BERR | Department for Business Enterprise & Regulatory Reform

UK Renewable Energy Statistics - RESTATS

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Based on a seminar from the Energy School

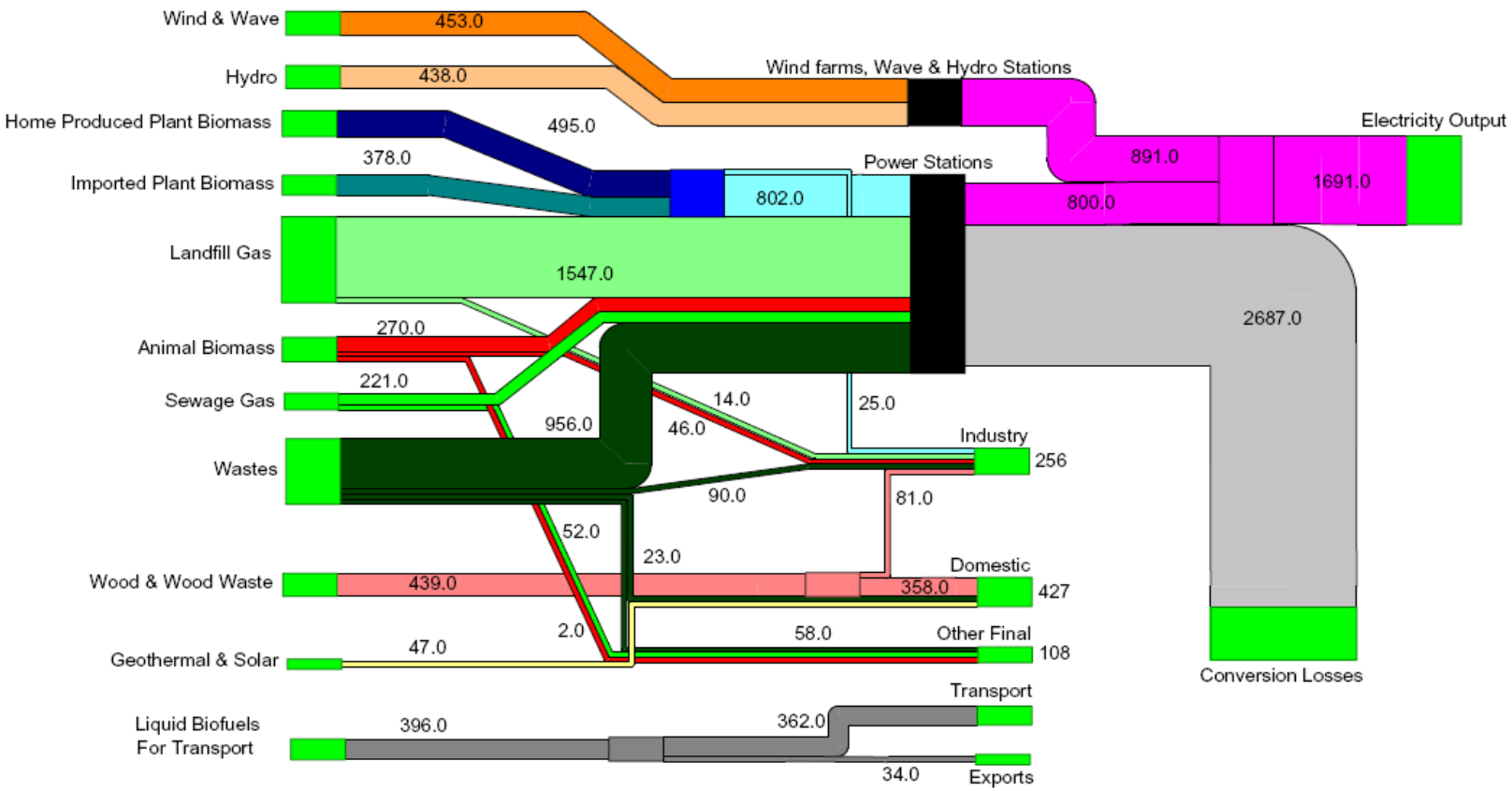
UK Renewables Statistics - Coverage

What we are interested in …

- **Technologies** covered:
  - Active solar
  - Solar photovoltaics (PV)
  - Wind (on-shore & off-shore)
  - Hydro
  - Tidal
  - Wave
  - Biomass (biowastes)
  - Co-firing
  - Biofuels for Transport (in detail this year)

