

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

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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!

Energy















Industrial Processes, **Solvents**



Land Use, Land-Use Change and Forestry





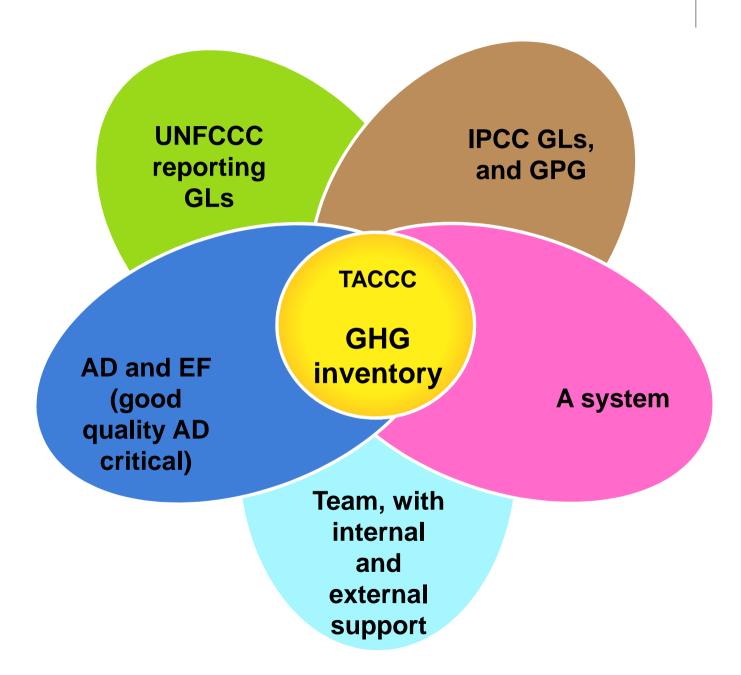
Waste



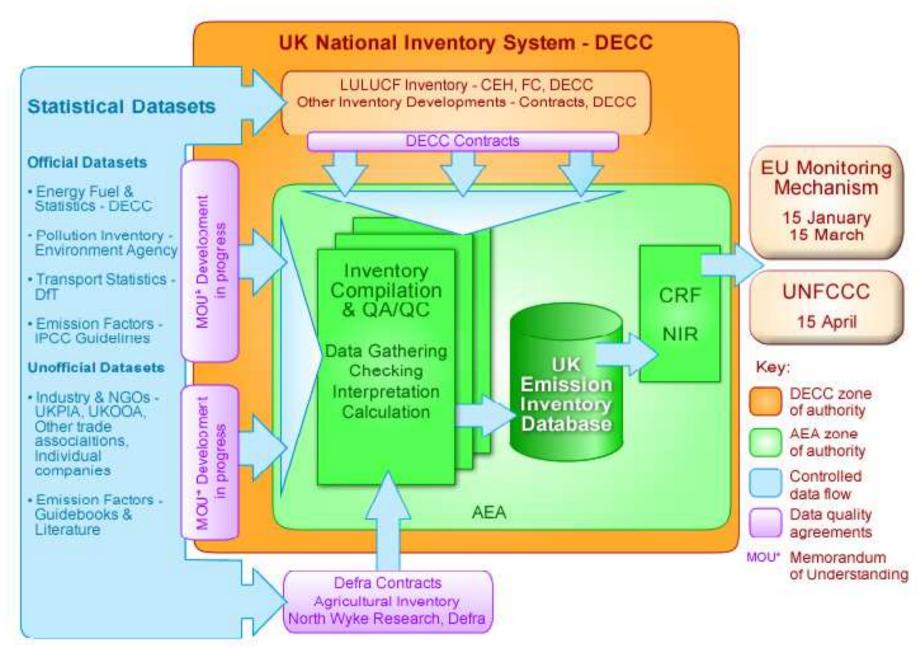
What are the elements needed for a GHG inventory?

