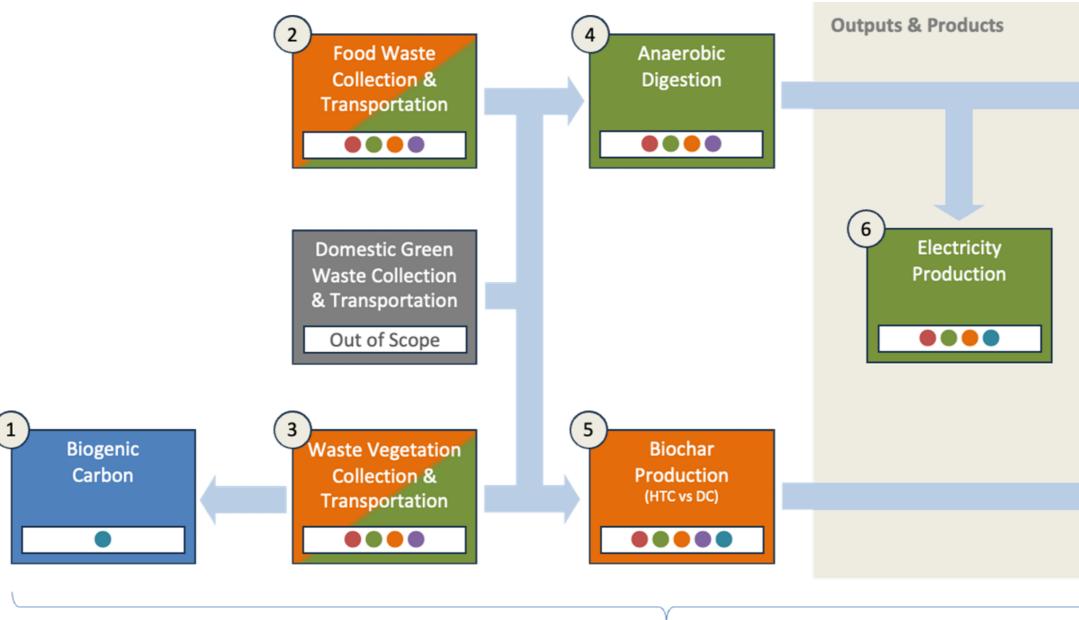
Live Labs II: West Sussex & South Gloucestershire

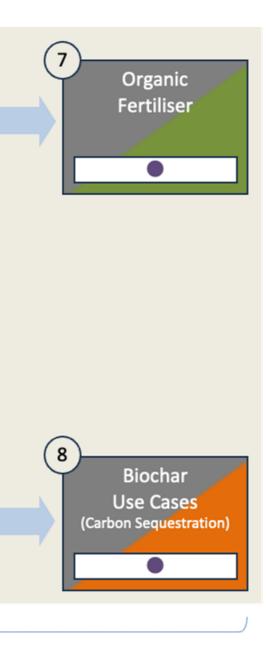
Programme Route Map v11.3



Unit of Measure: Tonnes

- People (Commuting, Home Working & Business Travel*)
- Premises & Sites (Combusted Fuels / Energy Use*)
- Vehicles & Plant (Embodied Carbon & Fuels / Energy Use*)
- Purchased Products & Services (Business Change, Future Operations & Transportation As A Service*)
- Carbon Offsetting & Sequestration (Including Energy To Grid*)

*Additional, Live Labs II specific, above baseline.





Stage Name

Biogenic Carbon (WSCC)

Stage Description

Stage 1 Biogenic Carbon of the Live Labs II: Greenprint Carbon Assessment Route Map focuses solely on verge-side biogenic emissions and biogenic carbon storage and sequestration. The 'waste vegetation cutting, collection and transportation process' emissions are calculated as part of Stage 3. The stage 1 processes include two main verge management types: 'cut and leave' (C+L) and 'cut and collect' (C+C). 'Cut and leave' is the baseline procedure involving cutting grass and vegetation and leaving them in situ on the verge. 'Cut and collect' (C+C) is a procedure for cutting and removing grass and vegetation from the site.

