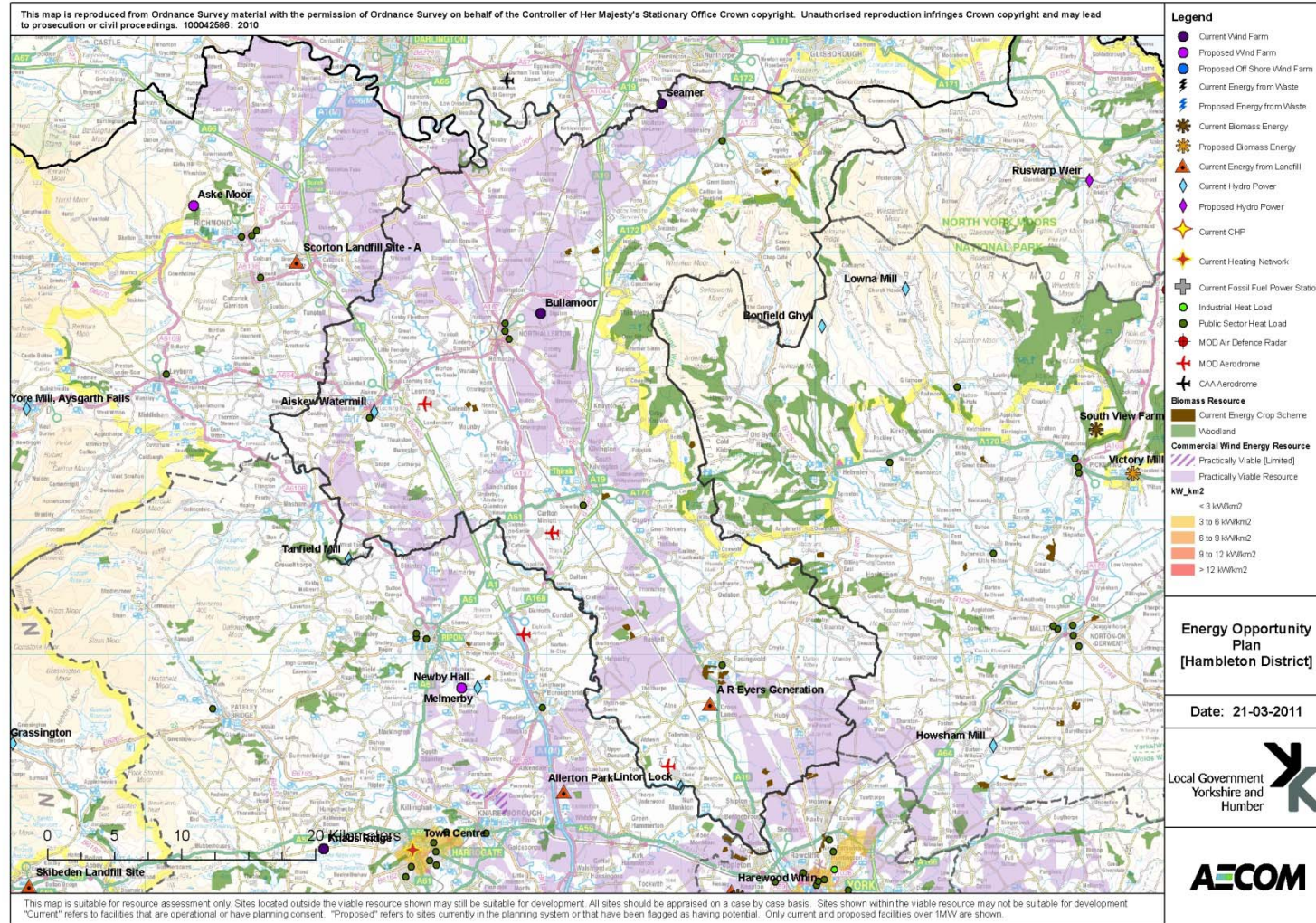


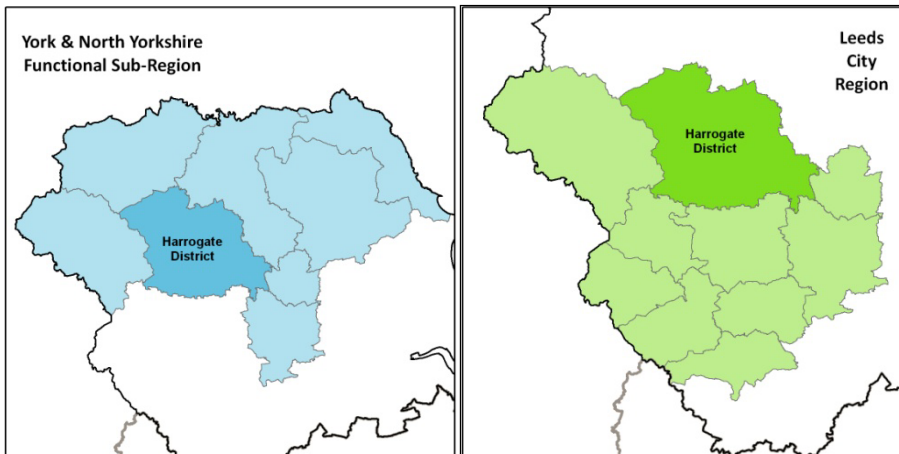
Figure 73 Energy opportunities plan for Hambleton. "Current" refers to facilities that are operational or have planning consent. "Proposed" refers to facilities currently in the planning system or sites that have been flagged as having potential. Only current and proposed facilities over 1MW are shown. The areas with purple hatched shading described as "Practically viable [Limited]" represent areas where commercial scale wind energy development should be viable but the number of turbines may be restricted due to environmental constraints. Please refer to section 5.15 and appendix A for more details.

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B.8 Harrogate

Population: 160,500

Land area (km²): 1,308



The district of Harrogate is located in both the York and North Yorkshire and the Leeds City sub-regions. It is primarily rural with three main settlements: Harrogate Town, Knaresborough and Ripon and at least 120 smaller settlements including several small market towns.

Harrogate town centre has sufficient heat density to support district heating networks and one is already in place, connecting the municipal offices, Turkish baths, tourist information centre, Royal Hall, Hall M, Queen's suite, Springfield House, Harrogate International Centre, Hall D and the International Hotel. The system is currently at capacity however nearby potential opportunities for expansion have been identified, although these have not been examined in detail and are subject to agreement and major changes to the existing system design. The Energy Opportunities Plan shows that there are several public buildings with significant heat loads which could potentially form part of an expanded heat network.