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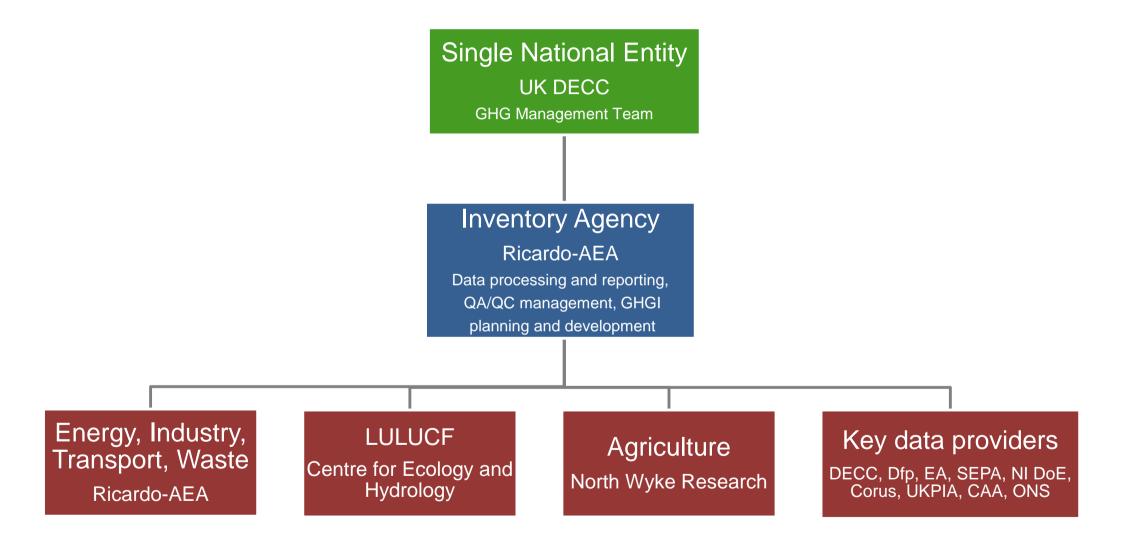


What could a National System look like, and what elements might it contain?