- **Non bio-degradable wastes** (MSW, tyres, clinical)

Renewables flow chart 2007 (thousand tonnes of oil equivalent)



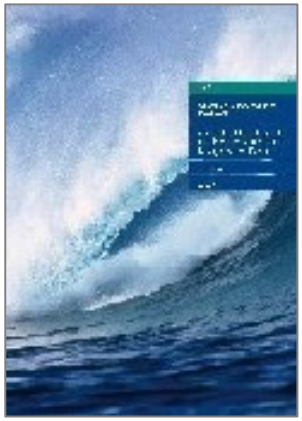
Why survey renewables?

- To provide **credible data** for Government and industry
- to provide **accurate up-to-date** energy statistics for the UK of which renewables is an important component – both for **electricity** and **heat**
- Means of **monitoring progress** against the UK target of 10% of electricity from renewables by 2010 and 15% of energy from renewables by 2020
- Assess **UK's performance** against European colleagues and World-wide
- Assess effects of **legislative changes**; e.g. clinical incineration

UK's Renewables policy for electricity

There are four strands ….

- **Renewables Obligation:** electricity suppliers to provide a proportion of electricity from renewables
- **Expanded support programme** via capital grants and R&D
- **Regional strategic approach** to planning and targets for renewables
- Electricity from renewables exempt from **Climate Change Levy** *



* Electricity generated by hydro stations with a declared net capacity of more than 10 MW is not exempt from the Climate Change Levy

Old and new EU Renewables Directives

Old came into force October 2001 …

- EU target of **12% electricity** from renewables **by 2010**.
- Each **Member State** is set a **renewables target** so EU meets its objective
- UK share: **10% electricity** consumption **by 2010**.

New published January 2008 …

- EU target of **20% energy** from renewables **by 2020**.
- Each **Member State** is set a **renewables target** so EU meets its objective
- UK share: **(proposed) 15% energy** consumption **by 2020**.

Data collection and database management

The "RESTATS" database is updated each year:

To **collect information for the year** from projects already held on the database;

- To **improve the quality** of information held on these projects where necessary;
- Add data for **new projects**.

Data storage and handling …

- Security
- Confidentiality
- Backup/resilience – continue through hardware fault, fire, etc
- Integrity – making sure data doesn't get corrupted
- Accuracy/consistency of data entry and checking
- Checking for duplicate entries
- Maintaining status

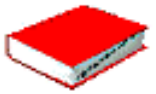
Data collection – Survey coverage

What data are we collecting …

- Fuel input → energy input
  - Indigenous or imported
- Electricity output
- Generating capacity

