



## Overview of the air quality and non-CO<sub>2</sub> projections

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# What's in this presentation

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## Air quality

- Methodology
- Trends
- Uncertainties

## Non-CO<sub>2</sub> GHGs

- Methodology
- Trends
- Uncertainties

## Summary

# AQ Projections

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- **Reporting Requirements**

National Emission Ceiling Directive

- Yearly, 31 December
- Pollutants covered: NO<sub>x</sub>, NMVOCs, NH<sub>3</sub>, SO<sub>2</sub>
- Time series: 2010, 2015, 2020

# Policy Overview

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- Based on DECC UEP37 energy forecasts, DfT's 2008 traffic forecasts. The inventory baseline is the same as for the previous set of projections (2007). This set of emission projections is referred to here as UEP37 (2007).
- Traffic forecasts from DfT's National Transport Model (NTM) as an Annex to the Annual Forecasts 2007 paper (October 2007).
- EU NRMM Directives
- Sulphur Content of liquid fuels Directive 2000 (1999/32/EC), The Sulphur Content of Liquid Fuels (England and Wales) Regulations 2007 (SI 2007/79)
- Marpol VI
- Revised Large Combustion Plant Directive (LCPD, 2001/80/EC)
- Solvent Emission Directive (1999/13/EC)

# Methodology

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- **Assumptions**

- Measures are introduced when required by legislation and not earlier
- All operators comply with new legislation
- New abatement is applied to sources

- **QA/QC**

- The projections dataset is based on a live database system into which quality assurance and quality control procedures have been built over several years.

