Climate Jobs Summary: 'Surrey, East and West Sussex'

This document summarises jobs estimates for Surrey, East and West Sussex from Green House Think Tank's Climate Jobs Project modelling (v2019a) done on behalf of the Green European Foundation. This work can be found at greenhousethinktank.org/climate-jobs/. The modelling was done for each NUTS (Nomenclature of Territorial Units for Statistics) 2016 level 3 area in the UK using Eurostat and the UK Office of National Statistics (ONS) data and published job metrics. The most recently published statistics are taken where possible but due to gaps and time lag in what statistics authorities publish, the data use to represent now (2019) may be a few years older. All jobs estimates are in full time equivalents and negative numbers indicate jobs lost.

NUTS regions are a hierarchical geographic code system created by the EU for the consistent collection and collation of statistics across Europe. The first two letters signify the country, the next the NUTS1 region, and the last two numbers of the NUTS 2 & 3 regions respectively. The NUTS 3 areas are generally smaller than English Counties but bigger than districts, NUTS 2 areas generally cover large cities or a few counties and NUTS 1 represent regions.

The table below summaries background statistics for the Surrey, East and West Sussex area. The breakdown of the modelling results by sector, which add up to these jobs totals, is shown below. The full explanation of the transition proposed, the methodology used and references are in *'Unlocking the Job Potential of Zero Carbon'*, published in December 2018[1].

	Population / Pop per Hectare		Area	Total Net Jobs	
NUTS Code	2019	2030	hectares	Transition	Long Term
UKJ2	2,910,000 / 5.3	3,180,000 / 5.8	550,000	23,200	15,300

2030 has been taken as the date when greenhouse gas emissions need to be reduced to net zero (at the latest). Setting such a target is consistent with the UK using no more than its fair share of the global carbon budget and limiting the risk of exceeding a global warming to 1.5°C. This end date is also consistent with Zero Carbon Sooner paper published by Tim Jackson[2] and most climate emergency declarations by local council areas across the UK.

Reuse & Recycling

The table below shows how many jobs are created and lost due to an increase in the recycling rate for three waste categories. The modelling uses recycling as a proxy for the reuse, repair and deconstruction jobs which will need to be created over the transition. The latter are likely to be more labour intensive and less energy intensive than recycling, so creating more jobs than estimated.

	Recycling Rate		Additional Tonnes		
Category	2019	2030	Recycled	New Jobs	Jobs lost[a]
Municipal solid waste	44%	90%	1,050,000	1,440	-310
Commercial and industrial	44%	90%	883,000	603	-130
Construction and demolition	44%	90%	4,580,000	2,080	-449

[a] Landfill and incineration jobs are lost as waste disposal reduces (alongside the creation of new reuse and recycling jobs).

[1] Download at: gef.eu/publication/unlocking-the-potential-of-zero-carbon/

[2] www.cusp.ac.uk/themes/aetw/zero-carbon-sooner/

Transport

The transport modelling applies the modal shifts set out in Zero Carbon Britain, Rethinking the Future report (Centre for Alternative Technology, 2013) at a sub-regional level (40 NUTS2 areas for the UK). This is then scaled according to population to provide jobs estimates for NUTS3 areas.

	Modal Shift		Existing Modal Split		p-km/v-km[a]		Total Net Jobs	
Transport Type	v-km/y[b]	p-km[c] change	%	p-km /p/y[d]	2019	2030	Transition	Long Term
Maintenance private non-electric vehicles	-17.5 b	-99%	83%	10,200	1.6	1.7	-3,990	-7,980
Maintenance private electric vehicles	9.27 b	58%	0%			1.7	1,550	3,100
Bus Drivers	97.2 m	463%	2%	241	9.0	10.0	1,840	3,680
Bus Maintenance							483	966
Railways Operation and Maintenance	21.6 m	12%	15%	1,770	126.8	130.0	4,490	8,980

[a] Average occupancy per vehicle
[b] v-km/y = vehicle kilometres per year, b = billions, m = millions
[c] p-km = passenger kilometres
[d] p-km/p/y = passenger kilometres per person per year

These estimates only include some of the changes to shift to zero carbon transport. Changes to freight and increased jobs associated with walking and cycling are not modelled and would also indirectly support other local job creation and retention (e.g. local shops and community facilities).

Building Retrofit

The modelling assumes a street by street retrofit programme focused on the areas with the worst energy performance. The table below summaries the jobs created from retrofit of the proposed percentages of total dwellings for four different categories of retrofit.

	Dwellings to retrofit		Total Net Jobs	
Retrofit Type	%	Number	Transition	Long Term
Energy Efficiency Improvements	75%	882,000	7,920	2,770
Solar Thermal	75%	882,000	4,150	
Solar PV	20%	235,000	2,170	
Ground Source Heat Pumps (GSHP)	13%	153,000	4,270	

There will also be jobs required to improve the energy efficiency of public sector, commercial and industrial and community buildings, but these have not been modelled.

Land & Food

The modelling assumes that food is produced as close to where it is consumed as possible, particularly the most employment intensive activities (e.g. fruit and vegetable production). This will increase local resilience whilst reducing transport emissions and packaging requirements. The modelling also aims to remove the fossil fuel dependance of agriculture, in part by removing reliance on artificial fertiliser and pesticides. Together this is modelled as a shift to more mixed farming practices and a more organic/permaculture/agroecological based approach. The table below show how this would change agricultural land use[3].

