



Department for
Business, Energy
& Industrial Strategy

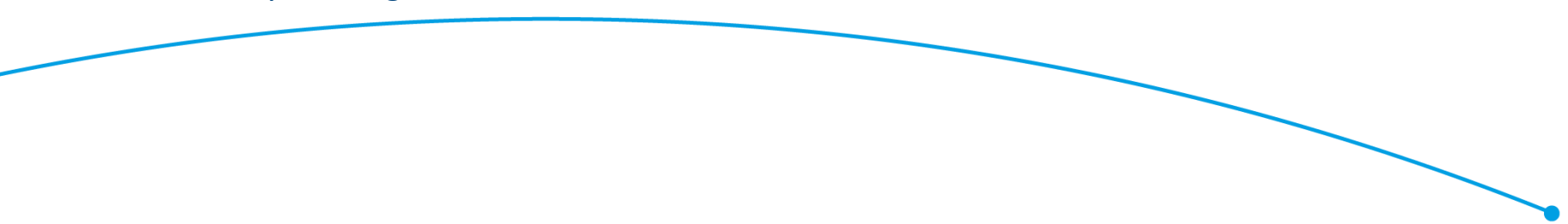
OFFICIAL

Data Collection and Validation in the Energy and IPPU in the UK

Sam Bradley & Anna Mikis

Department for Business, Energy & Industrial Strategy, United Kingdom

anna.mikis@beis.gov.uk
sam.bradley@beis.gov.uk





Overview

- The UK GHG inventory uses data from a range of published and unpublished sources
 - Largest data sources of Energy and IPPU data: DUKES and EU ETS
 - Each year, several hundred requests are sent out:
 - Government Departments
 - Statistics agencies
 - Plant operators
 - Environmental regulators
 - Trade associations
 - This presentation gives an overview of the key data sources
 - In all cases, the data providers are asked to provide information on their **data sources, quality systems, estimates of uncertainty** in the data provided
- to inform the inventory **uncertainty analysis** and **identification of improvement priorities**



Energy

- **The Digest of UK Energy Statistics (DUKES)** – the UK energy balance. *Derived from comprehensive reporting of fuel production, import/export and supply, based on data from energy companies and UK import-export statistics. The UK has long-established systems of data supply, statutory reporting requirements and data checking.*
- **EU-Emissions Trading System** installation-level data. *Analysis of data from >1000 installations in EUETS provides detailed data on carbon emission factors and NCVs, and is used to finesse / verify energy allocations within DUKES.*
- The **Pollution Inventory** installation-level data provided via the UK regulatory agencies for IED/IPCC. *Analysis of data from >5000 installations that report under IED/IPCC, and is used to estimate fugitive releases and emission factors for industrial processes.*
- Other data such as:
 - **BEIS Offshore Inspectorate, Trade Associations, Department for Transport, Gas network operators**



Industrial Processes

LEGAL BASIS (Statutory mechanisms)