Wind and biomass are two other main opportunities in Harrogate district, with significant potential for commercial scale wind energy in the east of the district. The only commercial scale wind installation at present is the Knabs Ridge Wind Farm, which consists of eight 2 MW wind turbines (i.e. total installed capacity of 16MW). A scoping study is currently being undertaken into the possibility of installing eight 2 MW turbines at Melmerby (north of Ripon). There is a small (0.08 MW) hydro scheme in operation at Newby Hall.

A planning application for an energy from waste facility at Allerton Park is expected to be submitted to the County Council in Spring 2011, to deal with the waste in North Yorkshire. About 256,000 tonnes of MSW and C&I will be incinerated to generate electricity and around 38,000 tonnes of waste will be treated in an anaerobic digester to generate electricity. It is not known if waste heat from the plant will be used to serve the energy demands of nearby buildings through a heating network.

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Harrogate	Current capacity (MW)	Current capacity (GWh)	Potential resource - heat (MW)	Potential resource - electricity (MW)	Potential resource (GWh)	Potential resource (No of existing homes equivalent energy demand)	Potential resource (Proportion of regional resource)
Commercial wind	16	42	0	126	331	0	0%
Small scale wind	0	0	0	1	1	0	4%
Hydro	0	0	0	1	3	0	0%
Solar PV	0	0	0	4	3	0	0%
Solar thermal	0	0	8	0	5	500	2%
Air source heat pumps	0	0	9	0	15	617	4%
Ground source heat pumps	0	0	3	0	5	188	2%
Biomass energy crops	0	0	31	17	257	2077	6%
Biomass woodfuel	1	2	10	0	26	666	3%
Biomass agricultural arisings (straw)	0	0	9	5	72	612	3%
Biomass waste wood	0	0	1	0	5	39	1%
Energy from waste wet	0	0	4	3	35	264	4%
Energy from waste poultry litter	0	0	0	2	12	0	0%
Energy from waste MSW	0	0	2	1	16	132	2%
Energy from waste C&I	0	0	4	2	35	298	3%
Energy from waste landfill gas	1	5	0	0	0	0	0%
Energy from waste sewage gas	0	0	0	0	2	0	0%
Total	19	51	123	163	1,007	8,204	

