



Helpu Cymru i leihau  
ei Hôl Troed Carbon  
Help Wales reduce  
its Carbon Footprint



Llywodraeth Cymru  
Welsh Government

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# **Climate Change Strategy for Wales**

## **First annual progress report**

### **Technical Annex**

**March 2012**





The technical annex sets out the proposed indicators for each of the following sectors:

- Transport
- Business
- Residential
- Agriculture and land use
- Resource efficiency and waste
- Public Sector

As we have highlighted in the main report, data for 2011 (the first year we will report against our 2006-2010 baseline) will not be available until September 2013. This means that this annex will not be an analysis of performance but will simply identify what the proposed indicators are and those data which will be used to report against them in future years. The main reason for this is because we currently only have GHG emissions data for 2009 and hence we are currently within the baseline.

The technical annex reports the progress on the development of the indicators. It will highlight, where possible the indicators for each of the actions listed in the *Climate Change Strategy for Wales Delivery Plan for Emission Reduction*. However, there are a number of actions that we have not been able to develop indicators for at this stage. This has largely been due to data restrictions. In this instance, case studies have been used in the main report. The gaps will be highlighted in this annex. To keep things as simple as possible the coding used in this report for each of the actions will be consistent with the coding used in the *Delivery Plan for Emission Reduction*, ensuring that readers can clearly relate the indicator to the Climate Change Strategy for Wales published in October 2010.

The indicator framework that we have adopted contains three tiers and a list of contextual factors for each of sectors:

- Tier 1: CO<sub>2</sub>e emissions estimates which are consistent with the 3% target definition for each sector.
- Tier 2: Data will generally come directly from the Greenhouse Gas Inventory for Wales in the form of activity data or emission factors.
- Tier 3: Policy tier indicators that aim to monitor the things which the Welsh Government is actively doing or aiming to do to reduce GHG emissions. This Tier can not be linked directly to Tier 1 or Tier 2. Instead it is intended to provide an indication of how individual actions are performing.
- **Contextual factors** – there are a variety of external factors that drive emissions such as economic factors and extreme weather conditions. We will need to be aware of, and examine these factors carefully when assessing our performance. Where relevant we will list the contextual factors specific to each sector in this technical annex. However, there are a number of contextual factors that we believe are cross cutting and relevant for each of the sectors and for some sectors these will be the only contextual factors developed so far. These cross cutting contextual factors are:
  - Gross Value Added (GVA) for Wales
  - Population for Wales
  - Labour market statistics – employment.



## Transport Sector

- The transport sector is responsible for approximately a fifth of emissions covered by the 3% target
- Welsh Government action in the transport sector is forecast to deliver 0.29 Mt CO<sub>2</sub>e savings in 2020
- UK action in the transport sector is forecast to deliver 1.07 MT CO<sub>2</sub>e savings in 2020

The Welsh Government interventions that we have developed indicators for are:

- WT1 – Sustainable Travel Centres
- WT2 – Smarter Choices
- WT3 – Travel planning and provision of personalised travel information
- WT4 – Developing a series of strategic modal interchanges
- WT6 – Promotion and support for walking and cycling
- WT7 – Investment in rail services
- WT8 – Investment in buses
- WT10 – Supporting the freight industry to reduce emissions

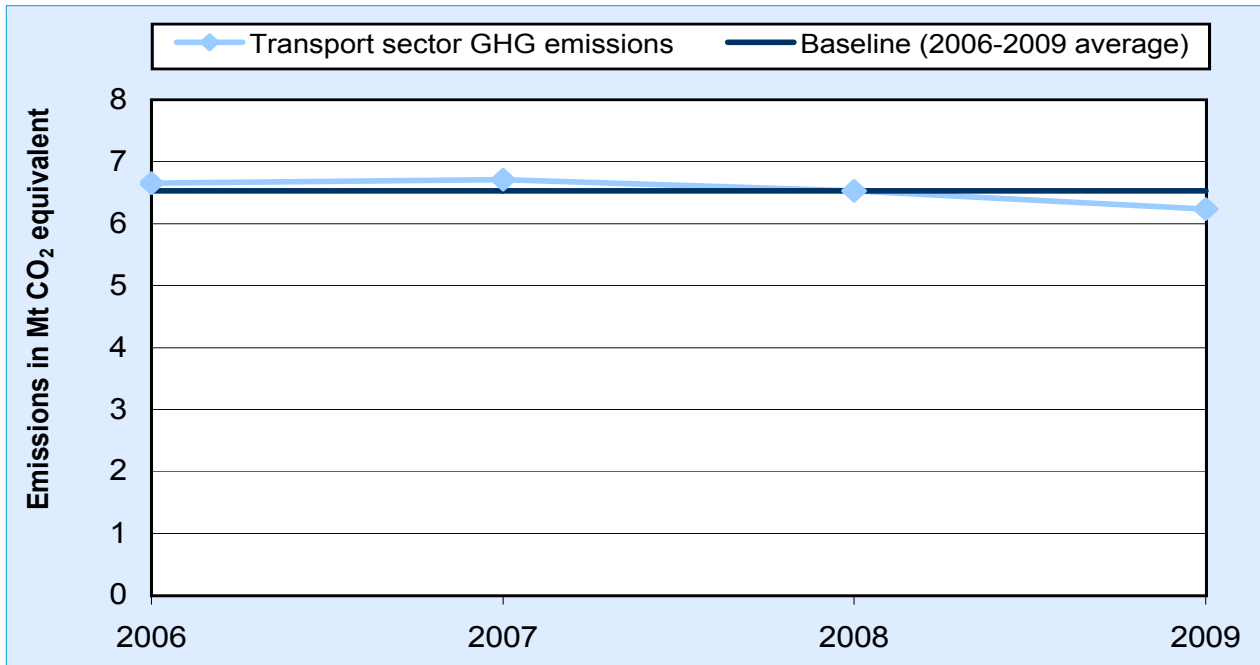
At this stage we are still developing indicators for:

- WT5 – Promotion of eco-driving
- WT9 – Improving traffic management of the strategic road network
- WT11 – Alternative fuels infrastructure

It is proposed that the three tier framework for the transport sector will be as follows:

### Tier 1

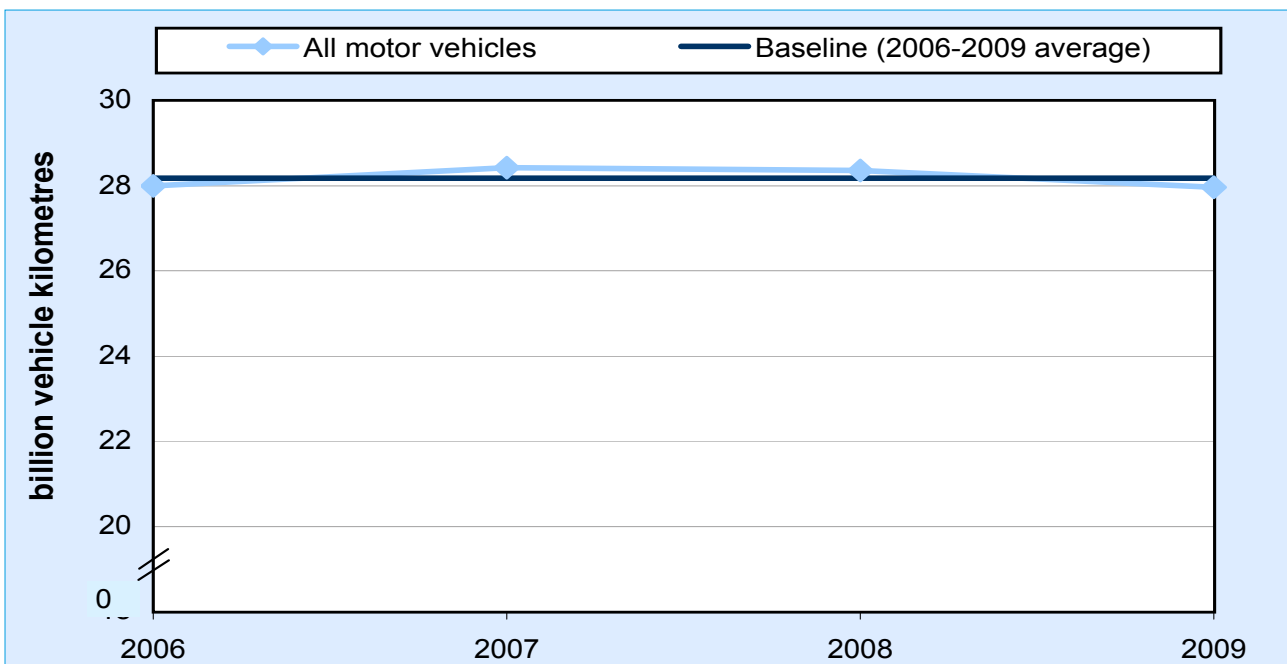
#### Transport Sector GHG emissions



Source: GHG Inventory

### Tier 2

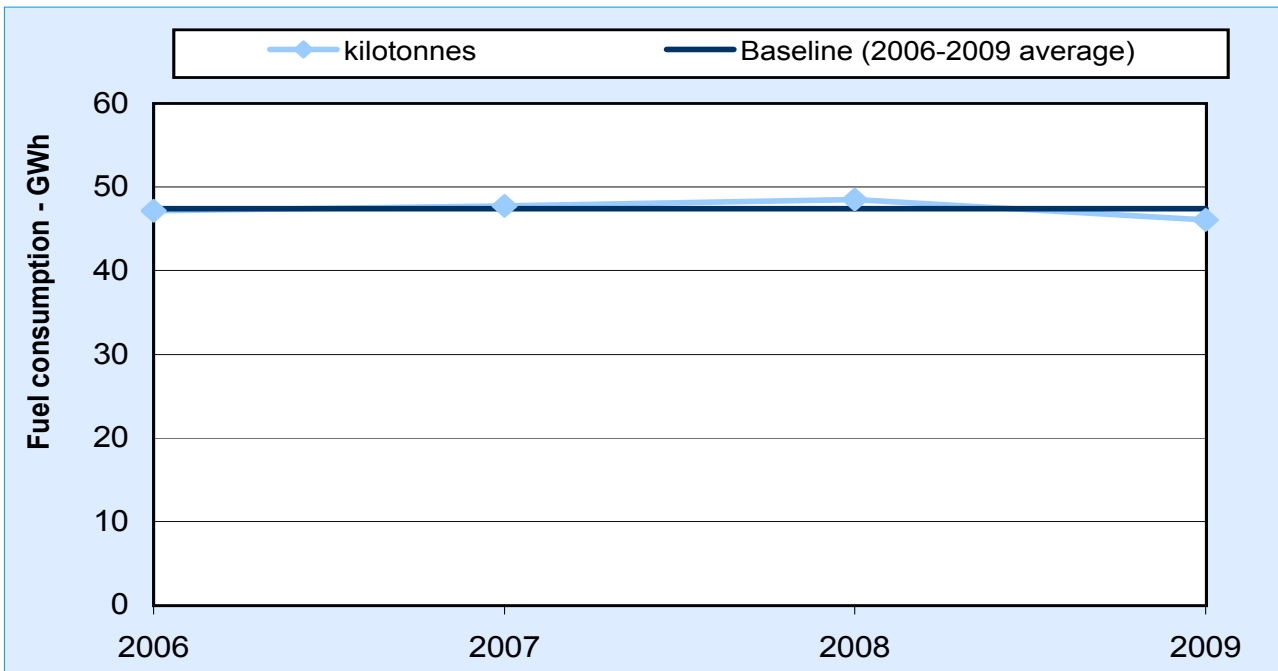
#### Volume of road traffic – total distance travelled (all motor vehicles)



Source: Welsh Transport Statistics

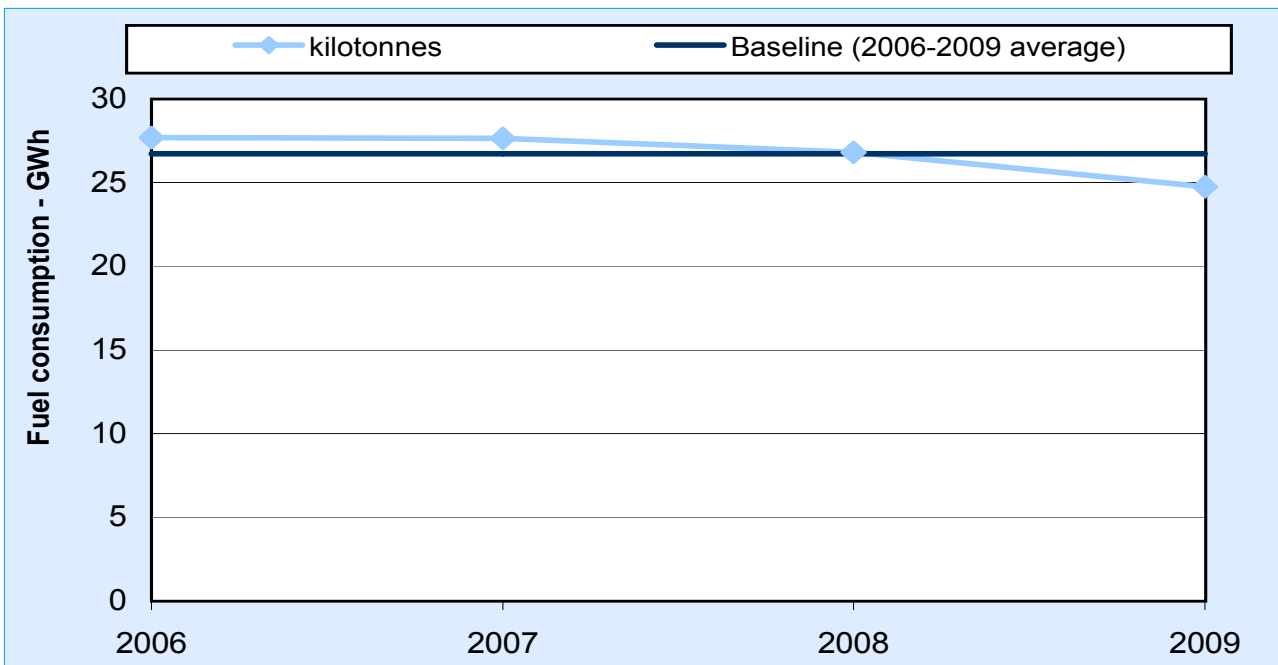
// in the chart indicates the y-axis starts at 20

## Fuel consumption – rail



Source: GHG Emissions Inventory Team – AEA

## Fuel consumption – rail freight



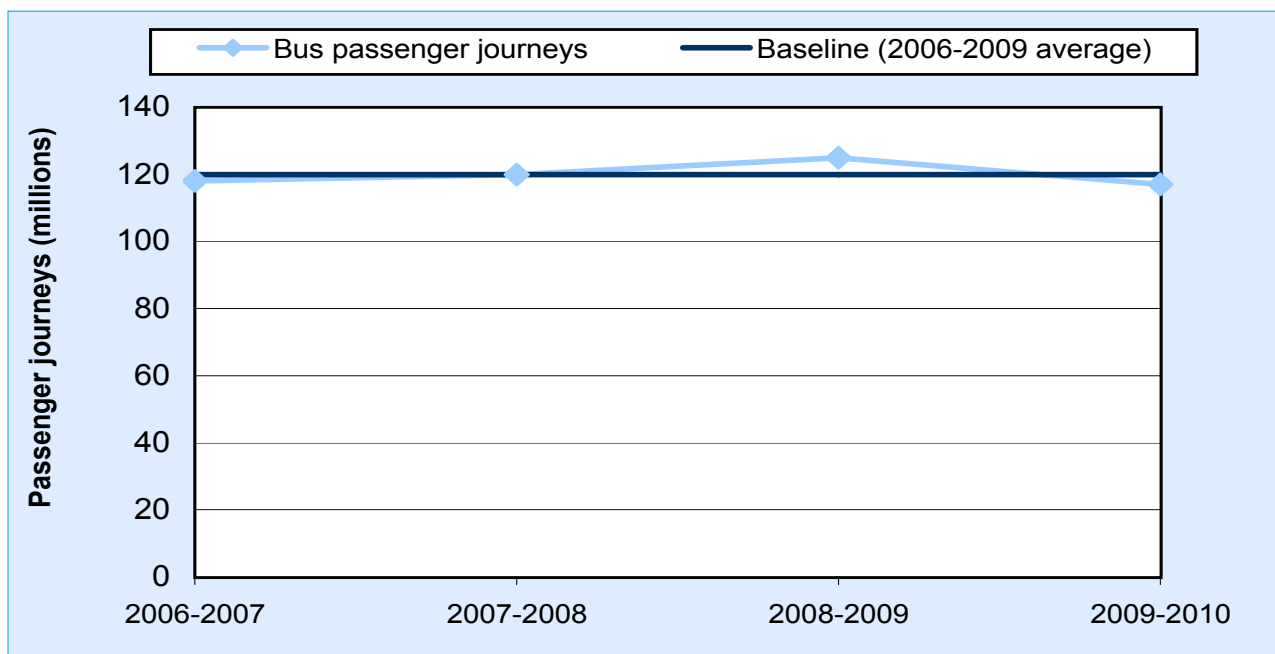
Source: GHG Emissions Inventory Team – AEA

### Tier 3

Table 1 highlights which indicators will be used to report on the performance of the Welsh Governments interventions mentioned above:

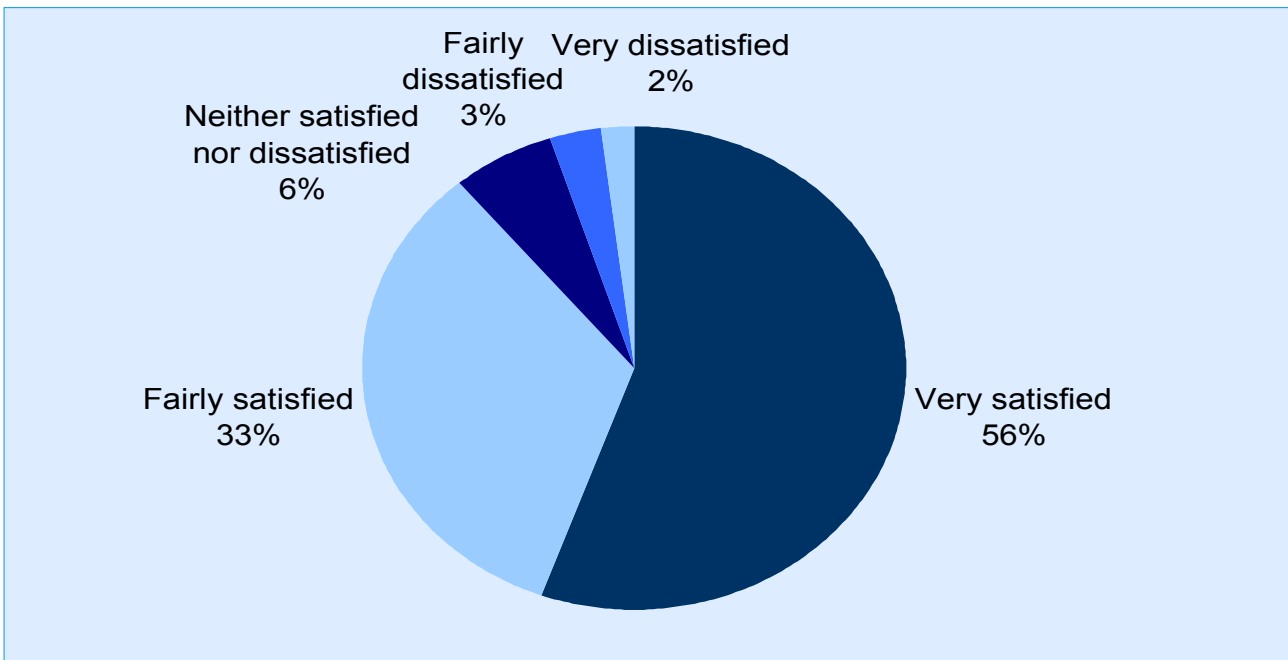
Indicator	Welsh Government Intervention
Local Bus service passenger numbers	WT1, WT2, WT3 and WT8
Bus travel satisfaction	WT1, WT2, WT3 and WT8
Rail passenger journeys to, from or within Wales	WT1, WT2, WT3 and WT7
Train user satisfaction	WT1, WT2, WT3 and WT7
Percentage of people travelling to work whose main mode of travel is cycling or walking	WT1, WT2, WT3 and WT6
Percentage of children and young people cycling to school	WT6
Average loading of buses in Wales	WT8
Traffic volumes of Heavy Goods Vehicles (HGV's) versus freight lifted in Wales	WT10

### Local bus service passenger



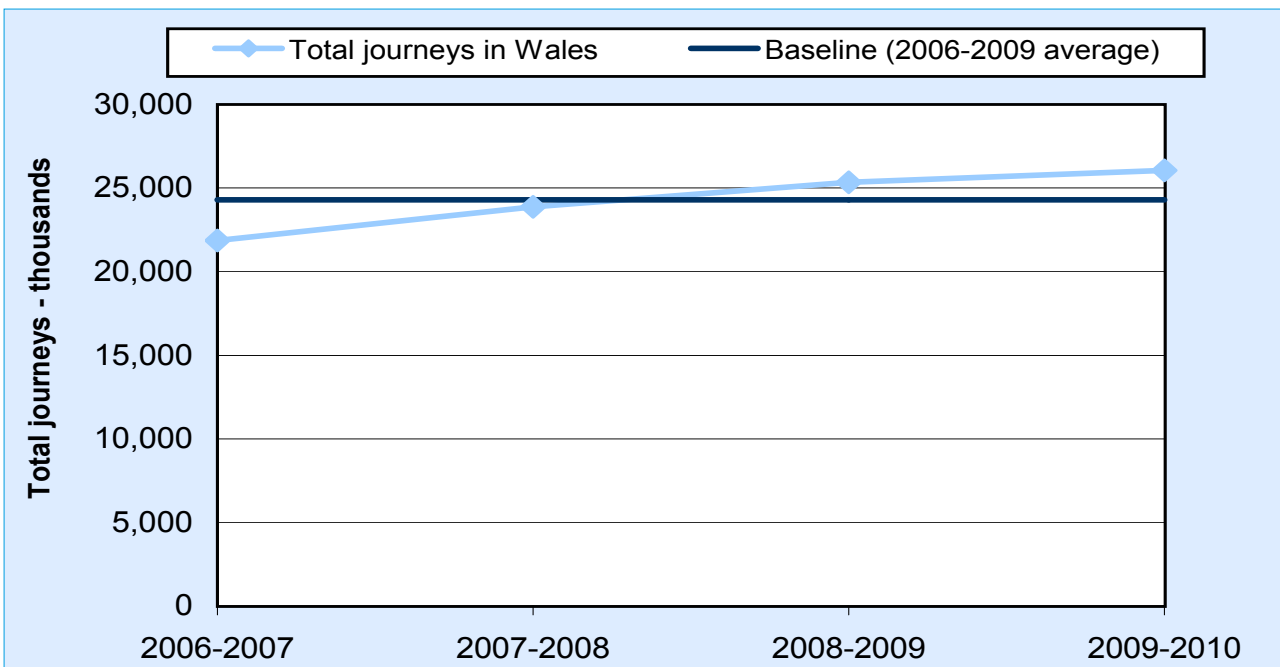
Source: Welsh Transport Statistics

### Bus travel satisfaction – percentage of passengers (2010)



Source: Welsh Assembly Government – Bus Passenger survey

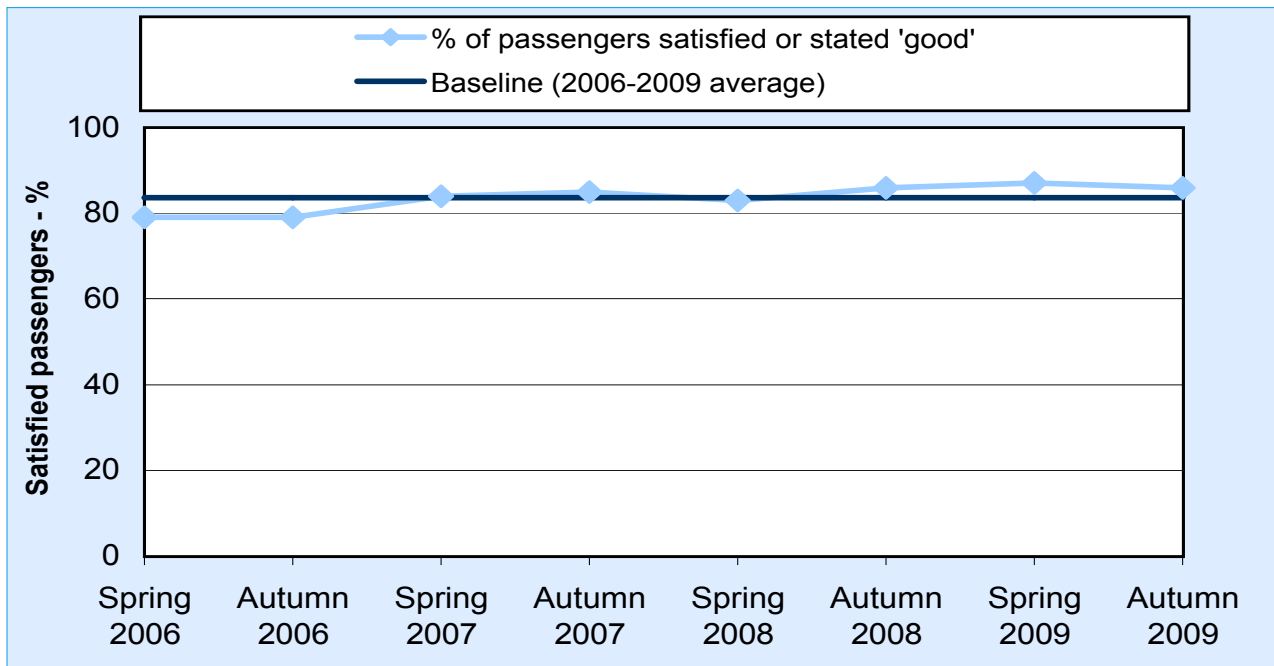
### Rail passenger journeys to, from or within Wales



Source: Welsh Transport Statistics

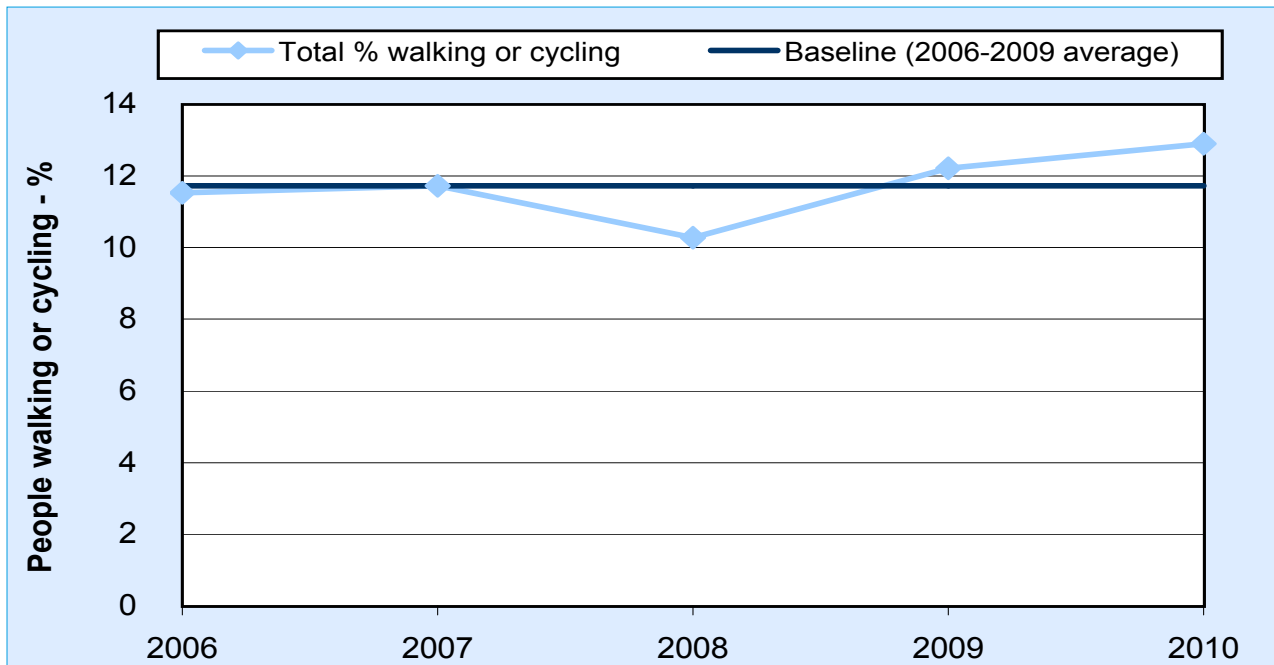


## Train user satisfaction



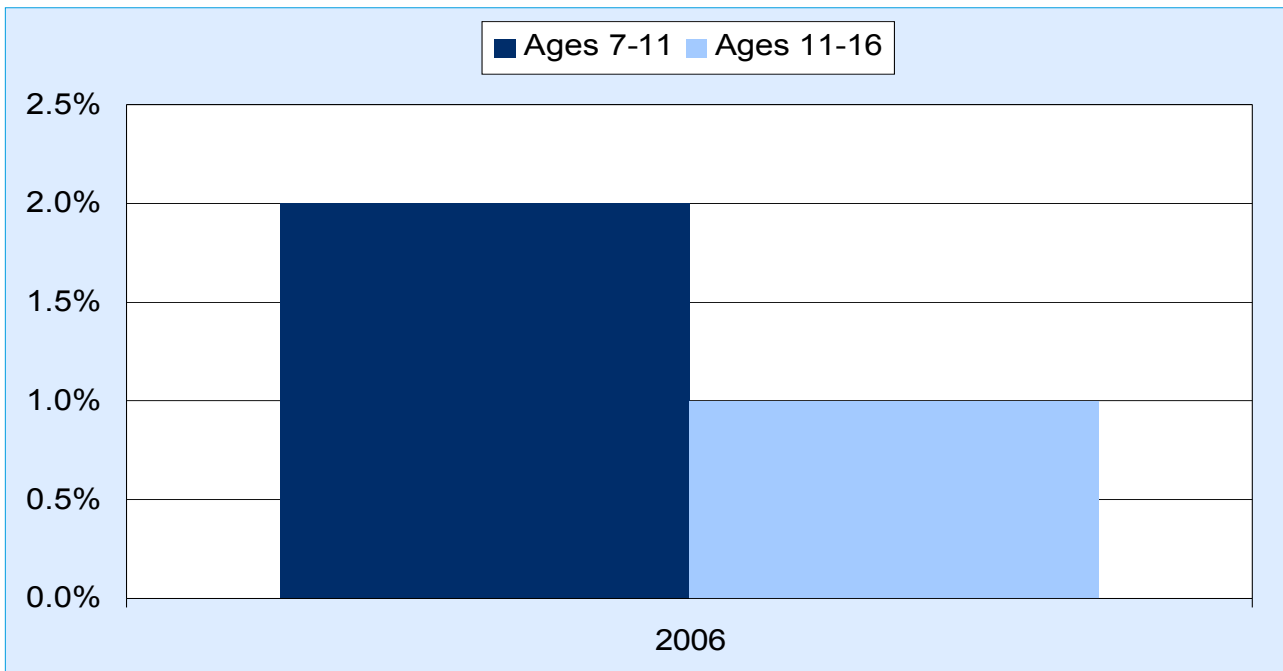
Source: Passenger Focus – National Passenger Survey

## Percentage of people travelling to work whose main mode of travel is cycling and walking



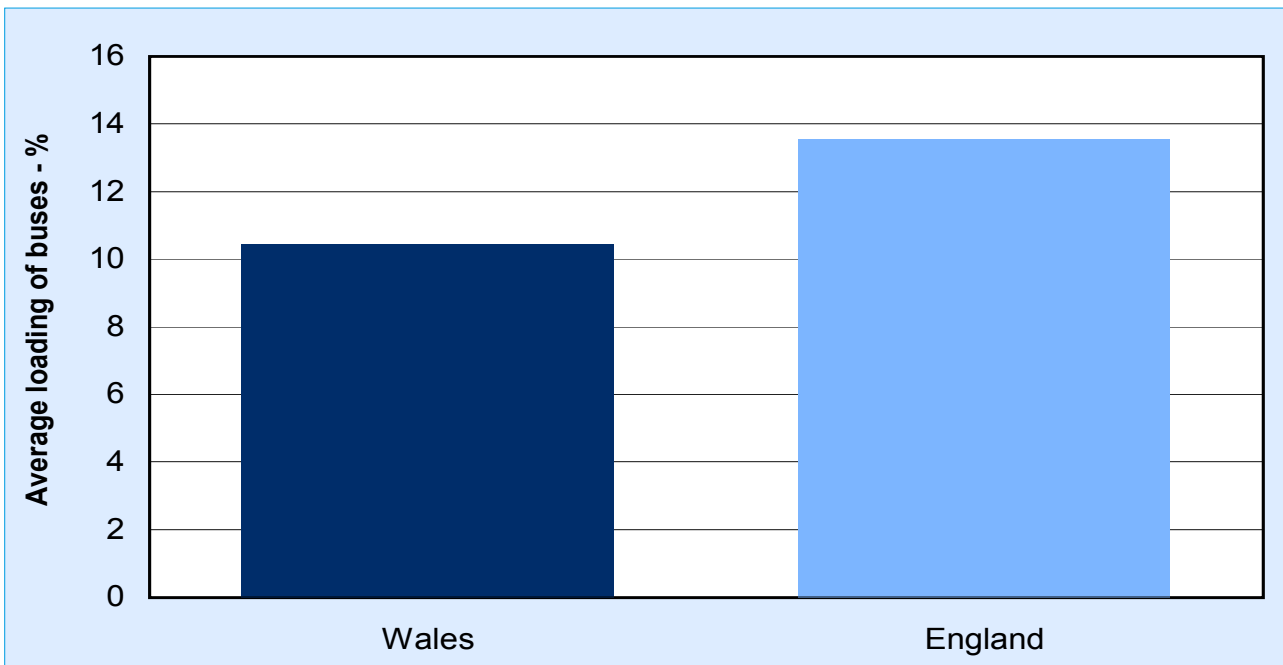
Source: Source: Welsh Transport Statistics