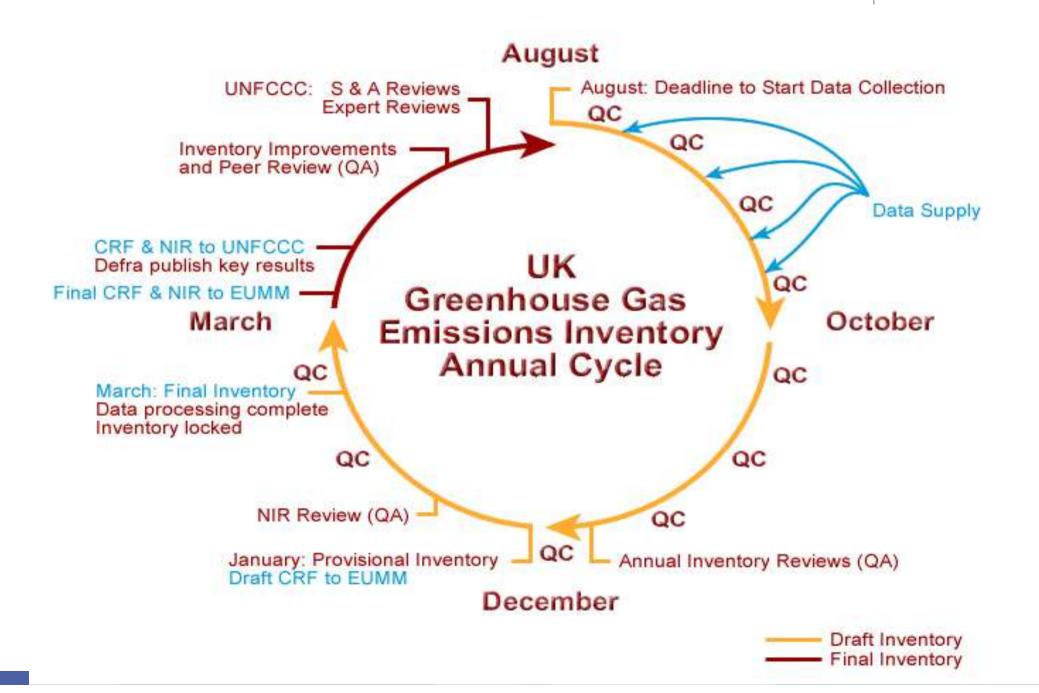


UK Inventory Structure

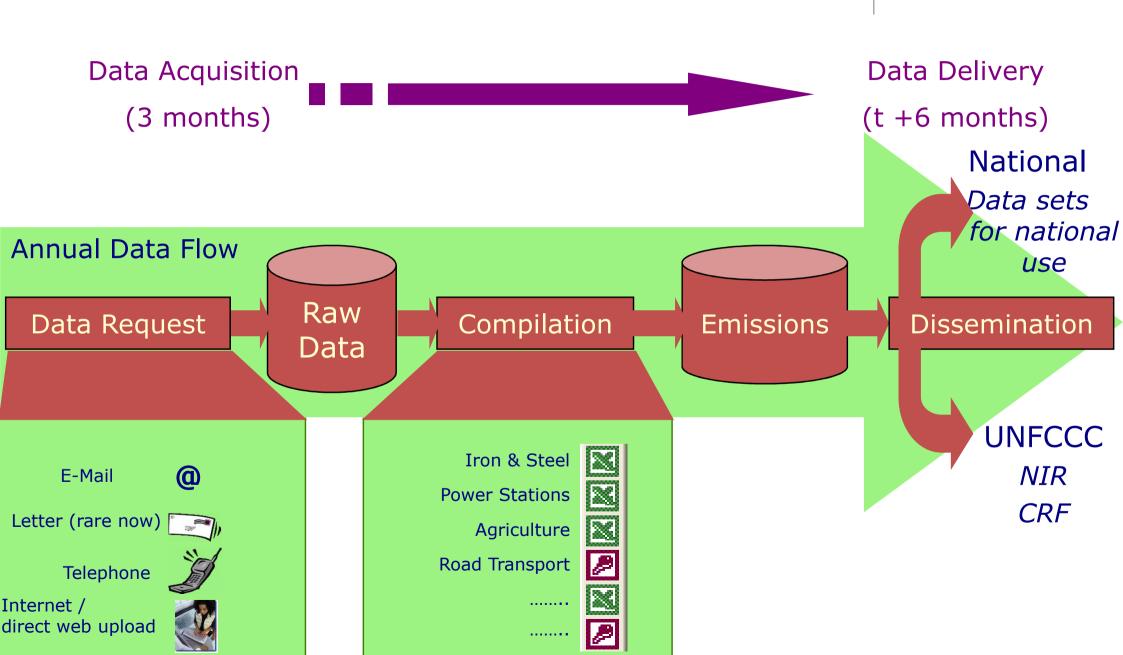
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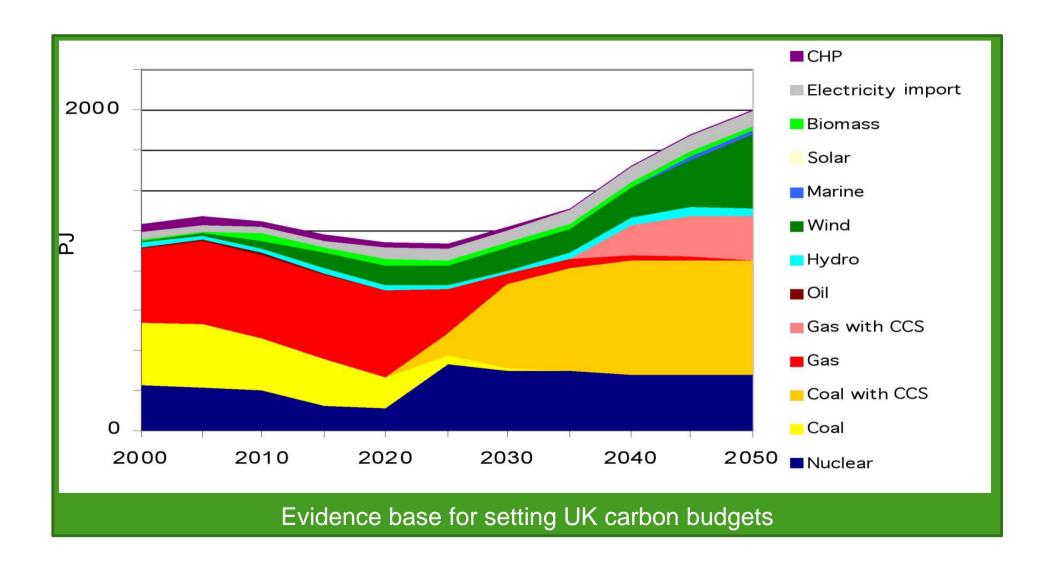
Elements of an inventory compilation cycle