Table 59 Current capacity and renewable energy resource in Harrogate. Currentⁿ refers to facilities that are operational or have planning consent

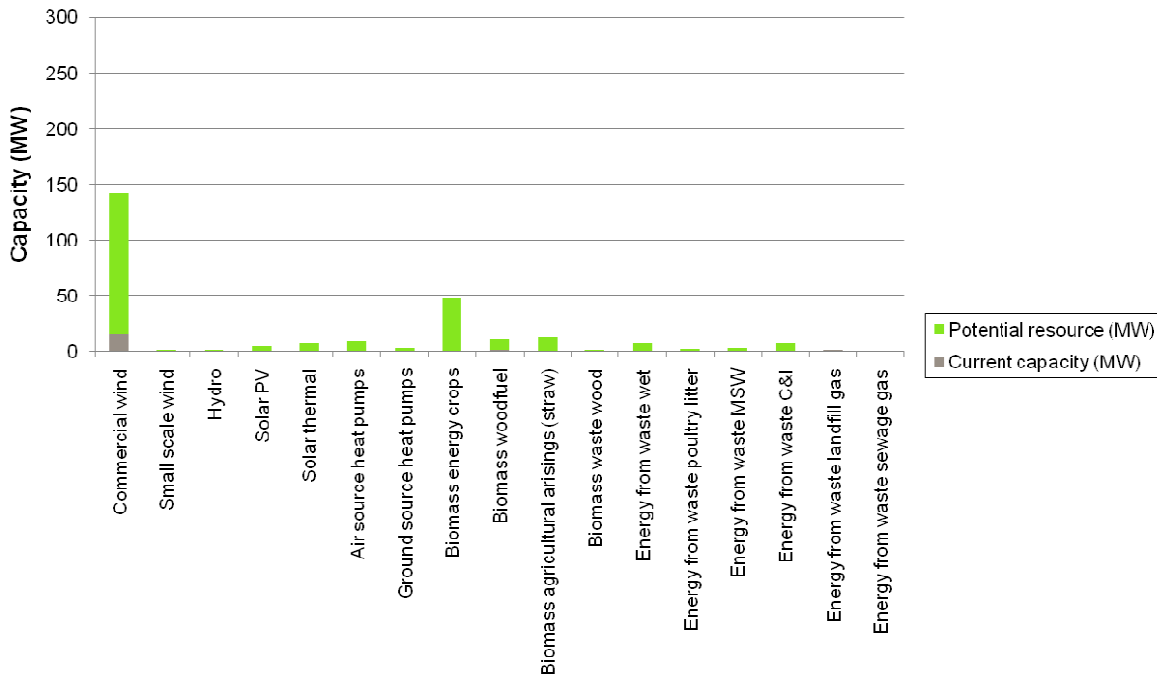


Figure 74 Current capacity and renewable energy resource in Harrogate. Currentⁿ refers to facilities that are operational or have planning consent

