GHG inventories: necessary condition for understanding emission levels and trends
or
„What can your GHG inventory do for you?“

Sina Wartmann
John Watterson, Glen Thistlethwaite, James Harries

21.08.2013
MRV Summer School

This Presentation

- Introduction to GHG inventories
- Inventory elements and structures
- The inventory year
- Processes benefitting from GHG inventories
- UK examples

GHG inventory ≠ MRV system

	MRV system	GHG inventory
Scale	Response measures	Economy and sector wide
Scope 1	Cost, impacts, outcome	Emissions
Scope 2	Mitigation and adaptation	Just mitigation
Causality	Yes	No
Implementation	Yes	No
Co benefits	Yes	No

A GHG inventory is not an MRV system – but an essential element of an MRV system!

The six sectors for reporting GHGs

RICARDO-AEA

Energy

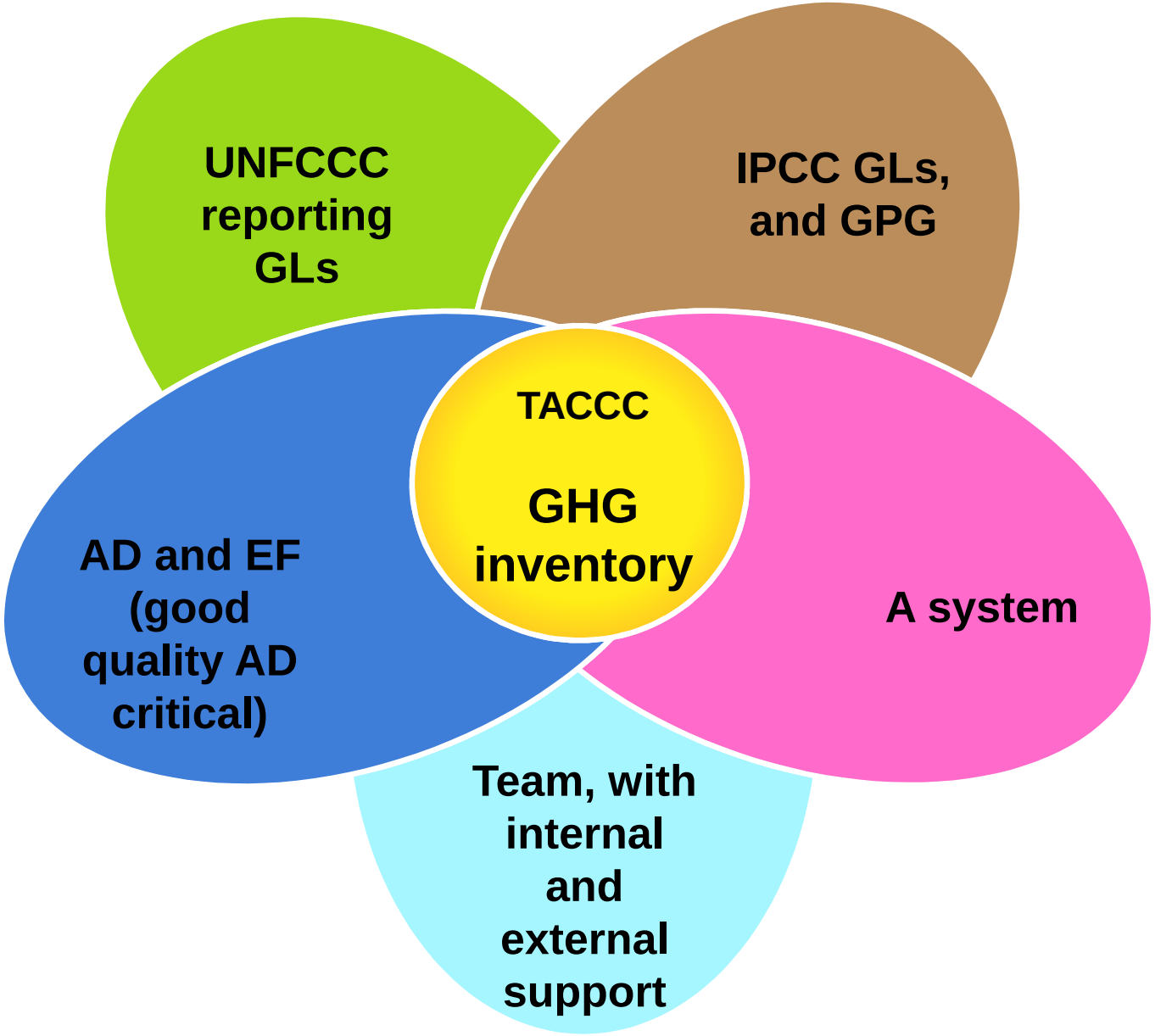
Agriculture

Industrial Processes, Solvents

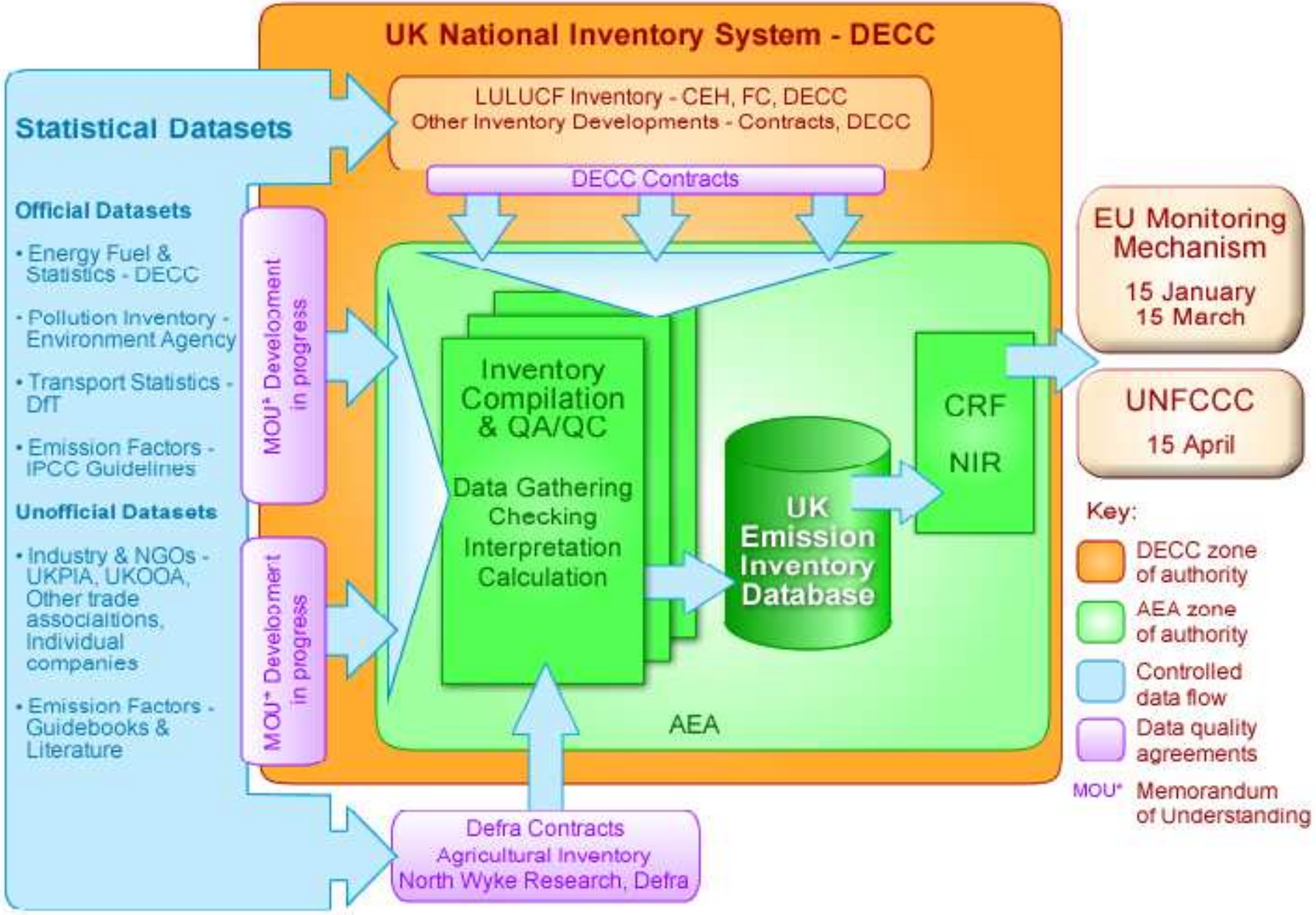
Land Use, Land-Use Change and Forestry

Waste

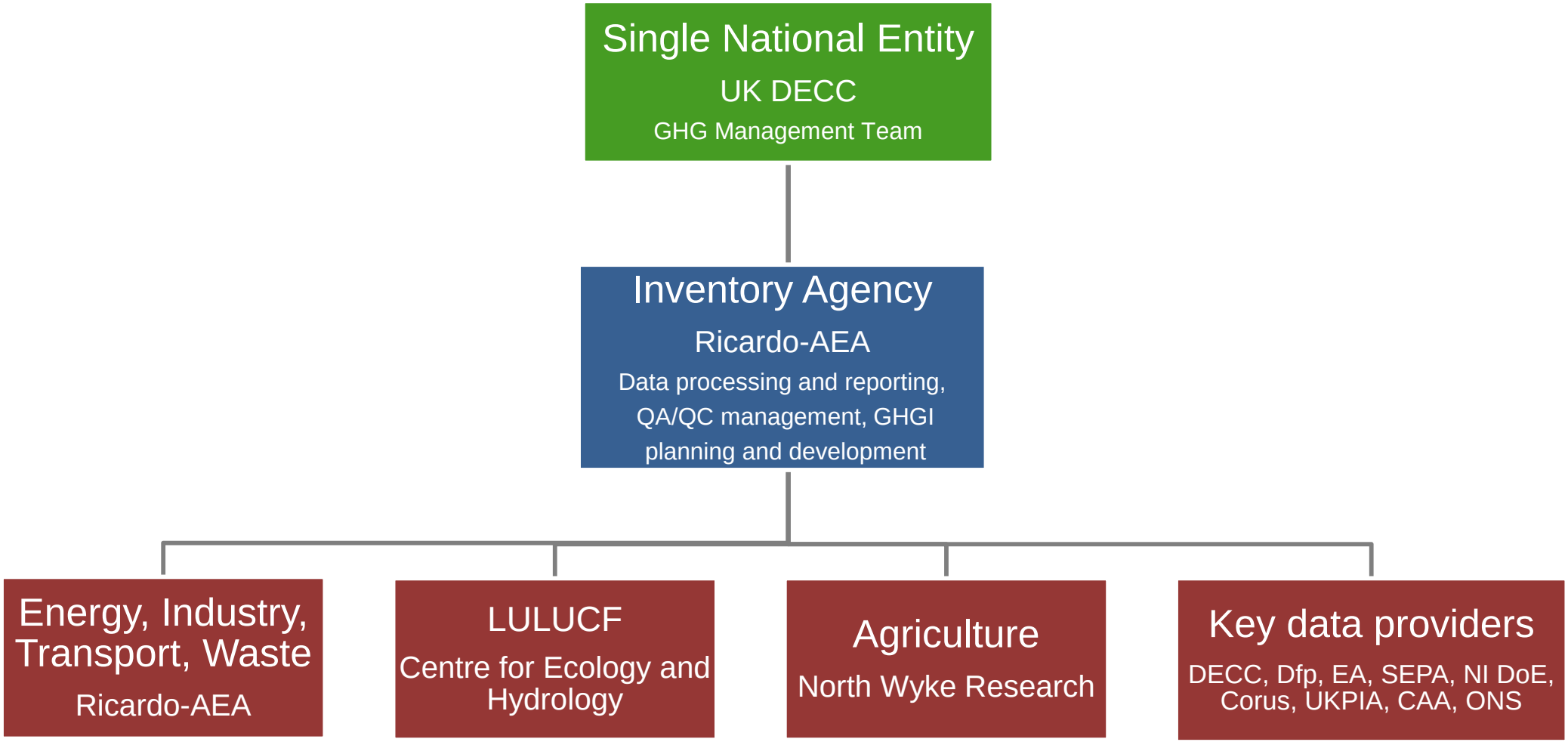
What are the elements needed for a GHG inventory?



What could a National System look like, and what elements might it contain?