- **ACTIVITY DATA FORECASTS**

- each source in the NAEI is linked to an activity driver

- **FUTURE EMISSION FACTORS**

- improvements in abatement measures

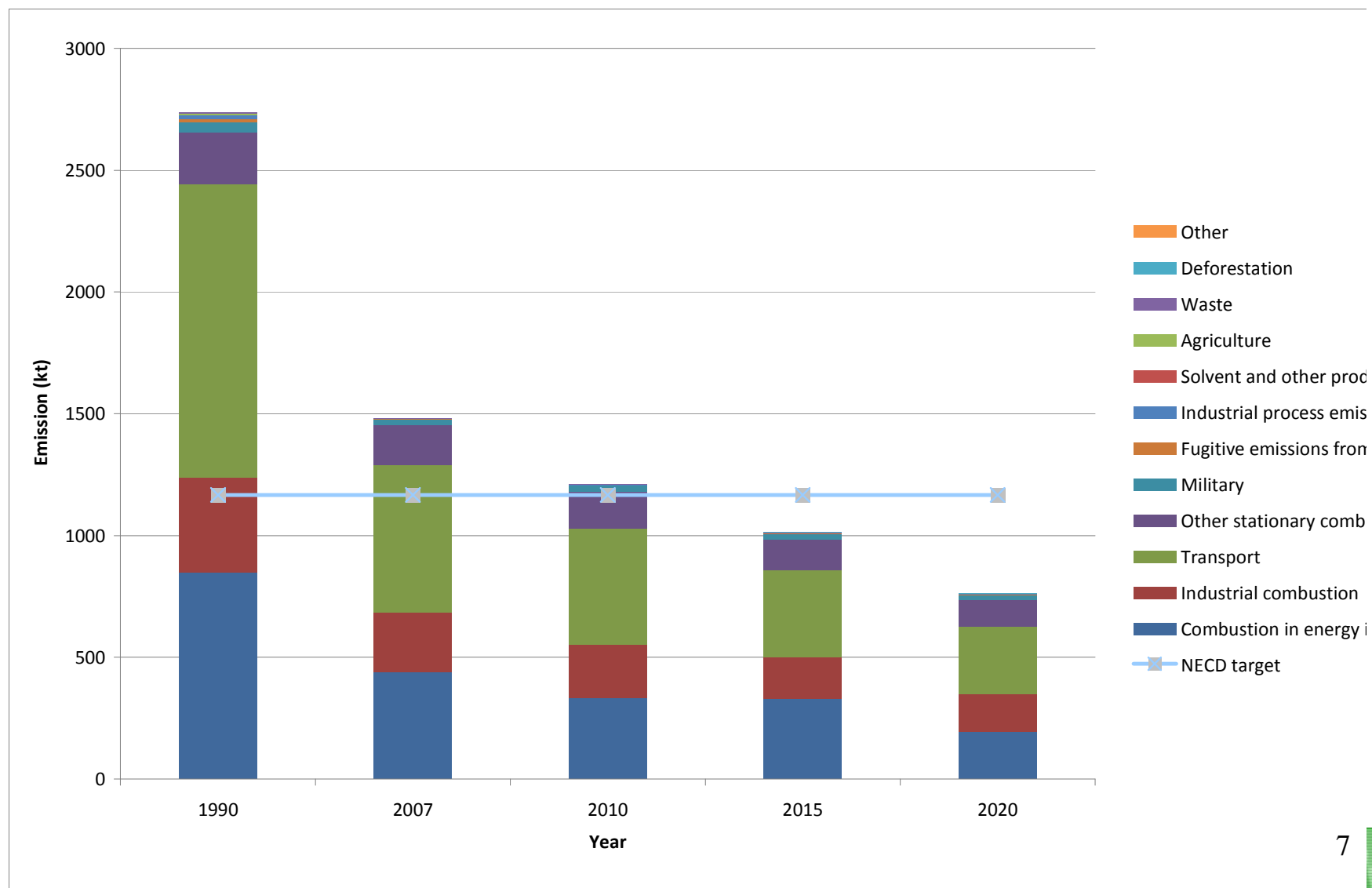


# Uncertainty

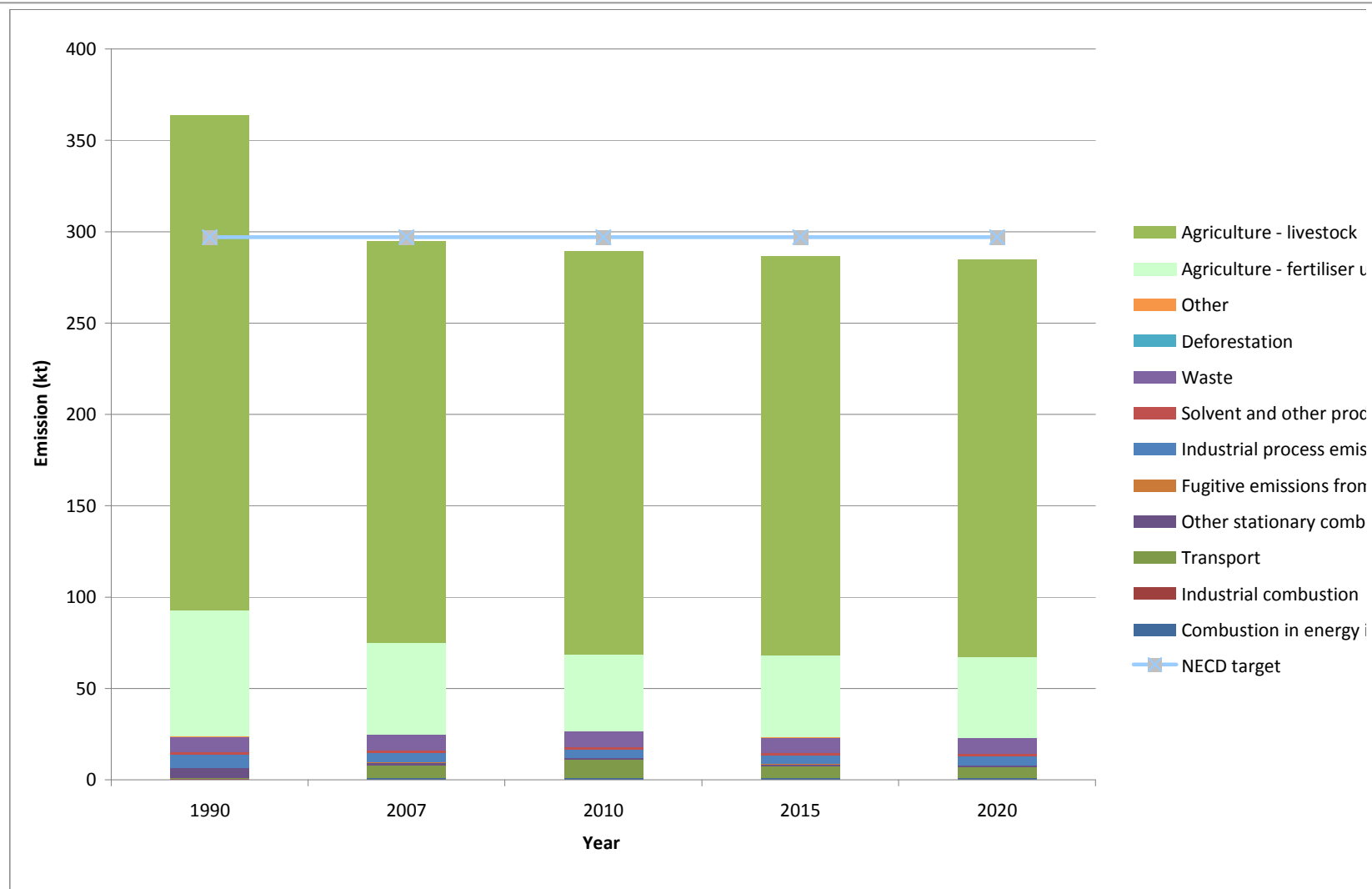
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- **Activity trends**
  - External Drivers (DECC, North Wyke)
  - AEA estimates
- **Measures included**
- **Effectiveness of measures**

# Trends - NOx



# Trends – NH<sub>3</sub>





# Non-CO<sub>2</sub> projections

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- John Watterson
- Joanna Jackson
- Glen Thistlethwaite
- and the team...