### Percentage of children and young people cycling to school



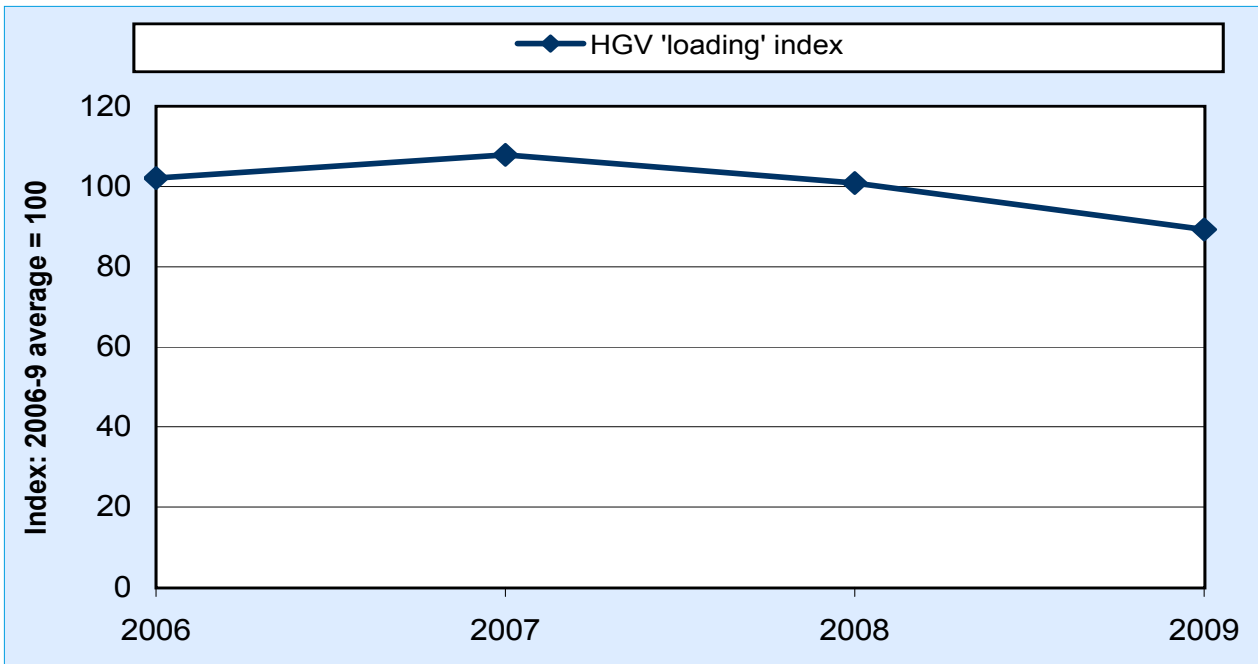
Source: Monitoring 'A Walking & Cycling Action Plan for Wales 2009 – 2013': Interim Update 2011

### Average loading of buses in Wales 2010



Source: Welsh Government internal document

### Traffic volumes of HGV's versus freight lifted in Wales (a)

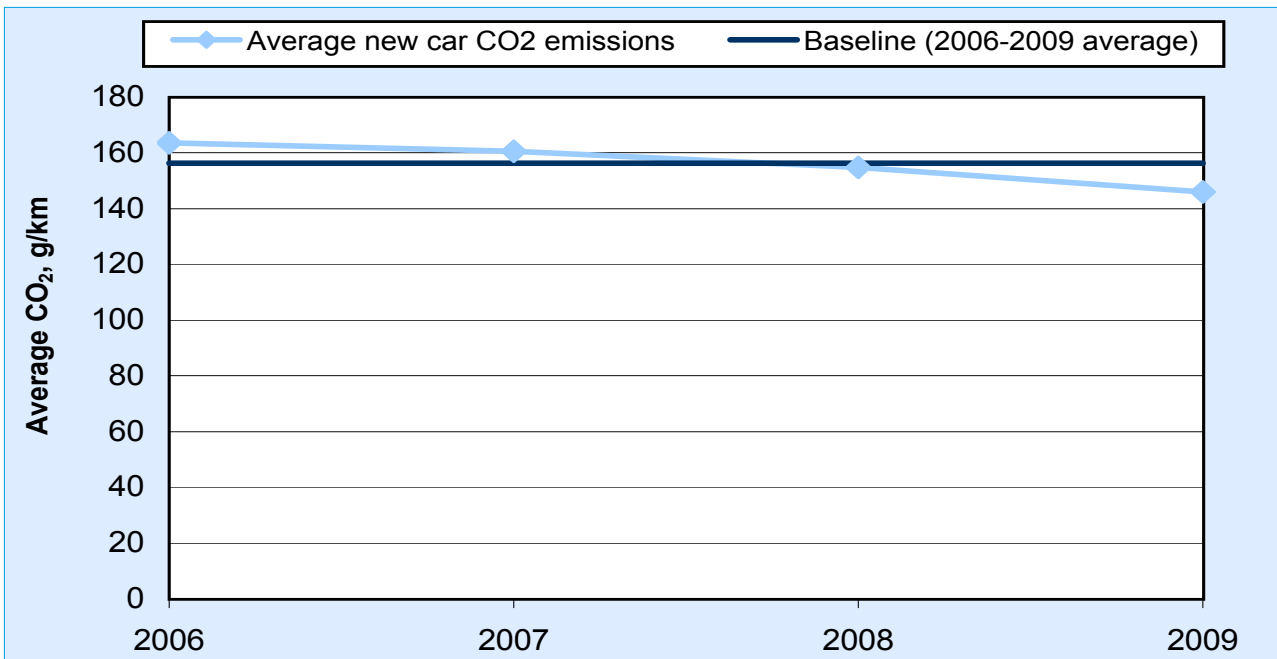


Source: Source: Welsh Transport Statistics

(a) Total weight of freight moved in Wales divided by the volume of HGV road traffic. The resulting series has been re-scaled into an index with the average value for 2006-09 expressed as 100

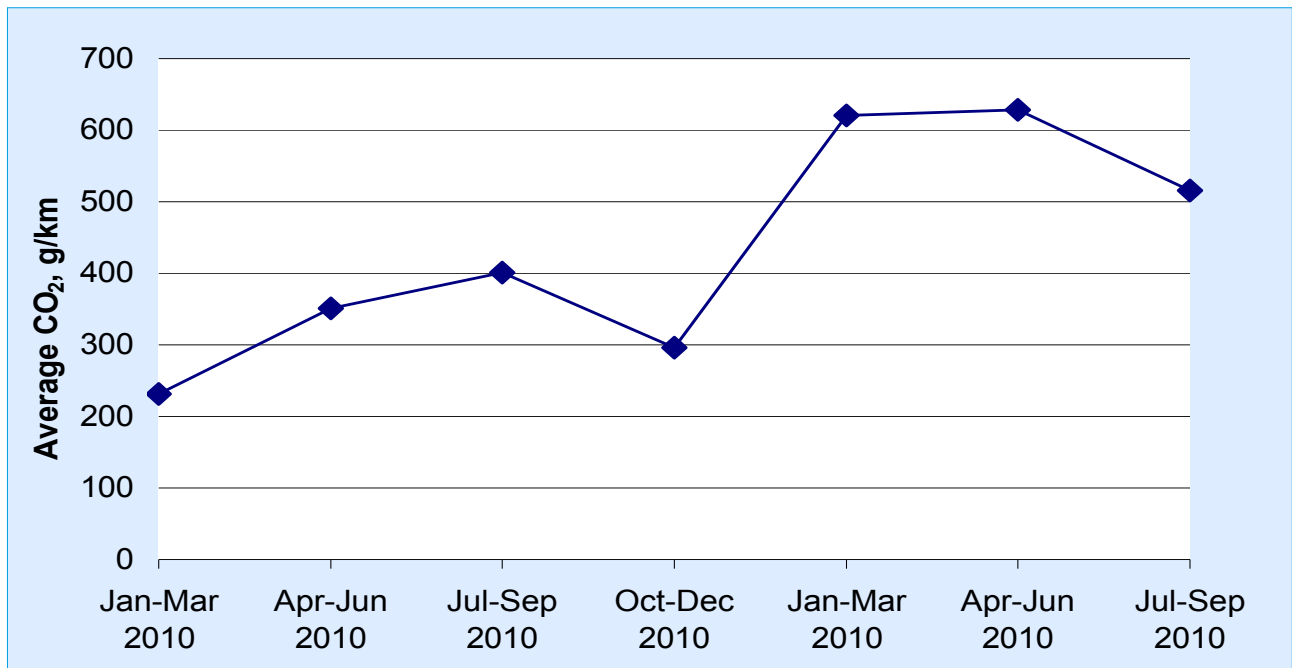
### Tier 3 UK measures

#### Average new car CO<sub>2</sub> emissions



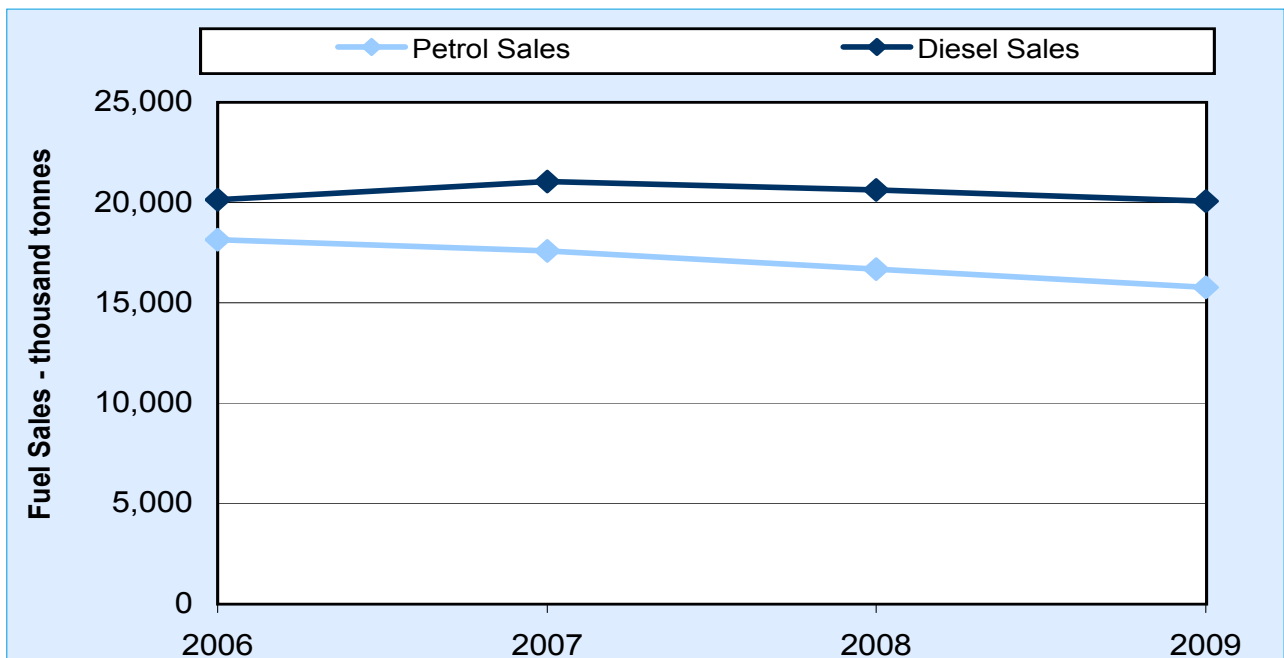
Source: DfT Vehicle Licensing Statistics

### Ultra-low emission vehicles registered for the first time



Source: DfT Vehicle Licensing Statistics

### Total UK road transport fuel sales



Source: Digest of UK Energy Statistics (DUKES), DECC



## Contextual factors

In addition to the cross cutting factors mentioned above, other contextual factors we believe to be relevant to the transport sector include:

- Petroleum prices
- Average number of trips (trip rates) by main mode, purpose and length
- Commuting patterns in Wales

## Business Sector

- The business sector (not including direct emissions from heavy industry and energy generation) is responsible for approximately a third of emissions covered by the 3% target
- Welsh Government action in the business sector is forecast to deliver 0.62 Mt CO<sub>2</sub>e savings in 2020
- UK action in the business sector is forecast to deliver 0.50 MT CO<sub>2</sub>e savings in 2020

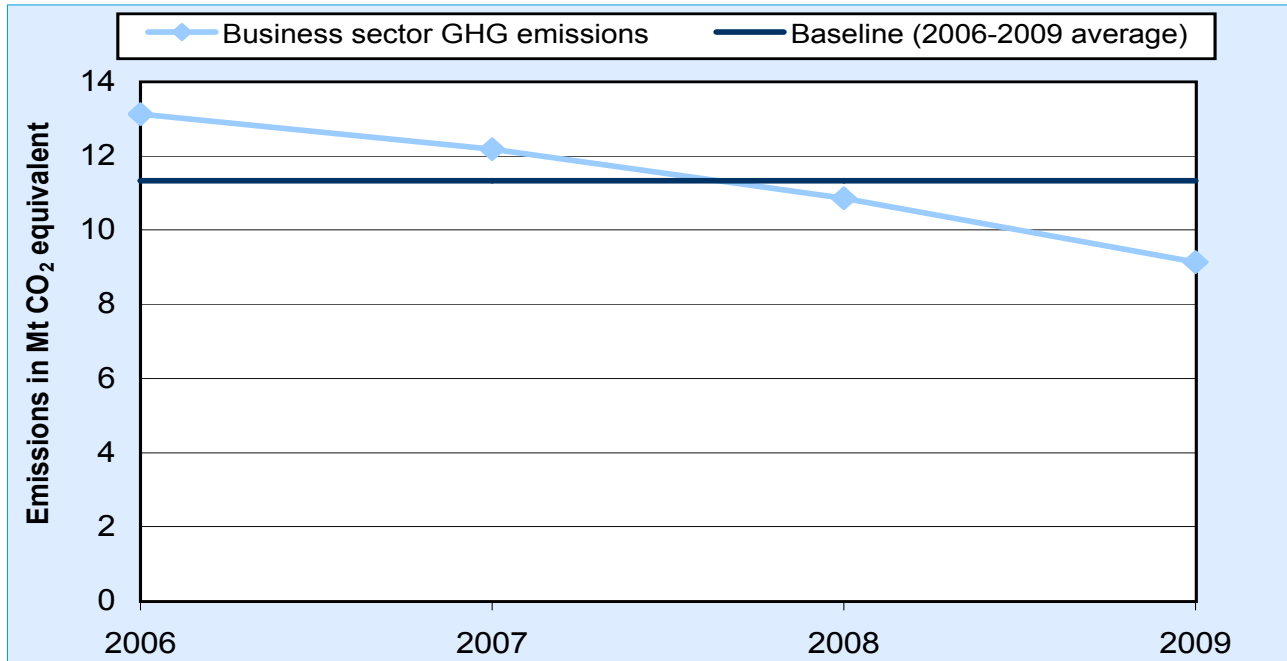
We are currently still developing the indicators for the Tier 3 Welsh Government interventions in the business sector. The development of indicators is ongoing for the following interventions:

- WB1 – Economic renewal: A new direction
- WB2 – Carbon Trust
- WB3 – Enabling more resource efficient business
- WB4 – Skills for a low carbon economy
- WB5 – More efficient use of, and regulation of, waste heat and energy
- WB6 – Low carbon energy

It is proposed that the three tier framework for the business sector will be as follows:

### Tier 1

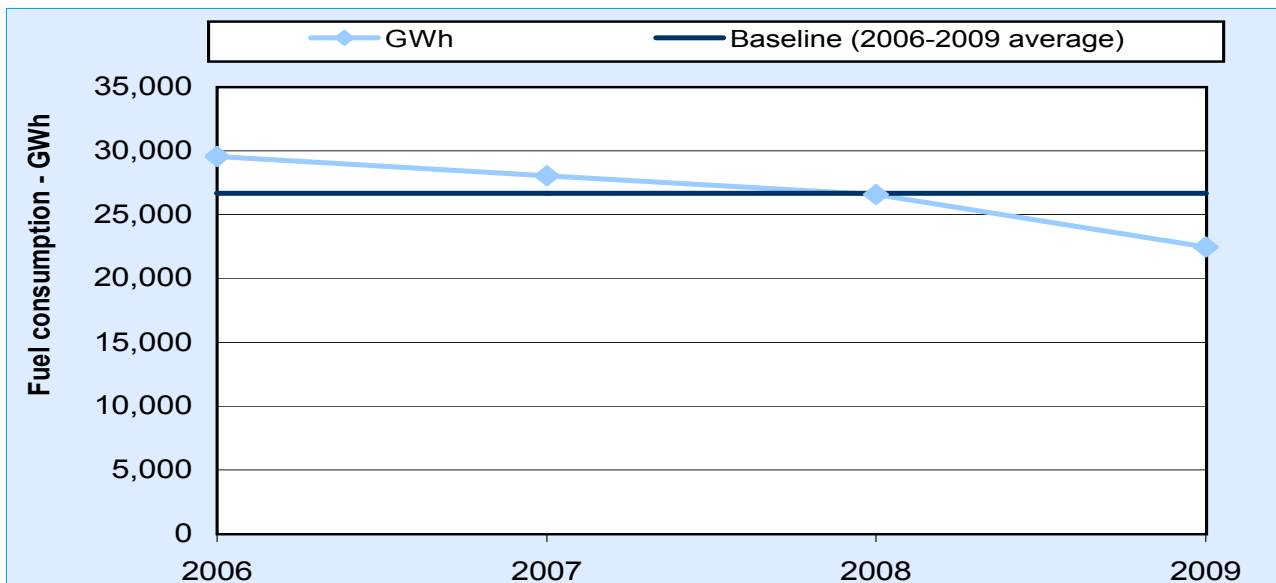
#### Business Sector GHG emissions



Source: GHG Inventory

### Tier 2

#### Business sector fuel consumption (liquid fuels, gaseous fuels, solid fuels, biomass, electricity, and other fuels)



Source: GHG Emissions Inventory Team – AEA



## Contextual factors

In addition to the cross cutting factors mentioned above, other contextual factors we believe to be relevant to the business sector include:

- Industrial energy prices

## Residential Sector

- The residential sector is responsible for approximately a quarter of emissions covered by the 3% target
- Welsh Government action in the residential sector is forecast to deliver 0.24 Mt CO<sub>2</sub>e savings in 2020
- UK action in the residential sector is forecast to deliver 1.20 MT CO<sub>2</sub>e savings in 2020

The Welsh Government interventions that we have developed indicators for are:

- WR1 – Area based domestic energy efficiency programmes
- WR2 – Demand-led energy efficiency programmes focused on those at risk of fuel poverty
- WR3 – Supporting community scale energy generation
- WR4 – Improving the energy performance of social housing
- WR6 – Low carbon new build Wales

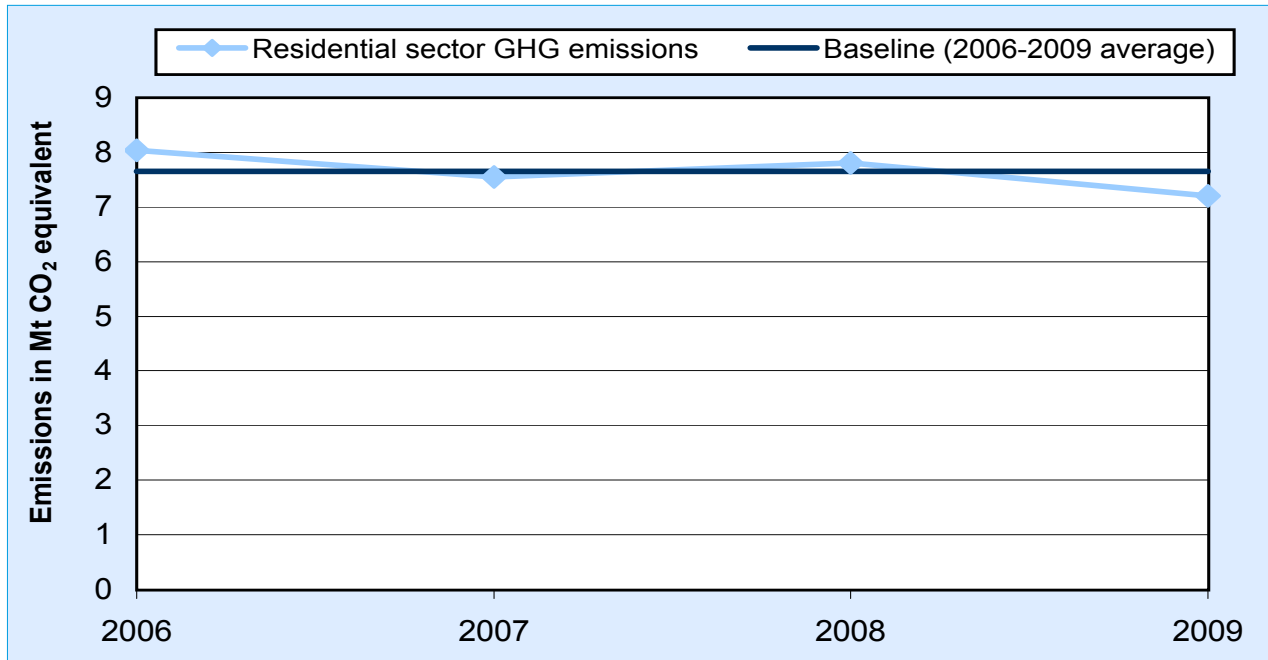
We are currently still developing the indicators for:

- WR5 – Behaviour change at home

It is proposed that the three tier framework for the residential sector will be as follows:

### Tier 1

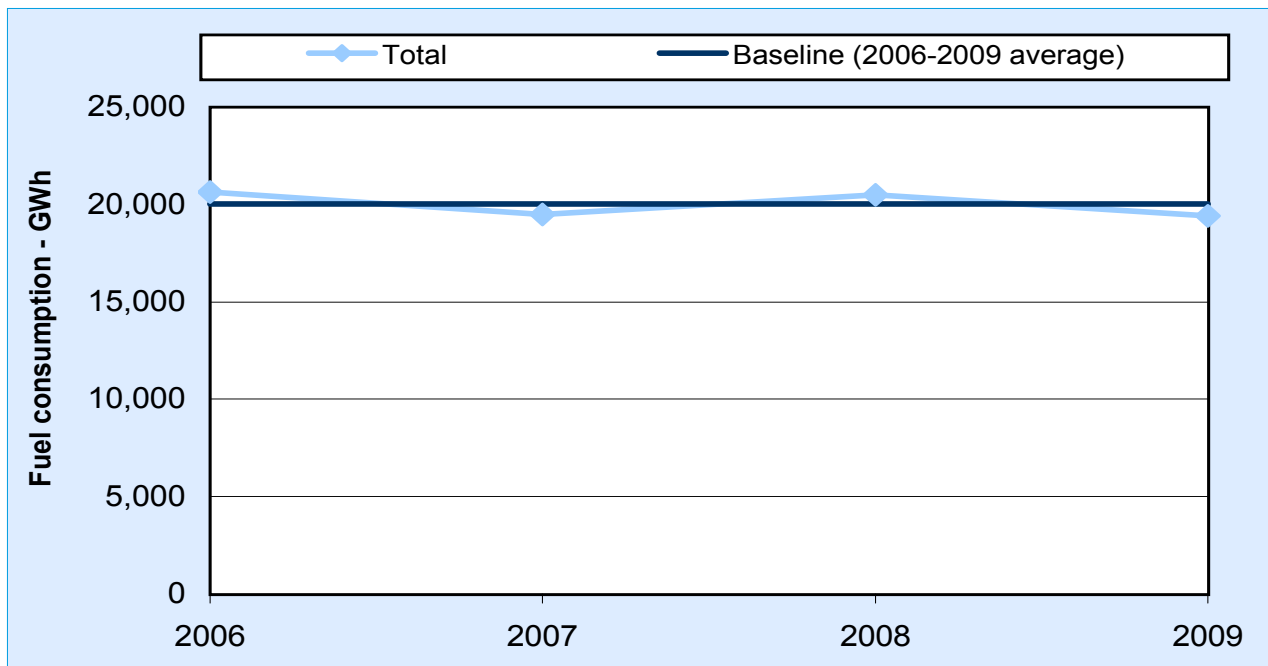
#### Residential Sector GHG emissions



Source: GHG inventory

### Tier 2

#### Residential sector fuel consumption (liquid fuels, gaseous fuels, solid fuels, biomass, electricity, and other fuels)



Source: GHG Emissions Inventory Team – AEA

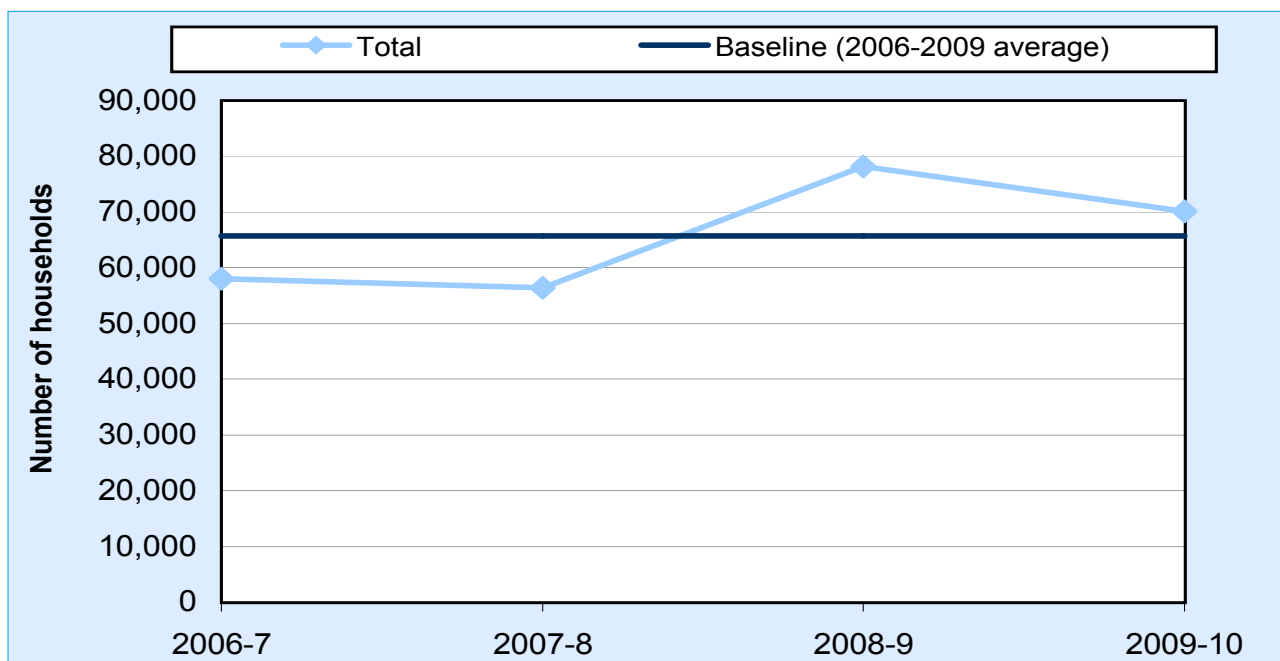


### Tier 3

Table 1 highlights which indicators will be used to report on the performance of the Welsh Governments interventions mentioned above:

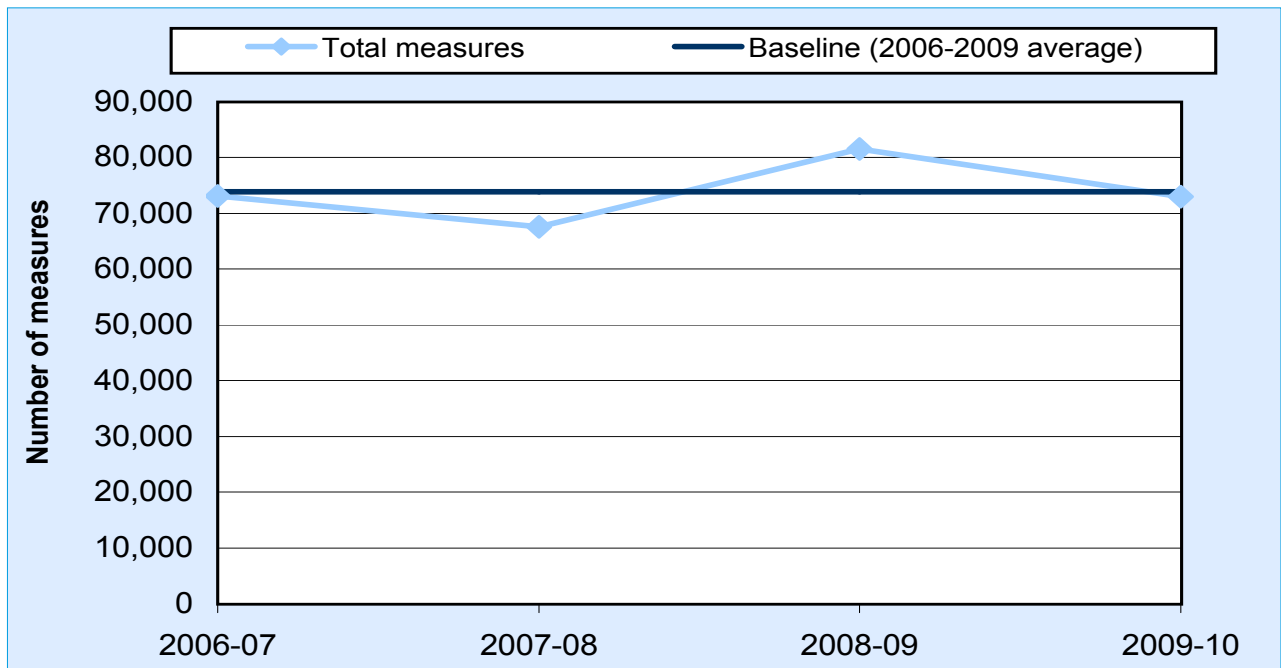
Indicator	Welsh Government Intervention
Number of Households receiving energy efficiency measures	WR4
Number of energy efficiency measures	WR1 and WR2
Total installed renewable heat capacity and installed renewable electricity capacity	WR3
Average energy efficiency (SAP) rating of new homes in Wales	WR6

### Total number of households receiving energy efficiency measures



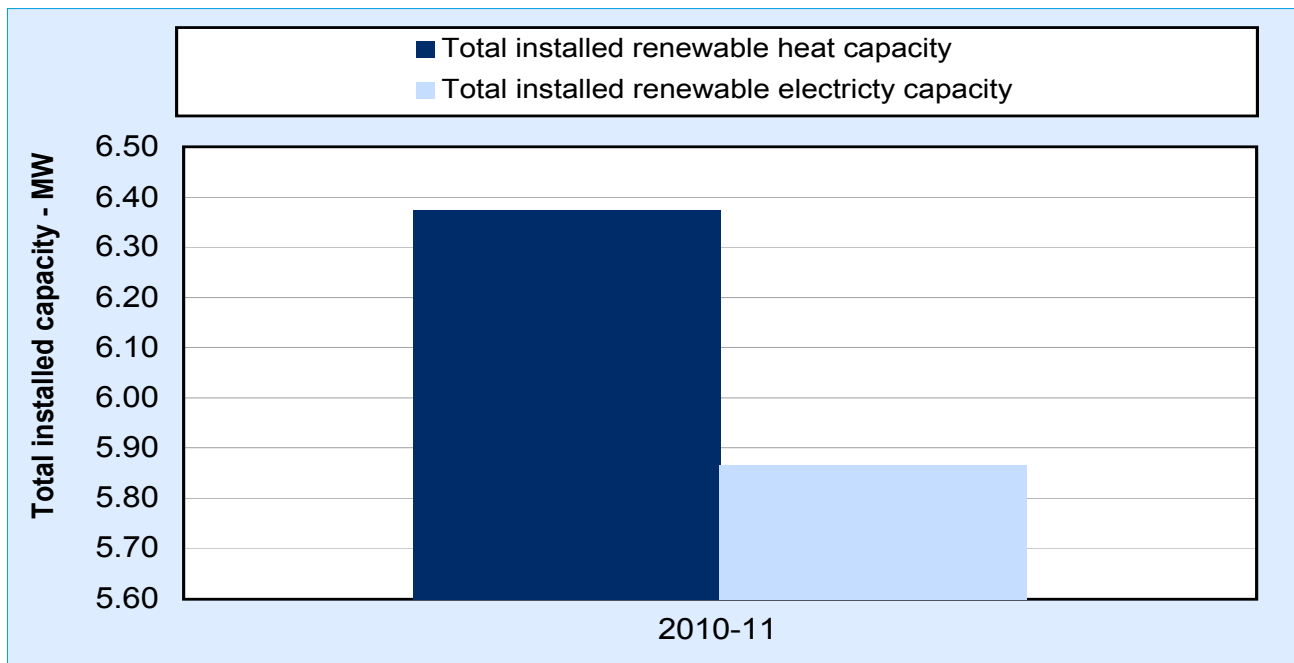
Source: Welsh Government fuel poverty scheme

### Total number of energy efficiency measures



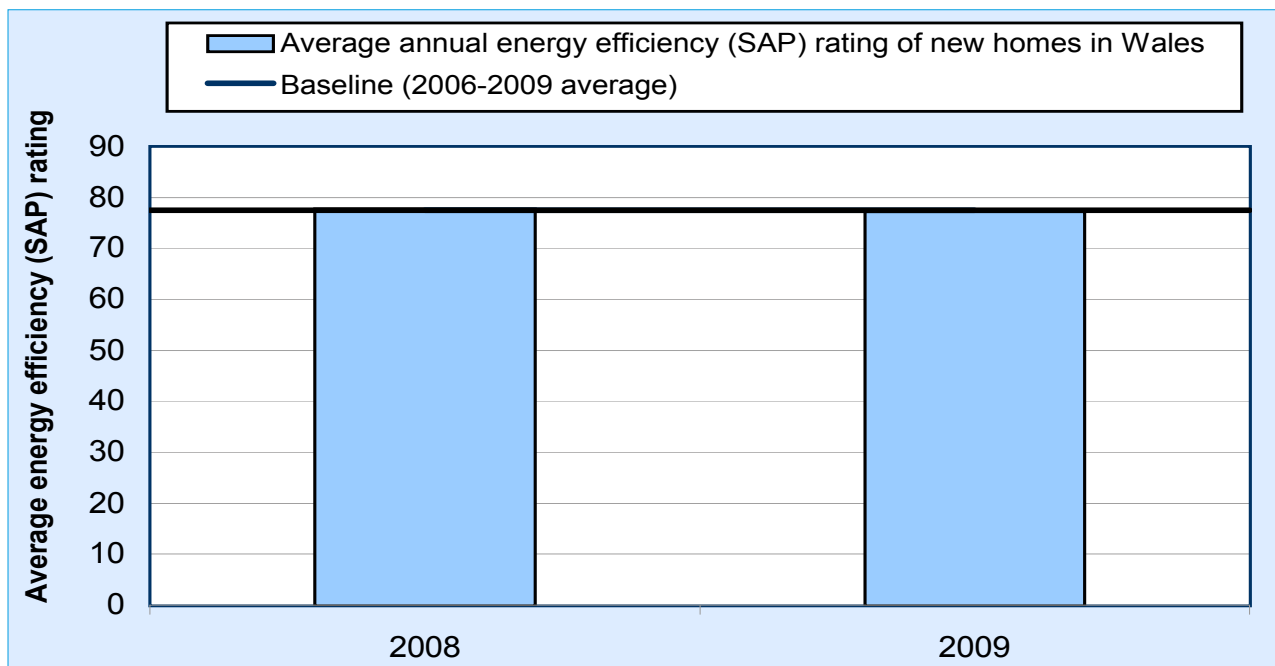
Source: Welsh Government fuel poverty scheme

