AEA Energy & Environment
From the AEA group

The National Atmospheric Emissions Inventory (NAEI): The Devolved Administration GHG and AQ Inventories

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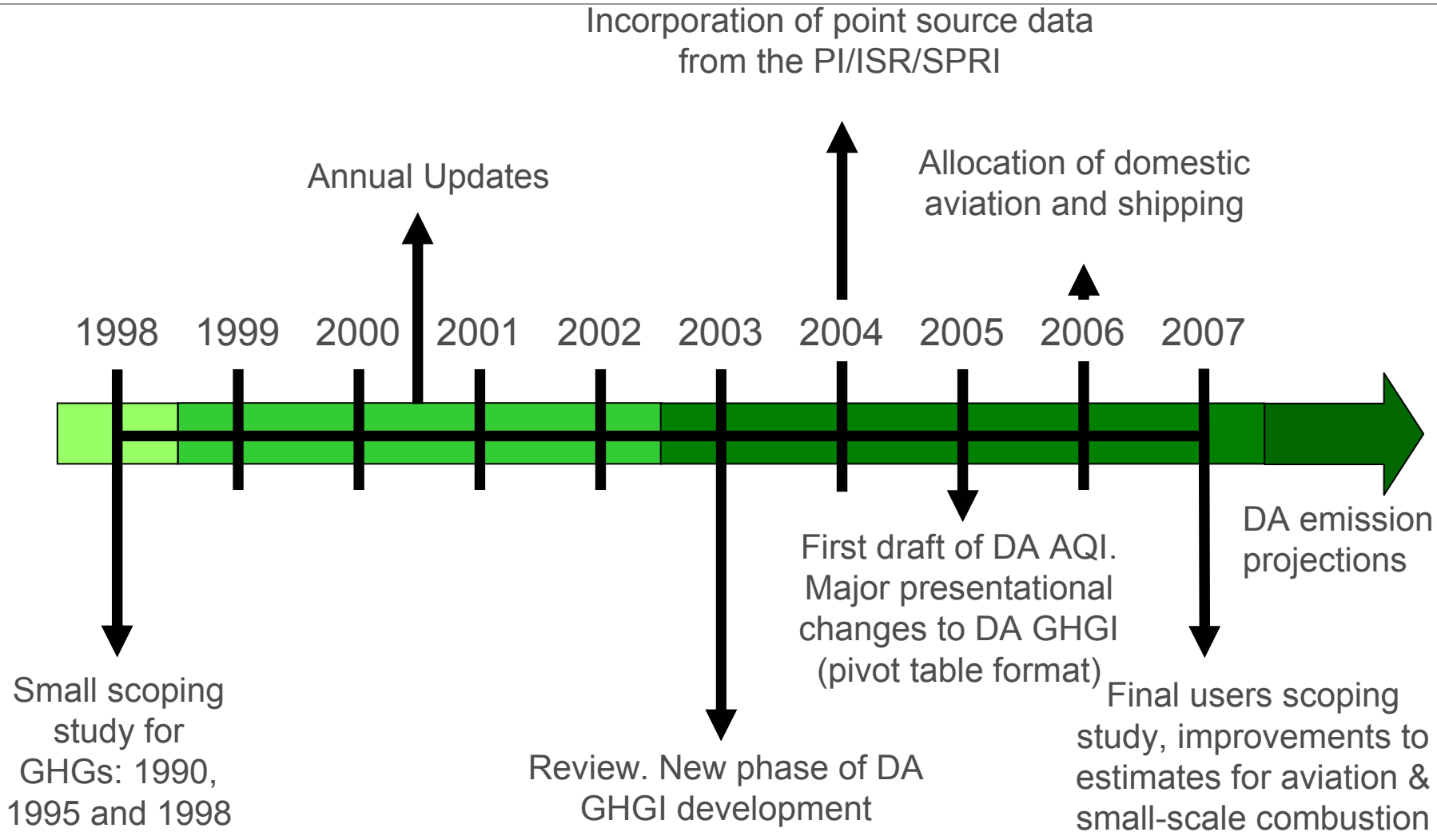
Introduction

What is included in this presentation?

- Introduction to the DA Inventories
- DA Inventory Methods – how we compile the data, consistency with UK GHGI / NAEI data
- Improvements – many completed, more required
- Trends – progress to 2005 and beyond.
- Usefulness / Limitations of DA Inventories
- Other work – Final Users data, DA emission projections

Timeline of DA Inventory Development



National Atmospheric Emissions Inventory

Introduction

In the beginning……the DA GHG Inventories

- Since 1998, AEA has provided GHG inventories to the DAs, including retrospective estimates back to 1990.

