

# Why and how to measure carbon impact of mental health services



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Dr. Frances Mortimer, Medical Director  
Centre for Sustainable Healthcare

Launch of JCP-MH Sustainable Commissioning Guide  
27<sup>th</sup> October 2015

# Why measure carbon impact?

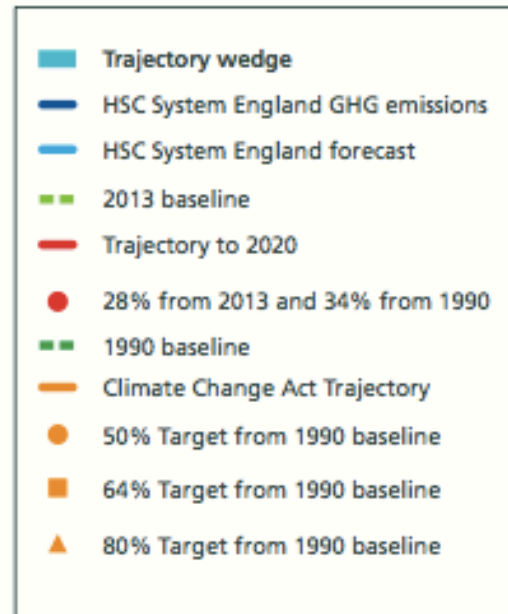
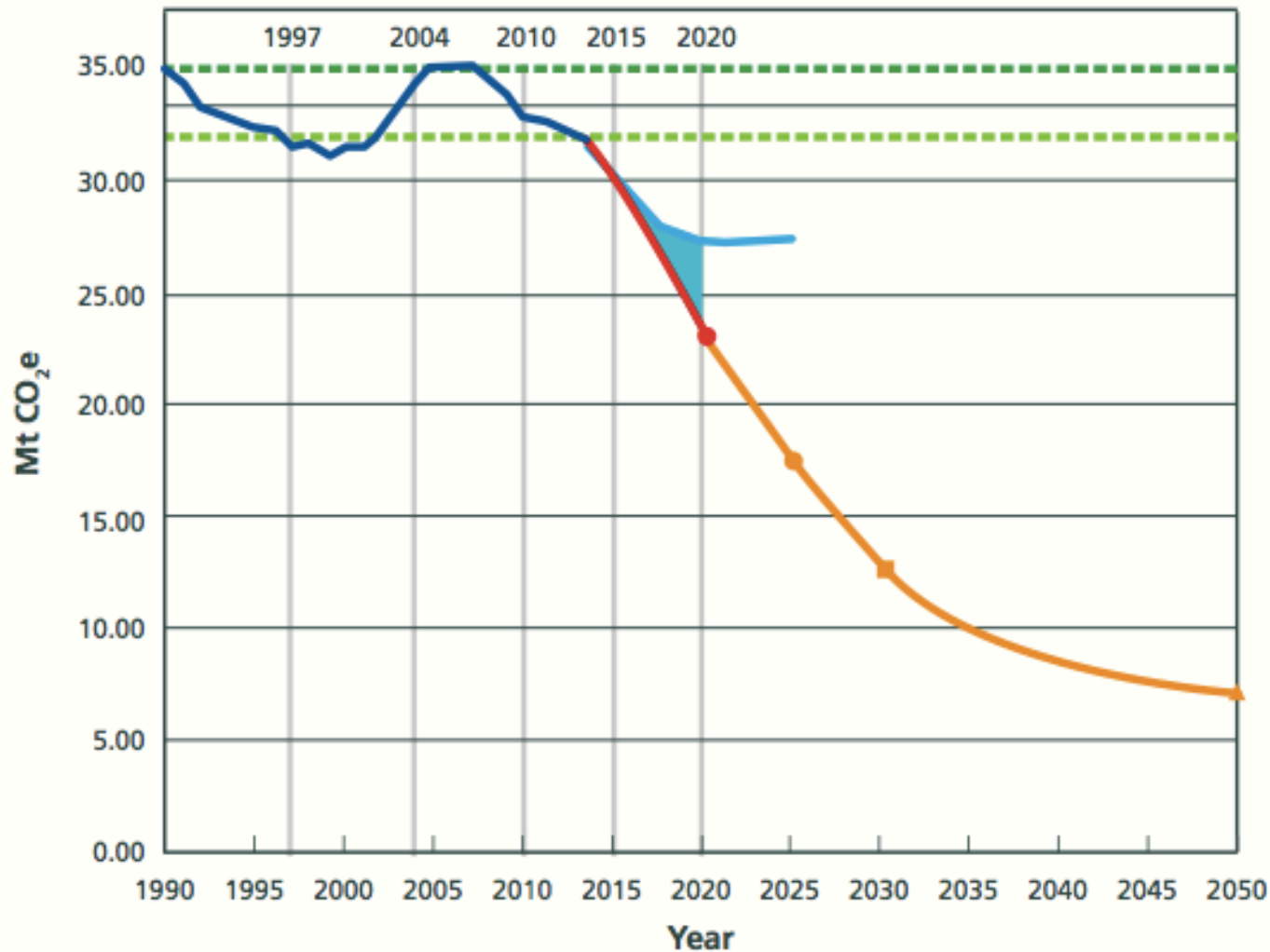
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**Consider carbon.** We will work together to understand the carbon impacts of interventions and models of care within mental health. This knowledge will become increasingly important in the design of carbon efficient services.