# Policy context

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- **Projections needed for national and international reporting, and policy decisions**
- **National**
  - Carbon budgets (including departmental carbon budgets) – Low Carbon Transition Plan
  - Annual reports to parliament
- **International**
  - Biennial reporting to the Commission under the EUMM - > EEA Trends and Projections report
  - National Communications to the UNFCCC

# Methodology

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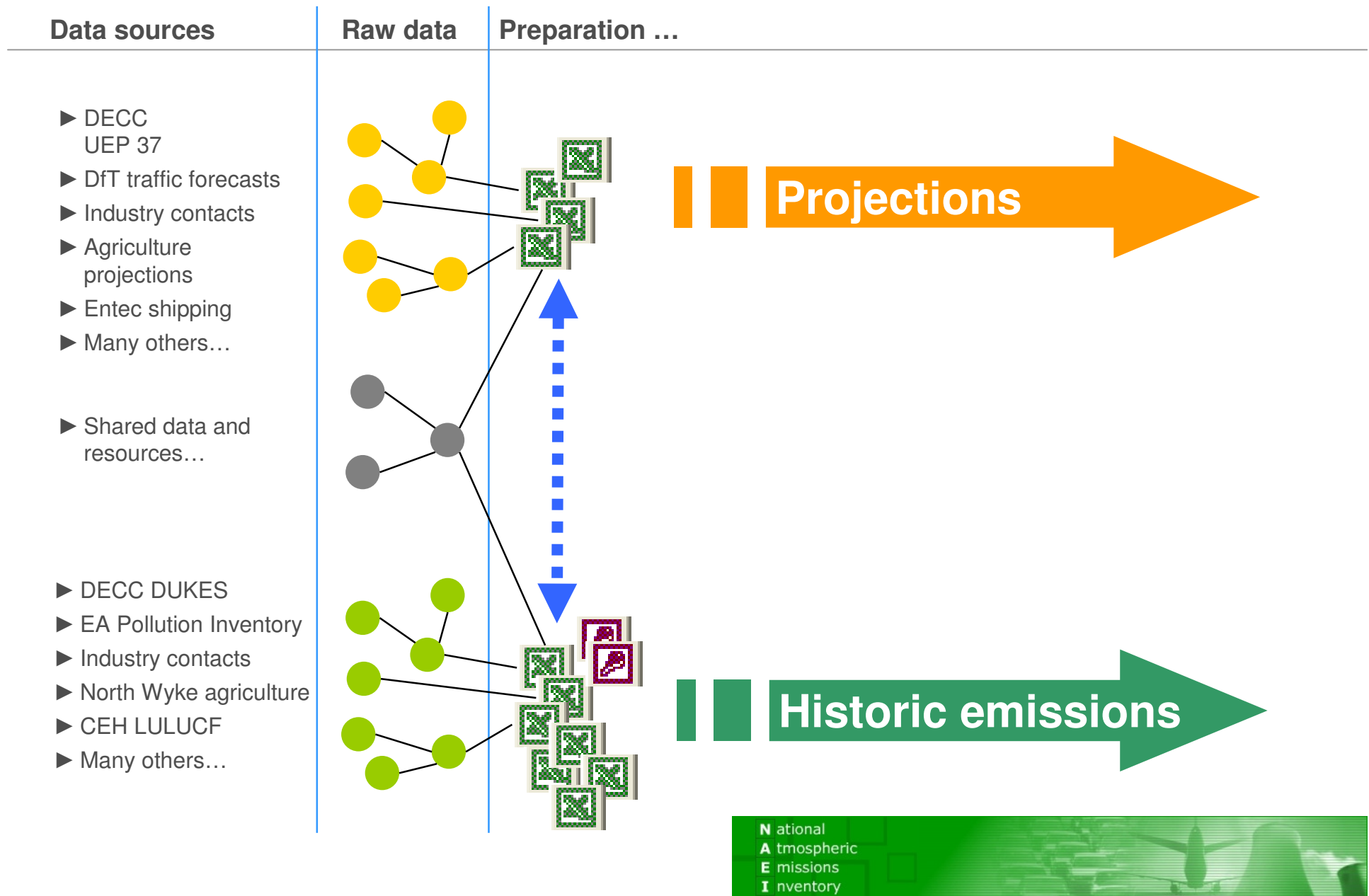
- **Data sources**