How the GHGI is used as a basis for other activities



Example energy projection to underpin setting UK carbon budgets



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Use of inventory data and inventory experience in the UK

LA climate change policy and local air quality management

LA transport planning

LA sustainable development + planning

LA energy efficiency policy

Local Authorities Climate change indicators
Sector data for DA

UK go

Sector data for DA policy teams

Statutory reporting

to DA targets

Sector target +

emissions data

- transport
- waste
- agriculture
- energy efficiency

Devolved Administration governments UK government dept. GHG reduction targets

Budget reporting

Dept. planning

DECC carbon budgets team



Informs economic

Evidence base for

Plans to achieve

UK compliance

Defra AO

programme

+ health impact

assessments.

AQ policy

development

MACCs

UK targets
 NECD, UNECE reports

DEPARTMENT OF ENERGY & CLIMATE CHANGE

- UK targets
- EU, UN reports

UK ambient AQ assessment

UK compliance assessments

Future AQ policy development

Scenarios

Health +

environment

research

Integrated

Models

assessment

Academia +

impact studies

Wide range of AQ

UK/EU AQ research + Policy

Urban assessments (NO PM,)

Regional (UK/EU) assessments (Ozone, PM)

Deposition studies (acid, Nitrogen, metals)

Integrated assessment models (NECD targets)

Department for Transport

Vehicle-groupspecific estimates (GHG/AQ)

Inter-modal transport studies

National Transport Model

Regulatory impact assessments

DECC energy statistics team

DUKES sector energy allocations

Sub-national energy stats.

Energy projections

Sector-specific energy studies DECC international team

Negotiations on future UK targets

Technical support on UNFCCC + IPCC guidance

Capacity building outreach projects

Summary



- Inventories form the basis for mitigation policies, projections, scenario setting
- Having a GHGI provides economy-wide data. Completeness is essential to enable costeffective, 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 topdown and bottom-up data management, and it is useful to foster better engagement across different stakeholders