Data collection - Questionnaires

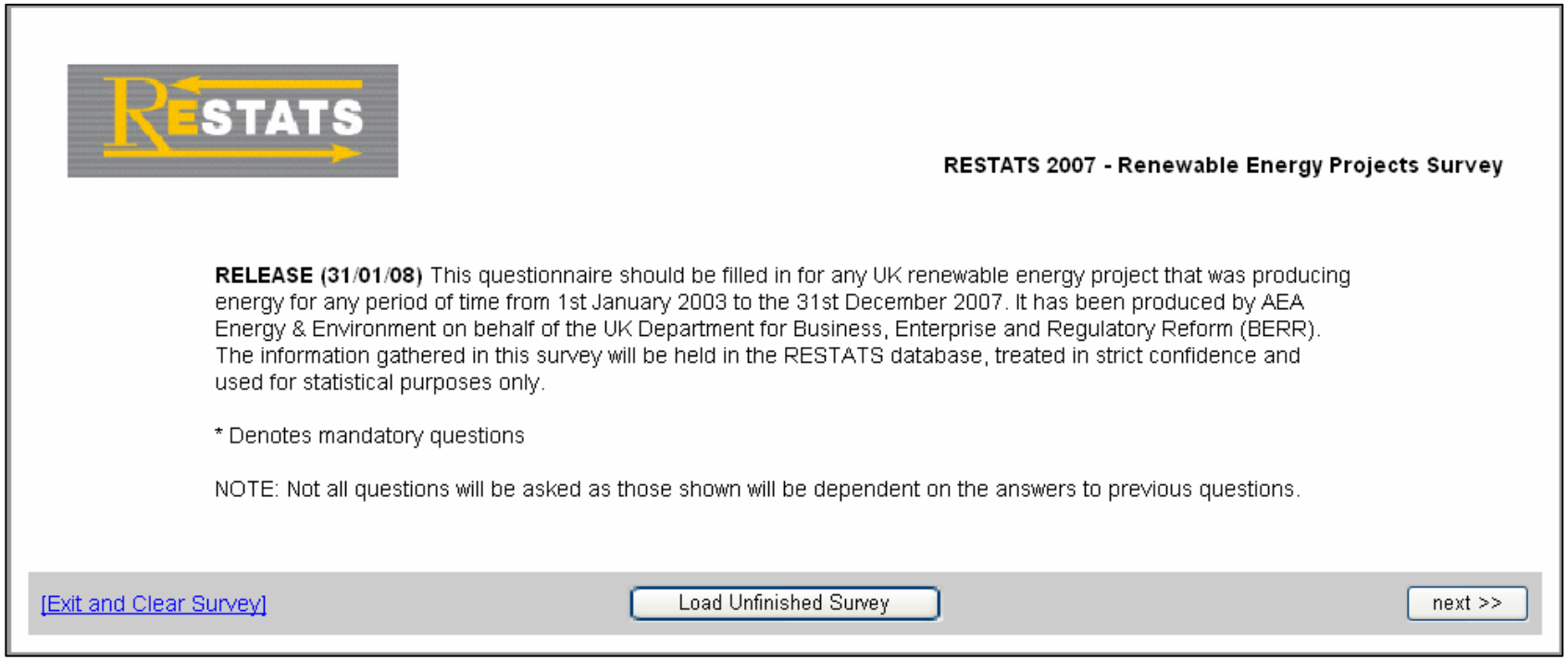
- Large projects: **annually surveyed** via questionnaire
- Large numbers of small projects: estimates based on **sub-sample**
- **Questionnaires**
  - Renewable Energy Projects Survey (REPS) Questionnaire
  - Waste-to-Energy Questionnaire; for small-scale specialised waste combustion projects