- DA emission estimates for the basket of 6 Kyoto Protocol Greenhouse Gases

- Time series from 1990 to 2005 (latest year) and updated annually

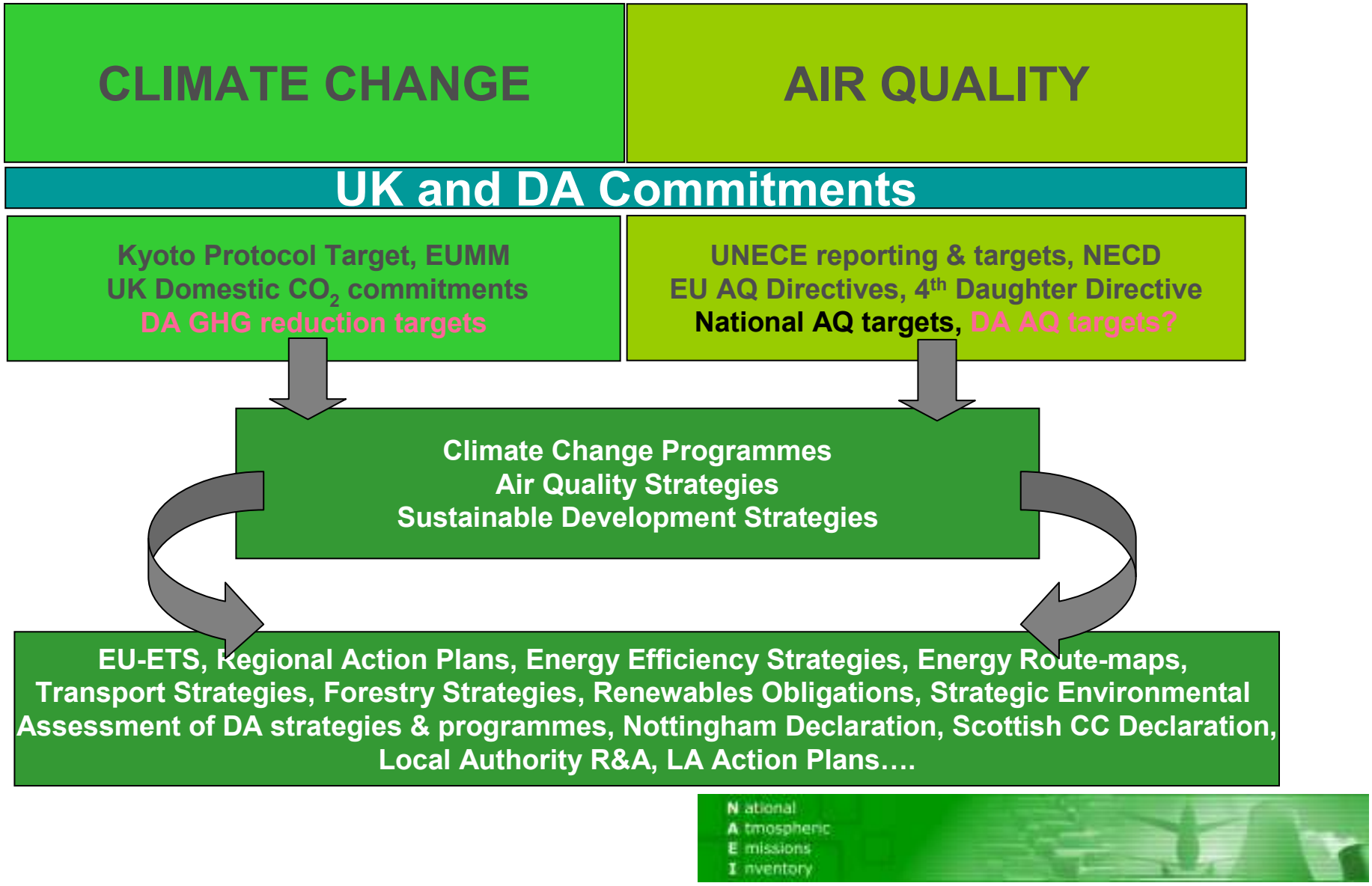
Introduction
And then came……the DA AQ Inventories

- First draft of DA inventories for CO, NO_X, SO_2, NMVOC, NH_3 and PM_{10} produced for the 1990-2003 inventory

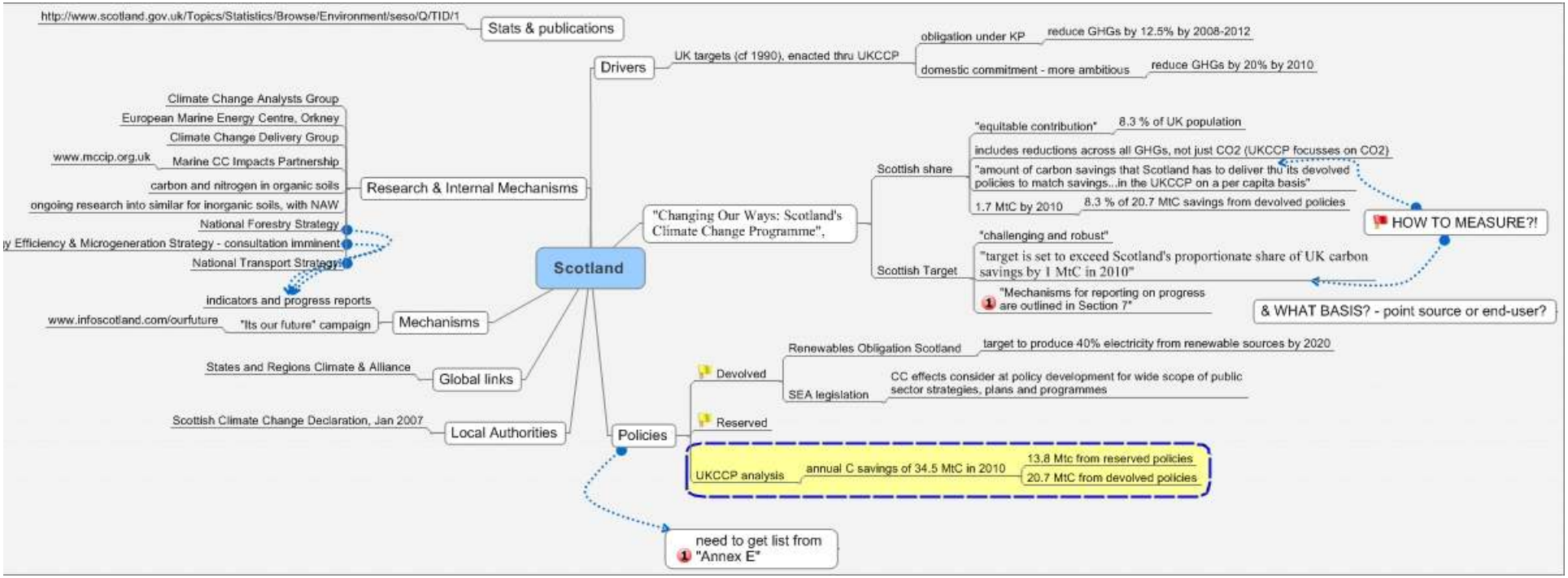
- Currently working on the data for the 1990-2005 inventories, the second time we've done this work