## Health and Social Care England Carbon Footprint

CO<sub>2</sub>e baseline from 1990 to 2025 with Climate Change targets

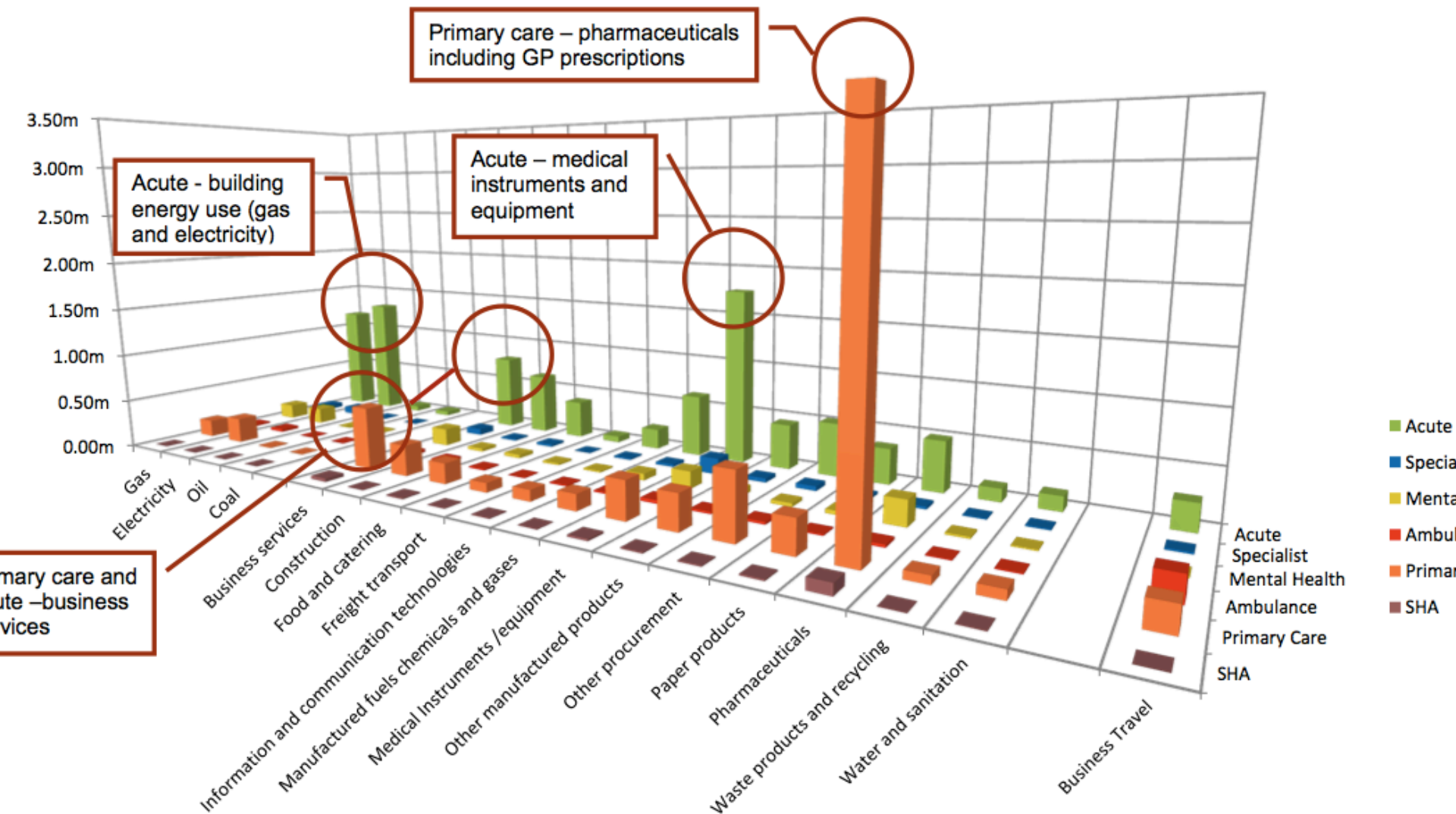


SDU. (2013). Goods and services carbon hotspots,

Why?

Setting targets and tracking progress

# Goods and Services carbon footprint – carbon hotspots



Why?

Identifying hotspots

## Original Paper

# Cost and carbon burden of long-acting injections: a sustainable evaluation

Daniel L. Maughan, Rob Lillywhite, Matthew Cooke

DOI: 10.1192/pb.bp.114.049080 Published 28 August 2015

Why?

Optimising / re-designing services

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**Table 2** Economic and environmental costs of flupentixol decanoate per year for Oxford Health NHS Foundation Trust

Resource	Financial cost £	Financial cost burden %	Carbon footprint kg CO <sub>2</sub> e	Carbon cost burden %
Medication	3876	22	1668	14
Needle and syringe	156	1	11	< 1
Appointment	12 576	70	8604	75
Travel	1404	8	1236	11
Total	18 012	100	11 519	100

Maughan et al, Cost and carbon burden of long-acting injections: a sustainable evaluation, BJPsych Bulletin 28 Aug 2015

Why?