- Wide range of data sources of activity data and emission factors
- Some projections done in-house (road transport, waste, F-gases, industrial emissions)
- Other work by DECC contractors (agriculture, shipping)
- Other data from other government departments (RT AD - DfT)

- **QA/QC**

- Overall quality depends on the underlying QC of the data supplied
- We do our best to check and question
- A range of checks are completed – including time series consistency checks, order of magnitude checks, and one-to-one discussions with sector experts

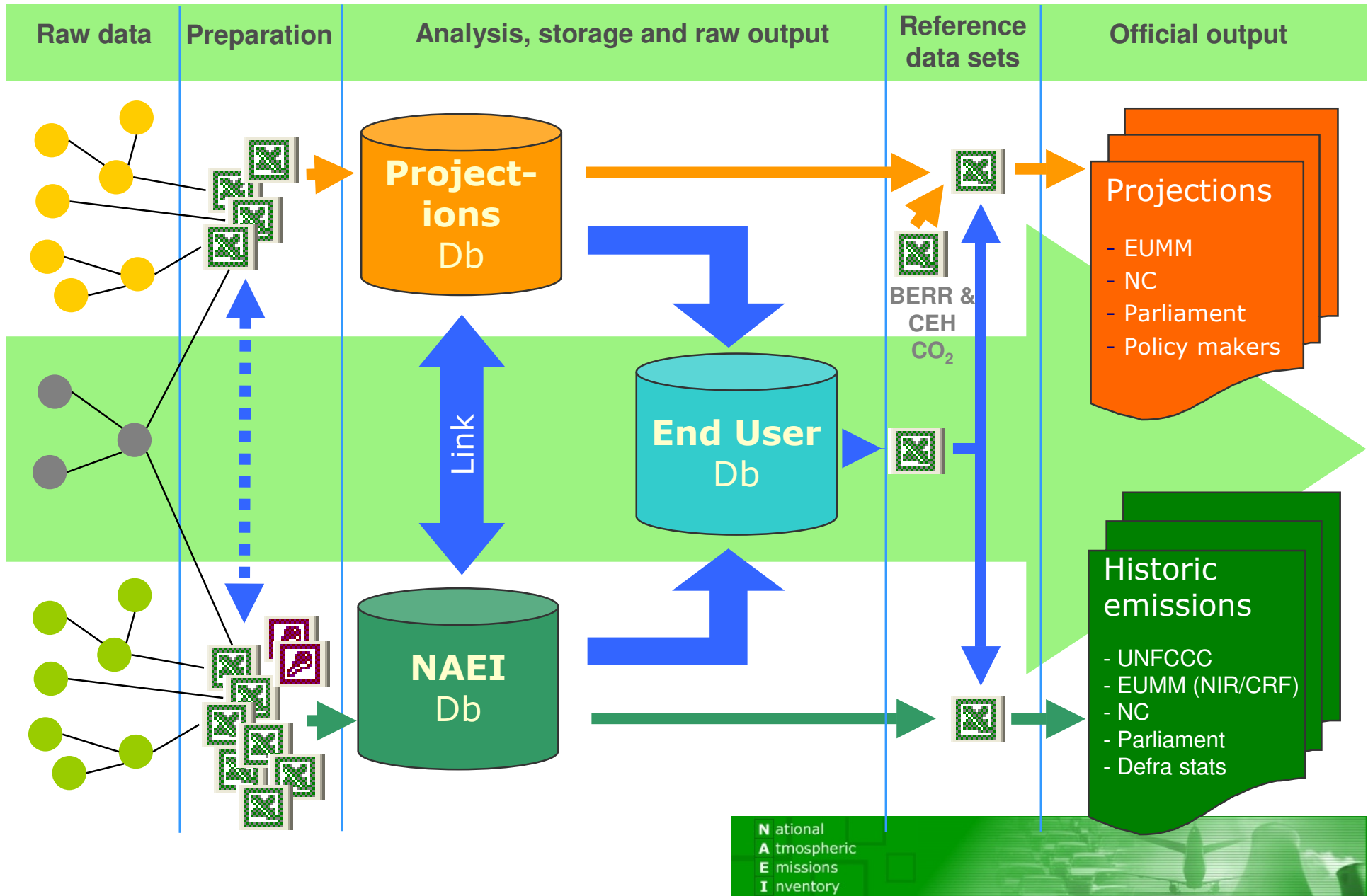
# Data sources for the GHG projections



**N**ational  
**A**tmospheric  
**E**missions  
**I**nventory

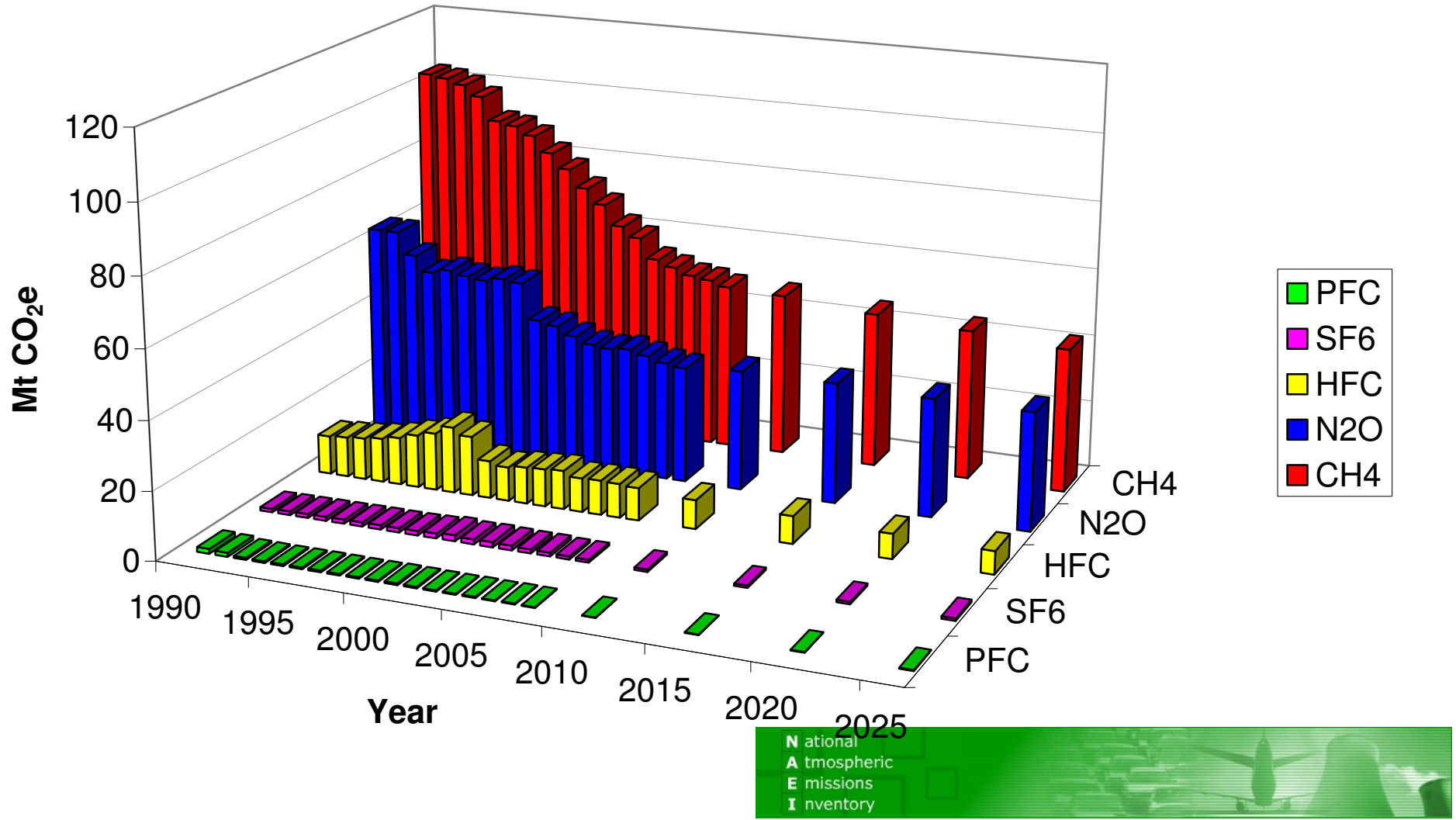


# Data collection and processing for the non-CO<sub>2</sub> GHG projections



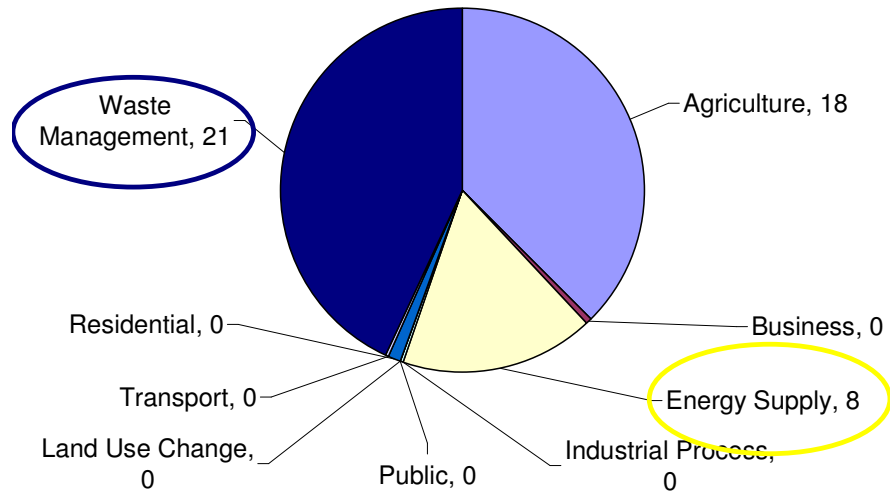
# Time series of non-CO<sub>2</sub> emissions

