

# UK emission Inventory Quality Control and Quality Assurance and National Inventory System

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# Overview of presentation

- QC in the UK inventory
- QA activities
- Summary of QA/QC plan in the UK
- Quality Manual
- Resources
- National Inventory System



# IPCC define QA/QC as.....

- Quality Control
  - A system to ensure regular & adequate checking
- Quality Assurance
  - A system of regular independent reviews
    - *Independent Review*
      - *Peer review*
      - *In-depth review*



# QA/QC programme

- AEA Technology is responsible for:
  - *Compiling the UK inventory for*
    - UNFCCC,
    - CLRTAP
    - other national uses
- Coordinating QA/QC activities
- QA/QC activities include:
  - *Documentation*
  - *Checking*
  - *Recalculation*
  - *Uncertainties*
  - *Archiving*
  - *Review*



# Quality Control: Overview

## Core elements of Quality Control:

- Referencing
  - *What data is used*
  - *Where does it come from*
- Documentation
  - *How is data used*
  - *What assumptions are used*
- Checking
  - *Are the results robust/defendable*
  - *Identify errors*



What is used?



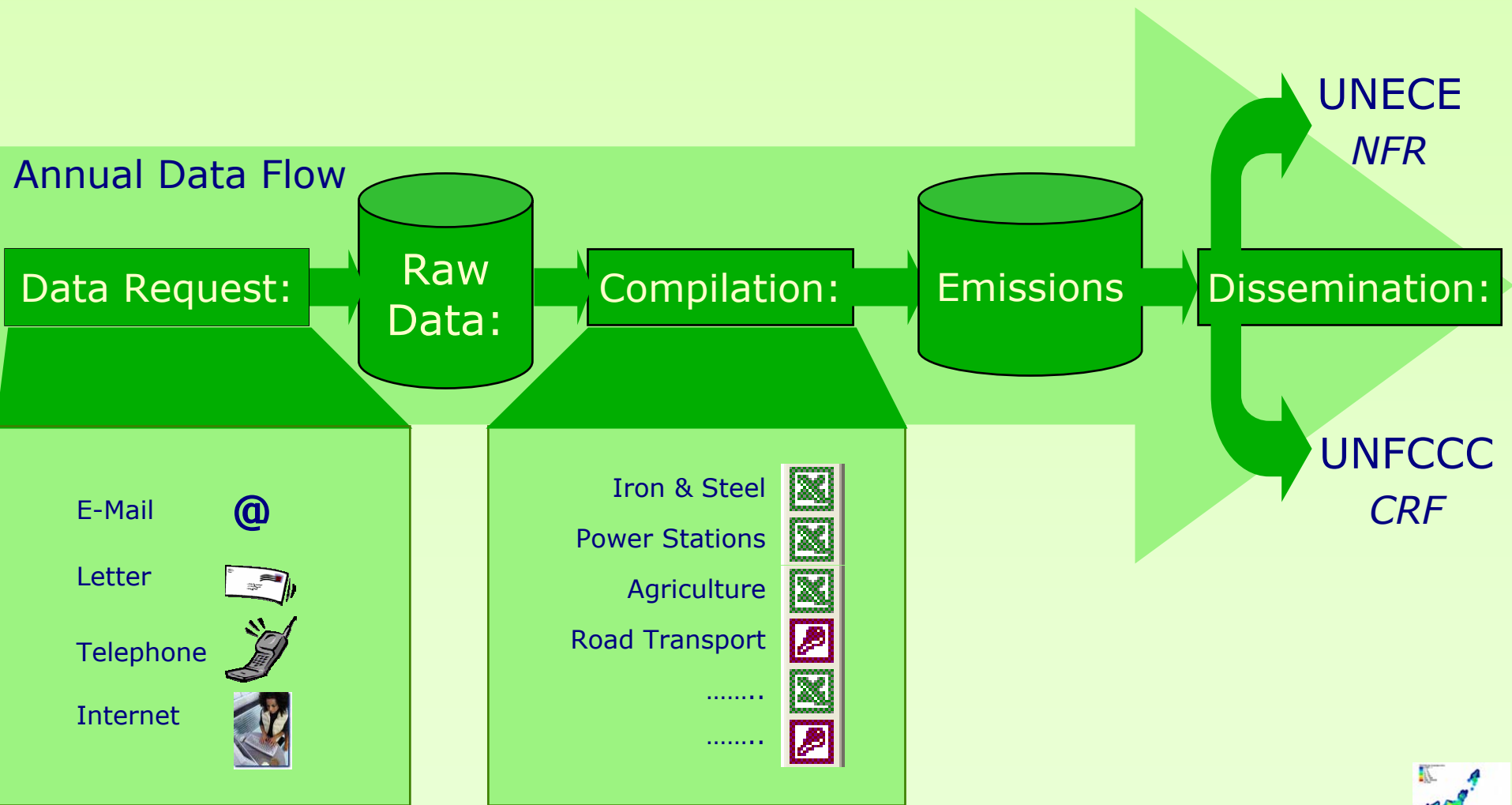
How is it used?