<table>
<tr><th></th><th>Hectares:</th><th>Current</th><th>Needed[a]</th><th>Surplus[b]</th><th>Allocated[c]</th></tr>
<tr><td rowspan="9"></td><td>Cereal Crops[d]</td><td rowspan="9">133,000</td><td>159,000</td><td rowspan="9">13,700</td><td>84,500</td></tr>
<tr><td>Potatoes</td><td>21,100</td><td>11,200</td></tr>
<tr><td>Sugar</td><td>4,960</td><td>2,640</td></tr>
<tr><td>Fruit & Veg</td><td>N/A [e]</td><td>5,260[f]</td></tr>
<tr><td>Natural Fibres</td><td>5,310</td><td>2,830</td></tr>
<tr><td>Energy Crops</td><td>24,400</td><td>13,000</td></tr>
<tr><td>Green Manure</td><td>26,400</td><td>16,800</td></tr>
<tr><td>Pasture as part of Rotation</td><td rowspan="2">338,000</td><td>83,800</td></tr>
<tr><td rowspan="3">Permanent Pasture</td><td>Dairy Cows</td><td rowspan="2">219,000</td><td rowspan="2">0.00</td><td>124,000</td></tr>
<tr><td>Beef Cattle</td><td>7,480</td></tr>
<tr><td>Orchards & Vineyards[g]</td><td rowspan="2">849</td><td rowspan="4">5,260</td><td rowspan="4">0.00</td><td>131</td></tr>
<tr><td>Fruit Trees & Vineyards</td><td rowspan="3">Fruit & Vegetables</td><td rowspan="3">5,260</td></tr>
<tr><td>Complex Cultivation</td><td>51.9</td></tr>
<tr><td>Irrigated Farmland</td><td>0.00</td></tr>
</table>

[a] for local sufficiency

[b] for local sufficiency

[c] For national sufficiency, assuming the local surpluses are distributed to nearby areas with land deficits

[d] Including Animal Feed

[e] See Fruit & Veg rows below

[f] Adding arable hectare allocated to Fruit and Veg on top of those below.

[g] Which could be grazed

The table below shows proposed changes in non-agricultural land use in order to meet non-food objectives including renewable energy generation, timber, enhancing of biodiversity and reducing release of/sequestering greenhouse gases.

(all hectares)	Moorland, Grass or Shrub	Existing Forest	Landfill + Mining Sites	Industrial	Urban	Urban Green Spaces	Peat Bogs	Other Natural[a]
Current	7,440[b]	84,400	1,220	3,480	68,100	3,060	0.00	1,300
Proposed Forest	3,720[c]	84,400[d]	488			[e]	All to be restored	
Solar PV			488	348[f]	1,360[g]			

[a] Bare rocks [D], Beaches dunes sands [E], Inland marshes [S], Salt marshes [AH], Intertidal flats [T], Glaciers and perpetual snow

[b] Currently Mostly Rough Grazing for sheep

[c] or prehaps re-wilded in other ways

[d] Returned to active management for timber

[e] It is proposed that there is a significant increase in urban horticulture and greenery in general. Some of this maybe in existing 'green' areas but much would be on walls, roofs, carparks etc.

[f] Assumed to be warehouse roof space

[g] Assumed to be Public/Community/Commercial Building roof space

[3] This modelling is based on national land use statistics and does not take into account the specifics of land in any local area or other local consideration. Further local analysis would be needed to assess the suitability of such shifts.

This shift towards more locally complex, mixed and diverse agriculture combined with better, active management of forestry and other land (e.g. hedges) will result in an increase in employment. The table below summaries the labour intensity change modelled in this sector. It is however felt, that this significantly underestimates job creation potential as ONS statistics for current farm jobs include non agricultural jobs (e.g. on farm processing, farm shops, local milk deliveries, grass/hedge cutting etc) that have not been modelled.

Current Jobs	Proposed Jobs	Change
9,070	8,110	-1,190

Renewable Energy

The table below outlines the proposed amount of different renewable energy technologies to be installed to transition to a zero carbon energy supply. This is based on the reduced demand for energy modelled in all sectors above and increased demand for electricity, mainly due to electrification in the transport and buildings sectors. It does not include PV panels on dwellings which are covered above. Energy storage and demand management jobs have not been estimated. Jobs in offshore renewables are not included in the total for specific areas, but are included in national totals.

	Capacity installed	Load Factor	Total Net Jobs	
Generation Type	MW[a]	%	Transition	Long Term
Existing Energy Jobs	N/A	N/A	-15	-31
Offshore Wind	-	43%	-[b]	-
Onshore Wind	723	29%	830	239
Tidal	-	24%	-	-
River run Hydro	22.3	30%	113	30
PV Farm	1,680	9%	300	-
Geothermal	-	96%	-	-
Electric Grid Upgrade	N/A	-	39	2

[a] MW = Mega Watt
[b] Only in National Summary

Other Jobs

The above jobs estimates indicate the scale of effort in different sectors required locally to transition to zero carbon in Surrey, East and West Sussex. This will increase the vibrancy of the local economy. This transition will also require changes to:

- Manufacturing different things in different ways (e.g. more electric vehicles, renewable technologies, local food processing and sustainable construction products, more reuse and use of recycled materials);
- Additional jobs to protect the most vulnerable, ensure these changes increase equality and strengthen community resilience (including adapting to climate impacts, such as increased flood risks); and
- Additional work to train and upskill the workforce across the UK, including providing support to ensure that these jobs are open to all (including those with disabilities). This has been estimated as 1,910 jobs during the transition and 1,260 long term jobs in Surrey, East and West Sussex.

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