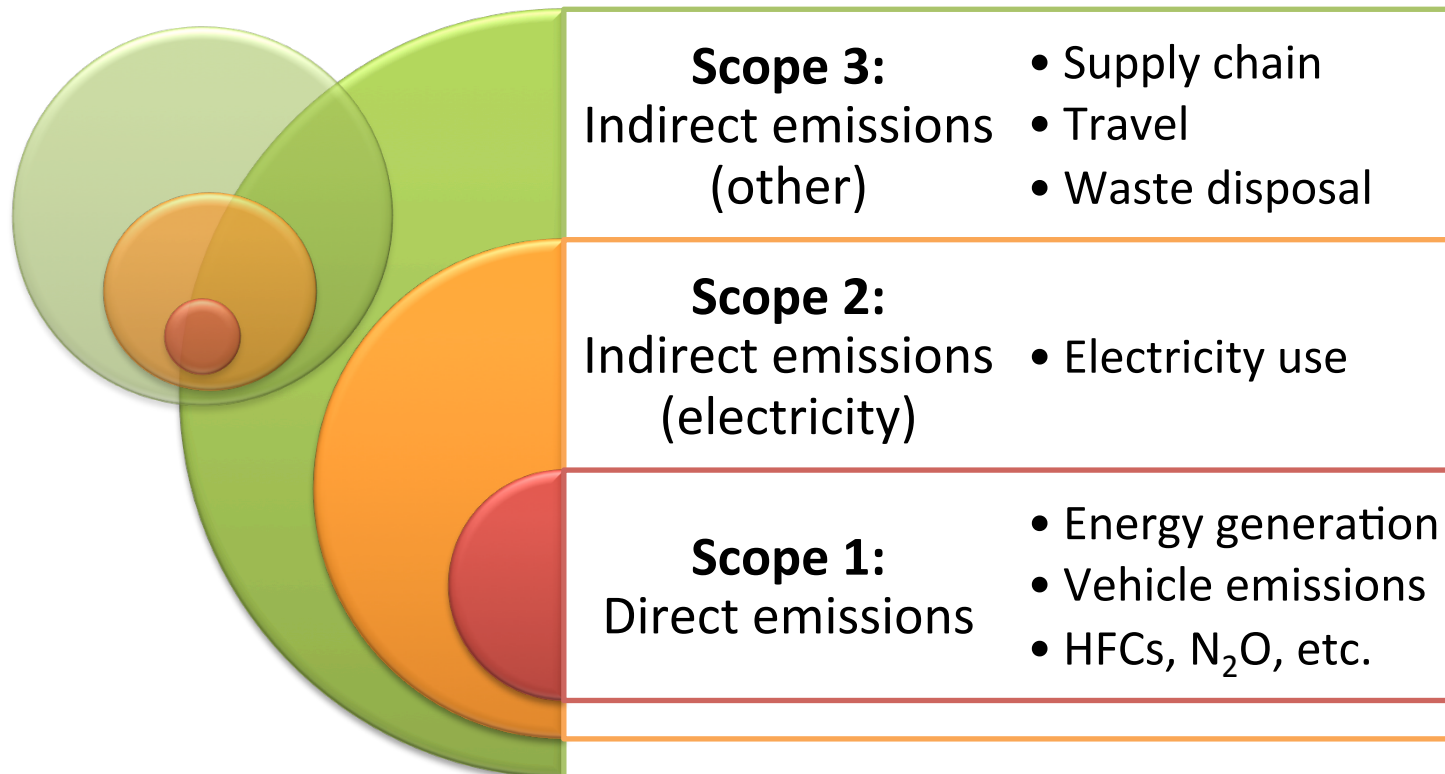
Optimising / re-designing services

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**Carbon footprint** - The sum of greenhouse gas emissions released in relation to an organisation, product or service, expressed as carbon dioxide equivalents (CO<sub>2</sub>e).

# Carbon footprint: what is included?

(operational boundaries)





# Steps involved

1. Define the goal and scope of the study
2. Identify the resources used  
*(set boundaries, create inventory)*
3. Measure the resource utilisation  
*(collect data)*
4. Attribute a carbon cost or footprint to the resources used  
*(apply emissions factors)*

# Greenhouse gas emissions factors - DEFRA

DCFCarbonFactors\_23\_1\_2015\_17137.xls

Search in Sheet

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A1

16 • The market segment conversion factors related to the vehicle market segments specifically defined by SMMT (UK Society of Motor Manufacturers and Traders)

17 • Where a vehicle is used by an organisation but isn't owned by them, these vehicles can be reported in scope 3 instead of scope 1, using the same factors. (These factors can also be found in the 'land' or 'managed assets- vehicles').

Activity	Type	Unit	Diesel				Petrol			
			kg CO <sub>2</sub> e	kg CO <sub>2</sub>	kg CH <sub>4</sub>	kg N <sub>2</sub> O	kg CO <sub>2</sub> e	kg CO <sub>2</sub>	kg CH <sub>4</sub>	kg N <sub>2</sub> O
Cars (by size)	Small car	km	0.14701	0.14519	0.00005	0.00177	0.16061	0.15991	0.00014	0.00014