- Where possible, methods to determine DA AQ estimates are linked to the DA GHG inventories to ensure consistency

DA Policy Mechanisms - Drivers



DA Policy Mind-Map – lots of actions & ideas



Introduction

DA GHG Reduction Targets

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

DOE

- Scotland's Climate Change Programme: Scottish Share & Scottish Target *"to exceed Scotland's proportional share of UK Carbon savings by 1MtC by 2010"*

- Welsh Assembly: "*20% reduction in GHG emissions by 2020 against a 2000 baseline*"; One Wales: "*We will aim to achieve annual carbon reduction-equivalent emissions reductions of 3% per year by 2011 in areas of devolved competence"*

- Northern Ireland: *Sustainable Development Strategy " to reduce GHG emissions by 25% below 1990 levels by 2025"*

Introduction

DA Inventories – Devolved Policies and Targets

- Much greater focus on DA GHG emissions data
- Huge increase in Climate Change policy development
- Lots of targeted research = lots more data that should be used
- Thirst for data to provide baseline emissions and tracking of progress towards emission reduction targets, linked to policies
- Many data management and presentational demands:
  - Emissions by IPCC sector, NC format, per capita, Final Users, trend analysis, reasons for changes in estimates, by kt gas, kt C, kt CO_2
- DA emission projections & comparison against carbon footprints too

DA Inventory Compilation Method (1)

- We adopt the basic principle that:

Sum of DA inventories = UK Inventory

...for each source and each pollutant.

- Incorporates benefits of the UK NAEI/GHGI
- No need to re-invent the wheel deriving emission factors, many activity data, conversion factors etc.
- Many advantages – UK inventories subject to rigorous QA/QC

DA Inventory Compilation Method (2)

- How to split the UK data out to the DA inventories for each emission source is dictated by data availability
- We split out the UK emissions totals by source using the best available data that enables consistent, accurate and transparent emission estimates <u>across the 1990-latest year time-series</u>
- New data (e.g. EU-ETS) brings benefits (improved recent data) but can bring dis-benefit of not employing a consistent method from 1990 onwards; **TRENDS** are of key importance as well as accuracy
- Always at the mercy of changing data provision (e.g. no detailed 2006 EU-ETS data from Scotland due to lack of regulator resources)

DA Inventory Compilation Method (3)

- "Bottom-up" estimates for sources where we have comprehensive DA-specific datasets, such as:
  - ✓ Industrial point sources
  - ✓ Road transport
  - ✓ Agriculture
  - ✓ Domestic flight data
  - ✓ LULUCF emissions
- These are all very significant sources of GHG and AQ pollutants and the activity data are generally of good quality

DA Inventory Compilation Method (4)

- "Top-down" or modelled estimates for sources where we DON'T have comprehensive DA-specific datasets, such as:
  - ✓ Combustion sources in domestic, commercial, small-scale industry and public administration sectors
  - ✓ Waste and sewage treatment and disposal emissions
  - ✓ F-gas emissions from refrigeration and other sources
- Use regional parameters such as population, employment or industrial production statistics (from ONS, ISSB etc.)
- Many of these are also significant sources of GHG and AQ pollutants but the *proxy* activity data introduce greater error to the DA estimates

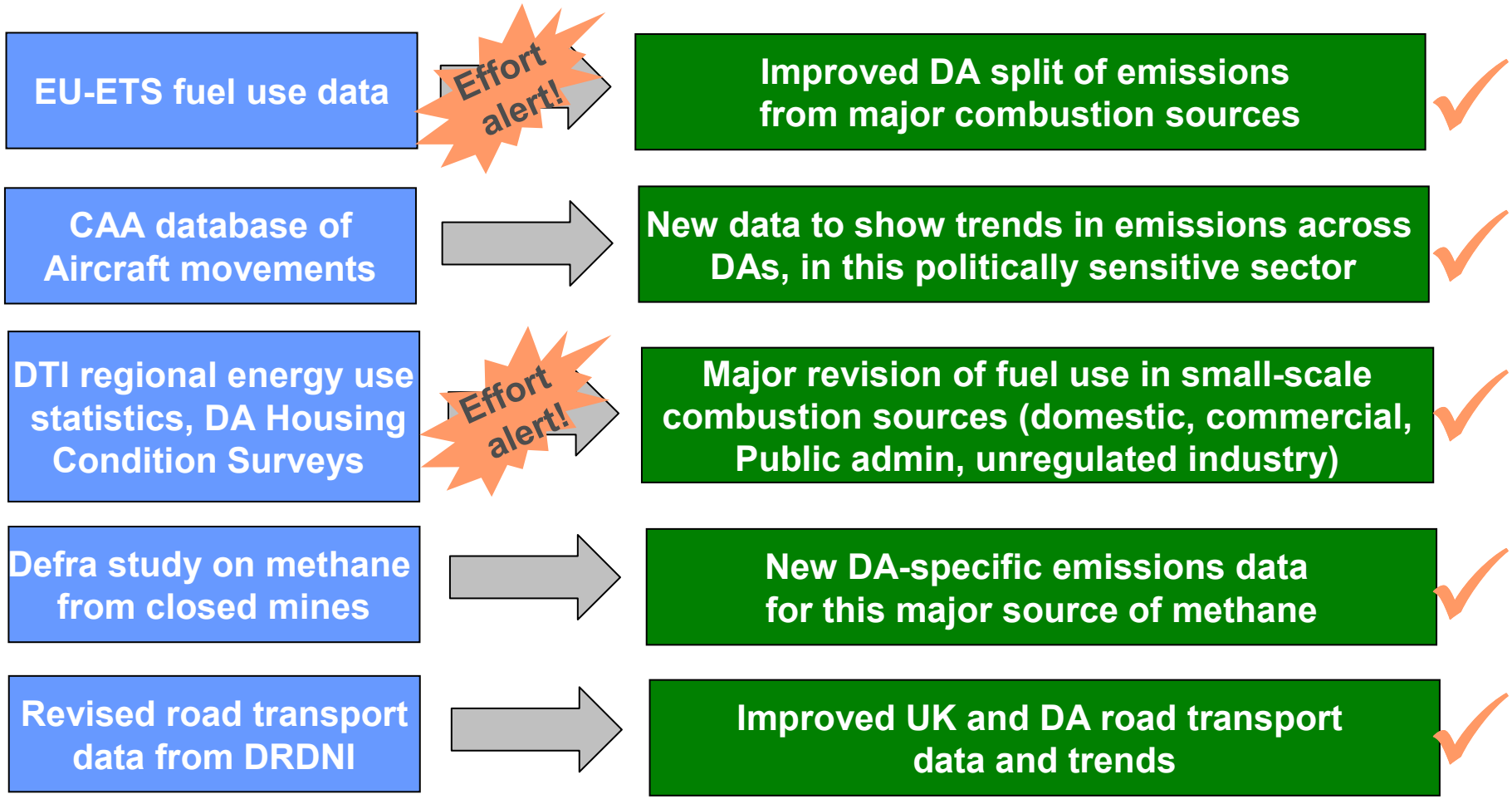
DA Inventory Compilation Method (5)