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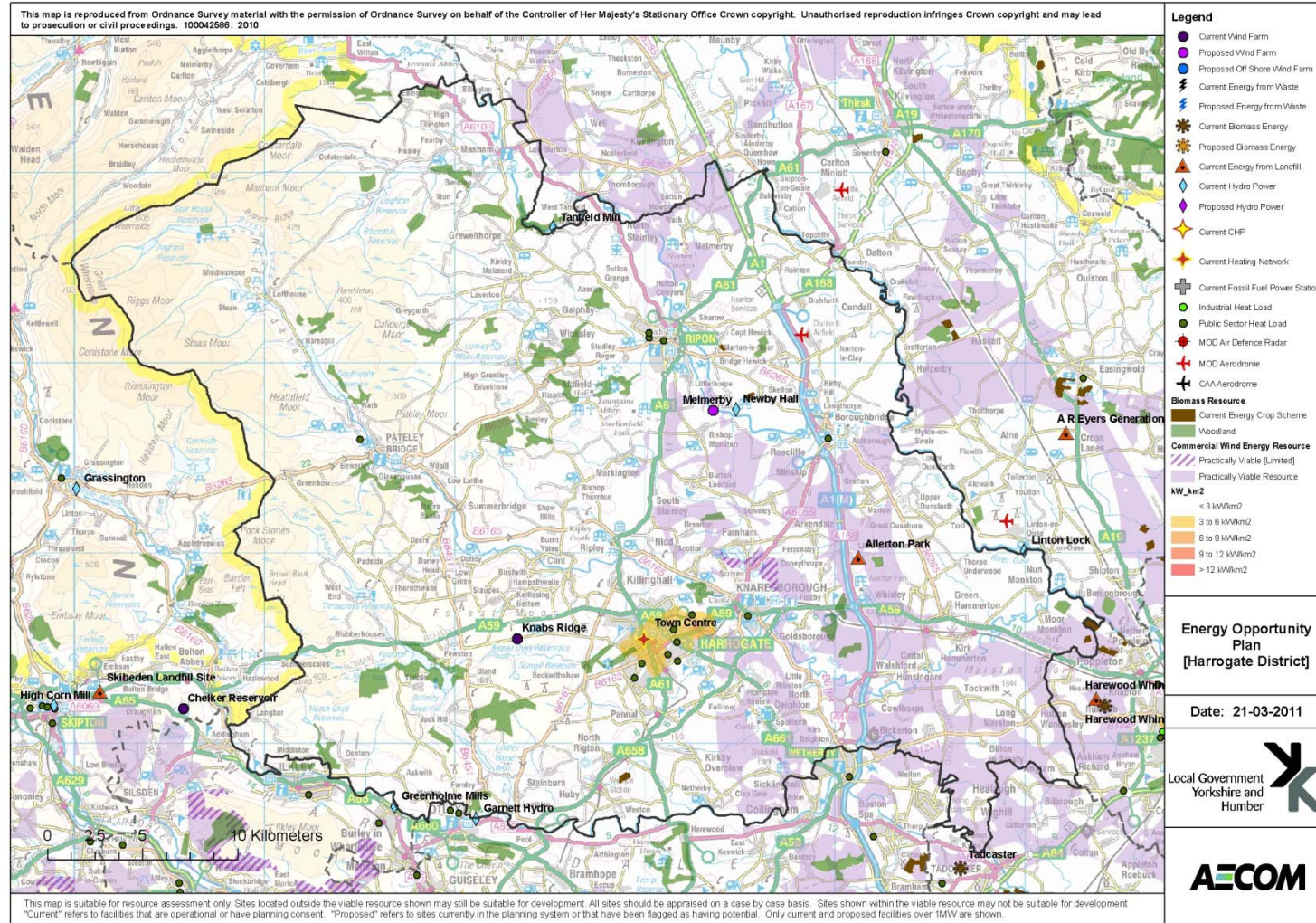


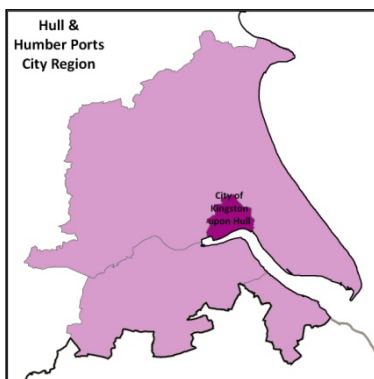
Figure 75 Energy opportunities plan for Harrogate. "Current" refers to facilities that are operational or have planning consent. "Proposed" refers to facilities currently in the planning system or sites that have been flagged as having potential. Only current and proposed facilities over 1MW are shown. The areas with purple hatched shading described as "Practically viable [Limited]" represent areas where commercial scale wind energy development should be viable but the number of turbines may be restricted due to environmental constraints. Please refer to section 5.15 and appendix A for more details.