### Total installed renewable heat capacity and installed renewable electricity capacity



Source: Welsh Government, Arbed

## Average energy efficiency (SAP) rating of new homes in Wales



Source: Department for Communities and Local Government (DCLG)

## Contextual factors

In addition to the cross cutting factors mentioned above, other contextual factors we believe to be relevant to the residential sector include:

- Domestic energy prices
- Household estimates for Wales by Household Type
- Gross Disposable Household Income (GDHI)

## Agriculture and Land Use Sector

- The agriculture and land use sector is responsible for approximately a sixth of emissions covered by the 3 % target
- Welsh Government action in the agriculture and land use sector is forecast to deliver 0.60 Mt CO<sub>2</sub>e savings in 2020
- There are no specific UK Government interventions covering Wales for this sector

The Welsh Government interventions that we have developed indicators for are:

- WA1 – Woodland creation

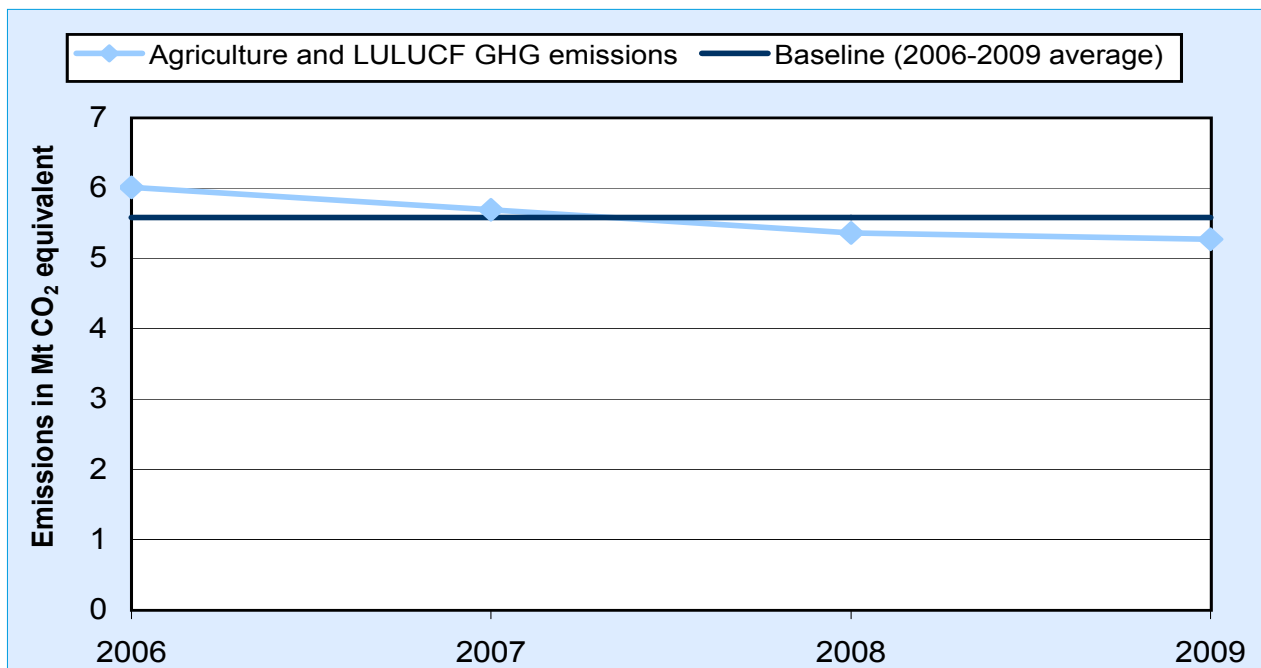
We are currently still developing the indicators for:

- WA2 – Optimal management of current woodland sink
- WA3 – Glastir
- WA4 – Supporting behaviour change in farming practice
- WA5 – Dairy and Red Meat Road Maps

It is proposed that the three tier framework for the agriculture and land use sector will be as follows:

## Tier 1

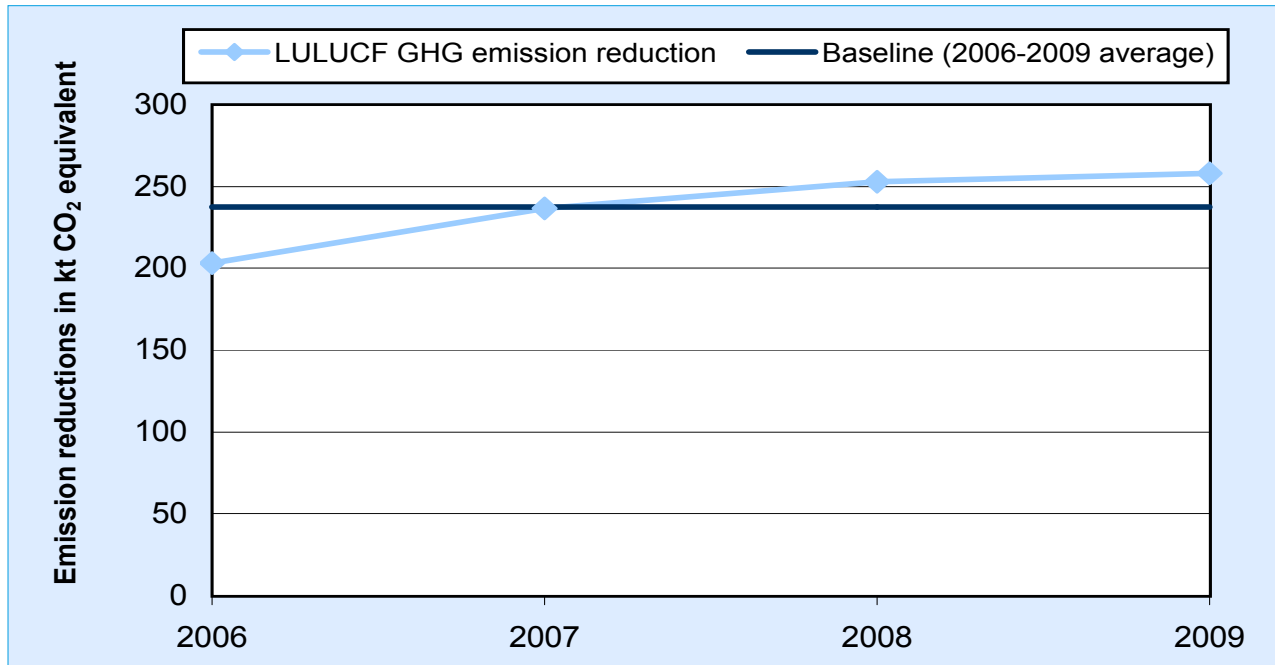
### Agriculture and Land Use Sector GHG emissions



Source: GHG Inventory

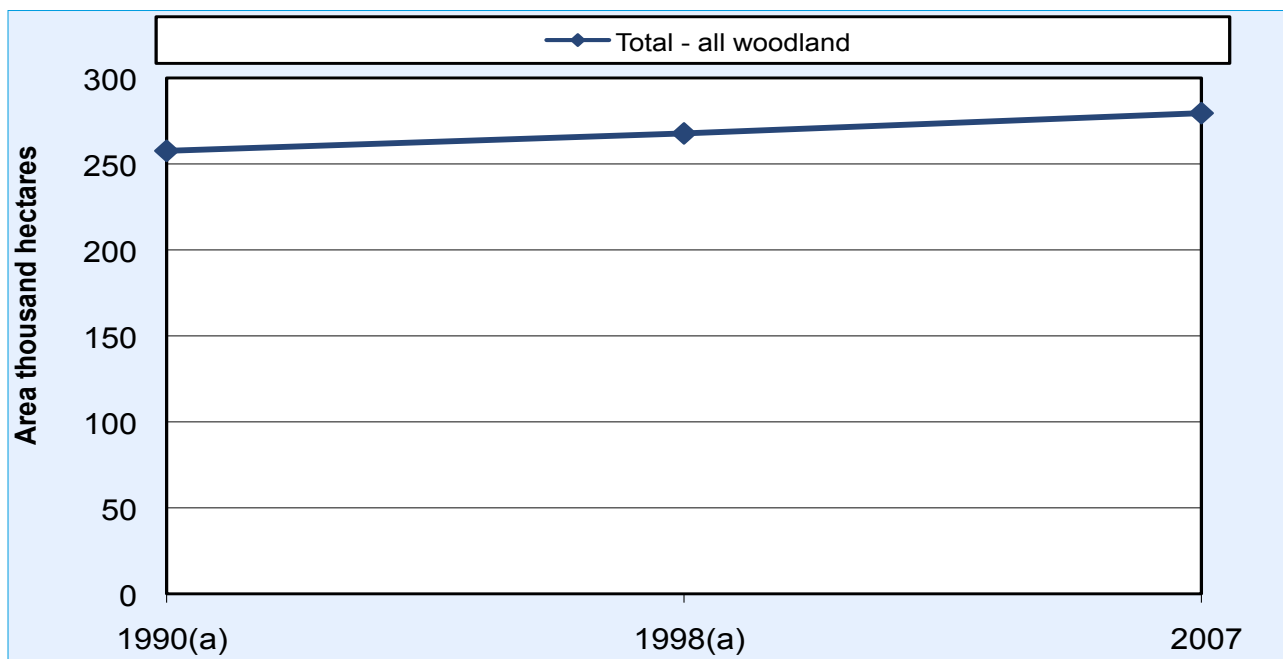
## Tier 2

### LULUCF GHG emission reduction



Source: GHG Inventory

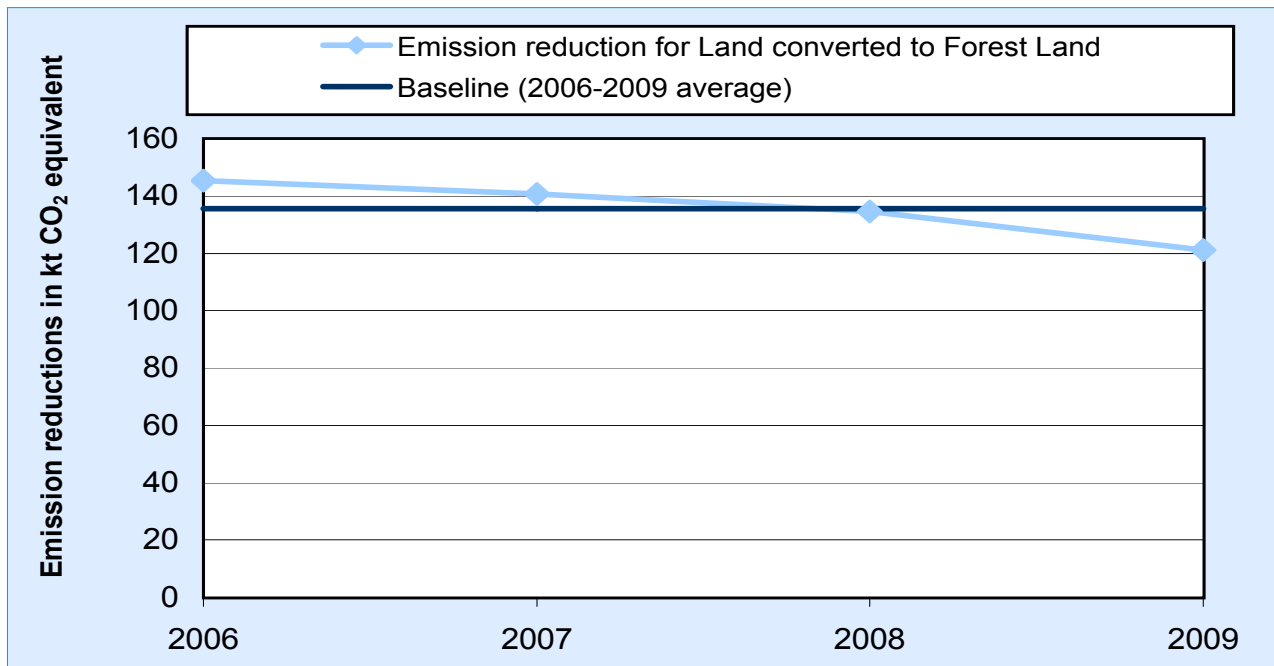
### Woodland Area



Source: Countryside Survey

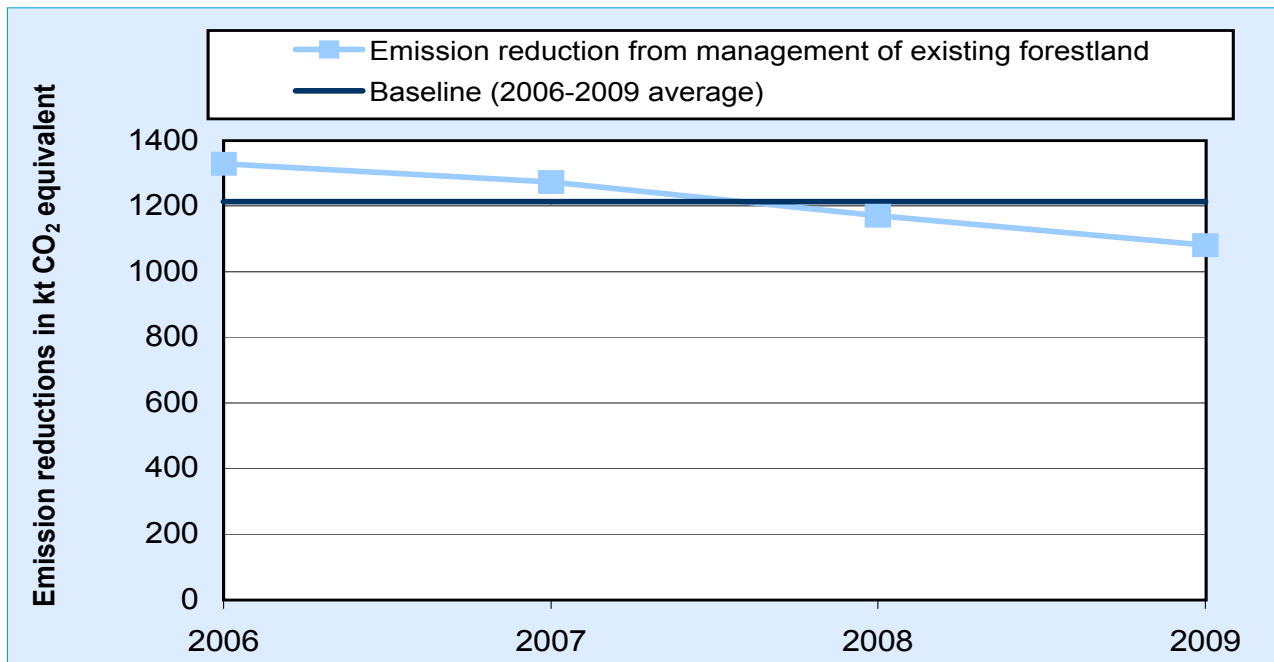
(a) data before the 2007 baseline, included only to give indication of trend to 2007