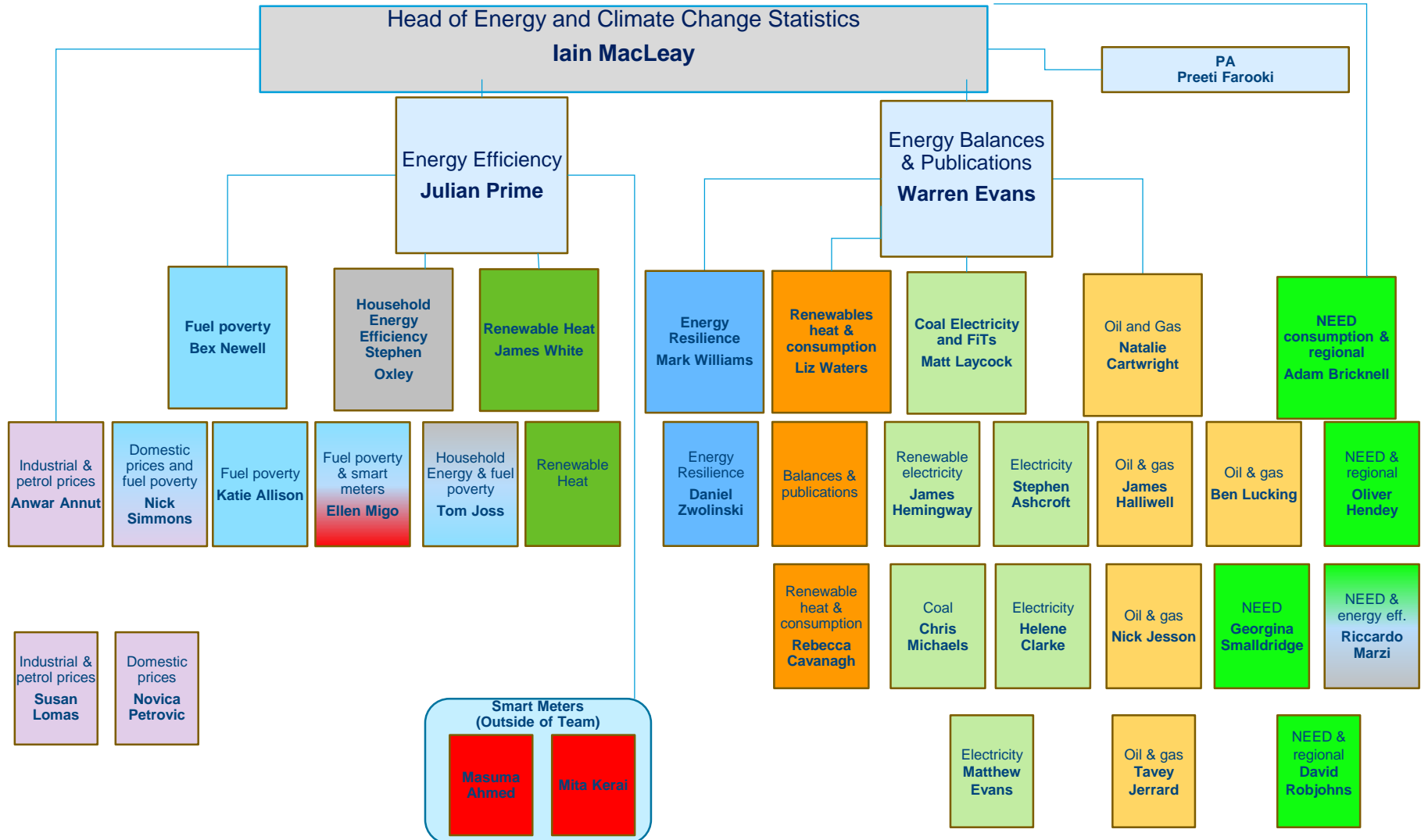
- The [Pollution Inventory](#) installation-level data provided via the UK regulatory agencies for IED/IPCC. *Analysis of data from >5000 installations that report under IED/IPCC, and is used to estimate fugitive releases and emission factors for industrial processes.*

DATA SUPPLY AGREEMENT / LONG-STANDING INFORMAL AGREEMENTS

- Data from trade associations:
 - The [Mineral Products Association](#) – *activity data for cement production*
 - The [British Geological Survey](#) – *activity data for lime production*
 - [Tata Steel, SSI, ISSB](#) - *activity data and emissions for iron and steel.*
- Data from individual plant operators, such as:
 - [Nitric acid producers](#)
 - [Aluminium producers](#)
 - [F-gas producers and users](#)



DUKES Team





Role of DUKES Statistics

Publications



International Submissions



International
Energy Agency

United Kingdom

October 2016



MONTHLY OIL QUESTIONNAIRE

Version 2012.2d

Export

Import

Reset

All data should be entered in thousand metric tons, with no decimal place.

Please round data before calculating the totals.

All opening stock levels should equal closing stock levels of the previous month.