Carbon & Cost Analysis (Baseline, Cut and Leave C+L)]				
				L	•			Total (kg	
		Unit Of		Amount of		Emission	Total (tonne	CO2e per	Data
		Measure		disposal grass	UoM	Factor (t-CO2e/t-	CO2e per ha	1000m2 per	Confiden
ID Category	Description	(UoM) (FW)	Quantity	clippings (t-FW/ha)	Adjustment	FW)	per year)	year)	ce
1 Biogenic emissions	C+L 1st cut @Pagham, Aldwick and Bersted (191,000 n	tonnes	32.83	1.72	1	0.2060	0.354	35.403	1edium-Hig
2 Biogenic emissions	C+L 2nd cut @Pagham, Aldwick and Bersted (191,000	rtonnes	50.83	2.66	1	0.2060	0.548	54.822	1edium-Hig
3 Biogenic emissions	C+L 3rd cut @Pagham, Aldwick and Bersted (191,000 r	tonnes	47.06	2.46	1	0.2060	0.508	50.756	1edium-Hig
4 Biogenic emissions	C+L 4th cut @Pagham, Aldwick and Bersted (191,000 r	tonnes	28.28	1.48	1	0.2060	0.305	30.496	ledium-Hig
						Tota	l Per 1000 m²	171.4761	
									I
9			0	0		0.0000	0.0000		
10			0	0		0.0000	0.0000		
11			0	0		0.0000	0.0000		
12			0	0		0.0000	0.0000		
13			0	0		0.0000	0.0000		
14			0	0		0.0000	0.0000		
15			0	0		0.0000	0.0000		

Carbon & Cost Analysis (Experiment, Cut and Collect)

		Unit Of						
		Measure		UoM	Emission	Total	Cost Per	
Category	Description	(UoM)	Quantity	Adjustment	Factor	kgCO2e	UoM (£)	Emission Factor Data Source
1			0	1	0.0000	0.0000	£ -	
2			0	1	0.0000	0.0000	£ -	
<mark>3</mark>			0	1	0.0000	0.0000	£ -	
4			0	1	0.0000	0.0000		
<mark>5</mark>			0	1	0.0000	0.0000	£ -	
6			0	1	0.0000	0.0000	£ -	
<mark>7</mark>			0	1	0.0000	0.0000	£ -	
<mark>8</mark>			0	1	0.0000	0.0000	£ -	
<mark>9</mark>			0	1	0.0000	0.0000	£ -	
<mark>10</mark>			0	1	0.0000	0.0000	£ -	
11			0	1	0.0000	0.0000	£ -	
12			0	1	0.0000	0.0000	£ -	
13			0	1	0.0000	0.0000	£ -	
14			0	1	0.0000	0.0000	£ -	
15			0	1	0.0000	0.0000	£ -	

Emission Factor Data Source

Stage Name

Biogenic Carbon (SGC)

Stage Description

Stage 1 Biogenic Carbon of the Live Labs II: Greenprint Carbon Assessment Route Map focuses solely on verge-side biogenic emissions and biogenic carbon storage and sequestration. The 'waste vegetation cutting, collection and transportation process' emissions are calculated as part of Stage 3. The stage 1 processes include two main verge management types: 'cut and leave' (C+L) and 'cut and collect' (C+C). 'Cut and leave' is the baseline procedure involving cutting grass and vegetation and leaving them in situ on the verge. 'Cut and collect' (C+C) is a procedure for cutting and removing grass and vegetation from the site.