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B.9 Kingston upon Hull, City of

Population: 258,700

Land area (km²): 71



The city of Kingston-upon-Hull (Hull) is a relatively small local authority with little undeveloped land. The opportunities for renewable energy generation are generally limited to its significant potential for district heating with CHP. As the Energy Opportunities Plan shows, Hull already has communal heating networks serving the Boothferry flats and Melville Street flats and a number of Council owned properties located nearby areas with high heat densities. Therefore, the Council might consider initiating new networks or expansion of the existing heat networks – becoming leaders and catalysts for low carbon energy in the process.

Given the built up nature of the district, using the building stock for microgeneration technologies would be another way for the council to champion renewable energy. For example, installing solar PV on Council housing stock would increase the energy performance of those properties, contribute towards local energy and carbon targets and allow the Council to take advantage of the feed-in tariff, which could potentially make it a profitable venture. Larger scale solar PV installations, such as in car parks, or on expansive flat roofs, would maximise benefits from the feed-in tariff. Urban wind turbines could also be a significant opportunity, as the 2MW wind turbine at the Croda Chemicals site demonstrates.

Hull's other energy opportunities include generation of energy from waste. Planning permission has been granted for an energy from waste facility at Saltend which will generate electricity from up to 240,000 tonnes of local municipal and business waste per annum, sufficient to the demand of 20,000 homes.⁶⁶ It is not known whether there are plans to use the waste heat from the process in district heating networks, although the Energy Opportunities Plan shows that this could be viable in the vicinity of the plant.

The area already hosts BP's centre for research and technology which develops new biofuel technologies. The University of Hull is also undertaking similar research into renewable energy, including options marine renewable energy sources. These two centres might present an opportunity to establish a biofuel technology research hub in Hull.

As part of this study, AECOM were given access to the draft executive summary of the "Renewable Energy Potential and Energy Efficiency in New Developments" report, produced by AEA as part of the evidence base for Hull's Local Development Framework. This suggests that Hull City Council sets a planning requirement for new development sites to generate at least 10% of their energy from renewables. The study also suggests that targets for renewable energy should be set of 20% electricity and 9% heat by 2025, whilst aiming for 36.5MW_e of electrical grid capacity by 2025.

⁶⁶ Salt End Energy from Waste Facility Community Liaison Group Panel Notes, November 2010

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Kingston Upon Hull, City of	Current capacity (MW)	Current capacity (GWh)	Potential resource - heat (MW)	Potential resource - electricity (MW)	Potential resource (GWh)	Potential resource (No of existing homes equivalent energy demand)	Potential resource (Proportion of regional resource)
Commercial wind	2	5	0	12	32	0	0%
Small scale wind	0	0	0	1	1	0	3%
Hydro	0	0	0	0	0	0	0%
Solar PV	0	0	0	9	7	0	0%
Solar thermal	0	0	16	0	10	1064	5%
Air source heat pumps	0	0	10	0	16	697	4%
Ground source heat pumps	0	0	20	0	37	1354	13%
Biomass energy crops	0	0	0	0	0	0	0%
Biomass woodfuel	0	0	2	0	5	134	1%
Biomass agricultural arisings (straw)	0	0	0	0	0	0	0%
Biomass waste wood	0	0	1	1	10	88	3%
Energy from waste wet	0	0	3	2	25	186	3%
Energy from waste poultry litter	0	0	0	0	0	0	0%
Energy from waste MSW	20	140	3	1	23	197	3%
Energy from waste C&I	0	0	6	3	45	382	4%
Energy from waste landfill gas	0	0	0	0	0	0	0%
Energy from waste sewage gas	0	0	0	0	5	0	0%
Total	22	146	74	29	272	4,955	

Table 60 Current capacity and renewable energy resource in Hull. Current^o refers to facilities that are operational or have planning consent