Before sending your submission, please ensure there are no discrepancies left.

A summary table of all discrepancies is shown below on this page.

You can address your questions to the MOS section:

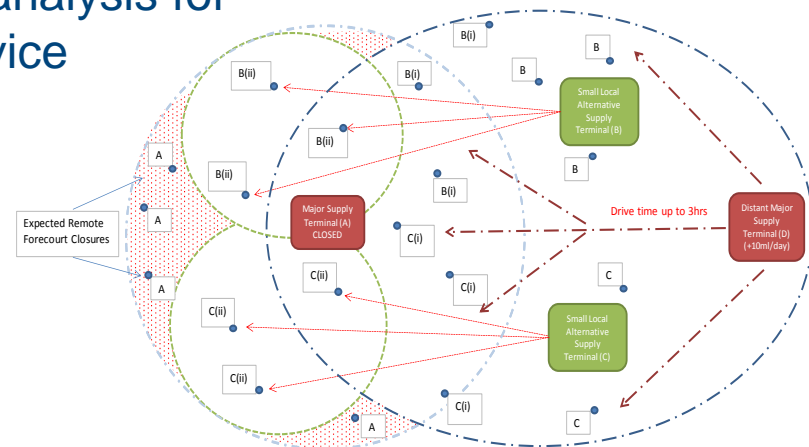
mos@iea.org

and to Eurostat:

estat-energy@ec.europa.eu

A summary of main discrepancies found in the tables:

Bespoke analysis for Policy Advice





UK National System for Data

UK relies on a mixture of existing environmental and energy legislation, and informal arrangements.

- **Legislation (non GHGI specific)**

- Statistics of Trade Act (UK energy statistics from BEIS)
- Environmental Permitting (England and Wales) Regulations 2010

Permitting of industrial processes

Process operator required to provide data to regulatory agencies, for example annual site emissions data

- **Legislation (GHGI specific)**

- Greenhouse Gas Emissions Trading Scheme Regulations 2012
- National Emissions Inventory Regulations 2005

- **Data Supply Agreements (DSAs)**

- Agreements formalise the acquisition of data and clarify the main requirements of quality, format, security and timely delivery of data for preparation of the inventory
- DSAs in place with the Scottish Environment Protection Agency (SEPA), Northern Ireland Environment Agency (NIEA), and Department for Transport (DfT)



Data Supply Agreements

Example table of data
required, taken from the
SEPA DSA



Annual Data Requirements			
Data Required	Key Data Provider	Deadline each year	Comments
Access to the SEPA SPRI inventory for previous years data	SEPA	15 August*	Electronic version of Scottish Pollutant Release Inventory (SPRI), including emissions where below reporting threshold. Could you please include site details such as address, post codes, grid references and permit numbers please.
Previous years EU-ETS installation-specific fuel use and characterisation data for all sites in Scotland	SEPA	15 August	<p>EU ETS activity data, calorific values, carbon factors, oxidation factors and carbon emissions by fuel and installation for fossil fuels, 2005-onwards</p> <p>EU ETS activity data, calorific values, carbon factors, oxidation factors and carbon emissions by fuel and installation for bio fuels, 2005-onwards</p> <p>EU ETS activity data, carbon factors, and carbon emissions by installation for process emissions, 2005-onwards</p> <p>Note: Confidentiality of data will be respected and any issues that prevent the data being provided these will be highlighted at the earliest opportunity and aggregated data provided where applicable</p>

Standard table regarding data
processes and quality checking
used in all DSAs



1. How are the data that you provide compiled by your organisation? e.g. "Data are compiled using company systems for financial / energy / emissions data reporting for regulatory / company performance monitoring." "Data are aggregated from across X operating sites, provided by site SHE managers."
2. Do you conduct any data quality checking, and if so, could you provide an outline of the process? e.g. "Data are sense-checked against annual data from last year, for each site and overall.", "We have a checklist of sites / emission sources /companies that we use to ensure that all data are included.", "Emission and energy use estimates are benchmarked against production output at each site.", "Our organisation has a quality assurance system accredited to ISO9001 and ISO14001, and these data fall within the scope of that accreditation."
3. What is your estimate for the level of uncertainty associated with the data that you provide to the NAEI/GHG? e.g. "Our carbon dioxide emission estimates are within a 2% error margin, due to the close control over fuel quality." "Our estimates for pollutant X stem from emission monitoring trials which have an uncertainty on the standard method cited as plus or minus 15%.", "We are reliant on data from many other third parties and are unable to provide a reliable estimate for the data uncertainty."