- Data management via the NAEI database.
- 68,000 data elements in the latest DA GHGI emissions calculations
- “Bottom-up” or “Top-down” data used to divide the UK emissions
- Ensures consistency with UK emissions totals
  - For un-regulated sources (e.g. domestic fuel use), reliable UK totals are provided by DTI Energy Statistics
  - Top-down approach for DA inventories ensures all fuel use is captured
- Wherever possible we use DA-sourced data to improve / refine these “top-down” estimates, e.g use of Housing Condition Survey data to improve DA domestic energy splits

DA Inventory Improvement

- An ongoing process, linked to QA system of NAEI/GHGI
- Every year we strive to improve the methods used to derive the DA inventories, to improve the rigour / detail of the estimates
- Progress is limited by budget, focussed on key policy areas
- Improvements from new DA data sources lead to improvements at UK level (e.g. NI road transport traffic count data)
- UK inventory improvements automatically feed into DA inventories

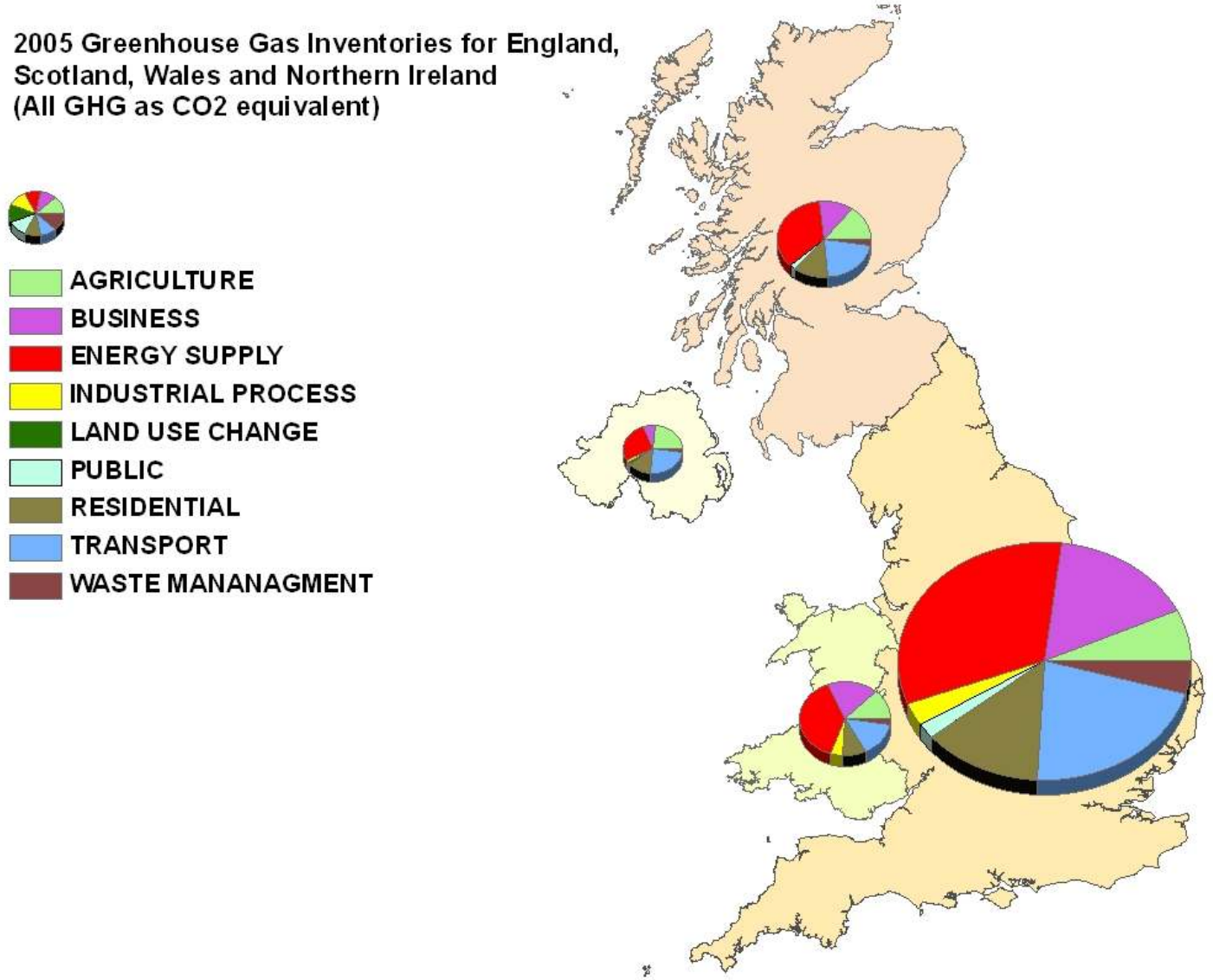
Recent Improvements



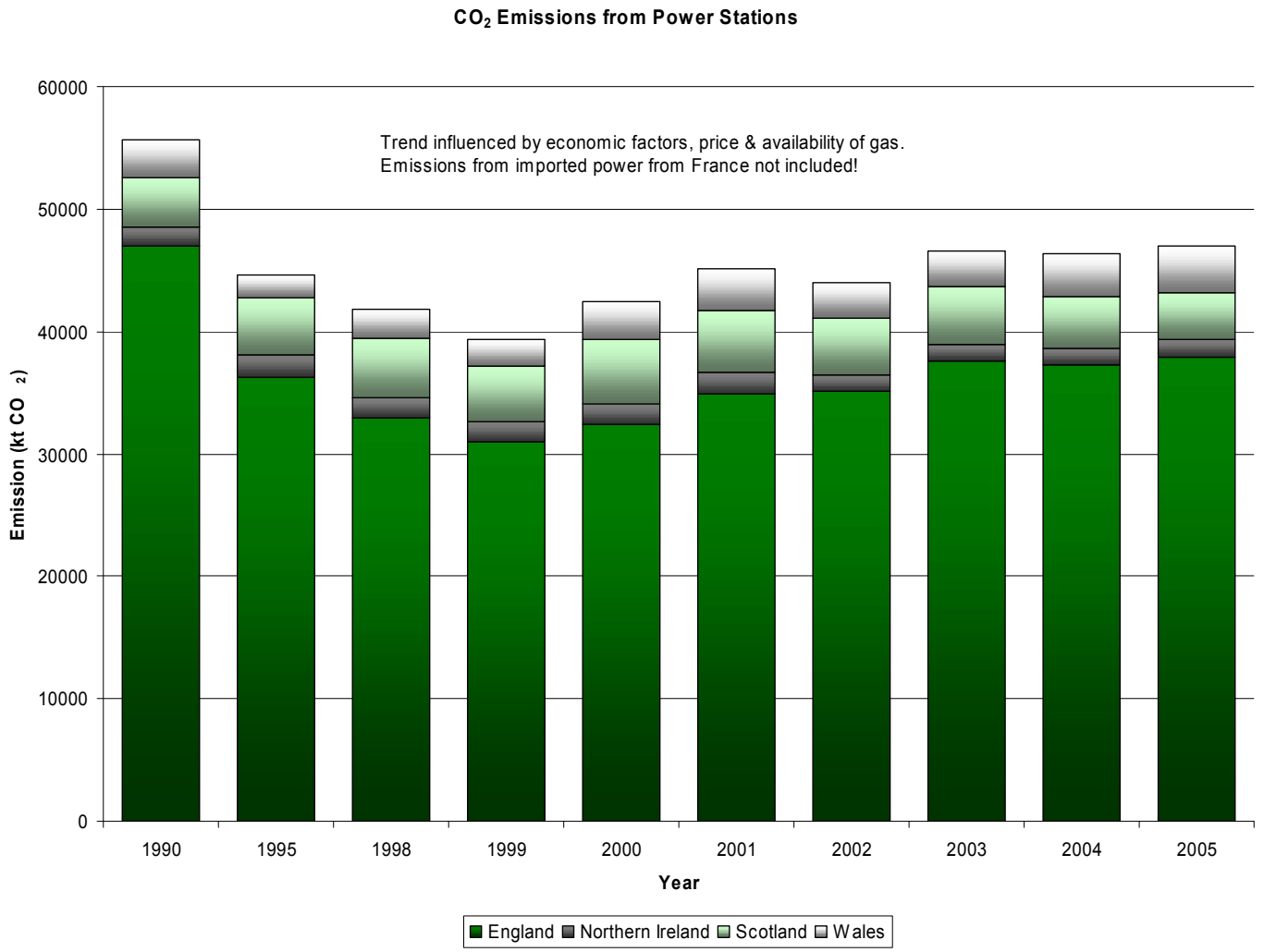
Future Improvements?

PI / SPRI / ISR data From landfill operators	?	Could lead to improved DA split of Methane emissions from landfills — Effort alert!
Water Industry Data	?	Could lead to much better DA and UK estimates of CH4 & N2O from waste water treatment & sewage sludge dispo (IF they ever provide any data!) — Data alert!
Gas Supply Data	?	Since the changes in UK gas supply networks, some changes to data available. Needs resolving to improve method again.
Carbon Reduction Commitment data, other DA/LA fuel use data	?	To derive better fuel use data for unregulated sectors, need access to more "bottom-up" data on fuel use (from surveys, CRC…) — Data alert! and Effort alert!