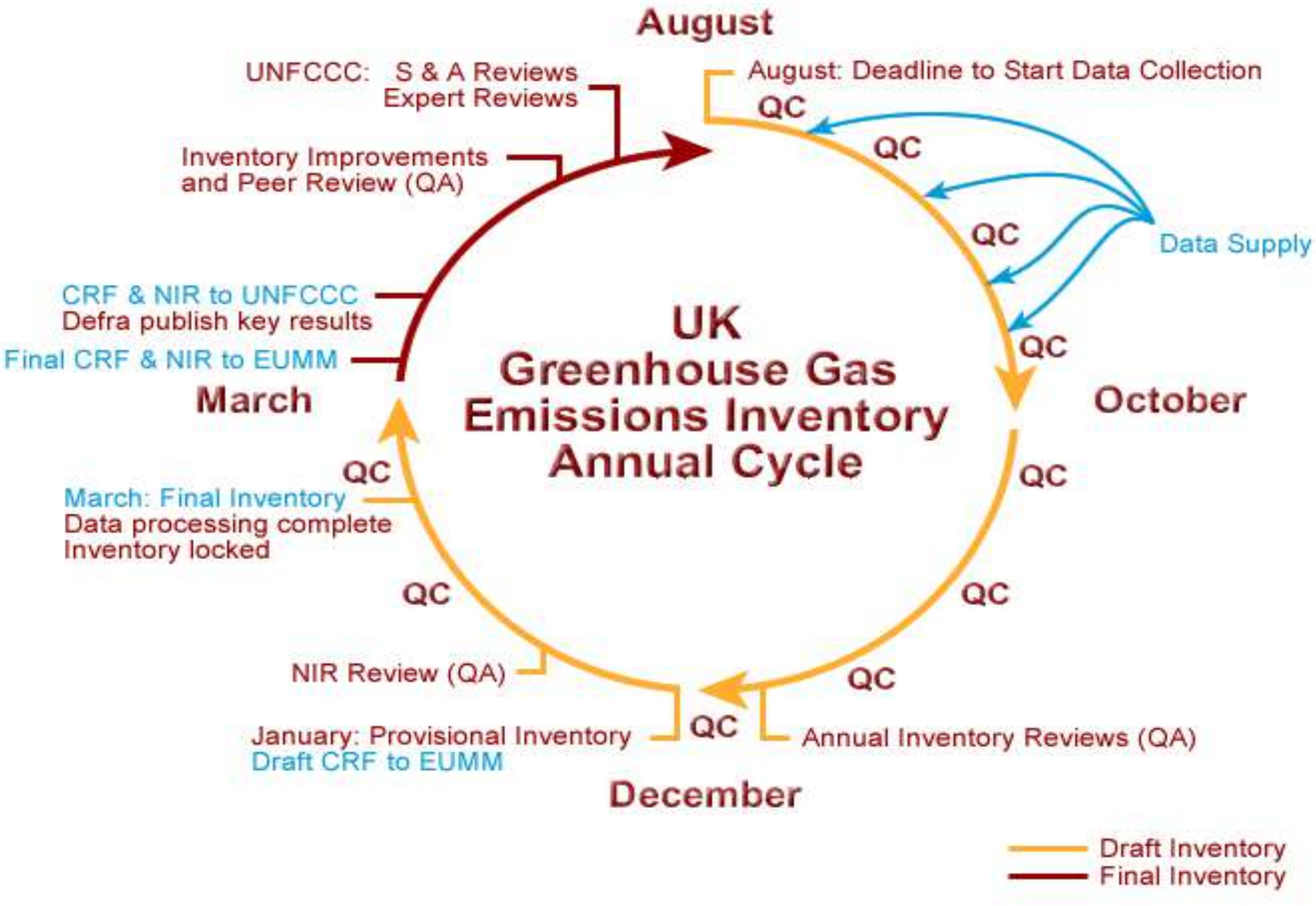


UK Inventory Structure

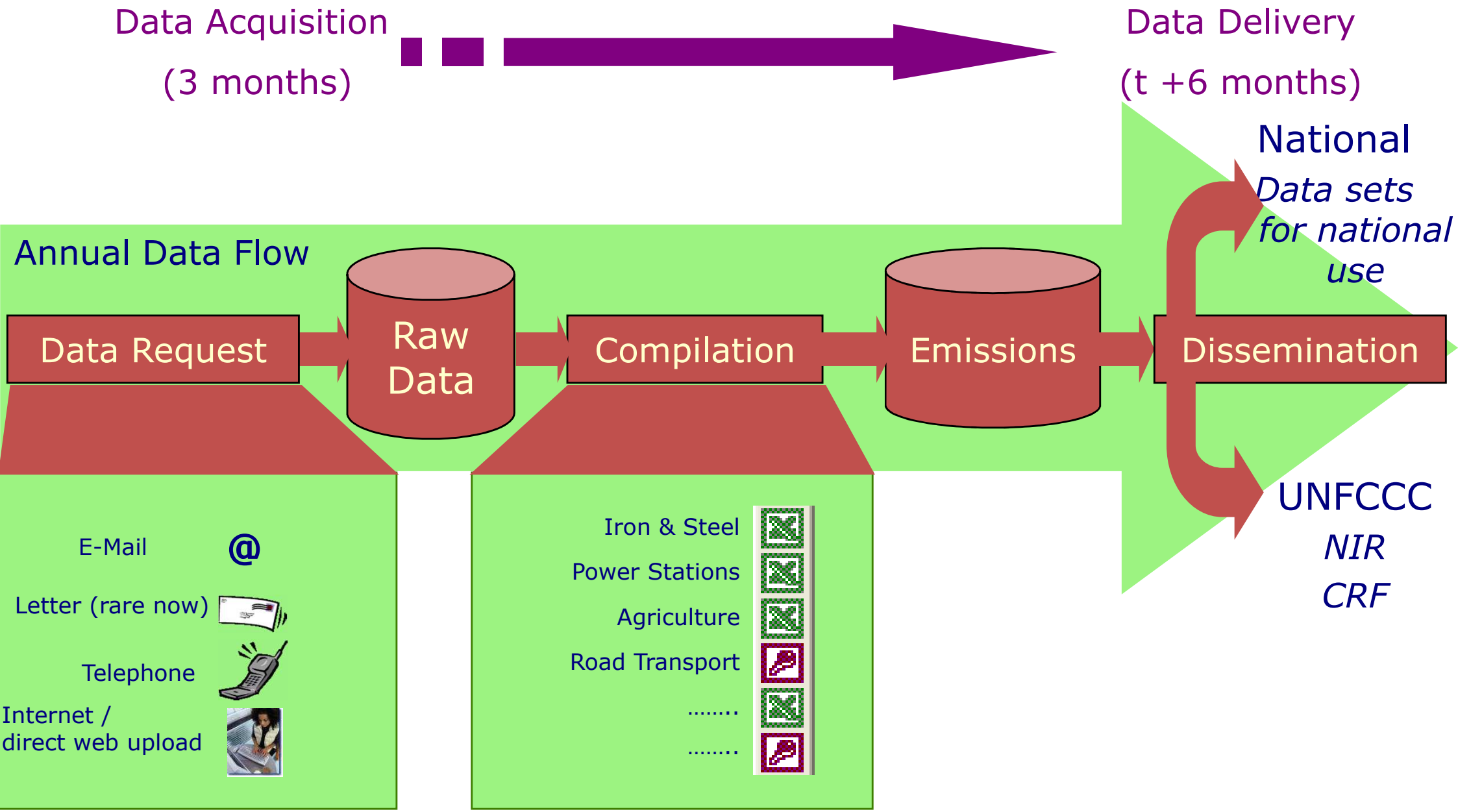


Annual inventory compilation cycle in the UK