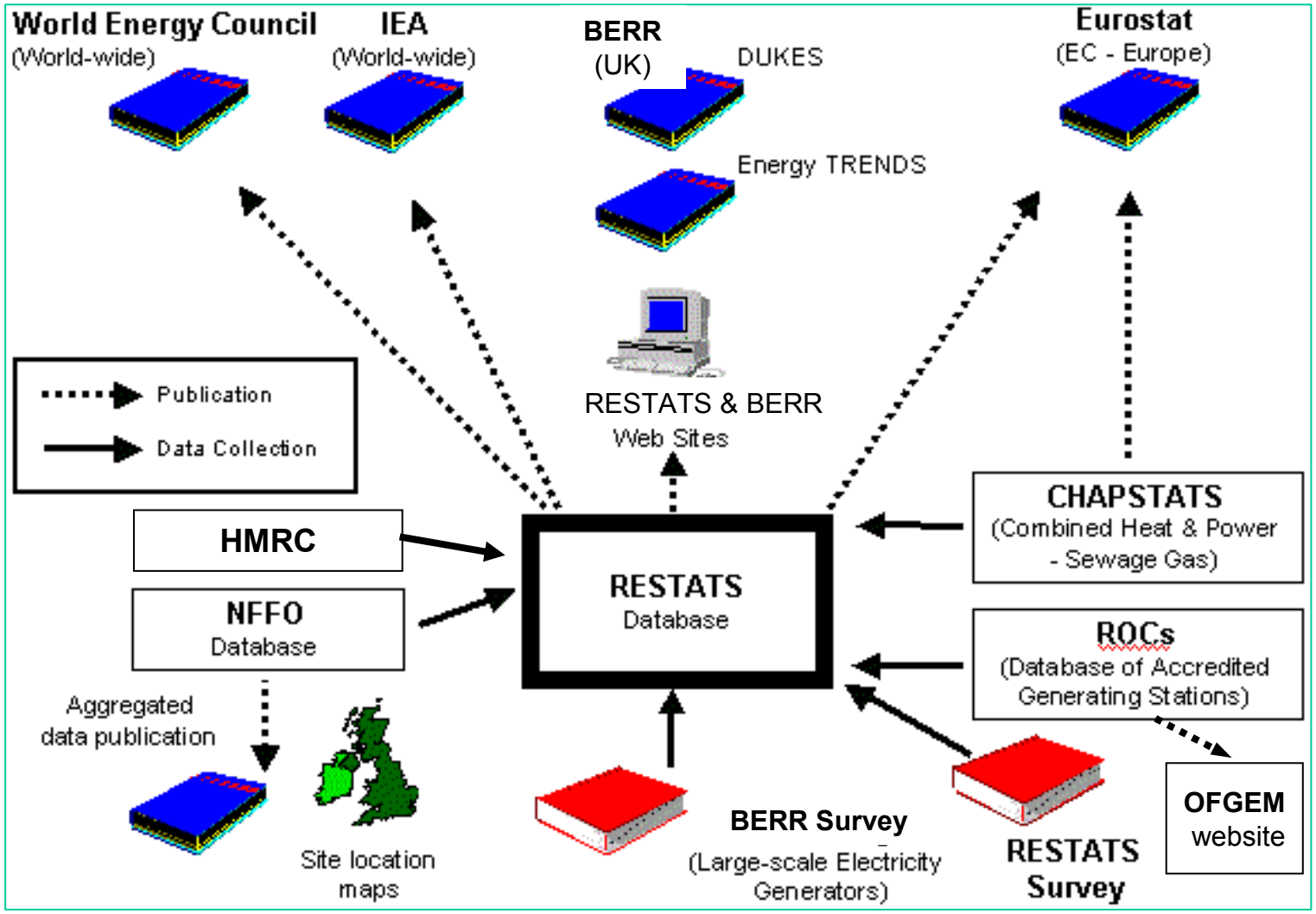
- **Mail shot** - December; follow-up - January
- Telephone follow up of **non-respondents**
- **Estimates**, where data are not available
- **'Gap Analysis' Surveys** to improve quality and completeness (3 year cycle)
- **On-line survey** from secure web site

Data Collection - On-line Survey

Giving choice to the respondents ….



Sources of data



Data processing - Sanity checks

- Check for and **eliminate duplicate entries**
- Scan the data for **inconsistencies**
- Confirm that **installed capacity** figures are sensible from what technical data we have been given
- Confirm that **generation** figures are meaningful for the installed capacity of the installation

Data processing - Methodology

Statistical methodologies and conversion factors in line with
International Energy Agency (IEA) and Statistical Office of European Commission (Eurostat) definitions

- **Conversion factors** used to convert figures to different energy units
  - therms
  - tonnes of oil equivalent (toe),
  - MegaWatt hours (MWh)
  - GigaJoules (GJ)
- **Capacities** - amount of generation the renewable energy projects are capable of producing
- **Gross Calorific Values** (GCV) for Biofuels

Conversion Factors	Technology	Adopted IEA/SOEC definitions
therms/toe	-	397
toe/MWh	-	0.08598
MWh/toe	-	11.63
MWh/toe	Wind	11.63
MWh/toe	Hydro	11.63
MWh/toe	Wave Energy	11.63
MWh/toe	Tidal Currents	11.63
MWh/t		
GJ/toe		

Renewable Energy Source	Gross GJ/tonne
Domestic Wood	14.5
Industrial Wood	11.9
Straw	15
Poultry Litter (on-farm use)	13.5
Poultry Litter (off-farm use)	8.8
	16
	14
	9.5
	18.6
	32