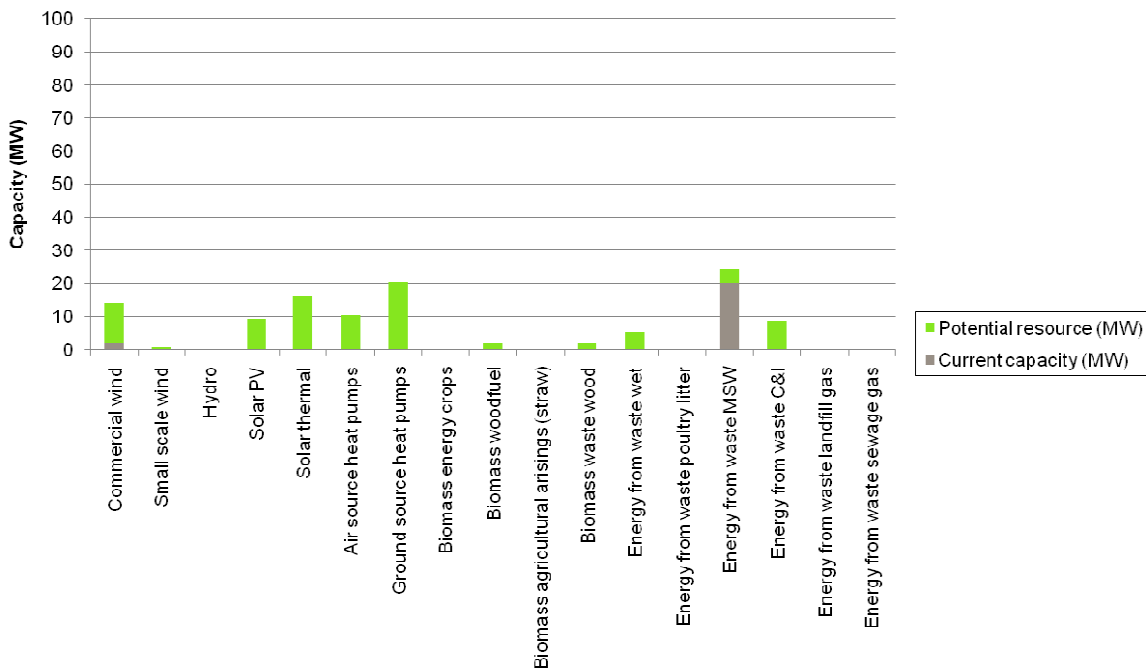


Figure 76 Current capacity and renewable energy resource in Hull. Current^o refers to facilities that are operational or have planning consent

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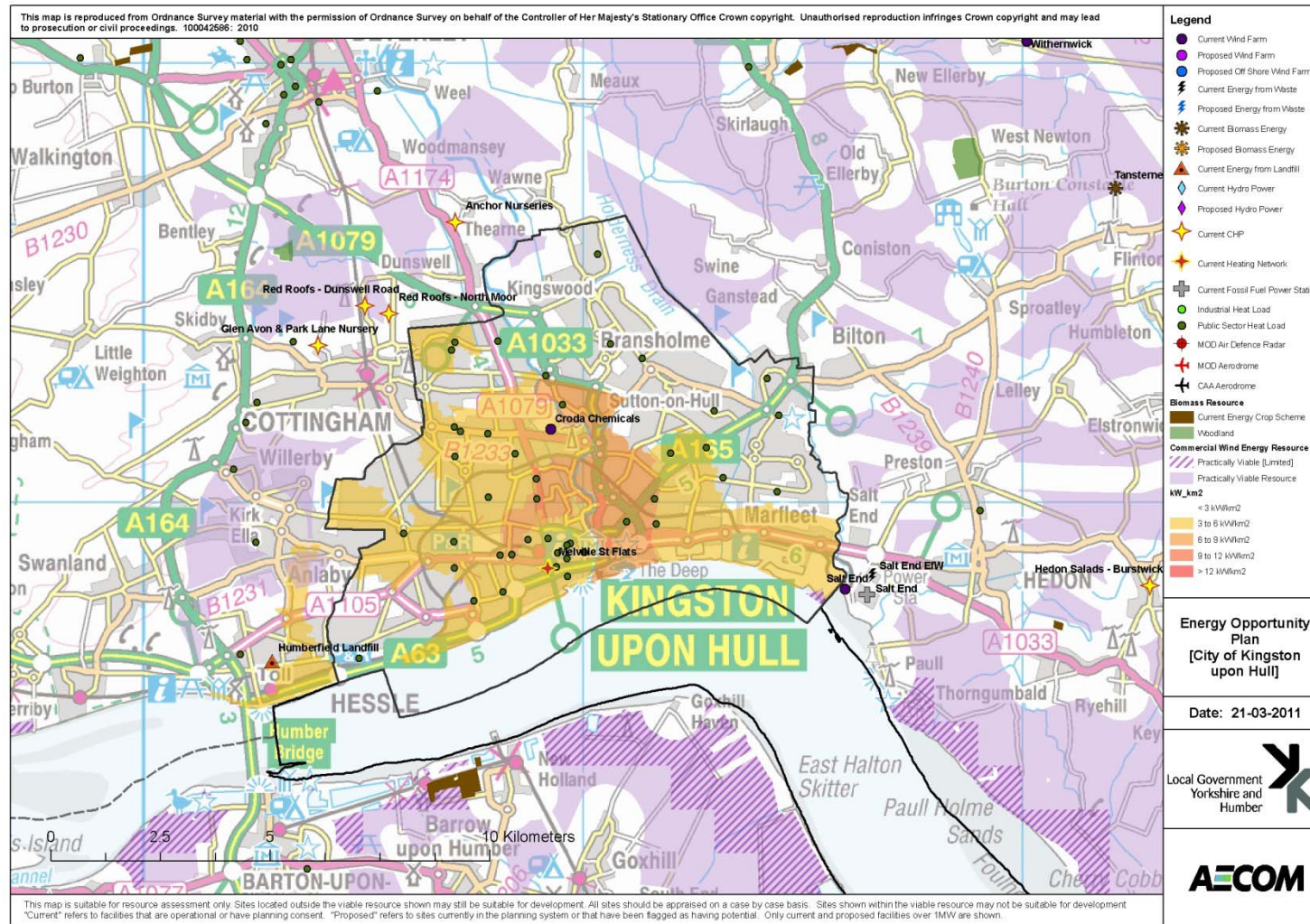