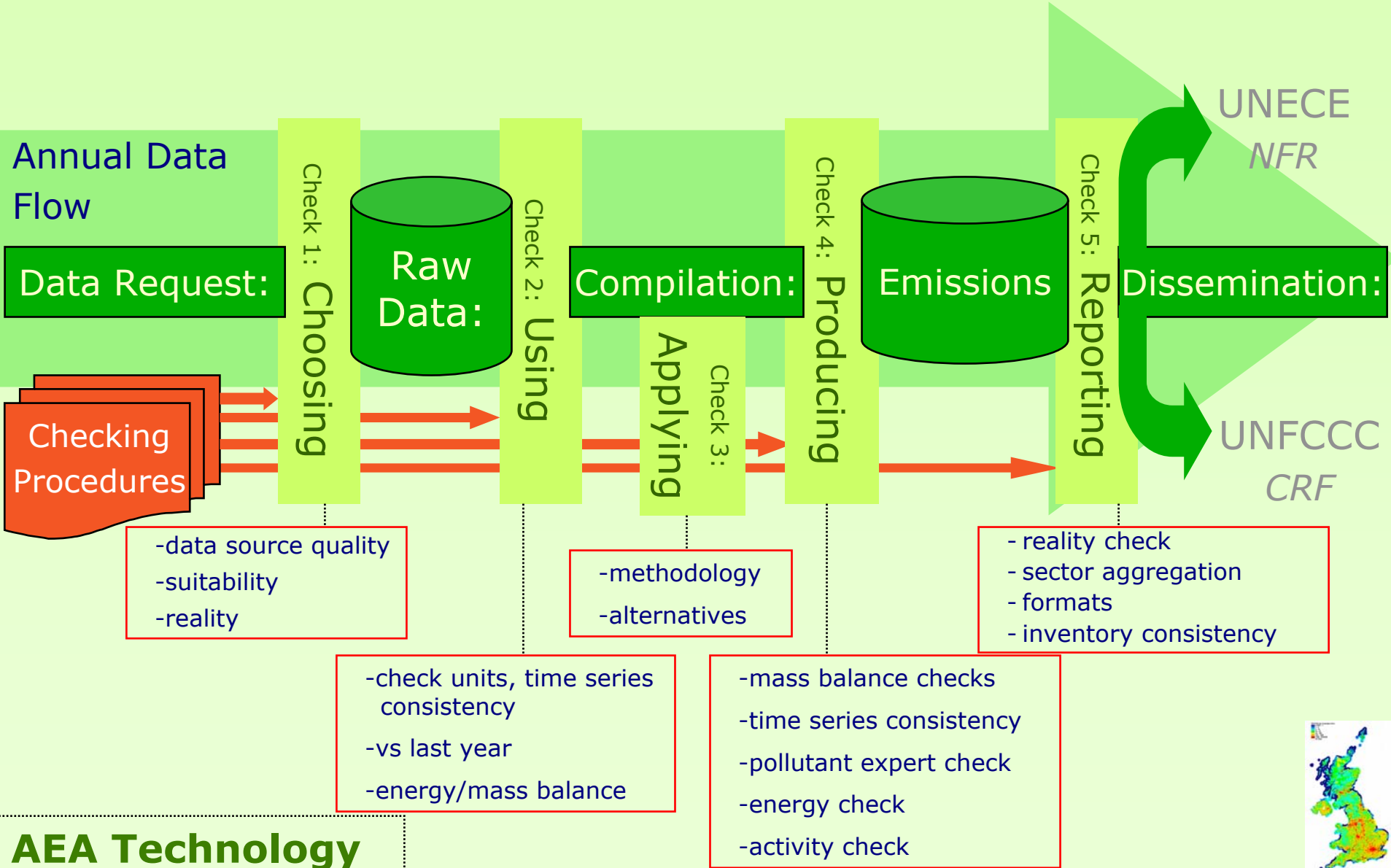
Are we Sure?