		miles	0.23659	0.233661	0.00008	0.002849	0.258477	0.25735	0.000225	0.000225
	Medium car	km	0.1772	0.17538	0.00005	0.00177	0.20088	0.20018	0.00014	0.00014
		miles	0.285176	0.282247	0.00008	0.002849	0.323285	0.322158	0.000225	0.000225
	Large car	km	0.23049	0.22867	0.00005	0.00177	0.29014	0.28944	0.00014	0.00014
		miles	0.370938	0.368009	0.00008	0.002849	0.466935	0.465809	0.000225	0.000225
	Average car	km	0.18546	0.18364	0.00005	0.00177	0.19388	0.19318	0.00014	0.00014
		miles	0.298469	0.29554	0.00008	0.002849	0.31202	0.310893	0.000225	0.000225

**FAQs**

**Do the conversion factors take into account the age of vehicles?**  
 The conversion factors are based on information from the DfT (Department for Transport) who regularly analyse the mix of cars on the road in Britain through DVLA records and automatic number plate recognition. The conversion factors are updated each year to reflect changes in the spectrum of cars of different types and ages being driven.

**I know the average mpg of my passenger vehicles as well as mileage; can this be used to improve my calculations?**  
 The mpg (miles per gallon) of the vehicle should be used to convert the distance travelled into litres of fuel used (refer to the 'conversions' listing to find values to assist this calculation). The conversion factors then be applied, which will give a more accurate view of the actual emissions from the vehicle (the conversion factors for vehicle mileage represent the average mpg of the whole UK vehicle population and using this value will yield more precise results).