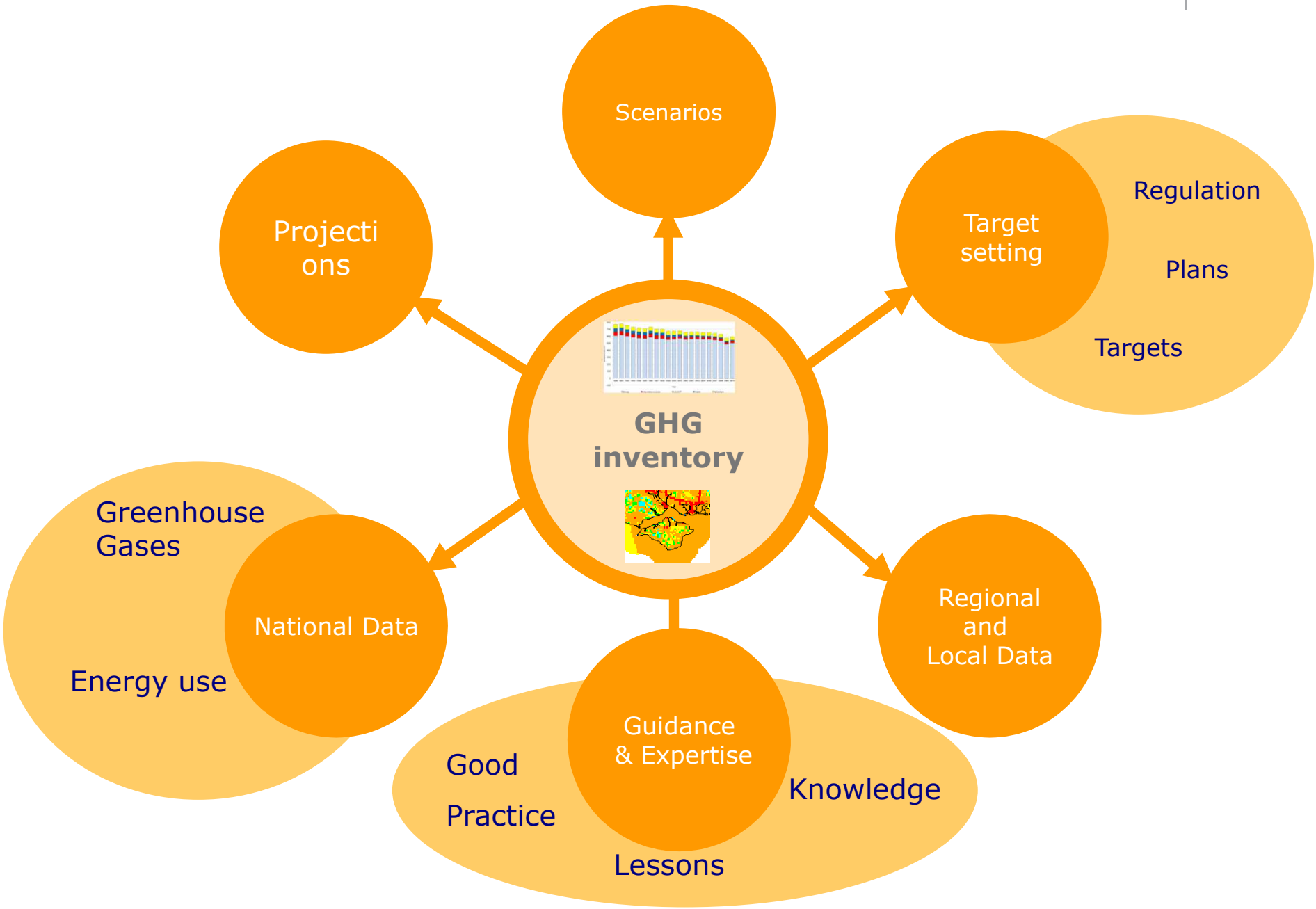
RICARDO-AEA



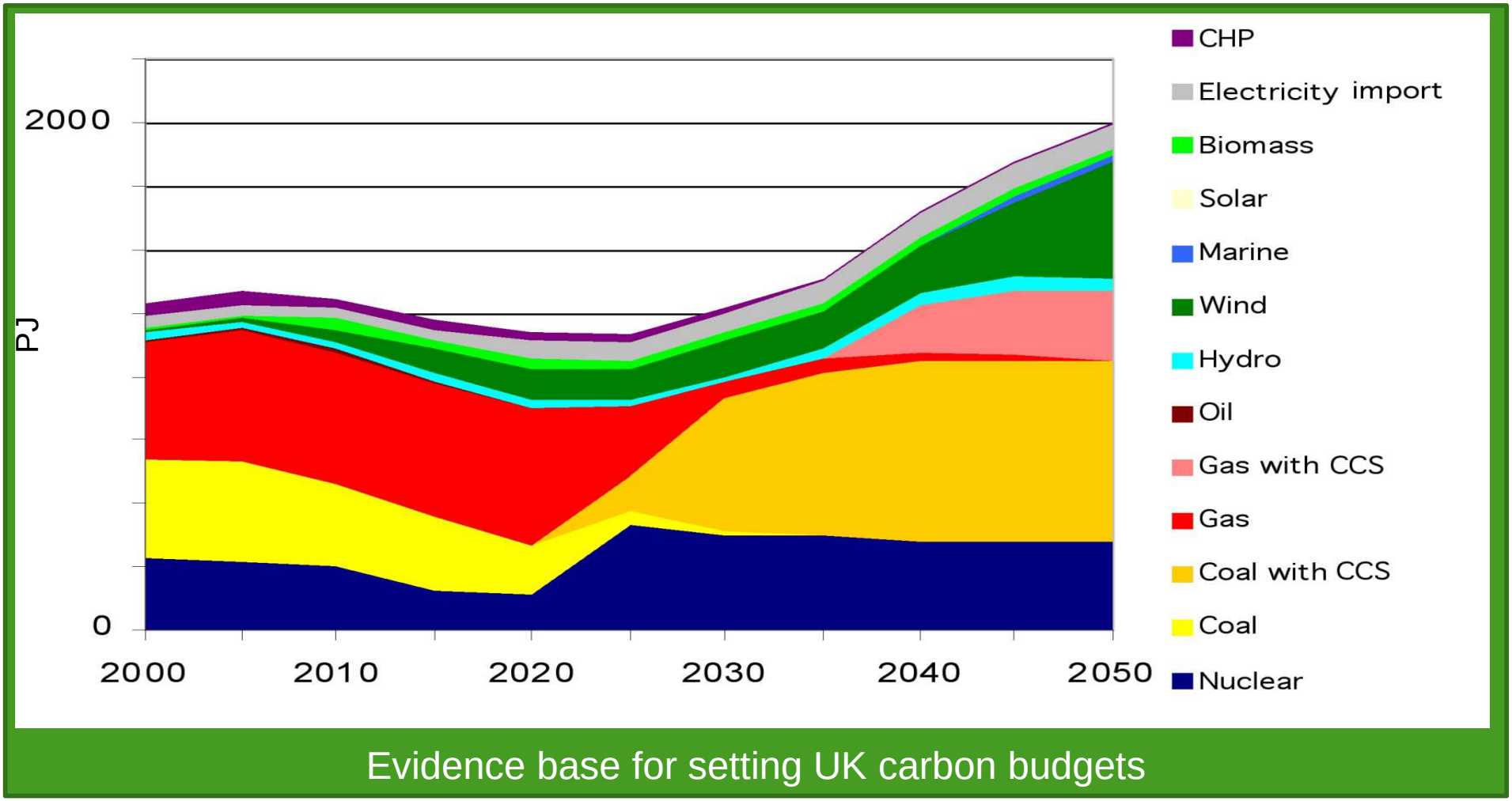
Elements of an inventory compilation cycle