# Emissions Inventory Data Flow

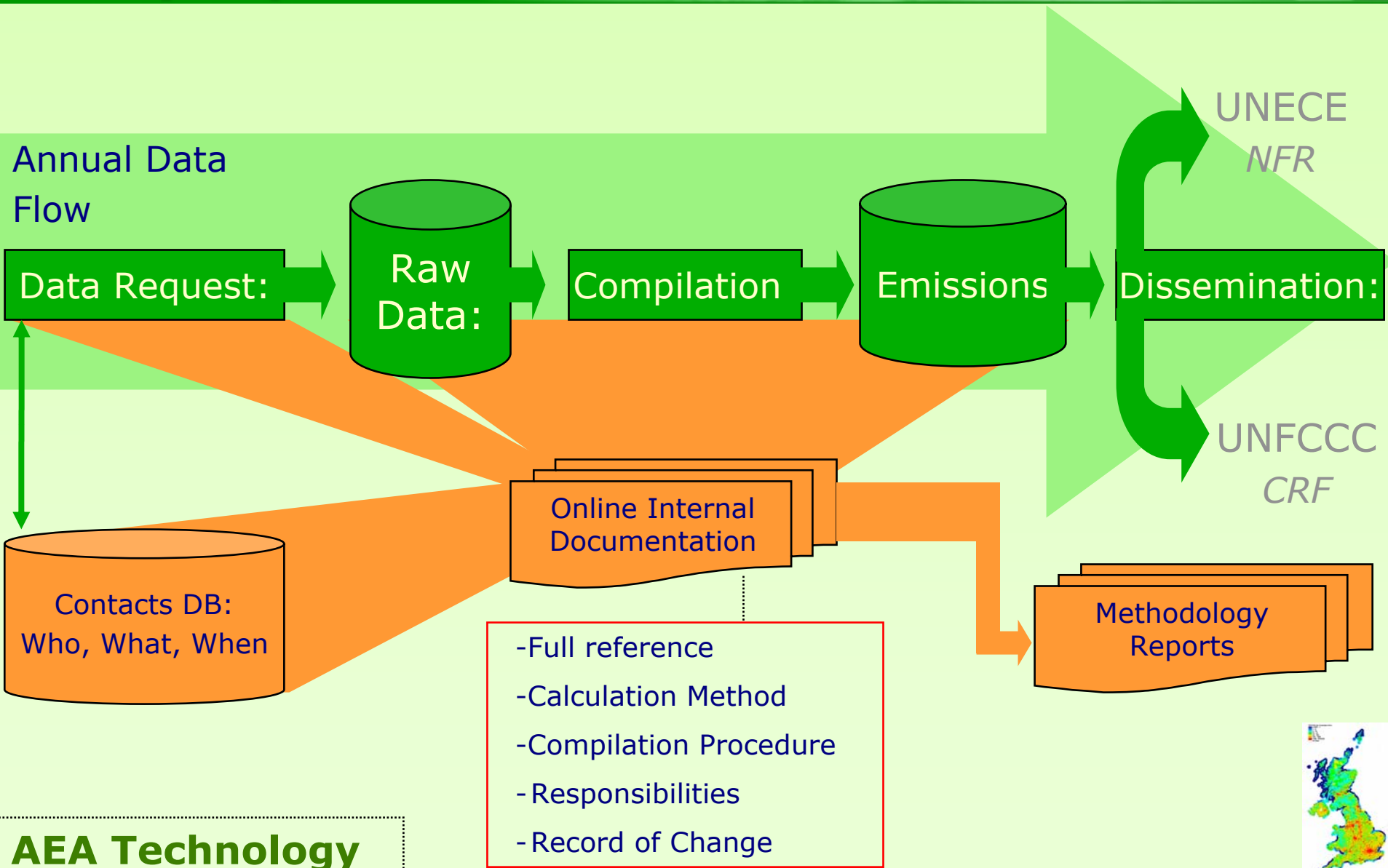


# Quality Control: (i) Checking



# Quality Control:

## (ii) Documentation & Referencing





# Quality Control (i)

- **Documentation**
  - *Contacts Database*
  - *On-line manual of methodologies*
  - *National Inventory Report*
- **Core Database and spreadsheets**
  - *Interlinked*
  - *Single repository (UNFCCC & UNECE)*
- **Checking/Review Procedures**
  - *Mass balance checks within the spreadsheets*
  - *Fuel entries in the database against DUKES totals*
  - *Year to year, sector by sector - need to explain any changes*



# Quality Control (ii)

- **Recalculation**
  - *Revisions to methodologies mean emissions for all previous years re-calculated*
- **Uncertainties**
  - *Assessment made following IPCC 'good practice' guidelines (Tier 1/2)*
- **Archiving**
  - *After each reporting cycle, all database files, spreadsheets, electronic documents 'frozen' and archived*
  - *Lektreiver holds most paper records and has associated database*
- **Computer records**
  - *For key databases, 60 minute rolling backup*
- **QA/QC of data suppliers**
  - *Requesting details of procedures from data suppliers*
  - *1-1 meetings with major data providers*



# Quality Assurance: Activities 2002-2004



- Verification of the halocarbon inventory
  - *Met. Office*