DA Inventories – 2005 GHG Emissions



DA Inventories – Emission Trends (1)



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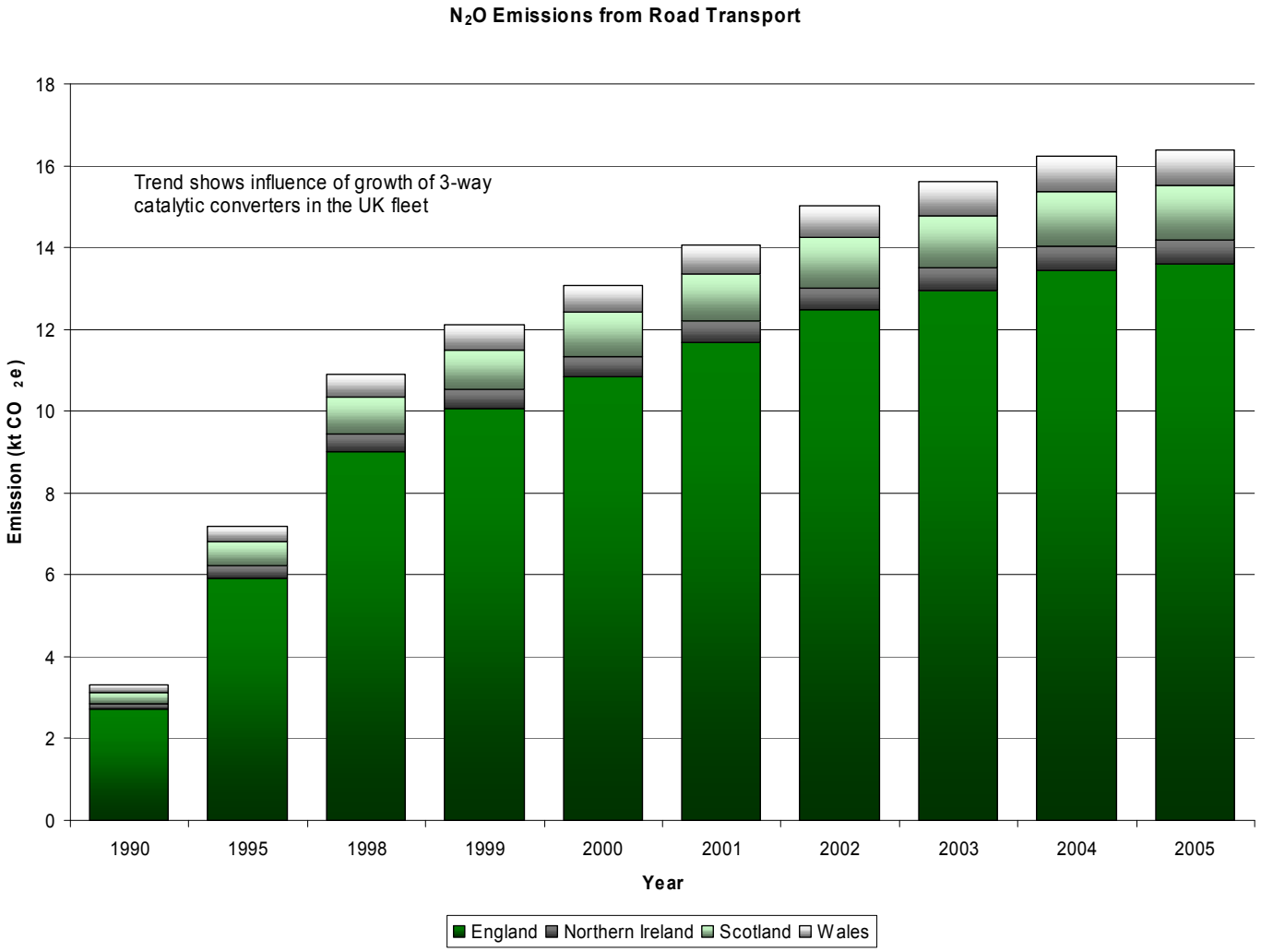
DA Inventories – Emission Trends (2)



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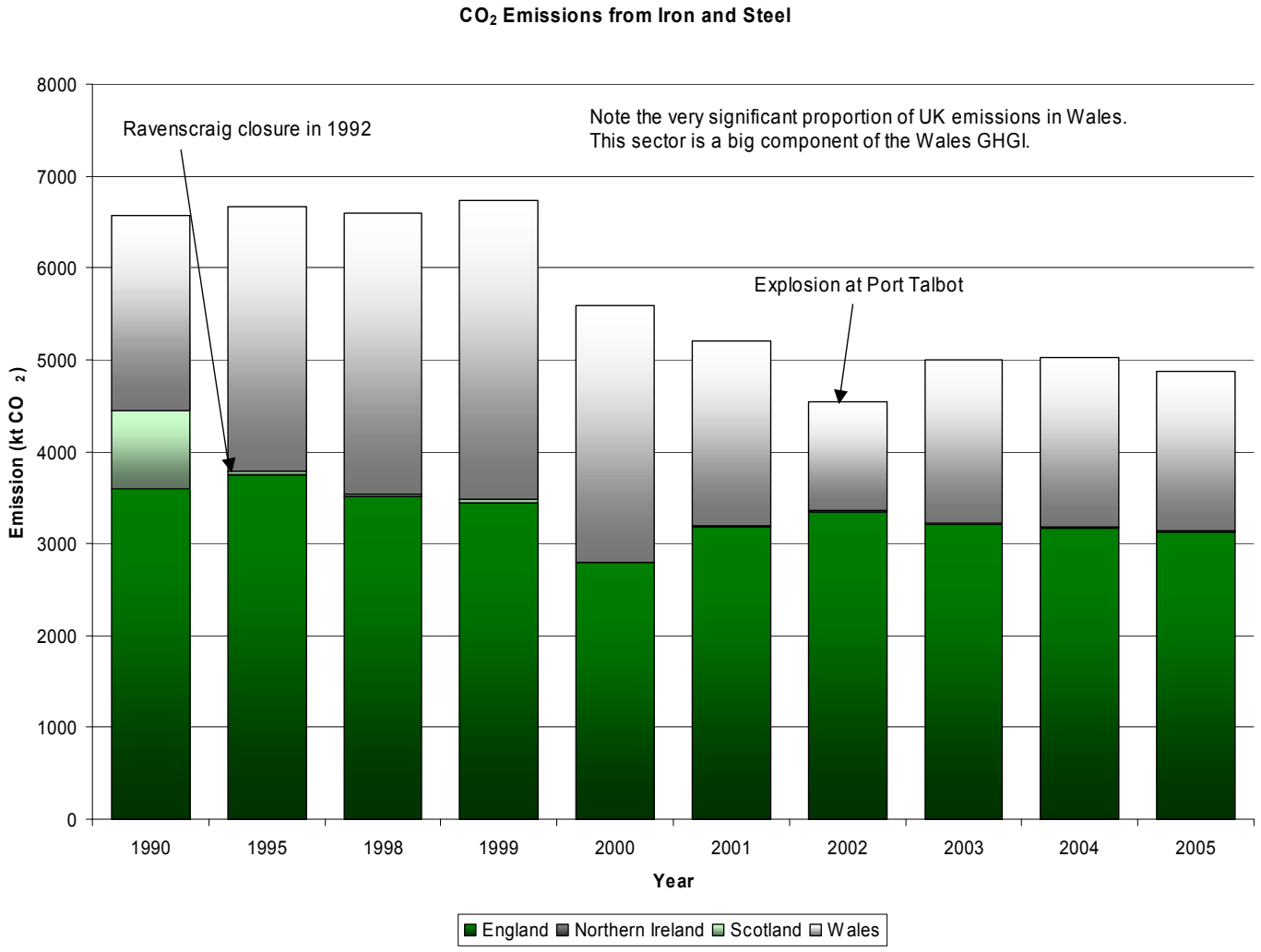
DA Inventories – Emission Trends (3)