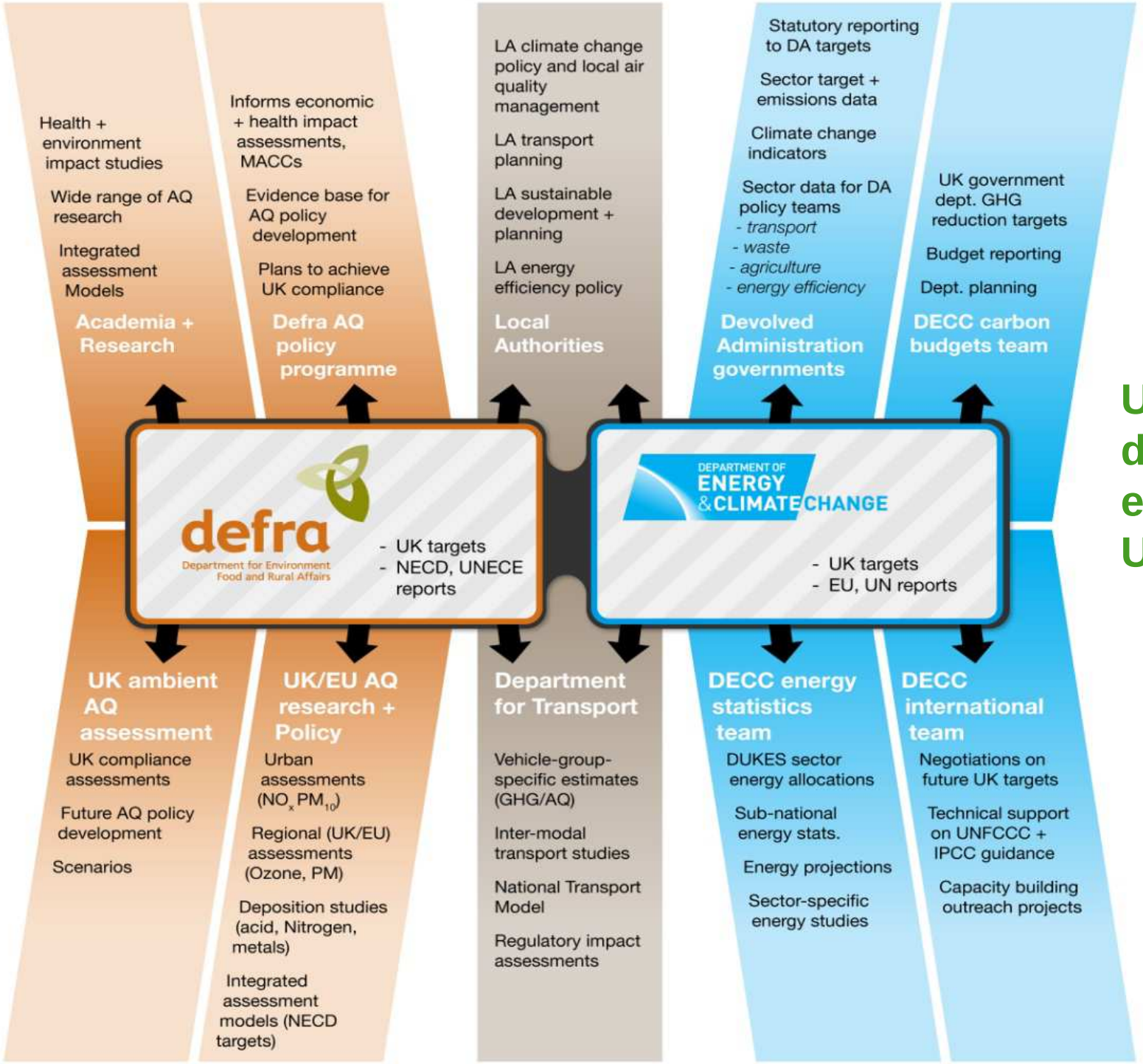


How the GHGI is used as a basis for other activities



Example energy projection to underpin setting UK carbon budgets





Use of inventory data and inventory experience in the UK

Summary

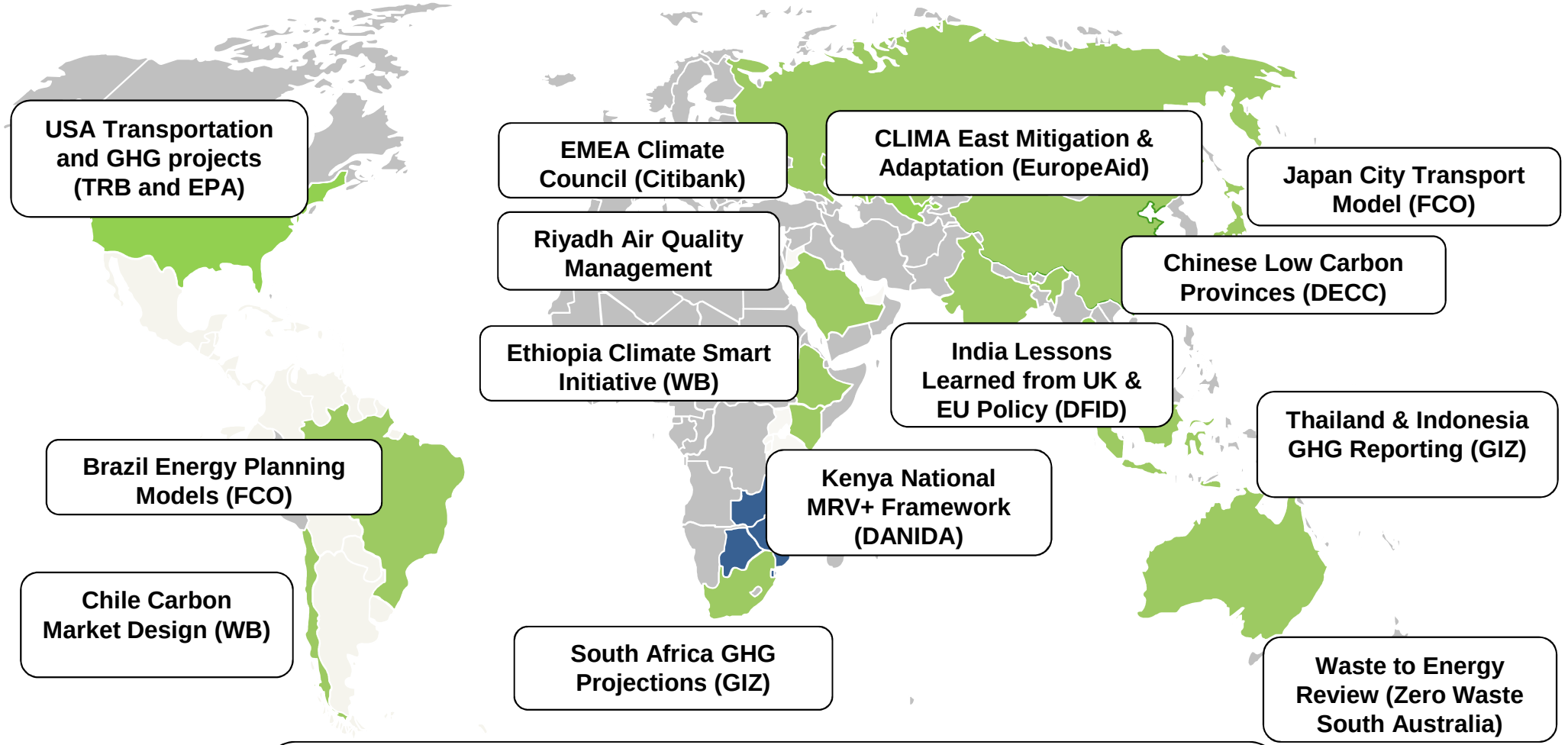
- Inventories form the basis for mitigation policies, projections, scenario setting
- Having a GHGI provides economy-wide data. Completeness is essential to enable cost-effective, prioritised policy effort
- Having a GHGI that meets some/all of the UNFCCC GLs, GPG and underpinning MRV requirements provides credibility
- The GHGI inventory agency will develop into a resource of technical expertise that can be drawn upon across a wide range of technical and policy areas.
- Inventory systems are live systems that operate year-round, geared to addressing specific outcomes
- Developing data at national, regional, local level is achievable through a mixture of top-down and bottom-up data management, and it is useful to foster better engagement across different stakeholders

Sina Wartmann
Ricardo-AEA Ltd
The Gemini Building
Fermi Avenue
Harwell, Didcot,
OX11 0QR