Data collection

Linked spreadsheets.....



International
Energy Agency

United Kingdom

April 2017

MONTHLY OIL QUESTIONNAIRE

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Before sending your submission, please ensure there are

A summary table of all discrepancies is shown below on the

You can address your questions to the MOS section:

and to Eurostat:

estat-energy@

A summary of main discrepancies found in the tables:

Table 1: SUPPLY OF CRUDE OIL, NGL, REFINERY FEEDSTOCKS, ADDITIVES AND OT



Edit Links

Source	Type	Update	Status
26062017 updated MOS_Oil Mar Values final.xls	Worksheet	A	Unkn
Advance Crude Oil Balance 2017.xls	Worksheet	A	Unkn
April 2017.xlsx	Worksheet	A	Unkn
DUKES 3.1 web.xls	Worksheet	A	Unkn
DUKES 3.2-3.4.xls	Worksheet	A	Unkn
ET 3.10.xls	Worksheet	A	Unkn
Exports Conversion 2017.xls	Worksheet	A	Unkn
Imports Conversion 2017.xls	Worksheet	A	Unkn
JODI MOS Data 2017.xlsx	Worksheet	A	Unkn
March 2017.xlsx	Worksheet	A	Unkn
petroleumproducts DORS 2017.xlsx	Worksheet	A	Unkn
primaryoil 2017.xls	Worksheet	A	Unkn
Stocks Analysis Apr 17.xlsx	Worksheet	A	Unkn
Stocks Analysis Mar 17.xlsx	Worksheet	A	Unkn
stry2016.xls	Worksheet	A	Unkn

Location: U:\Statistics\epa3b\Downstream Oil\DORS\Da...\05. 2017 May submission
Item:
Update: ☒ Automatic ☐ Manual
Startup Prompt... Close

Update Values
Change Source...
Open Source
Break Link
Check Status

And MS Access Databases, SAS, & SPSS



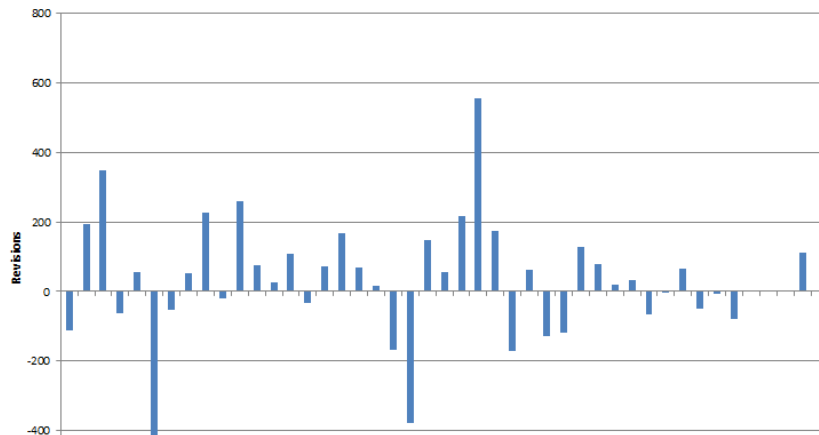
Quality assurance

Internal assurance

Standard t-test for the revisions		Adjusted t-stat for the revisions	
Number of observations (n)	44	First order of autocorrelation (a) of revisions	0.181
Mean of the revisions (m)	33	Adjusted variance of the revisions	39,776
Variance of the revisions (s2)	27,535	Number of independent observations (n*)	42
t-statistic	1.315	t-adjusted	1.095
t-critical(±)	2.017	t-adjusted critical(±)	2.018
Test significant at 5% significance level?	No	Test significant at 5% significance level?	No