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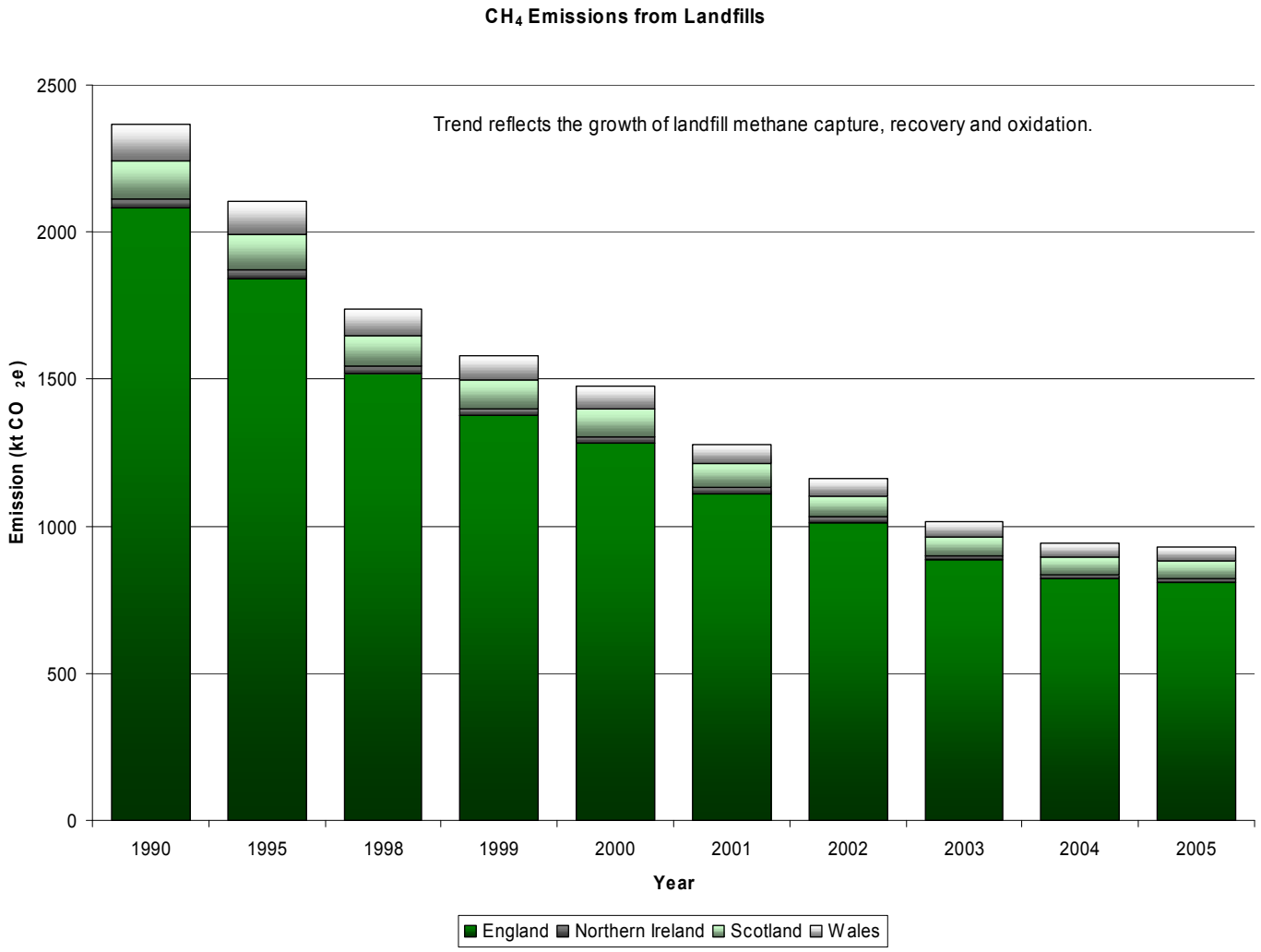
DA Inventories – Emission Trends (4)