B	RESOURCE
0.43	Wind
0.17	Solar
0.33	Tidal/Wave
1.00	All Others

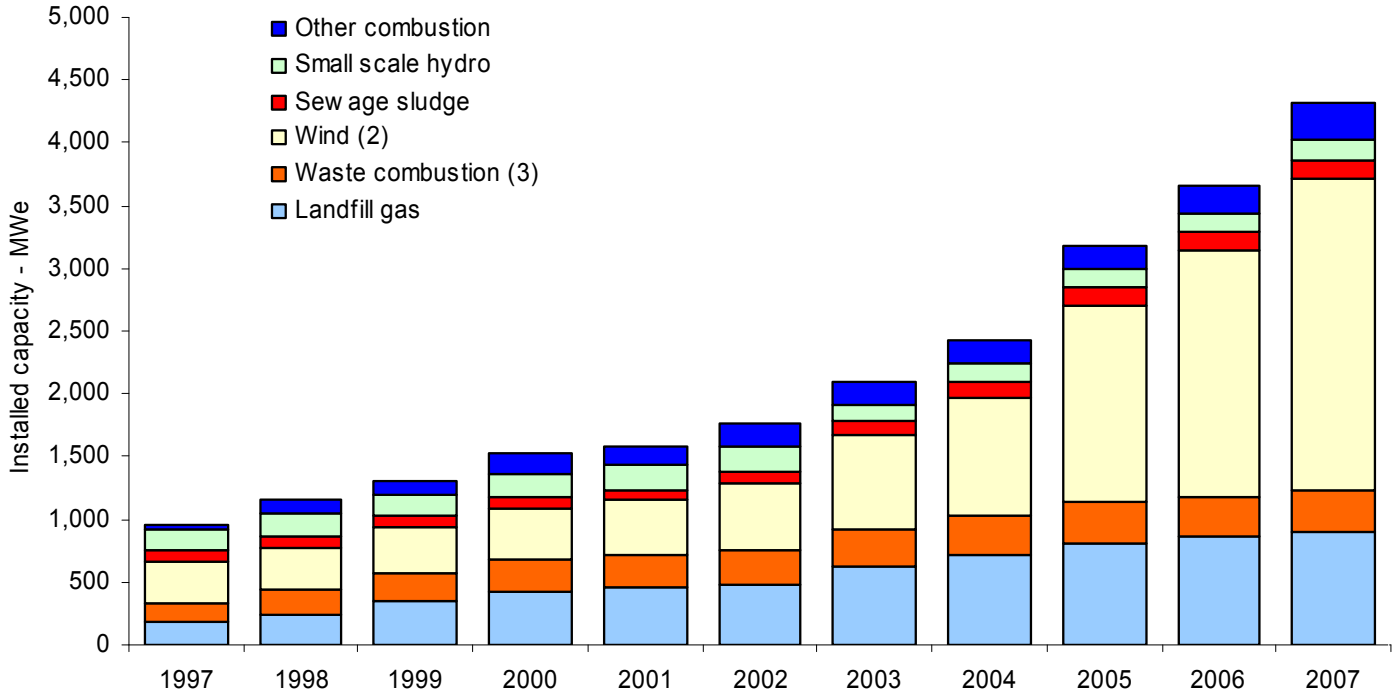
Monitoring the contract for continuous improvement

Renewable Energy Statistics Working Group …

- **Meets Quarterly**
- **Members:** EMU; REIU; Ofgem; AEA E&E; TV Energy; ad hoc invitees
- **Suggests and approves work schedule** for a survey cycle
- **Reviews** data and quality
- **Ensures** data are well managed
- Ensures **value** for money (c £65K pa)

Statistics - National

- Electricity generation
  - Growth
  - Capacity
- Renewables Obligation
- Heat & electricity generation
- Utilisation