- Review of halocarbon estimates
  - *AEAT*
- Peer Review of fuel combustion sources of CO<sub>2</sub>
  - *Tim Simmons*
- Review of landfill CH<sub>4</sub> emissions
  - *Nottingham University*
- In Depth Review (IDR) of 3NC
  - *UNFCCC*
- ISO 9002 2000 audit by Lloyds
- Review of revised Aviation methodology
  - *Manchester University*



# QA/QC programme and plan

Quality Assurance

## QA activities

- peer reviews
- review of emission factors & methods

e.g. Peer Review: Aviation

Other Peer Review: .....

e.g. Peer Review: Agriculture

Core Activity

Aug    Sept    Oct    Nov    Dec    Jan    Feb    Mar    Apr    May    Jun    Jul    Aug

**Data collection**

**Emission Calculation**



**Database entry**






**Output (CRF)**







**National Inventory Report Preparation**



**Archiving**





Quality Control


-  -unique reference
-  -check data input data

-  -Full referencing of input data
-  -check units, time series consistency
-  -second person check
-  -document on QA/QC page
-  -online manual

-  -Time series
-  -pollutant expert check
-  -Global check
-  -Explain large changes
-  -Database fuel totals-vs-National statistics
-  -mass balance checks

-  -check tables and numbers
-  -Second person check

-  -check database CRF output 
-  -CRF totals
-  -check for large changes from previous year