**I know the average gCO<sub>2</sub>/km of my passenger vehicles as well as mileage; can this be used to improve my calculations?**  
 If you know the manufacturers gCO<sub>2</sub>/km data this may be used as an alternative (and more precise) calculation for your passenger vehicle's emissions. The factors provided by manufacturers should be multiplied by the km distance travelled in the vehicle.

**Where do I find out how these conversion factors were calculated?**  
 For information on the methodology and data sources used to derive the conversion factors presented here, please refer to the accompanying 'Methodology paper', which is available from the [GOV.UK website](#).

What's new Fuels Outside of scopes Refrigerant & other Passenger vehicles UK electricity Transmission and distribution

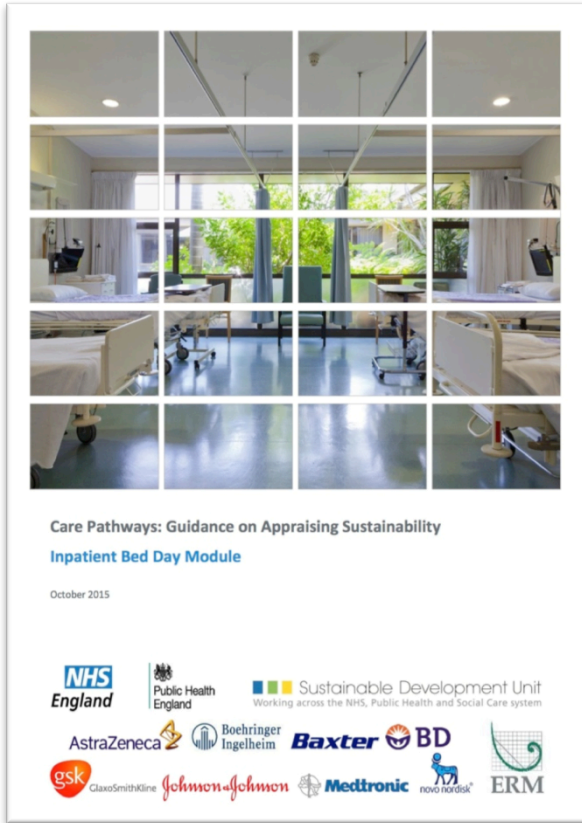


## Mental Health services characteristics

Mental Health Sector	Source	Unit	Value	Goods and services	Building energy use	Travel	Commissioned activity
						(business only)	
Number of organisations	HEFS 2010/11		54				
Operating expenditure	AC 2009/10	£	8.3b				
Non-pay spend	modelled	£	3.5b	2,249m	74m	12m	1,147m
Carbon footprint NHS England	modelled	tCO2e	1.47m	0.87m	0.32m	0.01m	0.26m
Average Carbon footprint per organisation	modelled	tCO2e	27,144	16,059	5,965	247	4,873
Carbon intensity based on total income	modelled	kgCO2e/£	0.18	0.10	0.04	0.00	0.03
Carbon intensity based on total non-pay spend	modelled	kgCO2e/£	0.42	0.25	0.09	0.00	0.08
Carbon intensity of category	modelled	kgCO2e/£	0.42	0.39	4.38	1.13	0.00
Patient activity – inpatient admissions	CHE RP 76 2009/10	admissions	151,116				
Patient activity – outpatient attendances	CHE RP 76 2009/10	attendances	23.44m				
Carbon footprint per inpatient admission	modelled	kgCO2e	476	281	105	4	85
Carbon footprint per bedday	modelled	kgCO2e	97	58	21	1	17
Carbon footprint per outpatient appointment	modelled	kgCO2e	59	35	13	1	11

*Goods and services carbon hotspots, NHS Sustainable Development Unit (2013)*

# Tools are being developed



Care Pathways Guidance on Appraising Sustainability (SDU, 2015)



# Measuring Carbon Impact

## Why?

- Setting targets and tracking progress
- **Optimising / re-designing services**

## How?

- (Data about your service) X (emissions factors)
- Altering boundaries and assumptions can produce very different results – transparency needed
- Important thing is to get started!

# One day soon...?

**NICE** National Institute for  
Health and Care Excellence



...the carbon cost per QALY  
gained was ... CO<sub>2</sub>e



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