Time series of emissions of the non-CO<sub>2</sub> gases  
Includes OT and CDs. Based on UEP37

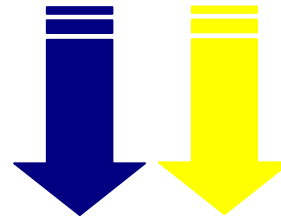
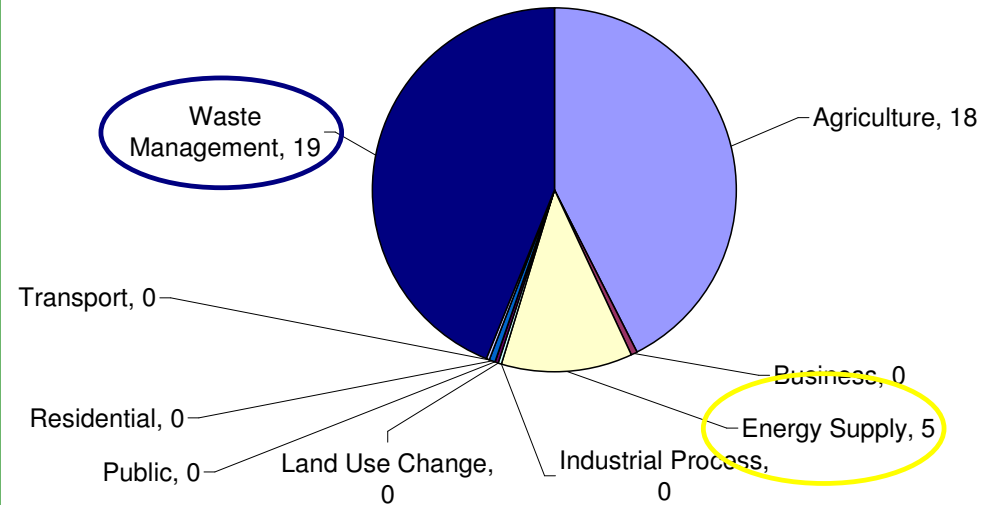


# Change in CH<sub>4</sub> emissions from 2007 to 2025

CH<sub>4</sub> 2007 (Mt CO<sub>2</sub>e)



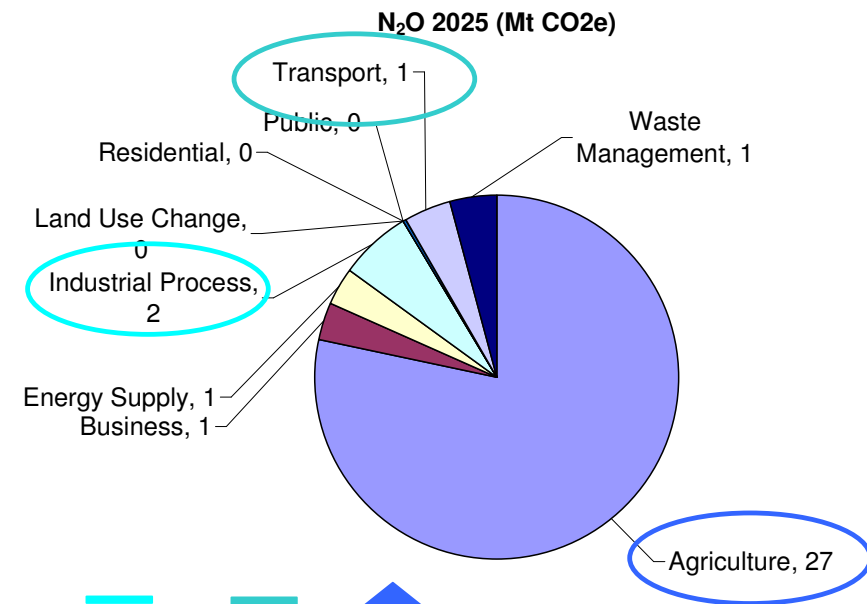
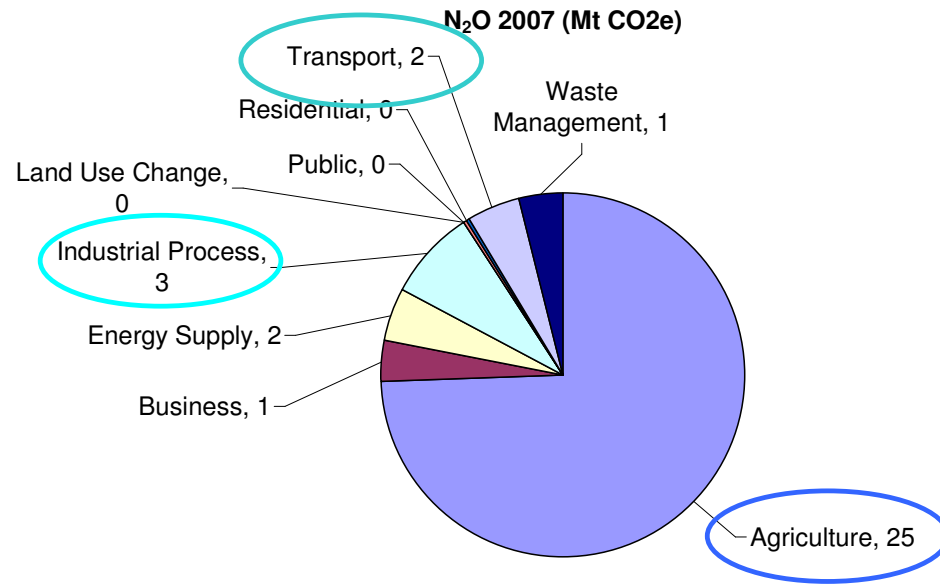
CH<sub>4</sub> 2025 (Mt CO<sub>2</sub>e)