### LULUCF GHG emission reduction – Land Converted to Forest Land



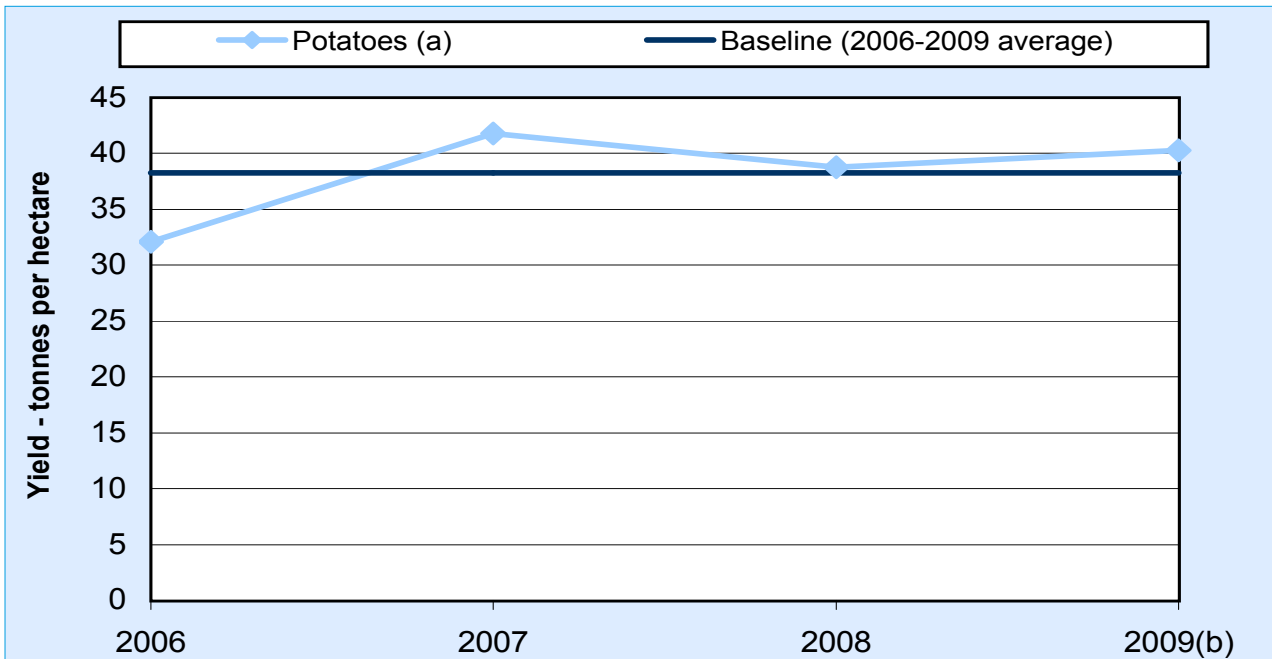
Source: GHG Inventory

### LULUCF GHG emission reduction – Management of existing Forest Land



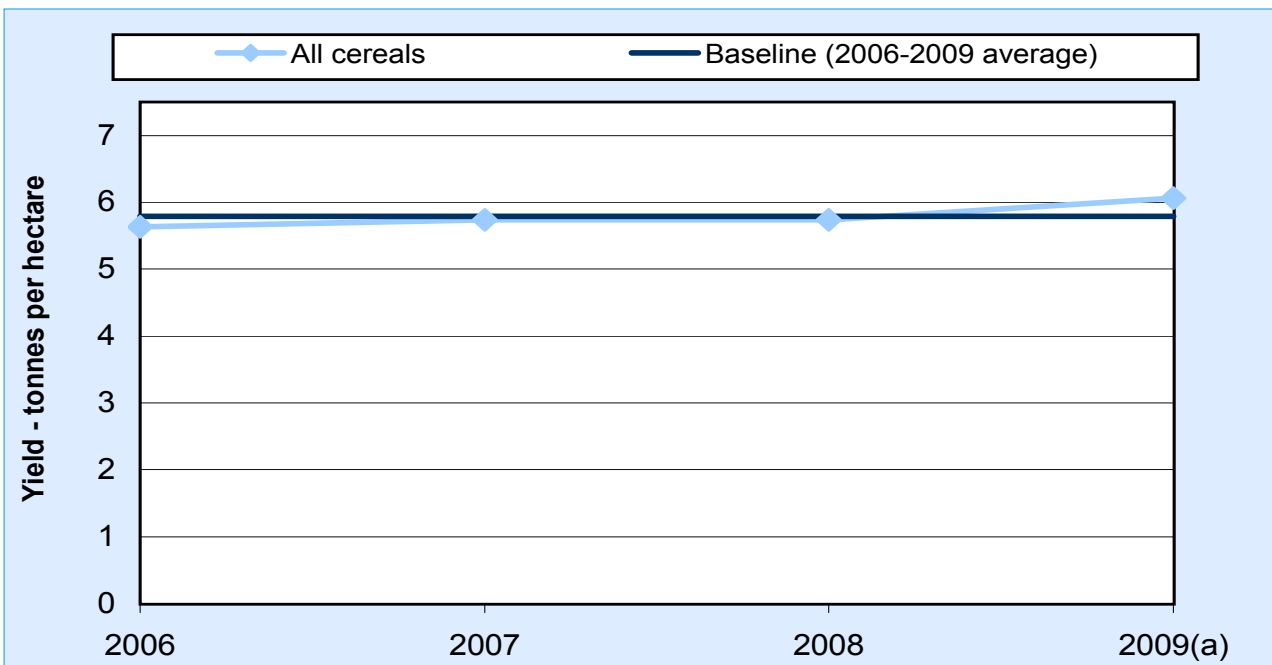
Source: GHG Inventory

### Crop production data potatoes (tonnes per hectare)



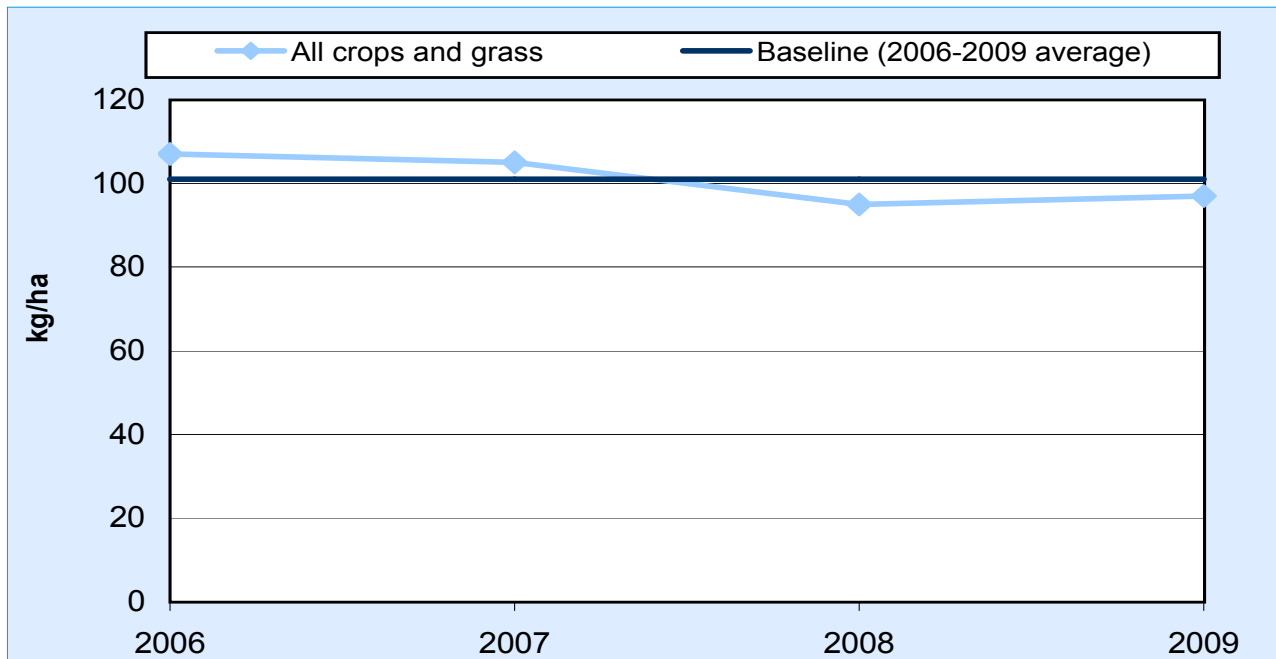
Source: Survey of Agriculture and Horticulture  
(a) Figures include production of both major and minor holdings  
(b) Provisional

### Crop production data cereals (tonnes per hectare)



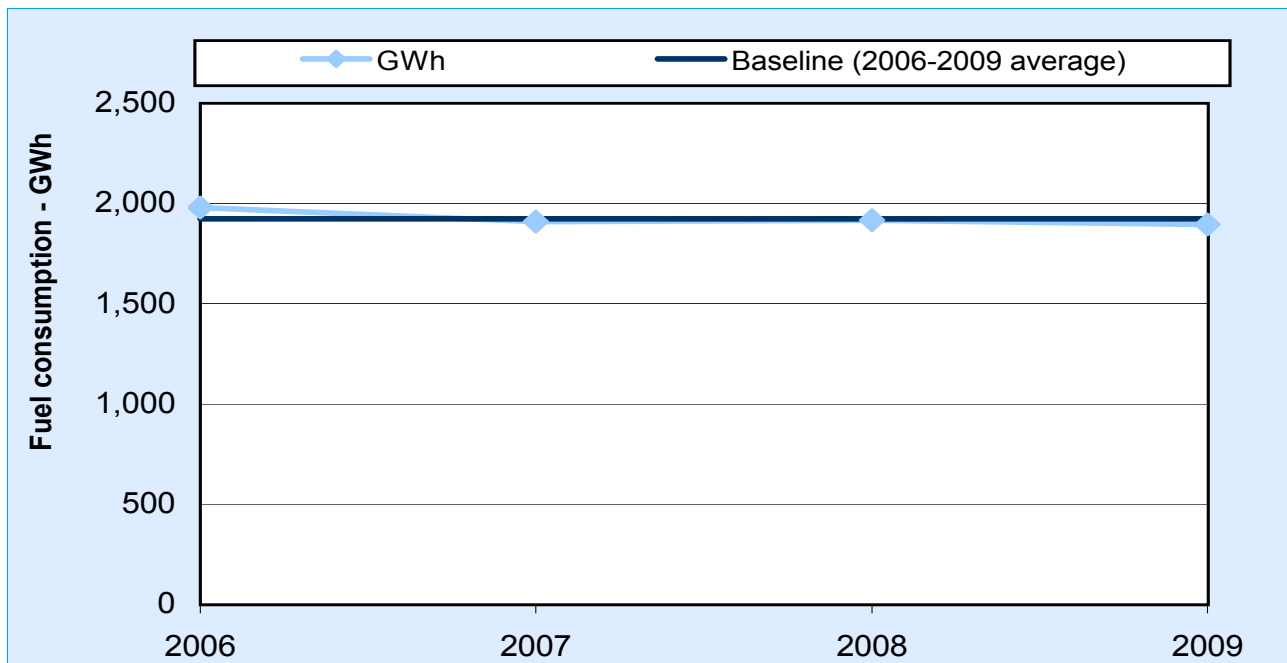
Source: Survey of Agriculture and Horticulture  
(a) Provisional

### Nitrogen application rates for all crops and grass



Source: British Survey of fertiliser practice 2010

### Fuel Consumption by agricultural mobile machinery



Source: GHG Emissions Inventory Team – AEA

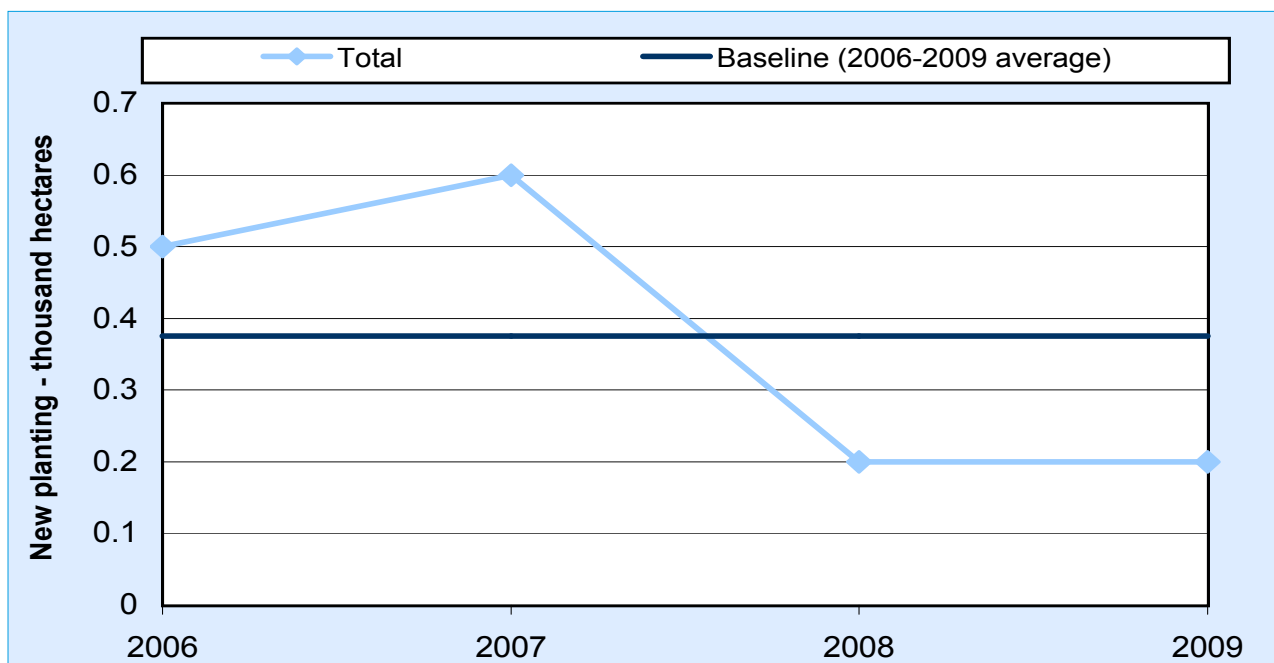


### Tier 3

Table 1 highlights which indicators will be used to report on the performance of the Welsh Governments interventions mentioned above:

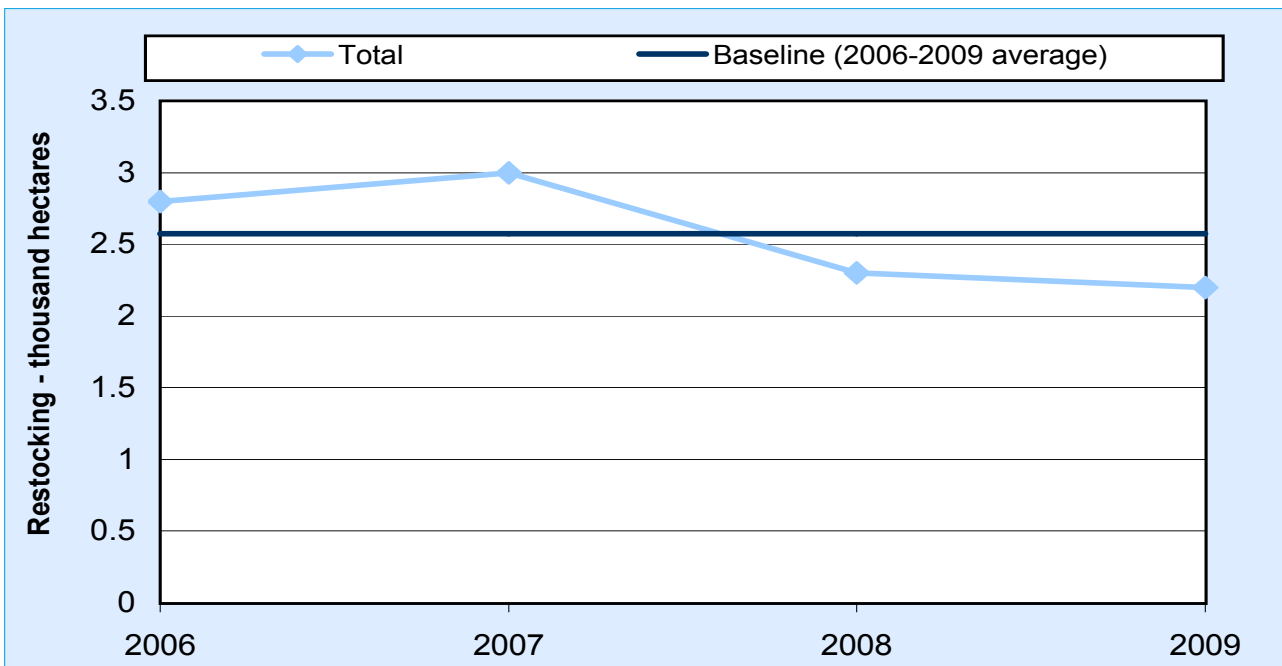
Indicator	Welsh Government Intervention
Annual Planting rate – new planting	WA1
Annual Planting rate – restocking	WA1
Certified woodland Area – National Forest Inventor	WA1

### New planting in Wales



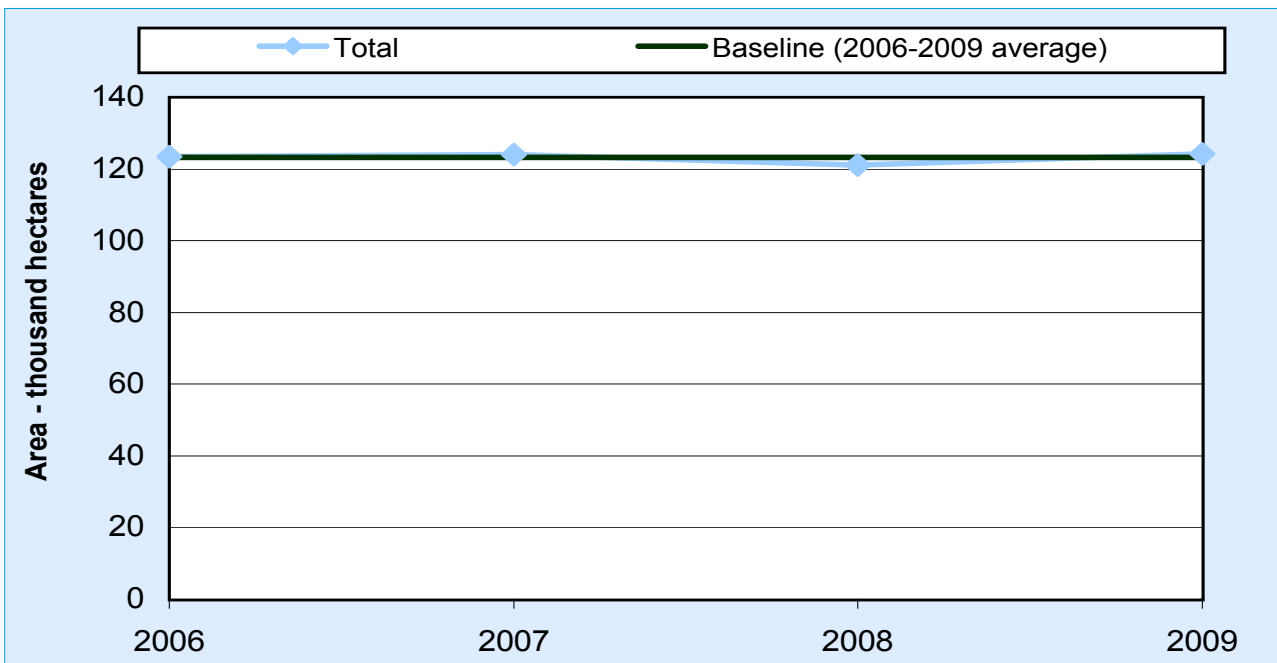
Source: Forestry Commission Woodland Statistics

## Restocking in Wales



Source: Forestry Commission Woodland Statistics

## Certified woodland Area – National Forest Inventor



Source: Forestry Commission Woodland Statistics



## Contextual factors

In addition to the cross cutting factors mentioned above, other contextual factors we believe to be relevant to the agricultural and Land Use sector include:

- Trends in UK food production and consumption
- Commodity food prices
- Average fertiliser application rates for England and Wales
- Biofuel production
- Productivity of agriculture
- Timber prices

## Resource efficiency and waste Sector

- The waste sector is responsible for a very small proportion of the emissions covered by the 3% target. However, the waste sector contributes a high proportion of emissions for sectors where the Welsh Government can take action directly
- Welsh Government action in the resource efficiency and waste sector is forecast to deliver 0.66 Mt CO<sub>2</sub>e savings in 2020
- There are no specific UK Government interventions covering Wales for this sector

The Welsh Government interventions that we have developed indicators for are:

- WW1 – Diversion of biodegradable waste from landfill to recycling, composting and anaerobic digestion

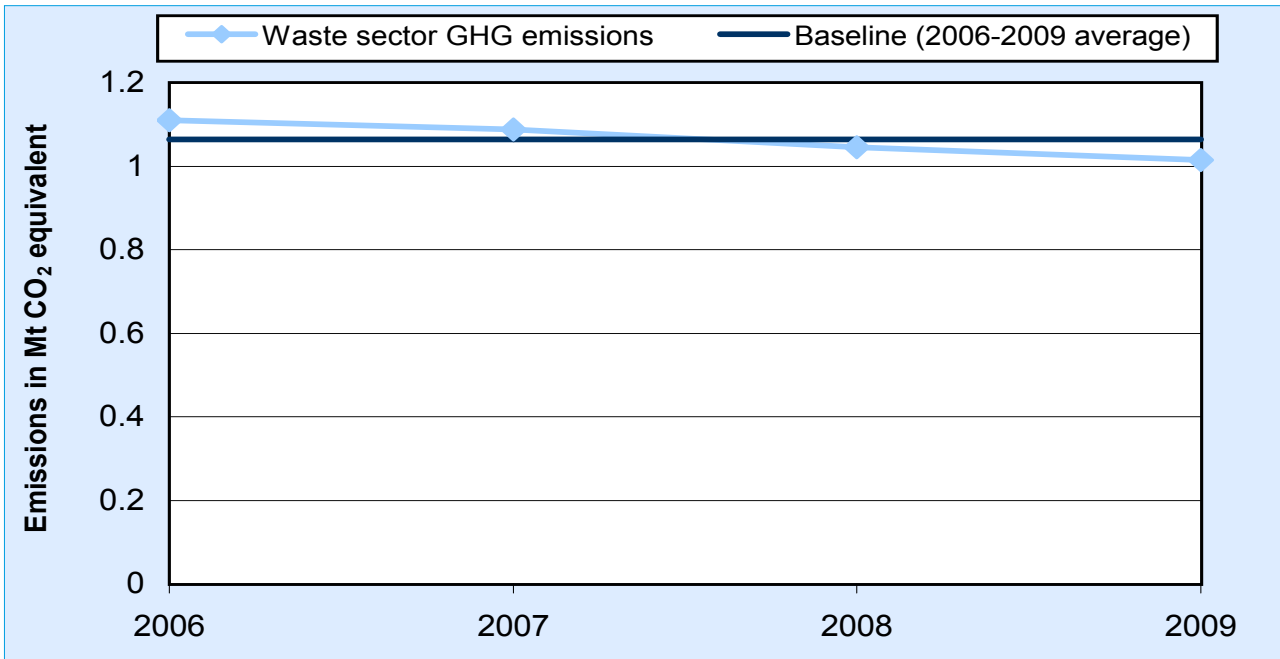
We are currently working on the development of an indicator for:

- WW2 – Programme of work to reduce further existing GHG emission at landfills

It is proposed that the three tier framework for the waste sector will be as follows:

### Tier 1

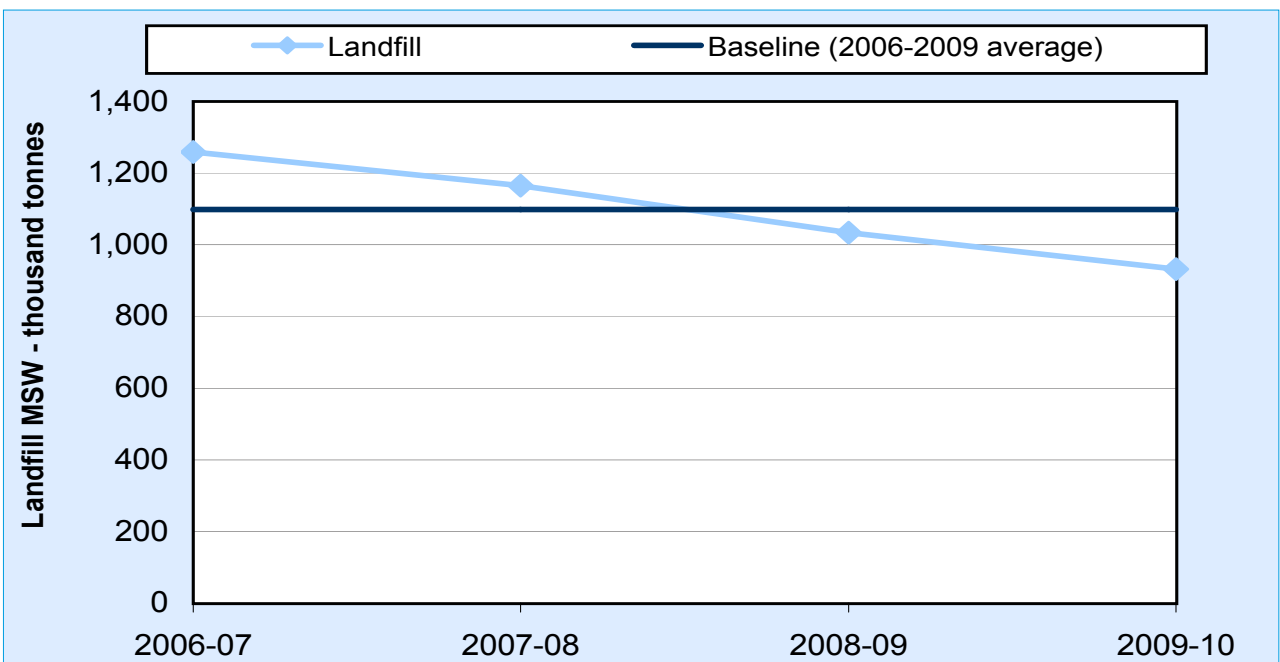
#### Waste Sector GHG emissions



Source: GHG Inventory 2009

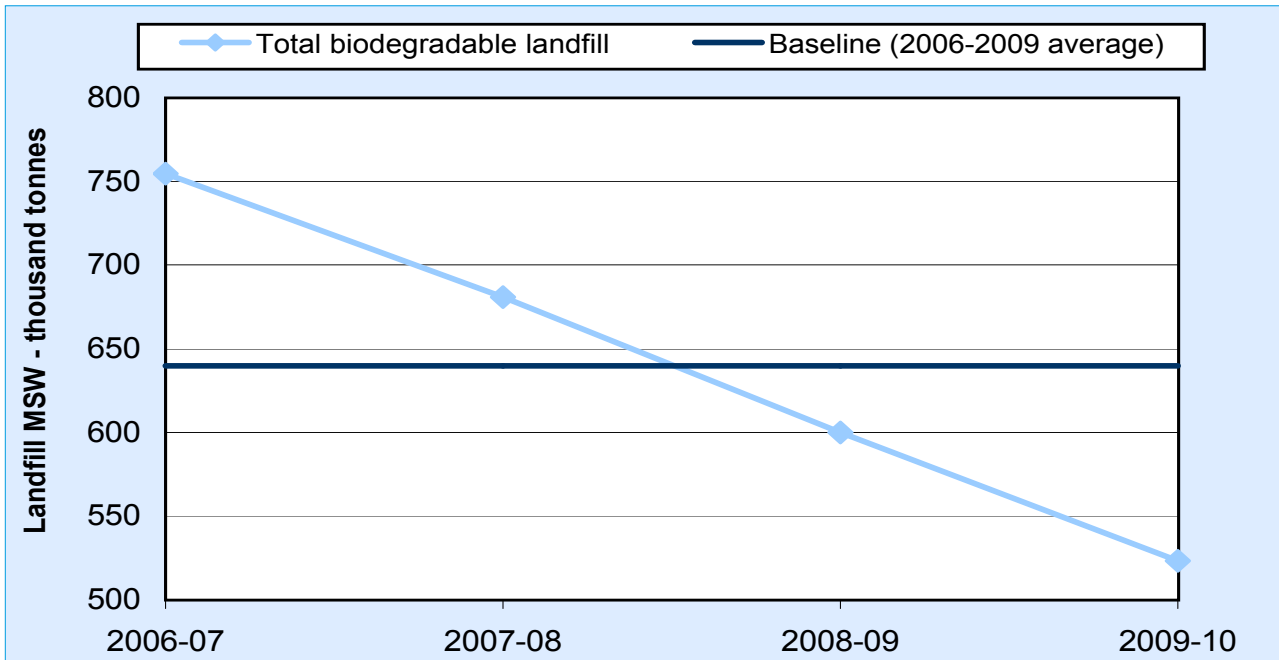
### Tier 2

#### Volume of municipal waste to landfill



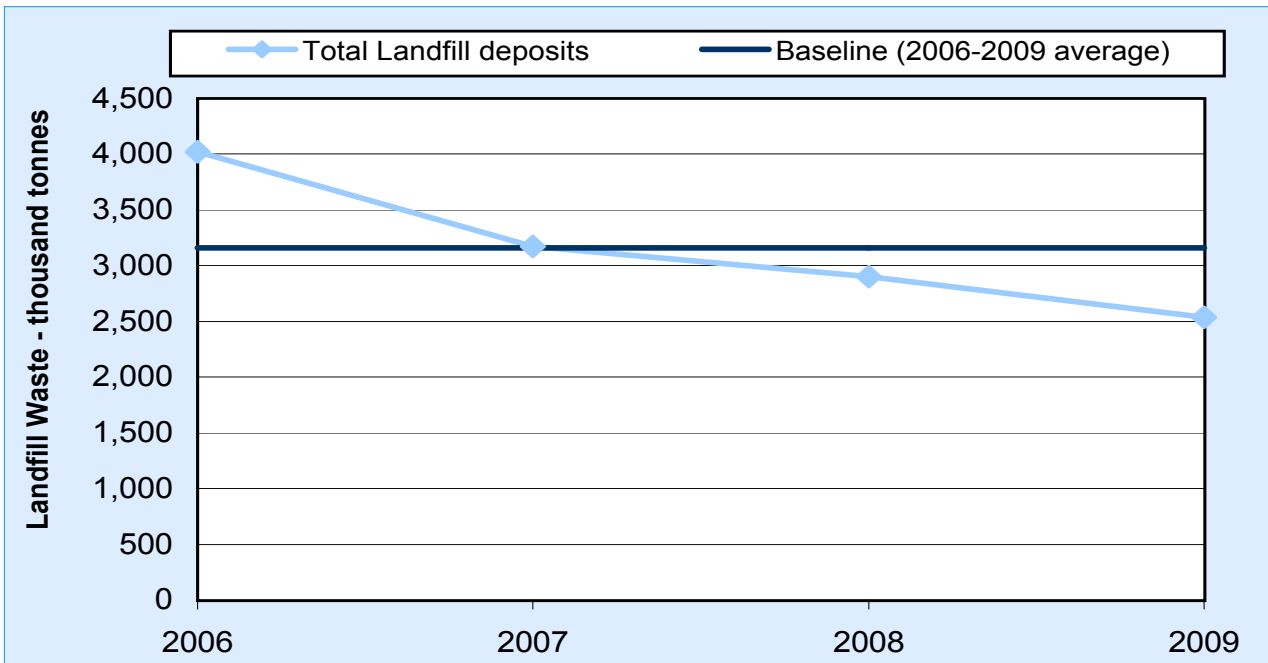
Source: WasteDataFlow

### Volume of biodegradable municipal waste to landfill



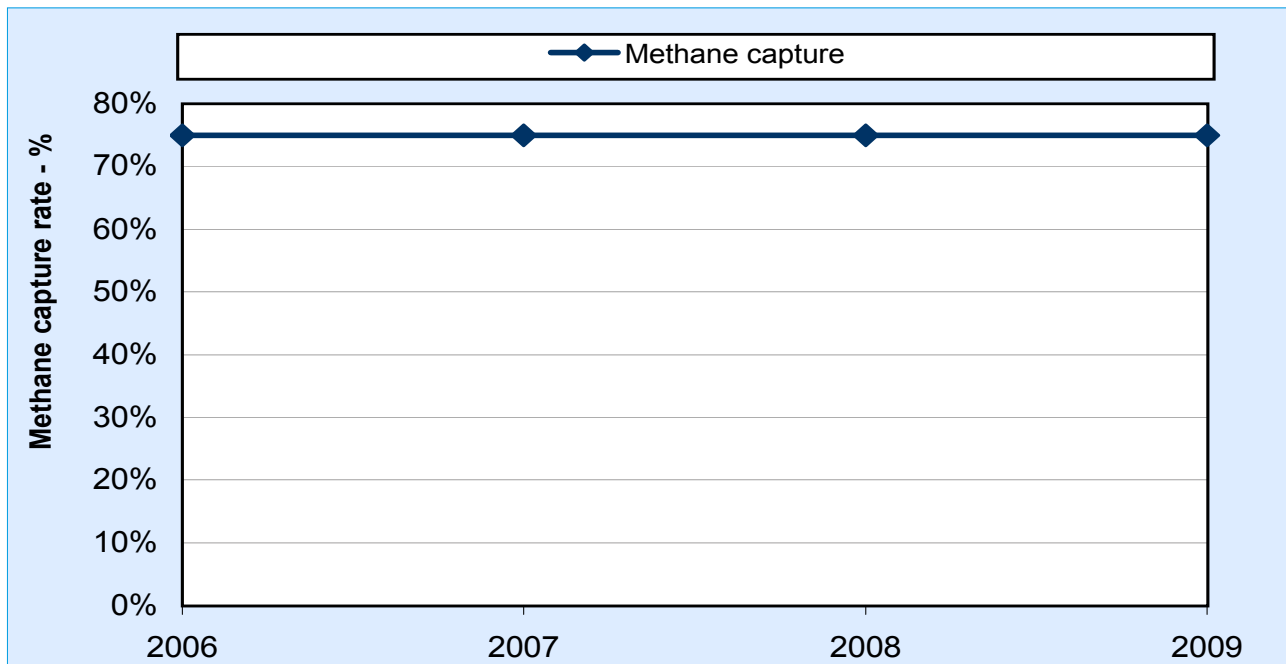
Source: WasteDataFlow

### Volume of total waste to landfill



Source: Environment Agency landfill site returns

## Landfill methane capture rate



Source: UK Greenhouse Gas Inventory

## Tier 3

Tier 3 data is currently under development.

## Contextual factors

In addition to the cross cutting factors mentioned above, other contextual factors we believe to be relevant to the waste sector include:

- Landfill tax rate

## Public Sector

- The public sector is responsible for a very small proportion of the emissions covered by the 3% target

The Welsh Government interventions that we have developed indicators for are:

- WPS2 – Reducing the carbon footprint of the Welsh Government estate
- WPS3 – Reducing the carbon footprint of the NHS
- WPS4 – Reducing the carbon footprint of education services
- WPS5 – Enabling wider contributions from others

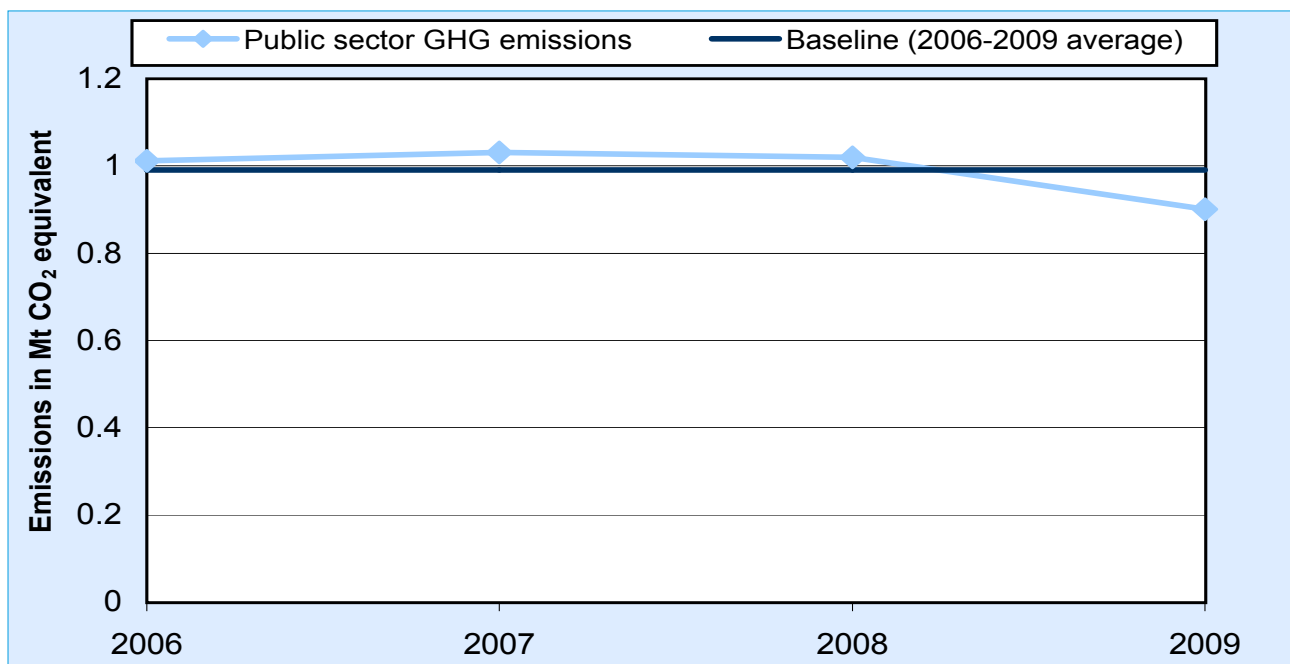
At this stage we are still developing indicators for:

- WPS1 – Enabling action on climate change
- WPS6 – Land use planning
- WPS7 – Spatial Plan Low Carbon Regions work and marine spatial planning

It is proposed that the three tier framework for the waste sector will be as follows:

## Tier 1

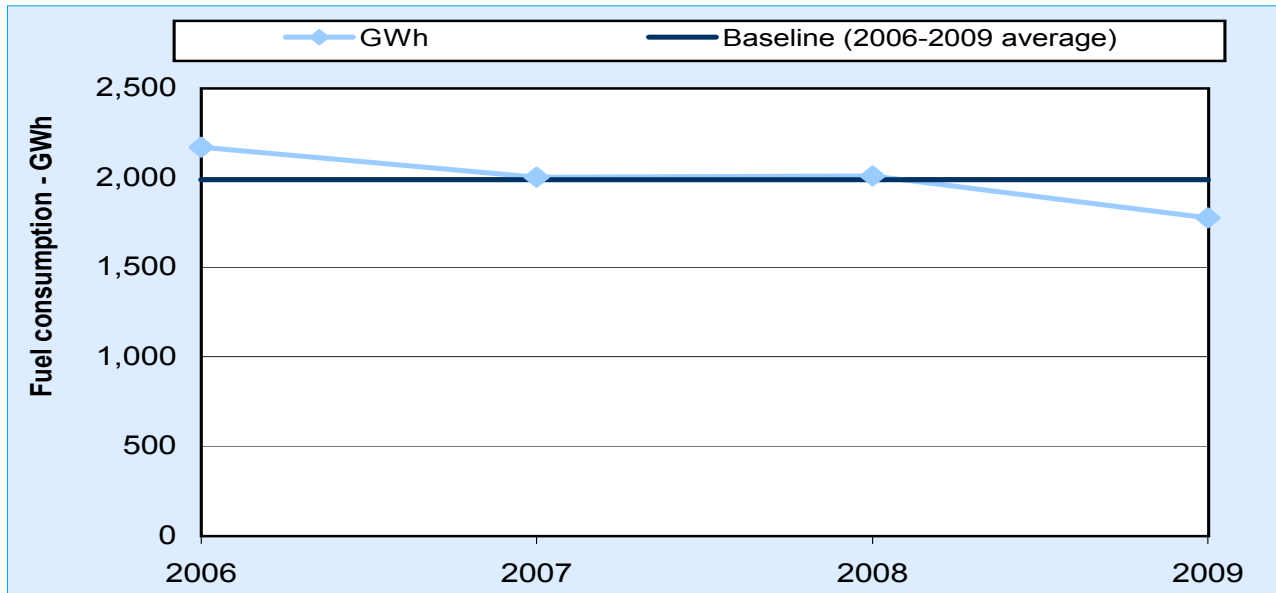
### Public Sector GHG emissions



Source: GHG inventory 2009

## Tier 2

Public sector fuel consumption (liquid fuels, gaseous fuels, solid fuels, biomass, electricity, and other fuels)



Source: GHG Emissions Inventory Team – AEA

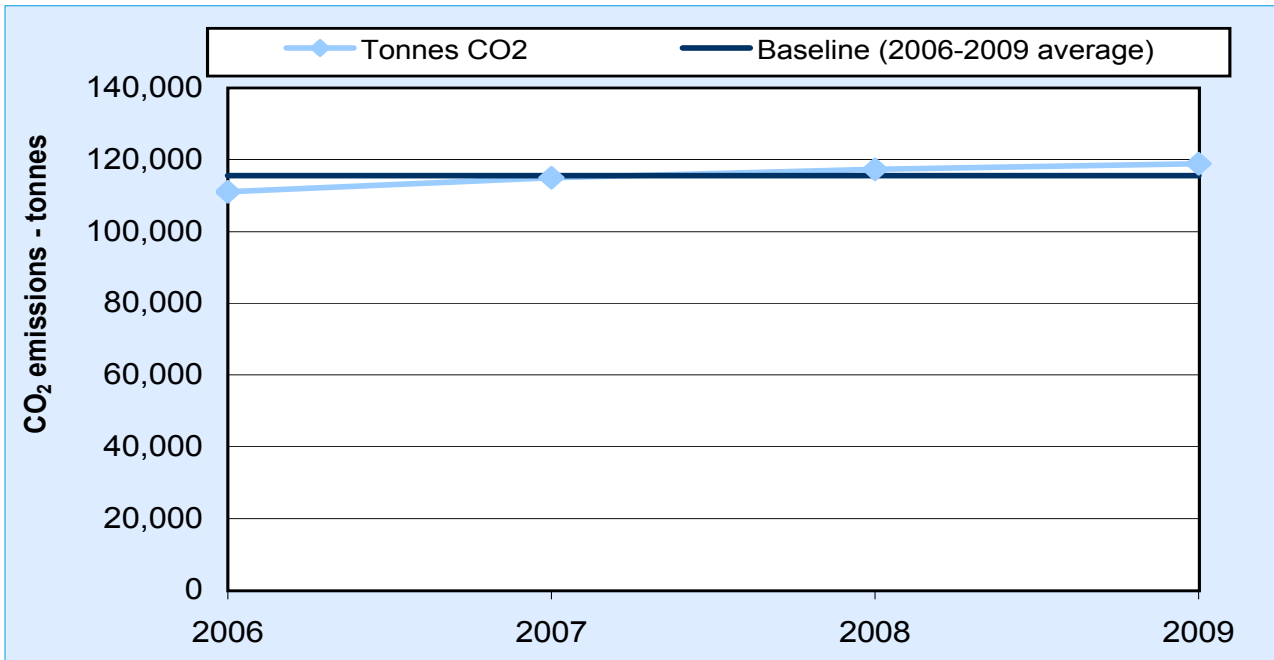
## Tier 3

Table 1 highlights which indicators will be used to report on the performance of the Welsh Governments interventions mentioned above:

Indicator	Welsh Government Intervention
NHS GHG emissions	WP2
Welsh Government CRC emissions	WP3
Education sector CRC emissions	WP4
LA CRC emissions	WP5

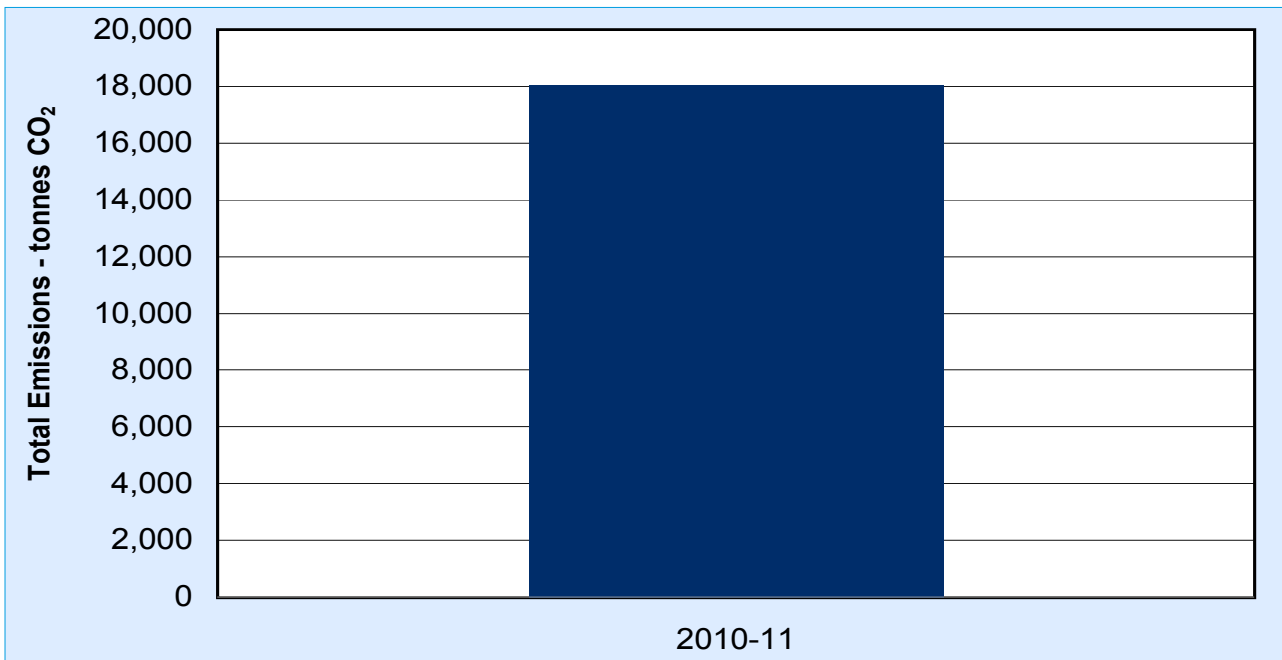


## NHS GHG emissions



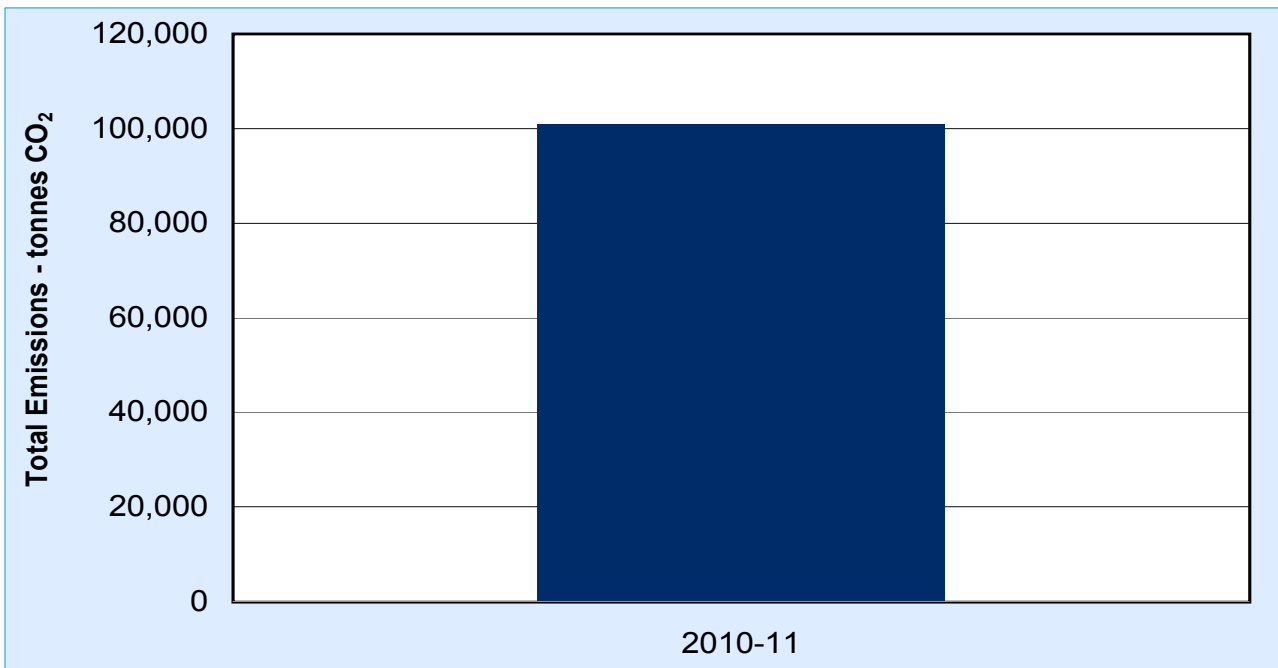
Source: NHS Wales Estate Condition and Performance Reports

## Welsh Government CRC emissions



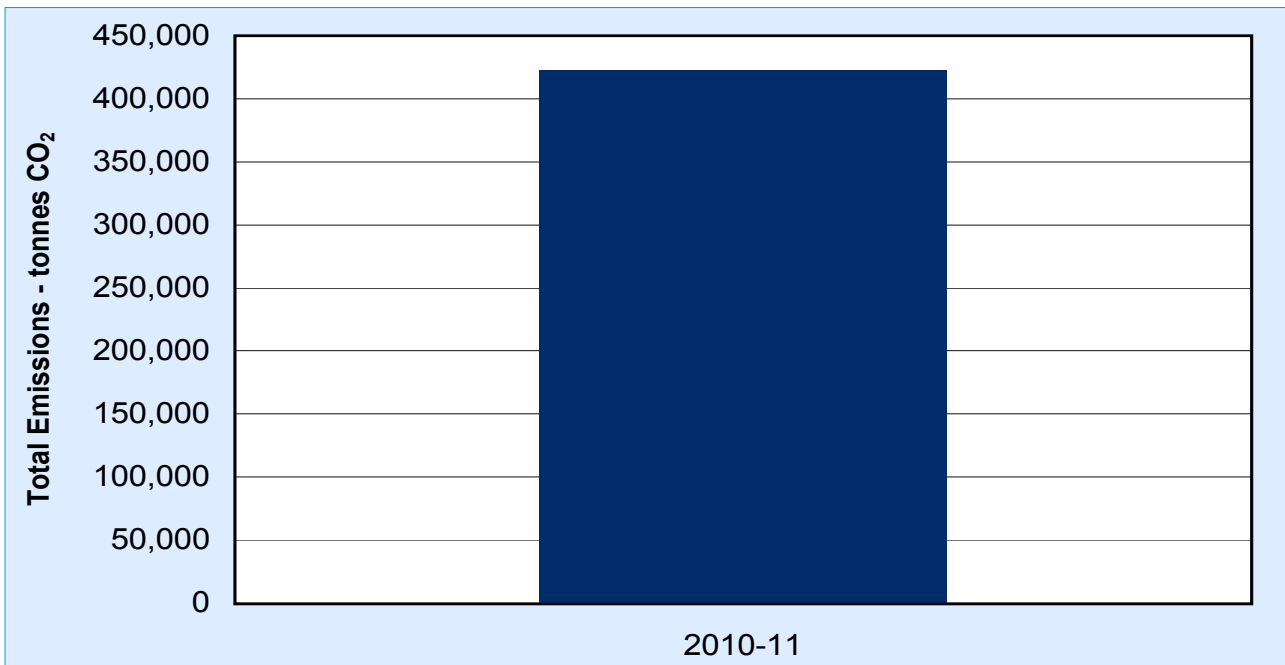
Source: CRC Performance League Table

### Education sector CRC emissions



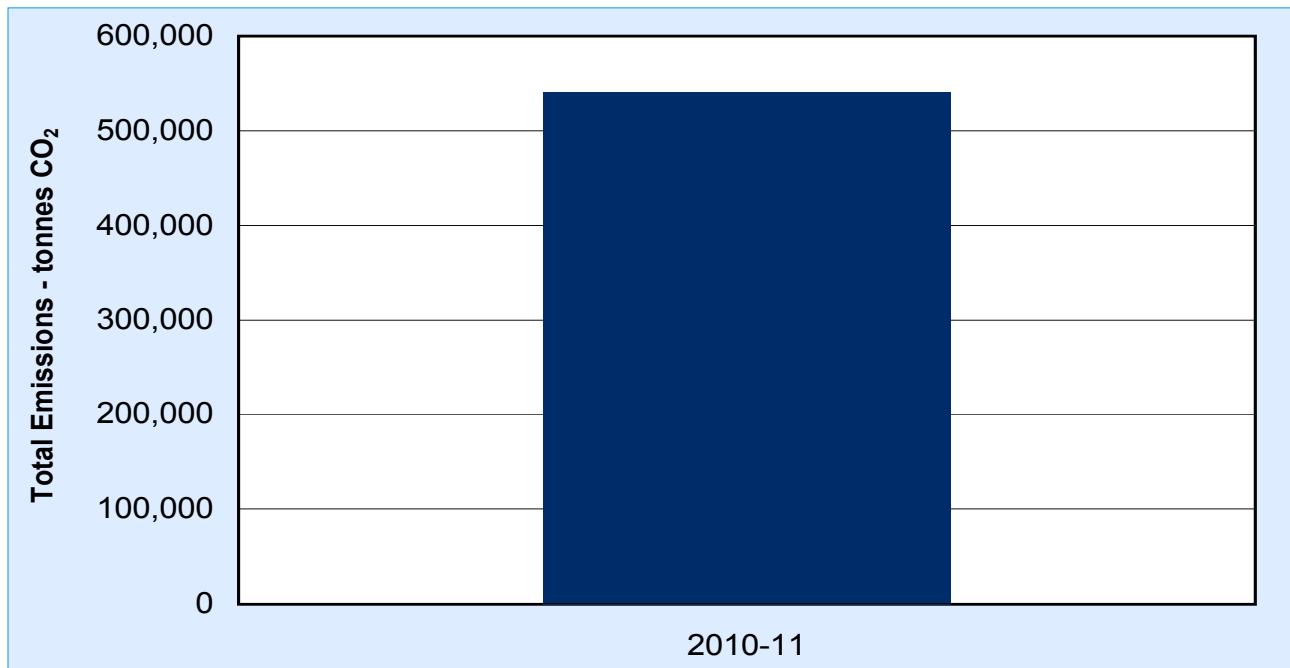
Source: CRC Performance League Table

### Local Authority CRC emissions



Source: CRC Performance League Table

## Public sector CRC emissions



Source: CRC Performance League Table