Positive and Negative Revisions		Size of Revisions	
Revisions greater than zero	28	Largest negative revision	-446
Revisions less than zero	16	Largest positive revision	556

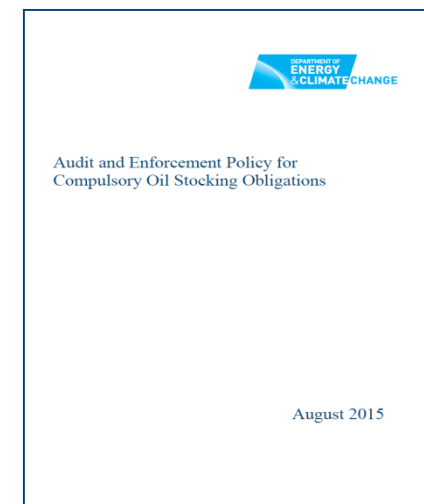
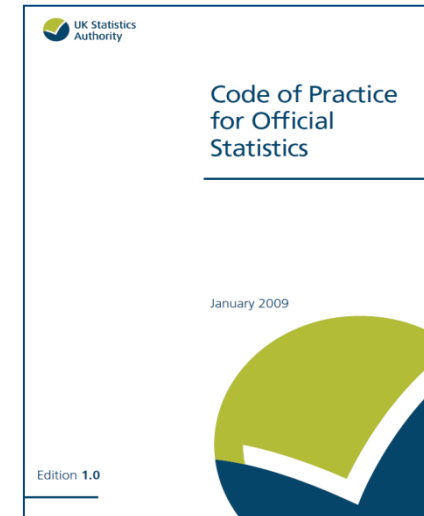
Revisions from January 2014 to July 2017

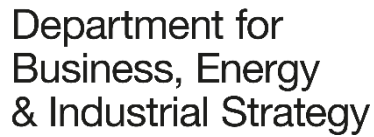


External assurance

Size of Revisions	Frequency
-500 to -400	1
-399 to -200	1
-199 to -100	5
-99 to 0	9
1 to 100	16
101 to 200	7
201 to 300	3
301 to 400	1
401 to 500	0
500+	1

Auditing and engagement processes





Engagement processes

[illegible]

Department for
Business, Energy
& Industrial Strategy



Internal assurance

Team balances

A suite of events

- Trend analysis & outlier detection
- Company consistency
- Cross-verification
- Statistical Differences



External assurance

Corroboration

Company financial reports

Independent market
assessments (e.g. Cornwall
energy)

Publically available data
(e.g. National Grid Entry
Points)

International comparisons
(e.g. trade flows)

External challenge function

The UK Statistics Authority is
responsible for the
assessment of the **National
Statistics 'tick mark'**

Whilst this is an ongoing
assessment (e.g. of our
behaviours) there are a
range of **one-off assessment
exercises** undertaken which
take a deep dive into our
processes.