- database files
- spreadsheet files
- source data
- manuals
- report 

### Key

Documentation 

Checking 

External Check 

# Quality Manual

- On-line manual
- Contains instructions on all aspects of inventory responsibilities including
  - *compiling the inventory*
  - *Reporting the inventory*
- QA/QC section explaining what checks need to be carried out and when
- Induction training for new staff
  - *UK inventory system*
  - *Outputs*
  - *QA/QC*
  - *Methods overview*
  - *Databases & internal systems*

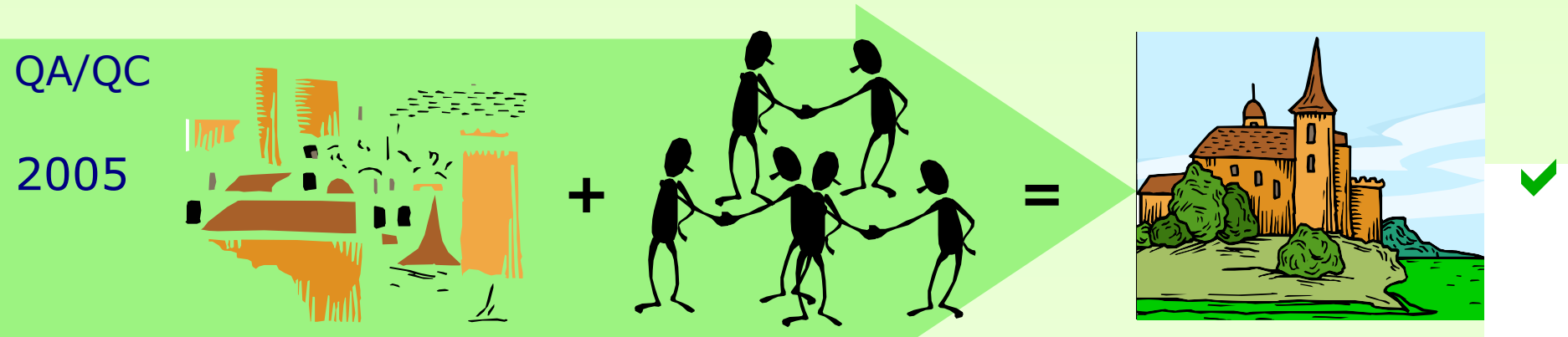
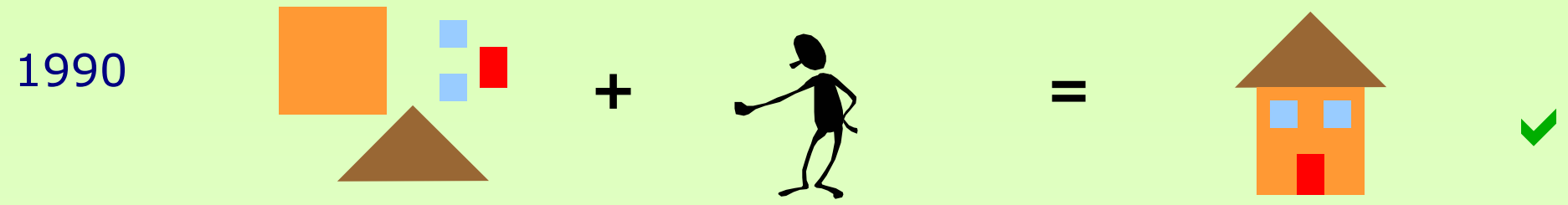


# Resources needed for QA/QC and QMS

- People
  - Expertise (sector and pollutant) in order to conduct checks
  - Appropriate expertise for reviews
- Time (Development of system + Compilation \* 10%)
  - *Spreadsheets and database population take longer*
  - *To meet strict deadlines, large team needed for busy periods*