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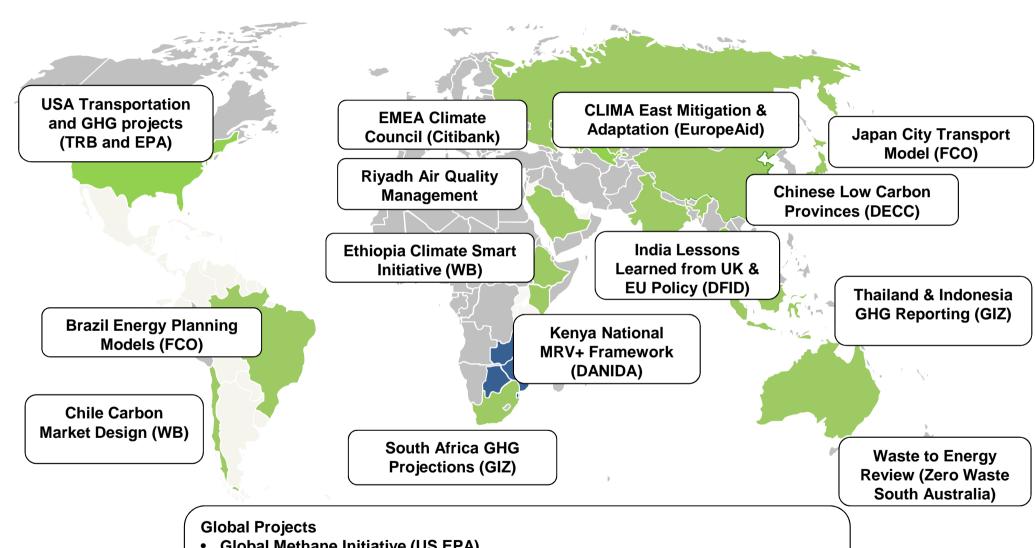
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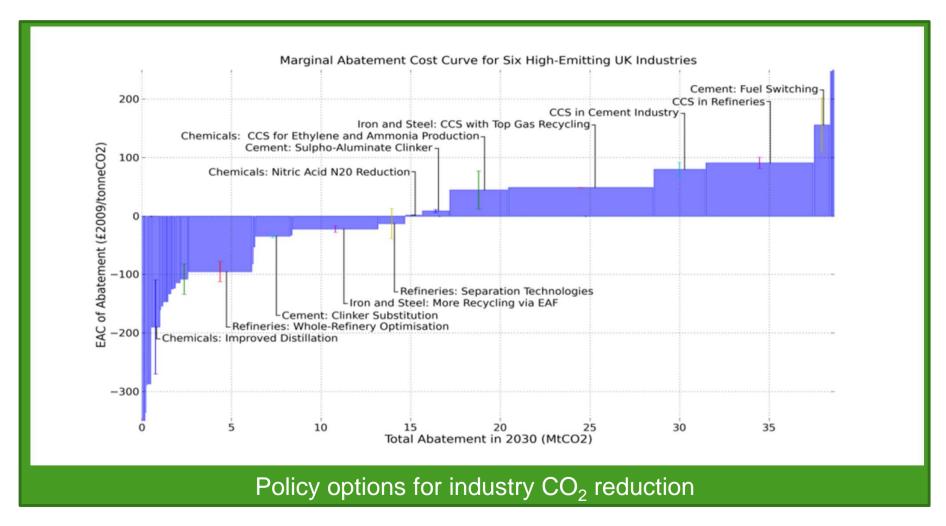
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Ricardo-AEA work on GHG inventories, MRV and NAMA expertise to the world



- 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





Guidance on methods

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





INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

National Greenhouse Gas Inventories Programme



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 quidelines 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]