T: +44 1235 75 3132
E: sina.wartmann@ricardo-aea.com
W: www.ricardo-aea.com

Ricardo-AEA work on GHG inventories, MRV and NAMA expertise to the world

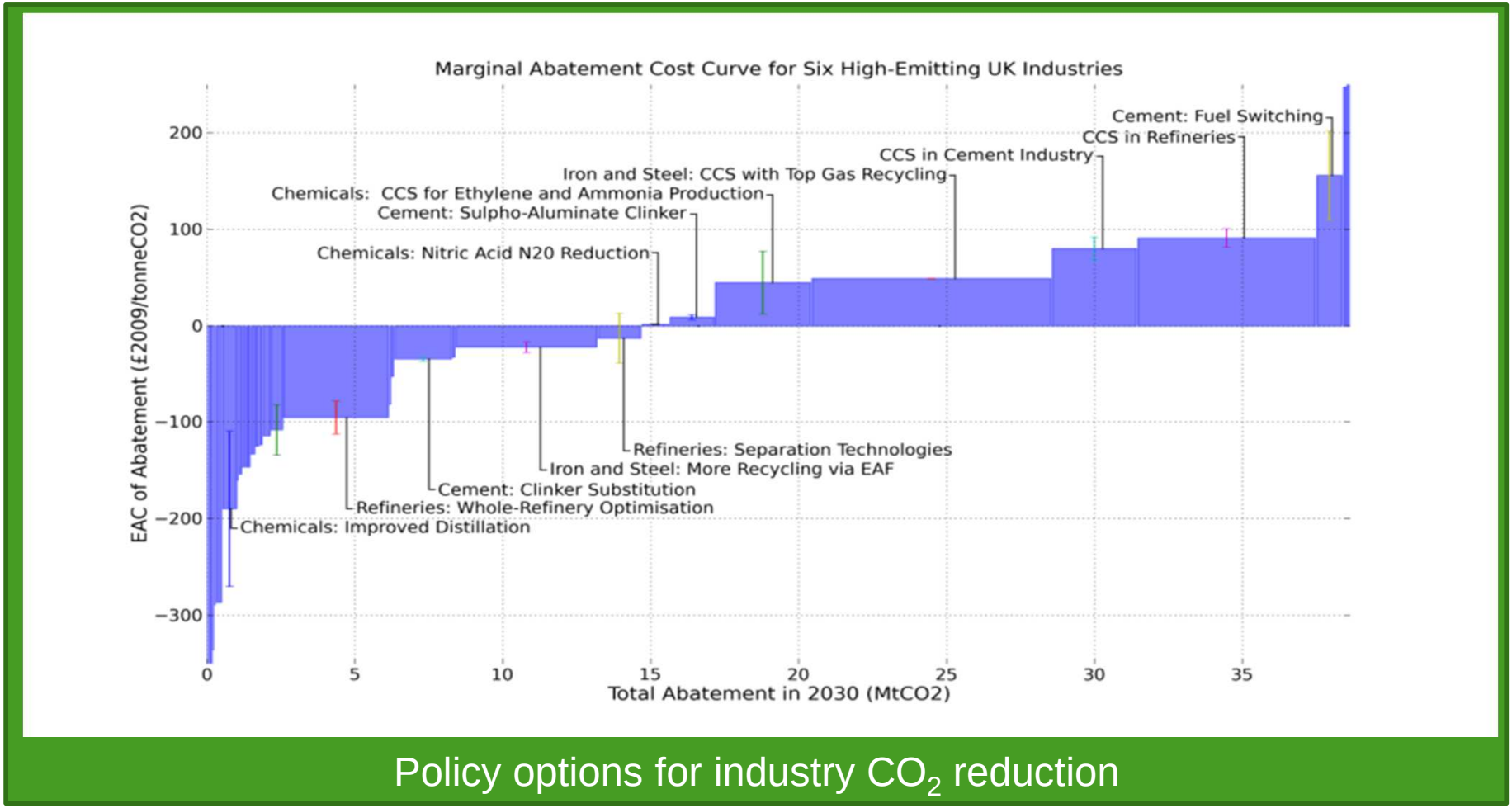
RICARDO-AEA



Global Projects

- **Global Methane Initiative (US EPA)**
- **Climate & Environment "Evidence on Demand" framework (UK DFID)**
- **Climate Negotiator Training for Least Development Countries (UK CDKN)**

Appraising carbon mitigation options and associated costs for industry



Policy options for industry CO_2 reduction

Guidance on methods

http://www.ipcc-nggip.iges.or.jp

RICARDO-AEA

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
National Greenhouse Gas Inventories Programme

WMO UNEP

IPCC-NGGIP

IPCC web sites

- IPCC-NGGIP Home
- Organization
- Technical Support Unit
- NGGIP Publications
- Presentations
- Meetings
- Support to Inventory Compilers
- FAQs
- Links
- Emission Factor Database (EFDB)
- Electronic DIscussion Group (EDG)

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988. Its main objective was to assess scientific, technical and socio-economic information relevant to the understanding of human induced climate change, potential impacts of climate change and options for mitigation and adaptation. The IPCC has completed four assessment reports, developed methodology guidelines for national greenhouse gas inventories, special reports and technical papers. For more information on the IPCC, its activities and publications, please see the IPCC homepage.

The IPCC National Greenhouse Gas Inventories Programme (IPCC-NGGIP) had been undertaken since 1991 by the IPCC WG I in close collaboration with the Organisation for Economic Co-operation and Development (OECD) and the International Energy Agency (IEA).

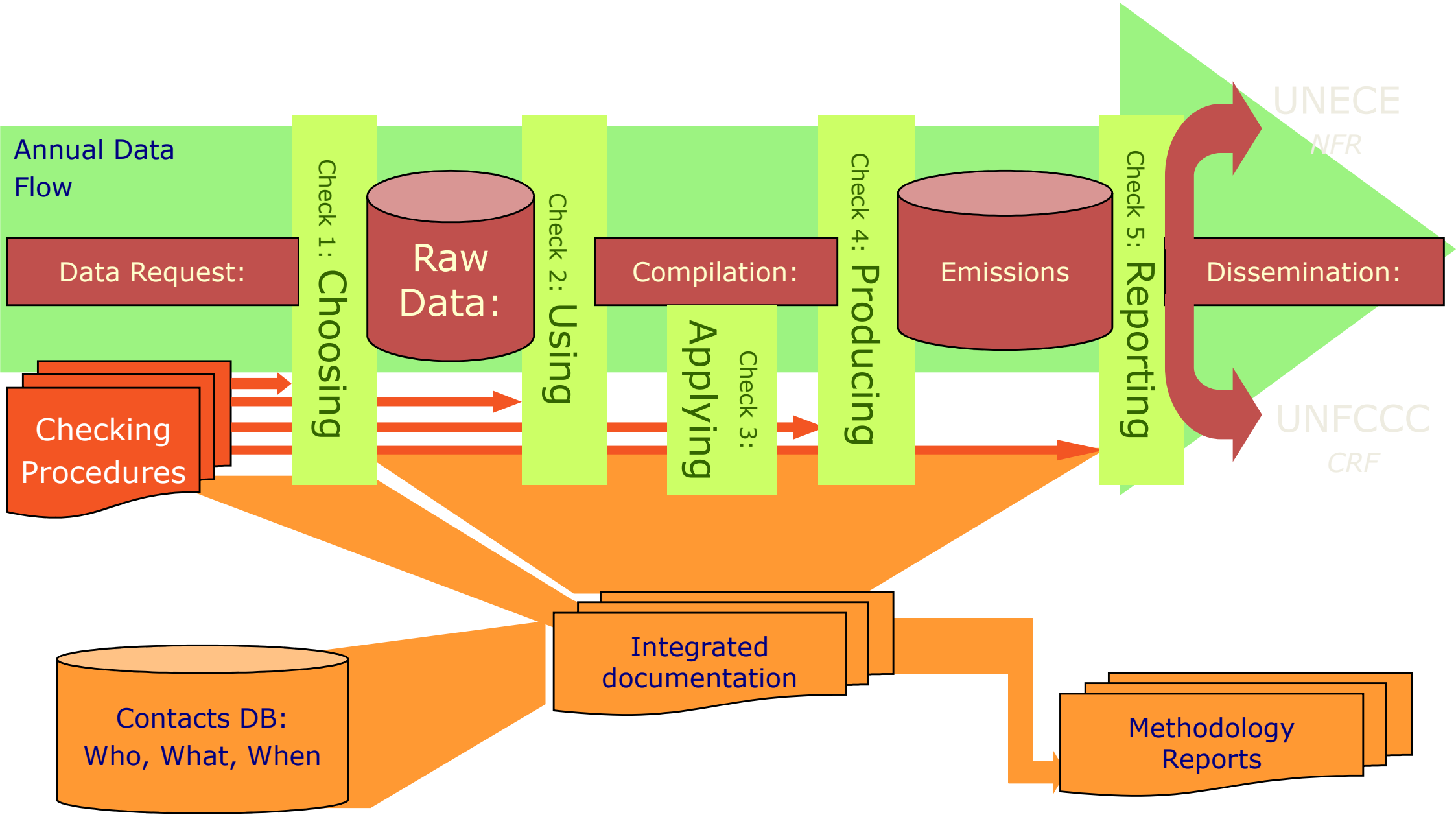
[More about IPCC-NGGIP]