Carbon & Cost Analysis (Baseline, Where Applicable)

	Category	Description	Unit Of Measure (UoM) (FW)	Quantity	Amount of disposal grass clippings (t- FW/ha)		Total (tonne CO2e per ha per year)	Total (kg CO2e per 1000m2 per year)	Confidence	
1	Biogenic emissions	C+L 1st cut @Yate (128,629 m2)(12.86 ha)	tonnes	31.12	2.42	0.2060	0.499	49.850	Medium-High	
2	2 Biogenic emissions	C+L 2nd cut @Yate (128,629 m2)(12.86 ha)	tonnes	44.66	3.47	0.2060	0.715	71.539	Medium-High	
	Biogenic emissions	C+L 3rd cut @Yate (128,629 m2)(12.86 ha)	tonnes	49.86	3.88	0.2060	0.799	79.869	Medium-High	
4	Biogenic emissions	C+L 4th cut @Yate (128,629 m2)(12.86ha)	tonnes	20.79	1.62	0.2060	0.333	33.303	Medium-High	
с -	5						Total Per 1000 m ²	234.561		

6	5		0	1	0.0000	0.0000	0.000	
7	7		0	1	0.0000	0.0000	0.000	
8	3		0	1	0.0000	0.0000	0.000	
9)		0	1	0.0000	0.0000	0.000	
10			0	1	0.0000	0.0000	0.000	
11			0	1	0.0000	0.0000	0.000	
12	<u>2</u>		0	1	0.0000	0.0000	0.000	
13	<mark>}</mark>		0	1	0.0000	0.0000	0.000	
14	La construction de la constructi		0	1	0.0000	0.0000	0.000	
15	5		0	1	0.0000	0.0000	0.000	

Carbon & Cost Analysis (Experiment)

			Unit Of					
			Measure		UoM	Emission	Total	
	Category	Description	(UoM)	Quantity	Adjustment	Factor	kgCO2e	Confidence
1				0	1	0.0000	0.0000	
2				0	1	0.0000	0.0000	
3				0	1	0.0000	0.0000	
4				0	1	0.0000	0.0000	
5				0	1	0.0000	0.0000	
6				0	1	0.0000	0.0000	
7				0	1	0.0000	0.0000	
8				0	1	0.0000	0.0000	
9				0	1	0.0000	0.0000	
10				0	1	0.0000	0.0000	
11				0	1	0.0000	0.0000	
12				0	1	0.0000	0.0000	
13				0	1	0.0000	0.0000	
14				0	1	0.0000	0.0000	
15				0	1	0.0000	0.0000	

Emission Factor Data Source

Emission Factor Data Source

Stage Name
Waste Vegetation Collection & Transportation (WSCC)

Carbon & Cost Analysis (Experiment)

Stage Description

Stage 3, Waste Vegetation Collection and Transportation of the Live Labs II: Greenprint Carbon Assessment Route Map, focuses on the maintenance strategy, cut and collect processes and logistics, cut and collect technology, green waste management, and converting green waste into valuable resources.

Car	bon & Cost Analys	is (Baseline, Where Applicable Worthing - 1	Total of 5 cuts of	over one year -	Area size =	246,150m^2	1000 m^2]	For 5 cuts, th	at means 5x	246,150 = 1,230	,750m^2 were cut over the year Total are
	Unit Of						UoM	Emission	Total	Cost Per	Data	
ID	Category	Description	Measure	Quantity		Per 1000 m ²	Adjustment	Factor	kgCO2e	UoM (£)	Confidence	Emission
1	Combusted Fuels	Diesel for Plant Transportation	litres	915		0.7434		3.2856	2.4427	£ 0.96	Medium-High	£1.29 / L - Unleaded Fuel
2	Services	Resource Days (Staff & Contractors)	operative.day	150		0.1219		2.3360	0.2847	£ 15.84	Medium	Based on estimated day rate from C&C ex
3	Combusted Fuels	Diesel for Mowers	litres	2250		1.8282		2.9517	5.3961	£ 2.52	Medium-High	Diesel Fuel is £1.38 per litre.
4	Combusted Fuels	Petrol for Strimmers	litres	280		0.2275		2.9517	0.6715	£ 0.29	Medium	£1.29 for petrol unleaded
5	Combusted Fuels	Strimmer 2-Stroke Oil	litres	5.6		0.0046		3.1443	0.0143	£ 0.02	Medium-Low	Oil for strimmers. Roughly 5L Petrol : 0.1L
	Totals Per 1000 m									£ 19.64		