N ational  
A tmospheric  
E missions  
I nventory



# Change in N<sub>2</sub>O emissions from 2007 to 2025





# Reasons for the largest declines in emissions

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- **CH<sub>4</sub>**
  - **Waste management**
    - implementation of the Landfill Directive and Waste Strategy 2000 with associated gas utilisation or flaring (solid waste disposal on land)
  - **Energy supply**
    - an expected decrease in the quantity of coal produced (solid fuels sector)
    - replacement of cast-iron pipes in the gas distribution system (oil and natural gas)
    - reduction in projected UK oil and gas production (oil and natural gas)
- **N<sub>2</sub>O**
  - **Road transport**
    - Updates to the COPERT EFs
  - **Industrial Processes**
    - decline in emissions from the manufacture of nitric acid as we assume that new manufacturing plant replacing end of life plant will achieve BAT for emissions control

# Typical uncertainties

Summary of GWP weighted uncertainty analysis results									
Gas	2005		2020		2050		Trend (2005-2050)		
	Central estimate	Uncertainty	Central estimate	Uncertainty	Central estimate	Uncertainty	Central estimate	2.5%	97.5%
CH <sub>4</sub>	49.80	22%	43.55	22%	38.19	25%	-23%	-32%	-14%
N <sub>2</sub> O	38.87	215%	38.58	239%	38.37	240%	-2%	-27%	25%
HFCs	10.10	22%	6.89	20%	6.02	19%	-40%	-53%	-24%
PFCs	0.26	22%	0.22	32%	0.24	34%	-7%	-36%	27%
SF <sub>6</sub>	1.11	18%	0.67	18%	0.68	18%	-38%	-50%	-24%
<b>Total</b>	<b>100.14</b>	<b>84%</b>	<b>89.90</b>	<b>103%</b>	<b>83.50</b>	<b>111%</b>	<b>-18%</b>	<b>-28%</b>	<b>-8%</b>

**Note** – these estimates have been superseded

# Areas of research to reduce uncertainty

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- **AQ pollutants**
  - **Activity data:** Increase consultation with data providers
  - **Shipping inventory:** incorporate data developed by Entec
- **non-CO<sub>2</sub> GHGs**
  - **Agricultural soils** – Research to improve the accuracy of the UK specific factors for emissions of N<sub>2</sub>O from agriculture soils
  - **Offshore oil and gas**– There are problems with the accuracy of the historic emissions data which necessarily affect the quality of the projections
  - **Abandoned mines** – Revise the White Young Green work to predict emissions from closed coal mines.