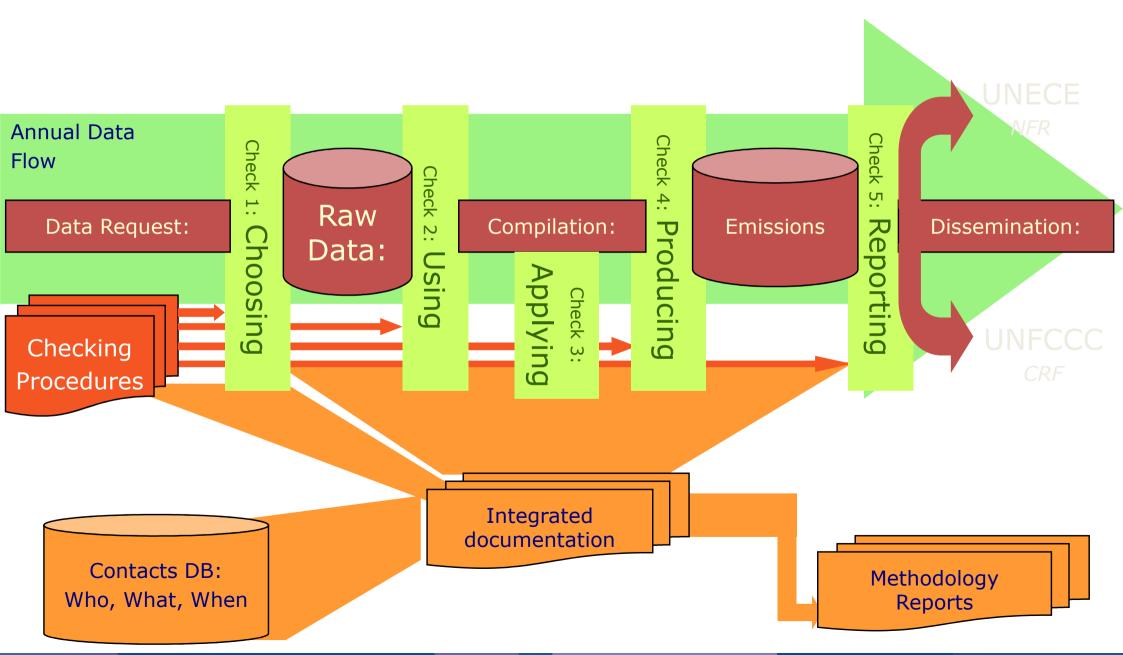
IPCC-NGGIP Publication



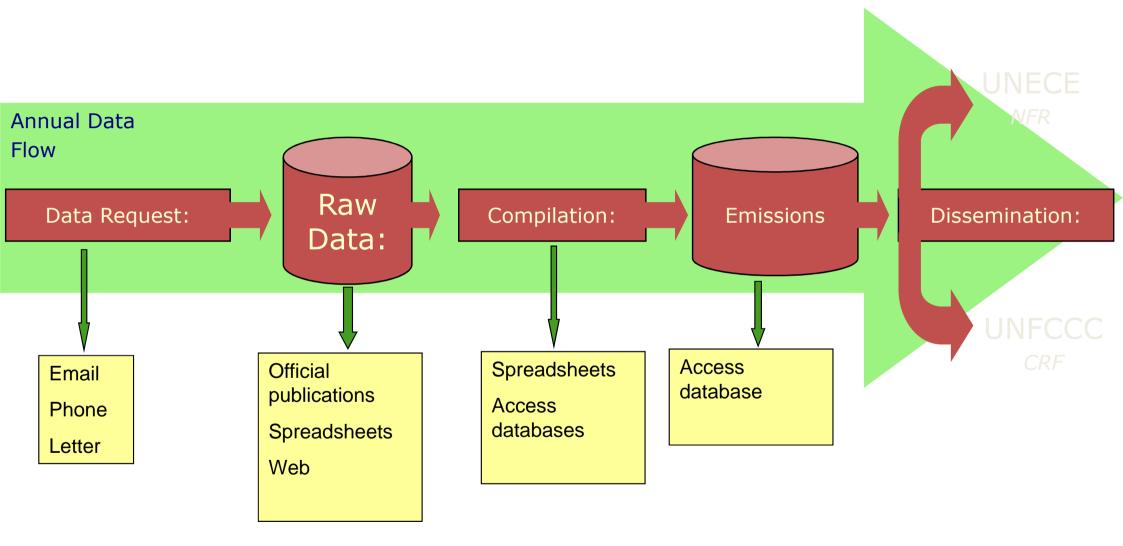
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories
- Good Practice Guidance for Land Use, Land-Use Change and Forestry
- Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other VegetationTypes
- Good Practice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

[More Publications]

Quality Control & Documentation in the Inventorigando-AEA



Flow of Data through the UK Inventory



National Government Actions

National Transport and Energy Policy

Industry Regulation, Emissions Trading

Regional Government Actions

Area Plans

Regional Energy Policy Local Authority Actions

Energy Efficiency: domestic, commercial

Spatial Planning: impacts on transport

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Emission estimation

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.)