Aldwick, Bersted and Pagham - Total of 5 cuts over one year (data only for four cuts) - Area Size = 1 For 4 cuts, that means 4x 191,235 = 764,940 is the total area cut that year Total ar

			Unit Of				UoM	Emission	Total	Cost Per	Data	
ID	Category	Description	Measure	Quantity		Per 1000 m ²	Adjustment	Factor	kgCO2e	UoM (£)	Confidence	Emission
	1 Combusted Fuels	Diesel for Plant & Recyclate Transportation	miles	3052	3815	3.9899	1	3.2856	13.1092	£ 5.15	High	Let's take another look for litres
	2 Services	Resource Days (Staff & Contractors)	operative.day	172	215	0.2249	1	2.3360	0.5253	£ 30.85	High	2 operatives over 86 days to make 172 da
	3 Combusted Fuels	Diesel for Mowers	litres	2637.5	3296.875	3.4480	1	2.9517	10.1773	£ 4.76	High	
	4 Combusted Fuels	Petrol for Strimmers	litres	342	427.5	0.4471	1	2.9517	1.3197	£ 0.62	High	Assuming unleaded petrol is £1.40 per litr
	5 Combusted Fuels	Strimmer 2-Stroke Oil	litres	6.84		0.0056		3.1443	0.0175	£ 0.02	Medium	Oil for strimmers. Roughly 5L Petrol : 0.1L
			Per 1000 m²	25.1489	£ 41.40							

area cut:	1230750	Adjustment:	1230.75
on Factor Data	a Source		
extrapolated	to here. £130/day		
.1L Oil. Cost is	s £4.44 / L, Diverse	oil types used.	
area cut:	764940	Adjustment:	764.94
on Factor Data	a Source		
days. Cost is	for total labour ove	r this 18 day period.	
litre.			
.1L Oil. Cost is	s £4.44 / L		

Stage Name

Waste Vegetation Collection & Transportation (SGC)

Stage Description

Stage 3, Waste Vegetation Collection and Transportation of the Live Labs II: Greenprint Carbon Assessment Route Map, focuses on the maintenance strategy, cut and collect processes and logistics, cut and collect technology, green waste management, and converting green waste into valuable resources.

Carbon & Cost Analysis (Baseline, Where Applicable Doddington - Total of 9 cuts in one year - Area size is 254, 1000 m^2 For 9 cuts that means 254,010x9 = 2,286,090m^2 ct Total area cut: 2,986,090m^2 ct Total area cut: 2,9