# Summary of method and conclusions

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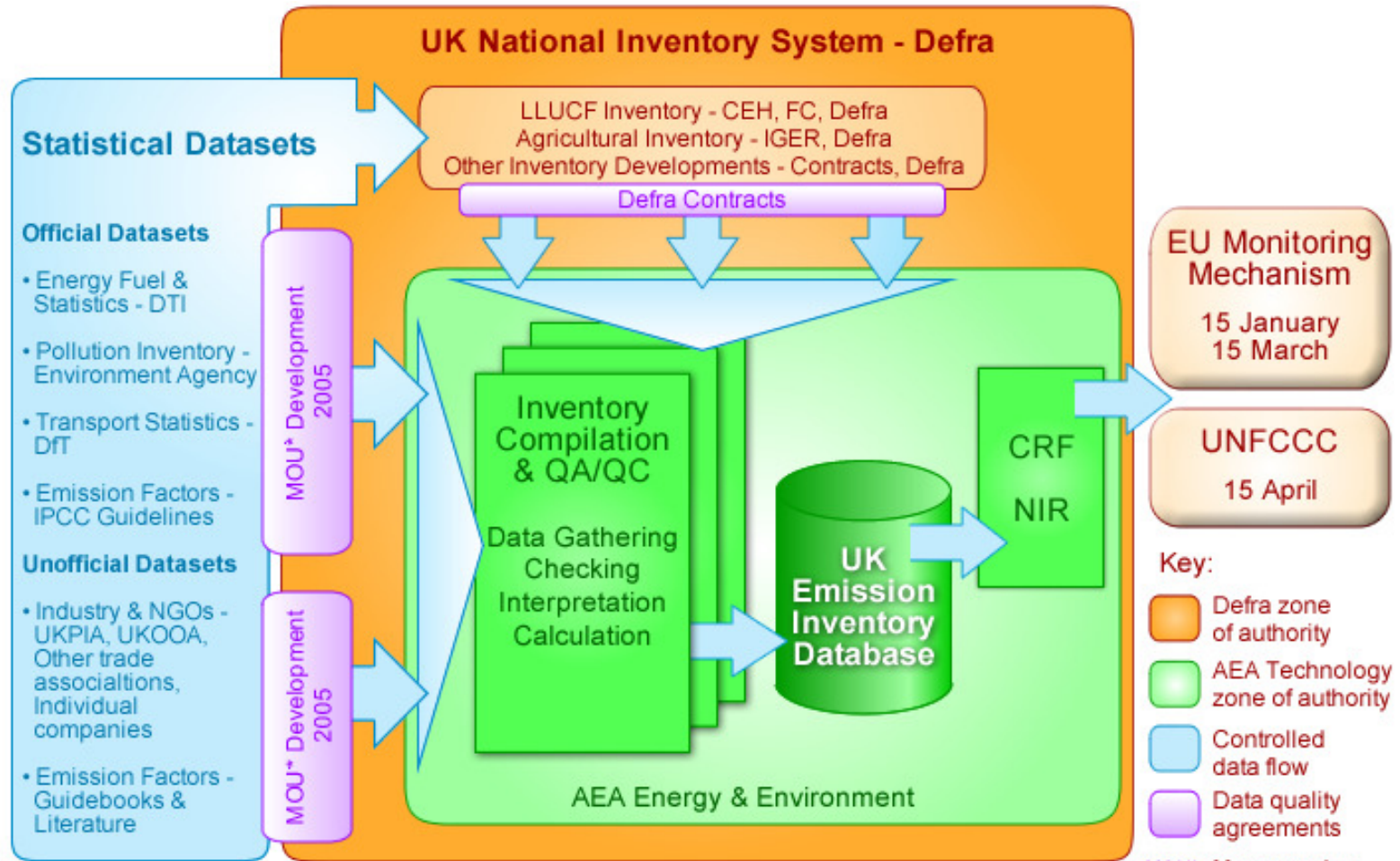
- Integrated approach to estimating projections of AQ and non-CO<sub>2</sub> GHG species in the NAEI
- Common core of activity data
- Projections held at the full sectoral detail of the NAEI
- Different geographical coverages easily calculated and reported (Kyoto, UK, DA, OT and CD)
- **AQ pollutants**
  - Strong decline in NO<sub>x</sub>
  - Less marked for NH<sub>3</sub>
- **Non CO<sub>2</sub> GHGs**
  - Decline in total emissions over the time series (**1990**: 183 Mt CO<sub>2</sub>e; **2007**: 94 Mt CO<sub>2</sub>e; **2025**: 85 Mt CO<sub>2</sub>e)
  - Agriculture and waste management are important current and future sources
  - Declines in emissions from energy supply, industrial processes and waste management
  - Large uncertainty in N<sub>2</sub>O emissions from agricultural soils

# Future possibilities

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- National projections system
- Closely coupled to the GHG National Inventory System
- Defined timeline and workplan
- QA and QC follow the best practice set in the NIS
- Data supply agreements and memorandums of understanding complementing those in NIS to ensure data quality and supply
- Attempt to have reductions in emissions associated with individual policies and measures – a challenge

# National Projections System



# Timeline of work of programmes and delivery dates