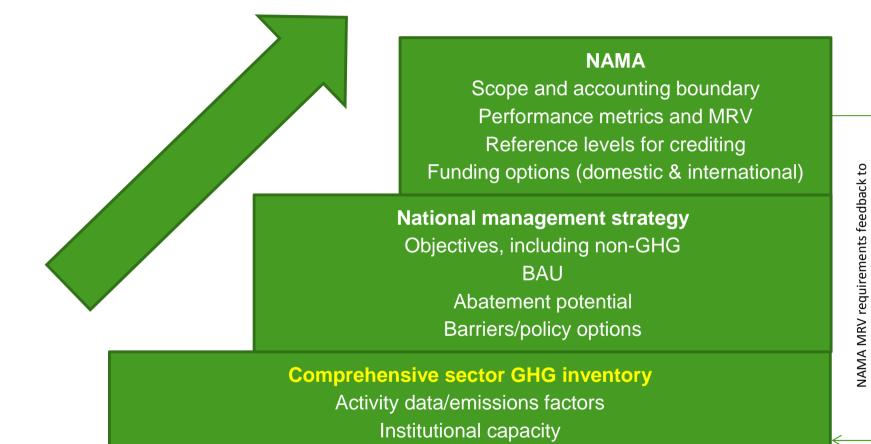
Estimation methods (& sometimes choice of AD, EF) based on international guidance or more appropriate country specific approaches or data.



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'



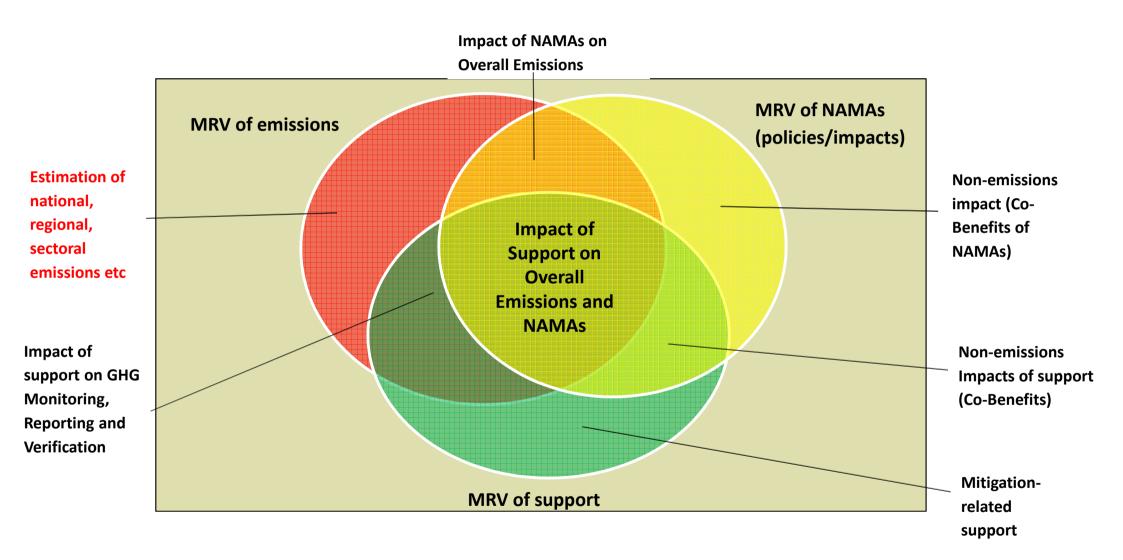
Monitoring system
Guidance

inventory system

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Guidance/support

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)