			Unit Of			UoM	Emission	Total	Cost Per	Data	
ו	Category	Description	Measure	Quantity	Per 1000 m ²	Adjustment	Factor	kgCO2e	UoM (£)	Confidence	Em
1 C	ombusted Fuels	Diesel for Plant Transportation (Class III LGV)	miles	594	0.2598	2286.09	3.2856	0.8537	£ -	Medium-High	2 miles from depot. Twice per day, 1
2 Se	ervices	Resource Days (Staff & Contractors)	operative.day	148.5	0.0650	2286.09	2.3360	0.1517	£ 10.26	Medium	3 people. 5.5 days per cut. Multiply
3 Co	ombusted Fuels	Diesel for Mowers	litres	1968.3	0.8610	2286.09	3.2856	2.8289	£ 1.21	Medium-High	72.9L per mower per cut. 3 mowers
4 El	lectricity	Energy for Strimmers (Rechargable Battery Packs)	kWh	118.8	0.0520	2286.09	0.2749	0.0143	£ -	Medium-Low	1.2Kw to recharge. National Grid. 2.
							er 1000 m²	3.8486	£ 11.48		
	2 S 3 C	 Combusted Fuels Services Combusted Fuels 	1 Combusted Fuels Diesel for Plant Transportation (Class III LGV) 2 Services Resource Days (Staff & Contractors) 3 Combusted Fuels Diesel for Mowers	CategoryDescriptionMeasure1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles2ServicesResource Days (Staff & Contractors)operative.day3Combusted FuelsDiesel for Mowerslitres	CategoryDescriptionMeasureQuantity1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5942ServicesResource Days (Staff & Contractors)operative.day148.53Combusted FuelsDiesel for Mowerslitres1968.3	CategoryDescriptionMeasureQuantityPer 1000 m²1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5940.25982ServicesResource Days (Staff & Contractors)operative.day148.50.06503Combusted FuelsDiesel for Mowerslitres1968.30.8610	CategoryDescriptionMeasureQuantityPer 1000 m²Adjustment1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5940.25982286.092ServicesResource Days (Staff & Contractors)operative.day148.50.06502286.093Combusted FuelsDiesel for Mowerslitres1968.30.86102286.09	CategoryDescriptionMeasureQuantityPer 1000 m²AdjustmentFactor1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5940.25982286.093.28562ServicesResource Days (Staff & Contractors)operative.day148.50.06502286.092.33603Combusted FuelsDiesel for Mowerslitres1968.30.86102286.093.28564ElectricityEnergy for Strimmers (Rechargable Battery Packs)kWh118.80.05202286.090.2749	CategoryDescriptionMeasureQuantityPer 1000 m²AdjustmentFactorkgCO2e1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5940.25982286.093.28560.85372ServicesResource Days (Staff & Contractors)operative.day148.50.06502286.092.33600.15173Combusted FuelsDiesel for Mowerslitres1968.30.86102286.093.28562.82894ElectricityEnergy for Strimmers (Rechargable Battery Packs)kWh118.80.05202286.090.27490.0143	CategoryDescriptionMeasureQuantityPer 1000 m²AdjustmentFactorkgCO2eUoM (£)1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5940.25982286.093.28560.8537£-2ServicesResource Days (Staff & Contractors)operative.day148.50.06502286.092.33600.1517£10.263Combusted FuelsDiesel for Mowerslitres1968.30.86102286.093.28562.8289£1.214ElectricityEnergy for Strimmers (Rechargable Battery Packs)kWh118.80.05202286.090.27490.0143£-	CategoryDescriptionMeasureQuantityPer 1000 m²AdjustmentFactorkgCO2eUoM (£)Confidence1Combusted FuelsDiesel for Plant Transportation (Class III LGV)miles5940.25982286.093.28560.8537£-Medium-High2ServicesResource Days (Staff & Contractors)operative.day148.50.06502286.092.33600.1517£10.26Medium3Combusted FuelsDiesel for Mowerslitres1968.30.86102286.093.28562.8289£1.21Medium-High4ElectricityEnergy for Strimmers (Rechargable Battery Packs)kWh118.80.05202286.090.27490.0143£-Medium-Low

Carbon & Cost Analysis (Experiment) Yate - Total of 4 cuts in one year - Area size is 128,629m^2

For 4 cuts, that means 128,629x4 = 514,516m^2 cut Total area cut:

			Unit Of			UoM	Emission	Total	Cost Per	Data	
П	D Category	Description	Measure	Quantity	Per 1000 m ²	Adjustment	Factor	kgCO2e	UoM (£)	Confidence	Emi
	1 Combusted Fuels	Diesel for Plant Transportation (Class III LGV)	litres	298.95	0.5810	1	3.2856	1.9091	£ 0.81	High	
	2 Services	Resource Days (Staff & Contractors)	operative.day	102	0.1982	1	2.3360	0.4631	£ 41.58	High	
	3 Combusted Fuels	Diesel for Mowers	litres	2322.87	1.7540	1	3.2856	5.7630	£ 2.46	High	
	5 Electricity	Energy for Strimmers (Rechargable Battery Packs)	kWh	81.6	0.1586	1	0.2749	0.0436	£ -	Medium	Extrapolate from calculation in baseli
							er 1000 m²	8.1788	£ 44.84		

2,286,090 Adjustment:

Emission Factor Data Source 7, 148.5 days (inclusive of days x No. of vehicles) ly by number of cuts and by number of people. This reflects th rrs. 3*72.9*number of cuts. Cost / L = £1.41 2.5 hours per day use. 2 strimmers / day. 9 cuts / year

514,516

6 Adjustment:

514.516

Emission Factor Data Source

seline