Figure 77 Energy opportunities plan for City of Kingston upon Hull. "Current" refers to facilities that are operational or have planning consent. "Proposed" refers to facilities currently in the planning system or sites that have been flagged as having potential. Only current and proposed facilities over 1MW are shown. The areas with purple hatched shading described as "Practically viable [Limited]" represent areas where commercial scale wind energy development should be viable but the number of turbines may be restricted due to environmental constraints. Please refer to section 5.15 and appendix A for more details.

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B.10 Kirklees

Population: 403,900

Land area (km²): 409



Kirklees is located on the western edge of the Yorkshire and Humber region within the Leeds City Region and part of Kirklees is within the Peak District National Park. The district contains a diverse mix of land uses with the main urban areas in the north and west containing the majority of the population. Huddersfield is the largest settlement of the district, and its centre of administration.

Huddersfield has a high heat density, capable of supporting district heating networks through most of the area. Waste heat from the Huddersfield energy-from-waste plant could potentially be used in nearby buildings, and the Syngenta CHP plant could also be connected. Batley and Dewsbury in the north east of the district have the potential to also implement a district heating networks, with a number of public buildings identified on the Energy Opportunities Plan that could provide suitable anchor loads.

As part of developing the evidence base for their Core Strategy, Kirklees undertook a renewable energy and low carbon energy study with surrounding local authorities. The study suggested that wind is Kirklees' largest opportunity for renewable energy, with biomass and micro-generation playing a less substantial role.

This study concurs that there is some potential for commercial scale wind but this does have a number of constraints. For example, there are constraints on bird and landscape sensitivity affecting the viable resource. The 10 MW Dearne Head Wind Farm is currently going through planning.

Hydro is also a promising renewable energy in the borough, with the sixth highest potential in the region. There are, however, no hydro schemes in operation or proposed.

Kirklees has quite a lot of solar microgeneration already installed, for example, solar PV on 121 homes at the Primrose Hill Solar Village. Kirklees Council also intends to install solar PV systems on 40 homes and 3 community centres in the Hillhouse area of Huddersfield, as part of a 'Low Carbon Communities Challenge' partnership project called 'Greening the Gap'.