IPCC-NGGIP Publication

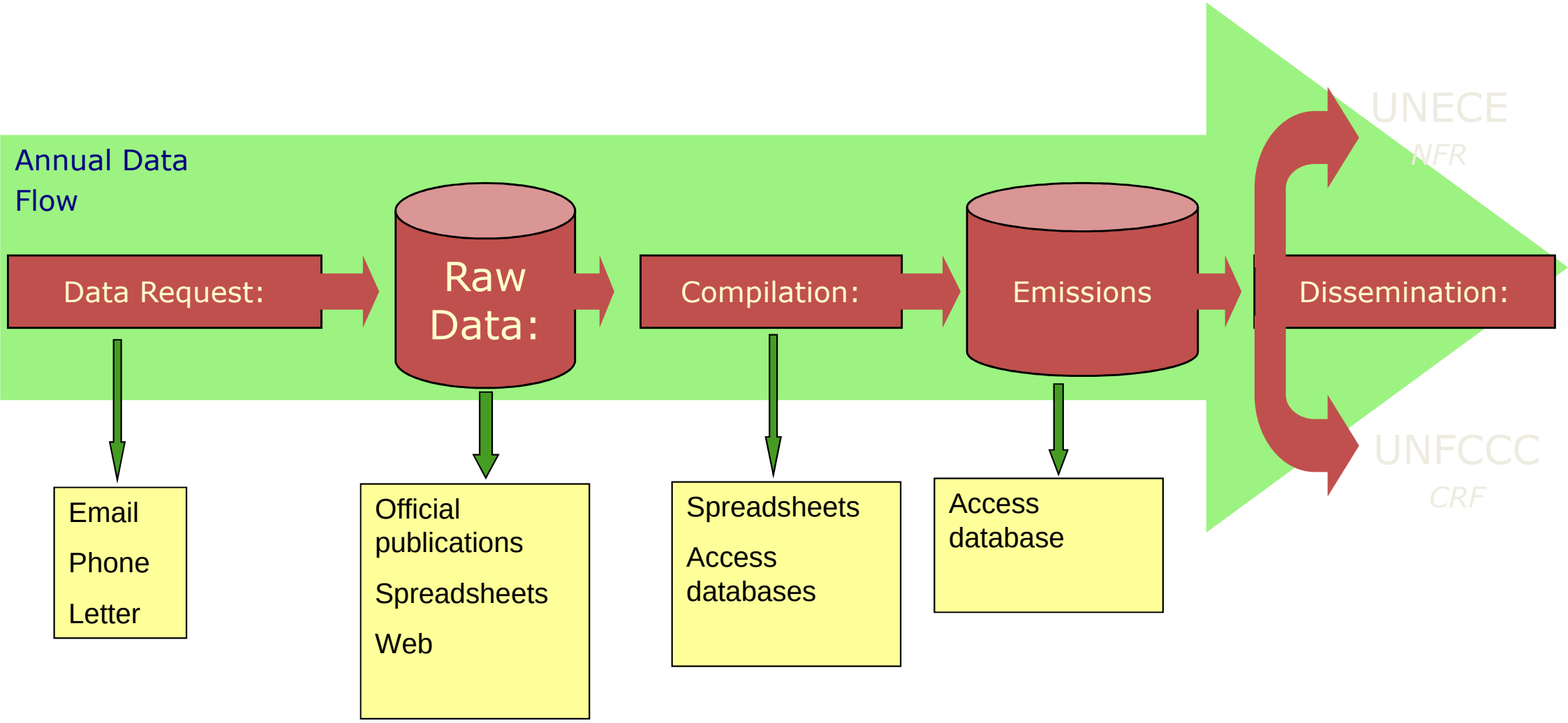
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- Good Practice Guidance for Land Use, Land-Use Change and Forestry
- Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other VegetationTypes
- Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories

[More Publications]

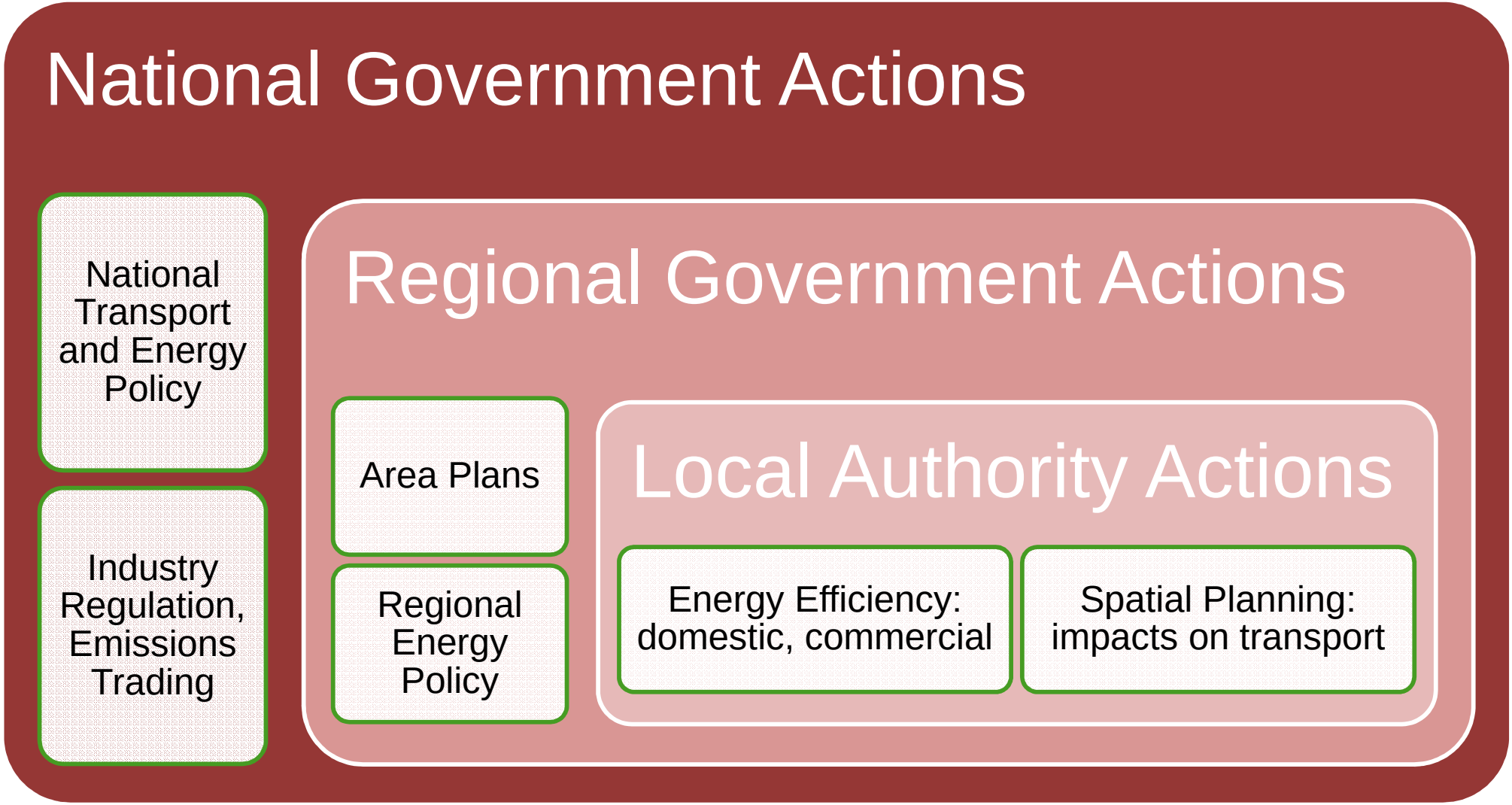
Quality Control & Documentation in the Inventory



Flow of Data through the UK Inventory



Policy Actions: National - Regional - Local



Emission estimation

Spreadsheets can be used to process data for emission compilation. Activity data and Emission Factors are the basis for emission estimations:

Emission = Activity Data X Emission Factor

Examples

Power station: Carbon emission = Mt coal x Carbon EF

Cattle: Methane emission = No. of cows x Methane EF

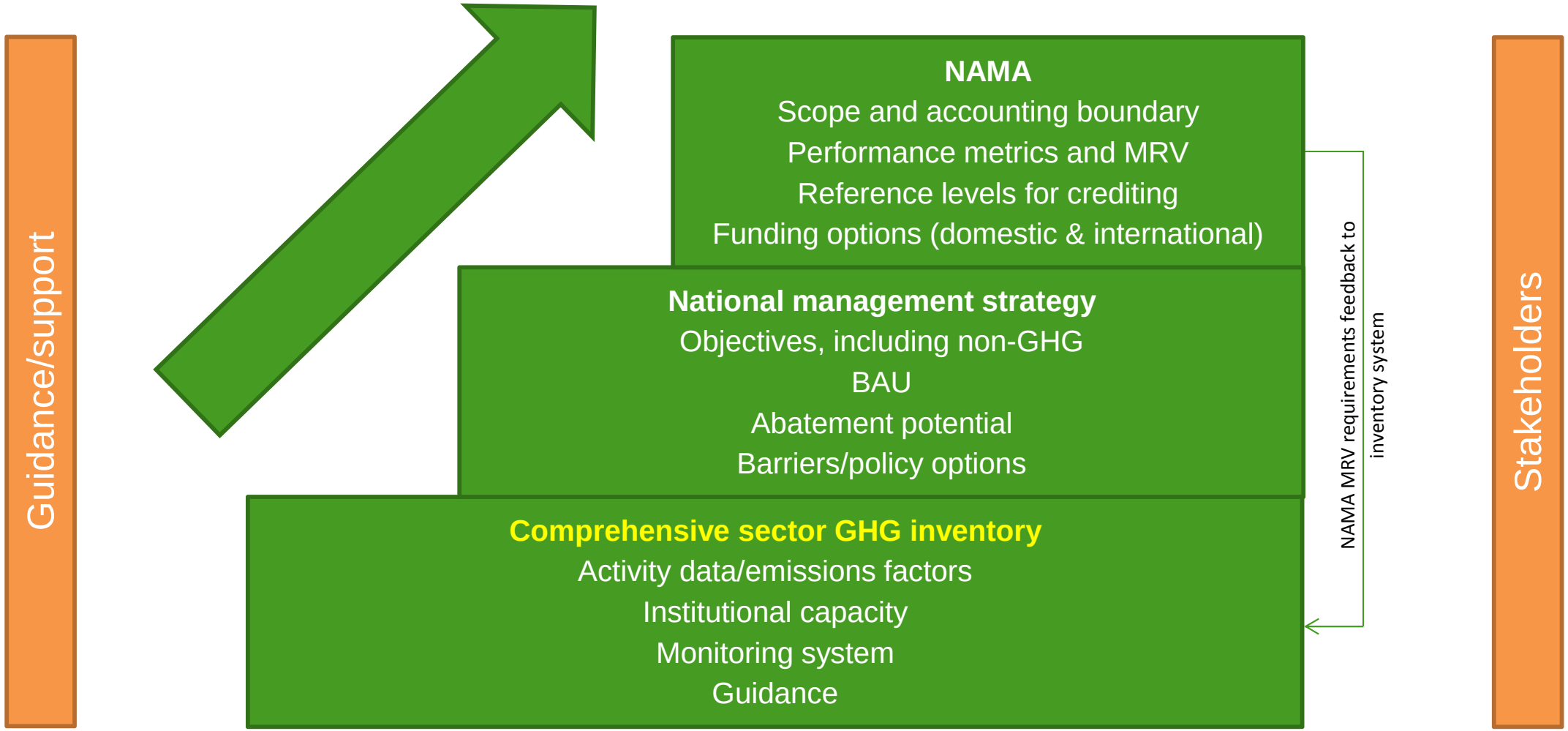
EFs usually derived from specific research, fuel analysis or reference sources (e.g. IPCC GLs, US EPA AP-42, EMEP-CORINAIR guidebook etc.)

Estimation methods (& sometimes choice of AD, EF) based on international guidance or more appropriate country specific approaches or data.

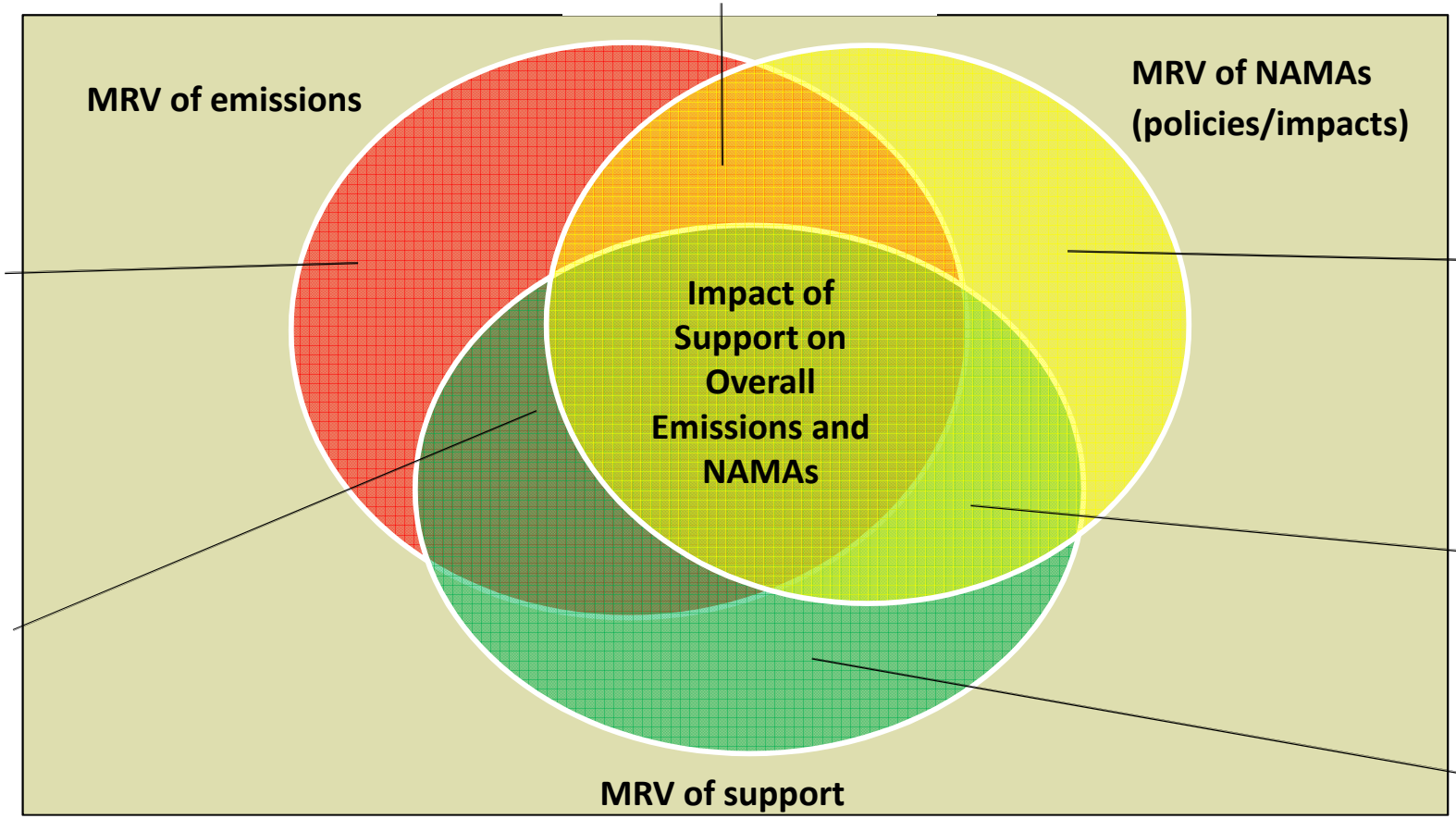
Emission = Emission Factor x Activity Statistic

- What factors
- Which activity data
- Converting units
- Understanding available statistics
- No double counting
- Mass Balance
- Processes
- Feedstocks
- Spatial dimensions
- QA/QC?

The NAMA 'journey'



The complete MRV picture



UK National / Regional / Local: GHG Reduction Targets

National Targets *(established since KP agreement)*	Kyoto Protocol (2008-2012) UK Government domestic targets (2010) UK Climate Change Act targets (2020, 2050 targets and 5-year carbon budgets)
Regional Targets	*(established over the last 4 years)*
Scottish Government	Climate Change (Scotland) Act (2020, 2050 targets and annual carbon budgets)
Welsh Assembly Government	Wales CC Strategy (Overall and sector-specific annual reduction targets)
Northern Ireland Assembly	N Ireland Sustainable Development Strategy (2025, 2030 targets)
Local Targets	*(established over the last 3years)*
430 Local Authorities in England and Wales alone	Local Authority National Indicators (GHG reduction targets)