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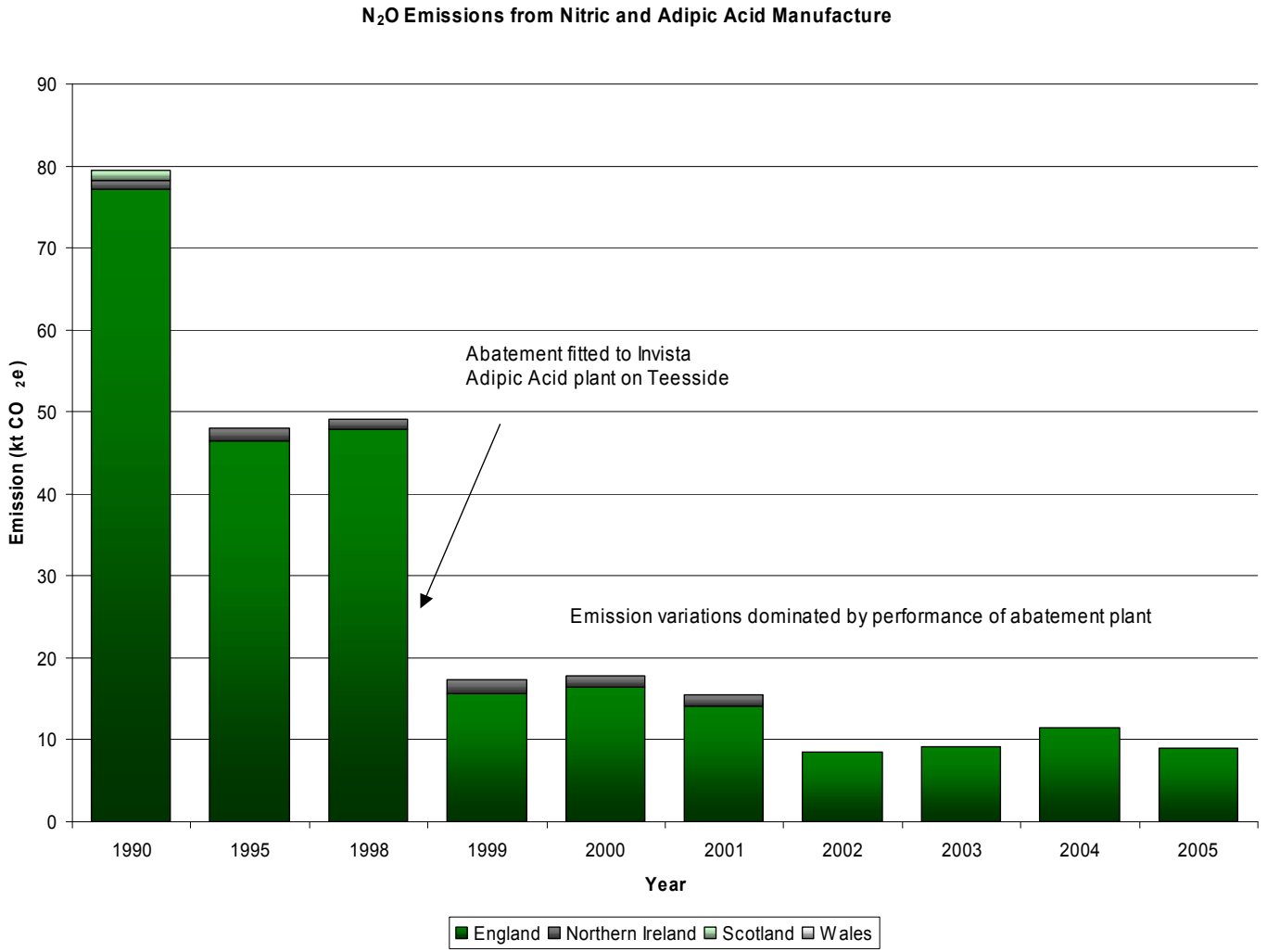
DA Inventories – Emission Trends (5)



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DA Inventories – Usefulness / Limitations

- Can be used to track progress towards targets through integration with emission projection work (via NAEI/GHGI database)
- For some sectors (e.g. transport, agriculture, heavy industry) the DA inventory data can easily be aligned with specific policies
- More difficult to link DA inventory data to other specific devolved policies (e.g. energy efficiency in homes, businesses) – more investment needed to tailor existing data to meet DA needs
- Impacts of UK policies (such as EU-ETS) can over-whelm devolved policy impacts (Longannet 2006?). Demonstrating progress in devolved policy areas is therefore of key importance.

DA Inventories – What next? (1)

Final User inventories

Where power/fuel is generated/refined in one region but exported and used in another, this method assigns emissions to where the energy & materials are CONSUMED not PRODUCED.

Energy Sector Source Emissions

Power stations + Refineries + Gas Production + Collieries

Redistribute emissions to…

Effort alert!

Final Users of Electricity, Refined Oil, Coal & Gas

Domestic + Commercial + Industry + Transport + Public Admin

Data alert!

Conceptual model to do these calculations has recently been developed for the DAs. (Lots more data to find and work to do, though!)

DA Inventories – What next? (2)

DA Emission Projections

DTI produce the Updated Energy Projections

Agricultural projections produced by Defra sub-contractors (IGER, ADAS)

LULUCF projections from CEH

AEA produce non-CO_2 GHG projections

Data alert!

BUT – as things stand the DA projections method is very limited due to budget and data availability. No time allocated for incorporating emission reductions from specific devolved policies; the method is basically an extension of UK trends.

Resources alert!

DA Inventories – Meeting DA needs?

- Exceptional value for money, but difficult to capture new data, continue to deliver to high standards and meet DA expectations on data presentation, monitoring progress and supporting policy development
- The DA stakeholders have contributed many improvements to UK inventory work, but we need to review level of funding going forward.
- Let us know your priorities and we will endeavour to take these on board

- Thank-you! (… and I hope that helped the lunch go down.)

Acknowledgements

- Many thanks to all of the DAs for their assistance in tracking down new data sources and contributing greatly to the QA/QC and improvement process over recent years and for asking us the questions that we don't always think to ask ourselves

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