Audit processes



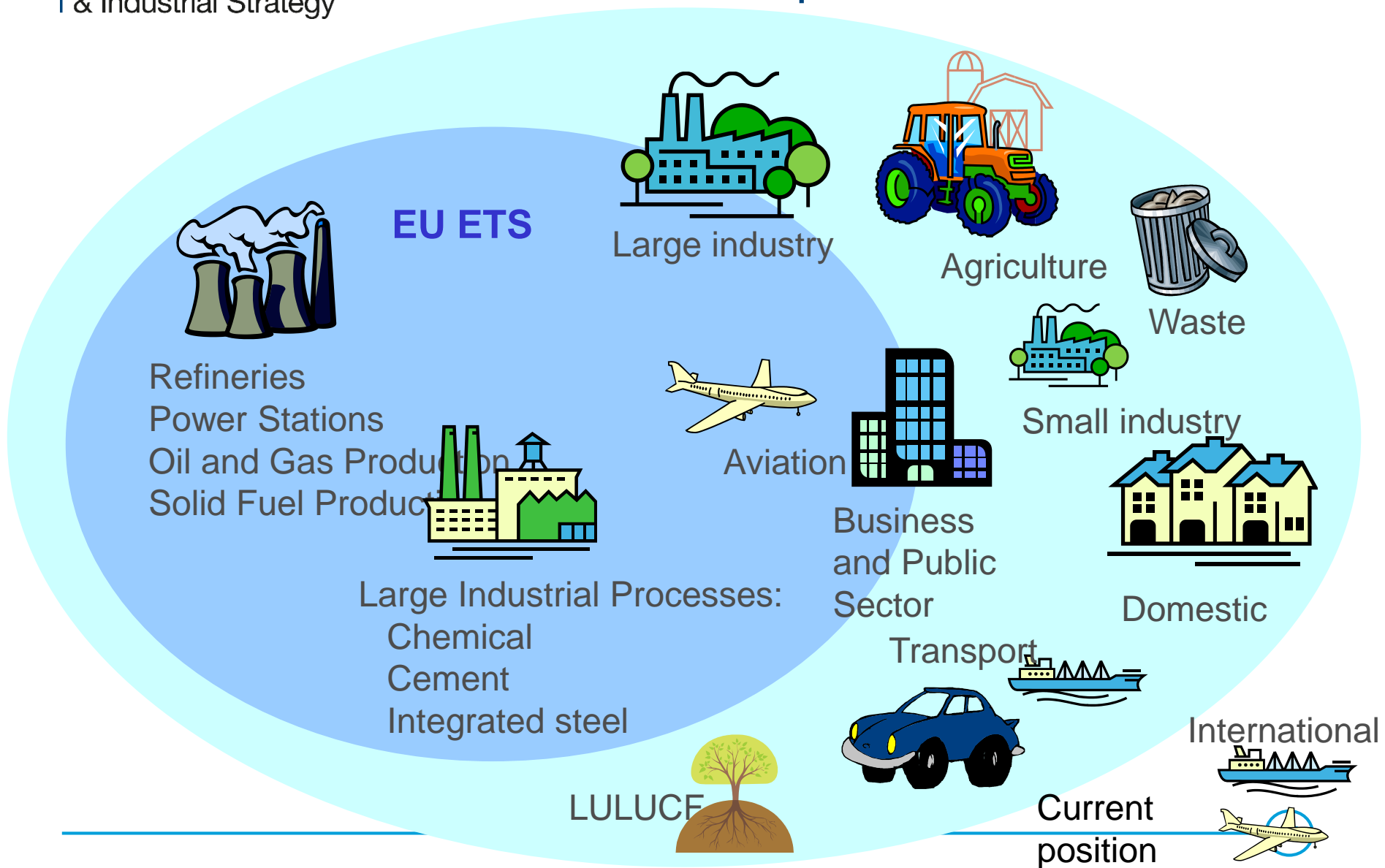
Audit and Enforcement Policy for
Compulsory Oil Stocking Obligations

August 2015

- For all substantial suppliers of oil
- ‘Regular’ on site visit
- Selection of random cells from Downstream Oil Return
- Seek corroboration from source: e.g. tank logs, bills of lading, invoices



Scope of EUETS vs. GHGI





2017 DUKES publications

- Digest of UK Energy Statistics 2017 main report:
 - <https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2017-main-report>
- Digest of UK Energy Statistics 2017: long-term trends:
 - <https://www.gov.uk/government/statistics/digest-of-uk-energy-statistics-dukes-2017-long-term-trends>
- Digest of UK Energy Statistics: energy sector
 - <https://www.gov.uk/government/statistics/energy-chapter-1-digest-of-united-kingdom-energy-statistics-dukes>