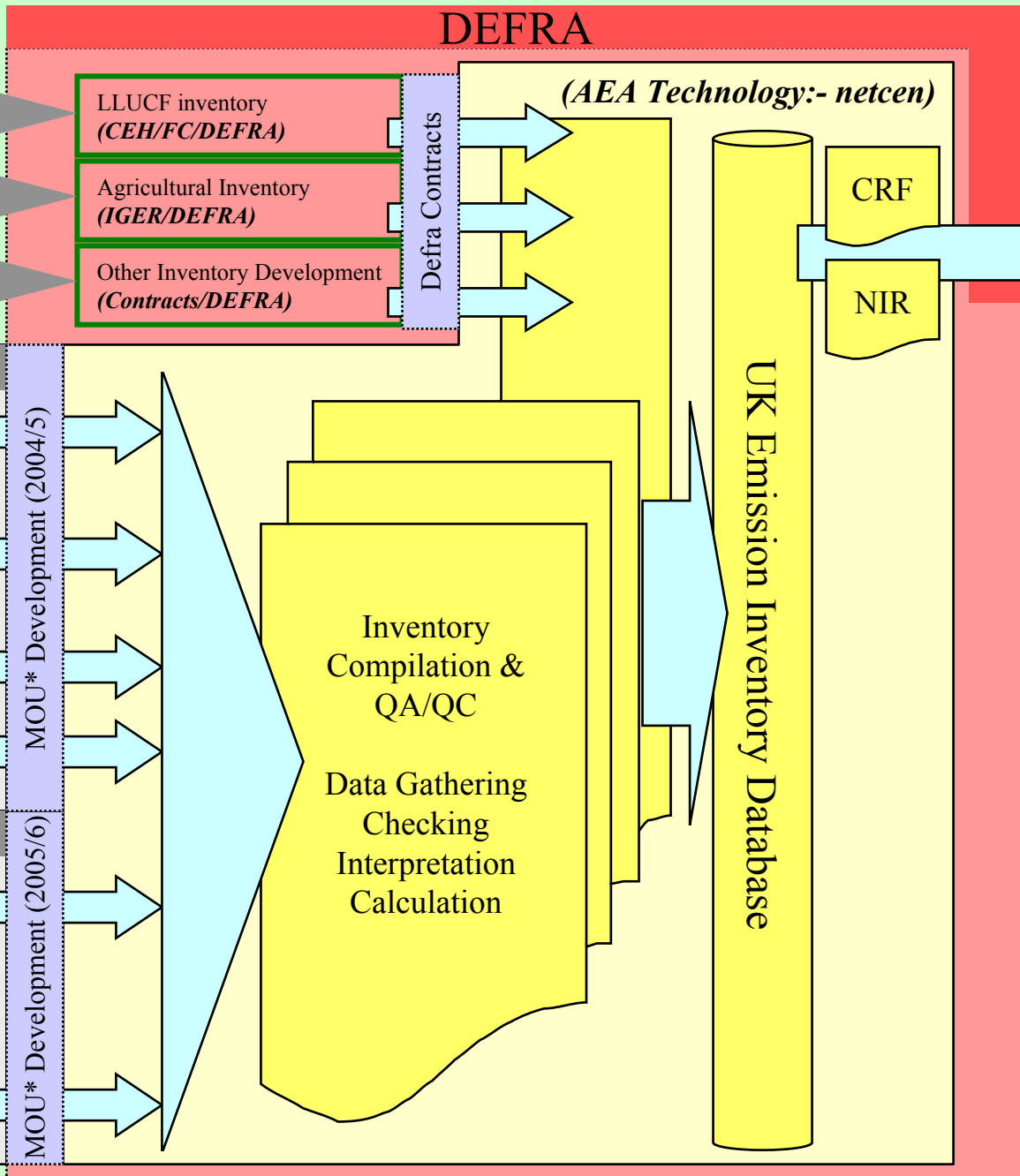


# Inventory Building!!!





# UK National Inventory System (DEFRA)



Statistical Datasets

**EU  
MONITORING  
MECHANISM**

15th January &  
31 March

**UNFCCC**

15 April

**Key**

- Controlled Data Flow
- Data Quality Agreements
- Data Sources:**
- Xxx...
- DEFRA's Zone of Authority
- AEA Technology Zone of Authority

\* MOU = Memorandum of Understanding