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Kirklees	Current capacity (MW)	Current capacity (GWh)	Potential resource - heat (MW)	Potential resource - electricity (MW)	Potential resource (GWh)	Potential resource (No of existing homes equivalent energy demand)	Potential resource (Proportion of regional resource)
Commercial wind	0	0	0	129	339	0	0%
Small scale wind	0	0	0	1	2	0	7%
Hydro	0	0	0	2	8	0	0%
Solar PV	1	1	0	16	12	0	0%
Solar thermal	0	0	26	0	16	1748	7%
Air source heat pumps	0	0	21	0	33	1411	8%
Ground source heat pumps	0	0	31	0	56	2049	19%
Biomass energy crops	0	0	7	4	60	484	1%
Biomass woodfuel	0	0	18	0	47	1182	5%
Biomass agricultural arisings (straw)	0	0	1	0	8	64	0%
Biomass waste wood	0	0	3	1	20	170	5%
Energy from waste wet	0	2	2	1	14	106	2%
Energy from waste poultry litter	0	0	0	0	1	0	0%
Energy from waste MSW	10	70	5	2	37	309	5%
Energy from waste C&I	0	0	8	4	62	525	5%
Energy from waste landfill gas	4	20	0	0	0	0	0%
Energy from waste sewage gas	1	5	0	1	9	0	0%
Total	17	98	145	164	827	9,642	

Table 61 Current capacity and renewable energy resource in Kirklees. Current^o refers to facilities that are operational or have planning consent

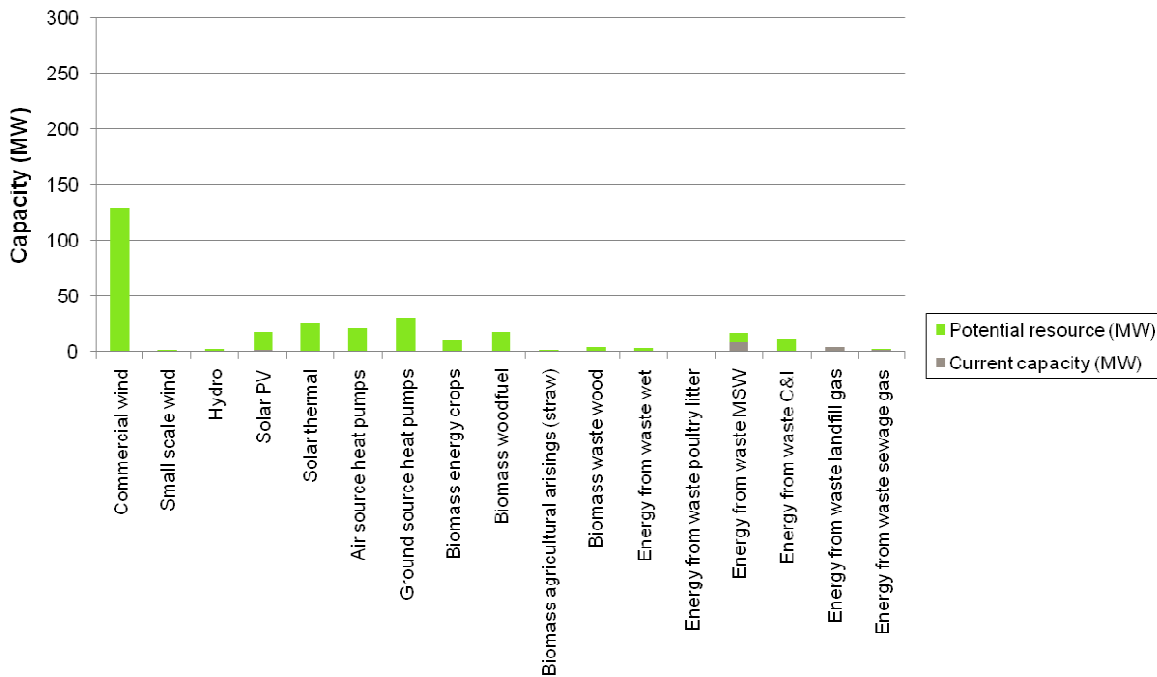


Figure 78 Current capacity and renewable energy resource in Kirklees. Current^o refers to facilities that are operational or have planning consent