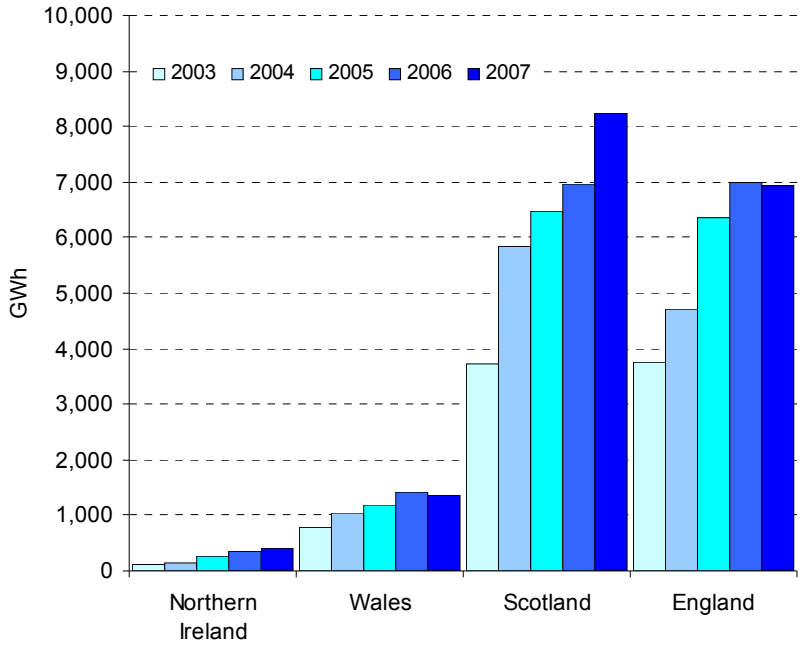
Statistics – Regional

England (+ regional offices), Wales, Scotland and Northern Ireland …

- Number of sites
- Capacity
- Generation
- Trends

In 2007

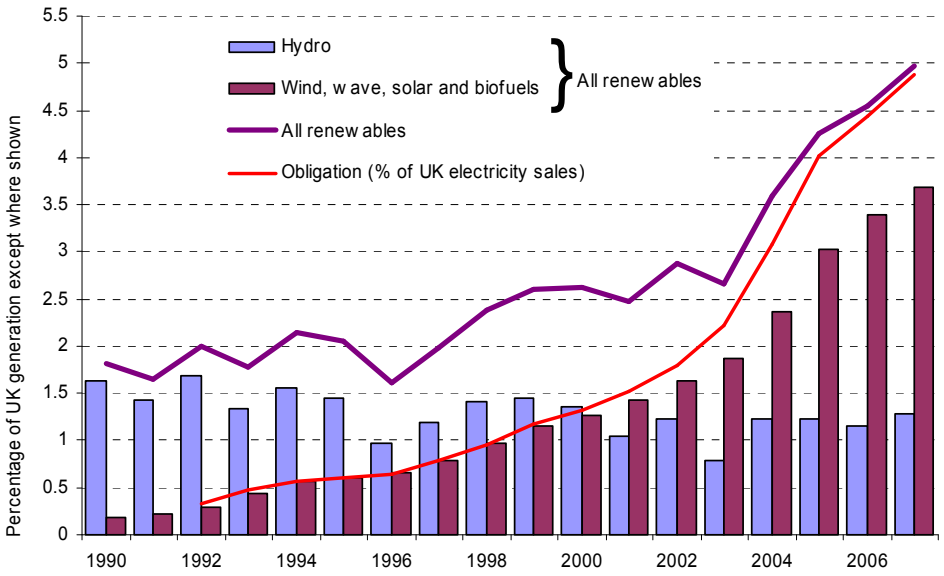
- England had most sites generating renewable energy (847 out of 1,436)
- Overall generation figures strongly dependent on hydro.
- Scotland has highest hydro-based and wind-based renewables capacities.
- England has the highest biomass-based renewables capacity



Statistical indicators

Highlight trends in the development of renewable energy technologies

- Trends for both **heat** and **electricity**
- Increase in the **electricity generation capacity** from all significant renewable sources
- Growth in the proportion of **electricity produced** from renewable, including progress towards 2010 and 2020 targets
- **Overall** percentage
- **RO** percentage
- **RD** percentage



Statistics – International

UK target – 15% of energy from renewables by 2020

- Currently at 1.78% in 2007 (25th out of 27 in 2005 at 1.32%)
- Measured in final consumption terms
- Measured in Net Calorific Value terms

Table 2: Components of the share of energy from renewable sources in final consumption of energy in 2005, 2006 and 2007

	2005		2006		2007	
	Ktoe	TWh	Ktoe	TWh	Ktoe	TWh
Renewables						
Electricity generation	1,506	17.52	1,614	18.77	1,752	20.37
Heat	475	5.53	494	5.74	562	6.54
Biofuels for transport	69	0.80	180	2.10	349	4.06
Total Renewables	**2,051**	**23.85**	**2,288**	**26.61**	**2,663**	**30.97**
Energy						
Total Final Energy Consumption	150,827	1,754.12	148,826	1,730.85	146,029	1,698.32
Distribution losses for electricity	2,380	27.68	2,362	27.47	2,270	26.4
Distribution losses for heat	-	-	-	-	-	-
Consumption of electricity in the electricity/heat generation sector[2]	1,604	18.65	1,744	20.28	1,659	19.29
Consumption of heat in the electricity/heat generation sector	26	0.30	-	-	-	-
Total energy	**154,837**	**1,800.75**	**152,932**	**1,778.60**	**149,958**	**1,744.02**
Renewables percentage	1.32%		1.50%		1.78%	

[2] includes transmission losses and electricity used for pumping at pumped storage stations

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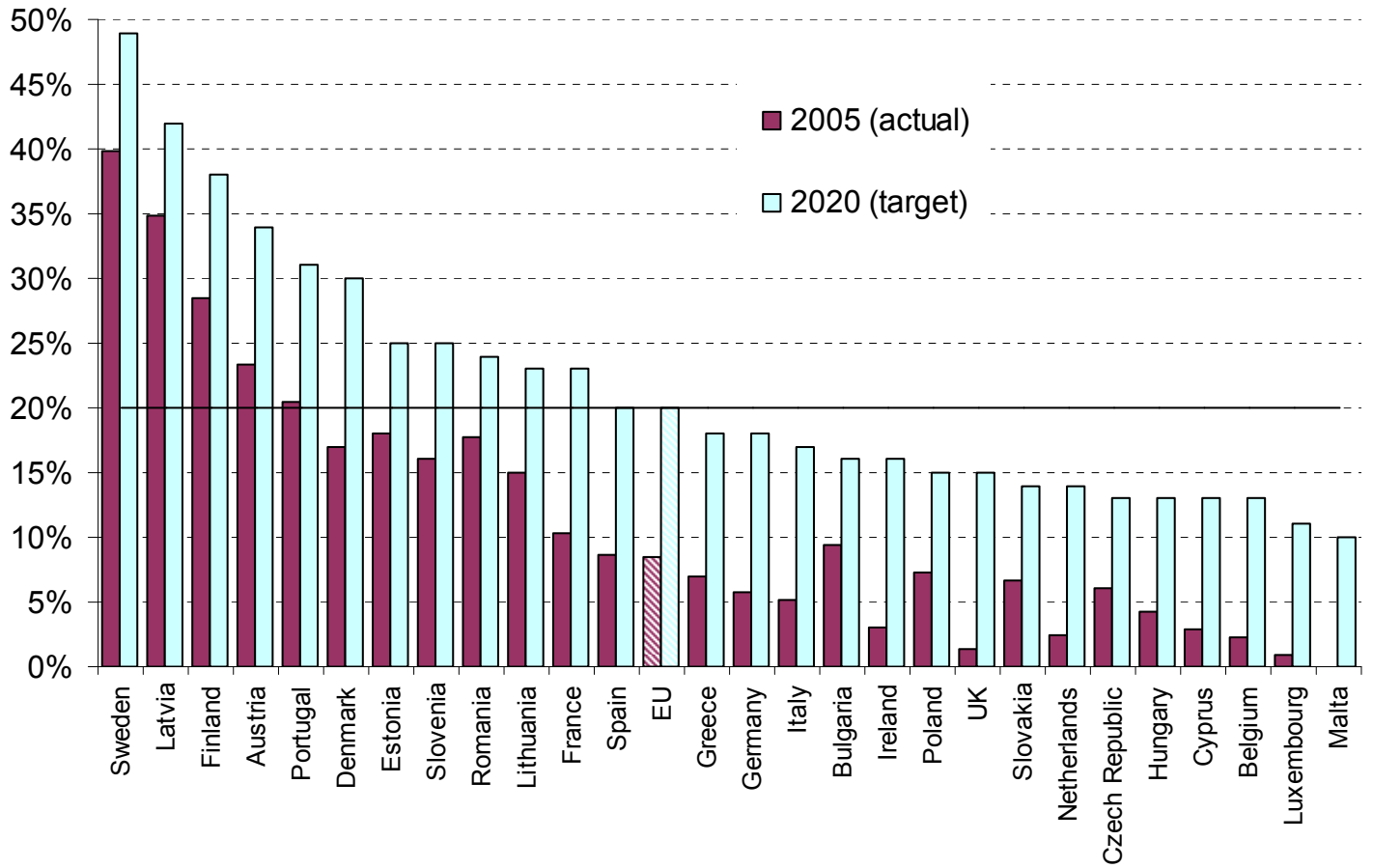
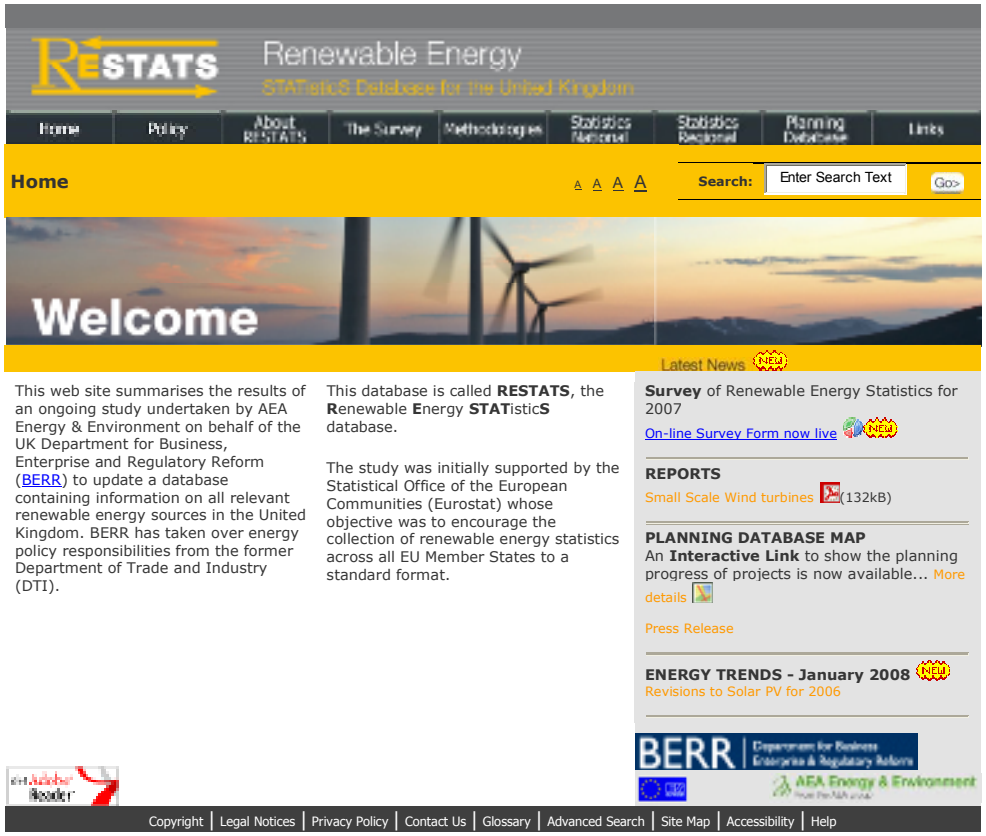
Statistics – International

Chart 5: Share of total final energy consumption of energy from renewable sources, 2005 and 2020, after normalisation of hydro



Promoting the results

Restats web site



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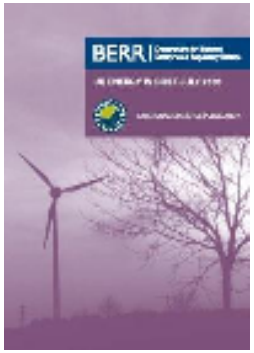
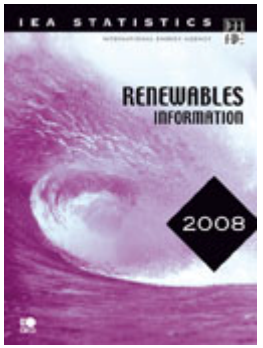
Energy Trends

UK Energy in Brief



IEA



In conclusion …..

- The need to survey is determined by UK energy statistics requirements; international requirements; and by government policies
- Policy can affect what data sources become available
- Policy can also influence how the survey is carried out and its likely success rate
- The approach to surveying renewables and CHP is always evolving; we must remain flexible
- The resulting statistics must be to National Statistics standards.