

**GL** Noble Denton



## **Allocation of Unidentified Gas Statement**

22<sup>nd</sup> May 2012



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# Outline

- Overview of current methodology
- Initiatives to improve estimate of UG
  - Consumptions
  - Sites with AQ=1
  - WCF
  - Lost/new sites
  - Change in Seasonal Normal (incl. Mod254)
  - Theft
- Initial questions / comments / clarifications on first draft 2012 AUGS for 2013/14
  - discussion

## High Level Plan

Key Dates	Description	Data	Analysis
30th April	First draft AUGS published	Provision of data	Update of methodology
22nd May	UNCC Meeting GL Noble Denton present AUGS		
1st May - 15th June	First consultation period		
Mid June	Consumption data expected		
31st July	Second draft AUGS to be published		
1st August - 31st August	Second consultation period		
Mid August	UNCC Meeting GL Noble Denton to present updated AUGS		
September date TBC	Third draft AUGS published		Apply methodology
October date TBC	UNCC Meeting GL Noble Denton to present updated AUGS		
October date TBC	Methodology submitted to UNCC for final approval and final version of AUGS published including figures		
October 2012 - 28th February 2013	Query process		
February 1st 2013	Final Figures published		

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## Unidentified Gas – Overview of current methodology



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## Unidentified Gas – Definition

Unidentified Gas is defined as consisting of:

- Unregistered and Shipperless sites
- Independent Gas Transporter CSEP setup and registration delays
- Shipper-responsible theft
- Metering bias
- Other
  - Shrinkage estimate error
  - Open bypass valves
  - Meters passing unregistered gas
  - Unknown sites

## Unidentified Gas – Calculation

Total Unidentified Gas is calculated directly

- Currently estimated from UG assigned to LSP sector due to data availability

Components are calculated directly where possible:

- Unregistered and Shipperless sites
- Independent Gas Transporter CSEP setup and registration delays
- Metering bias

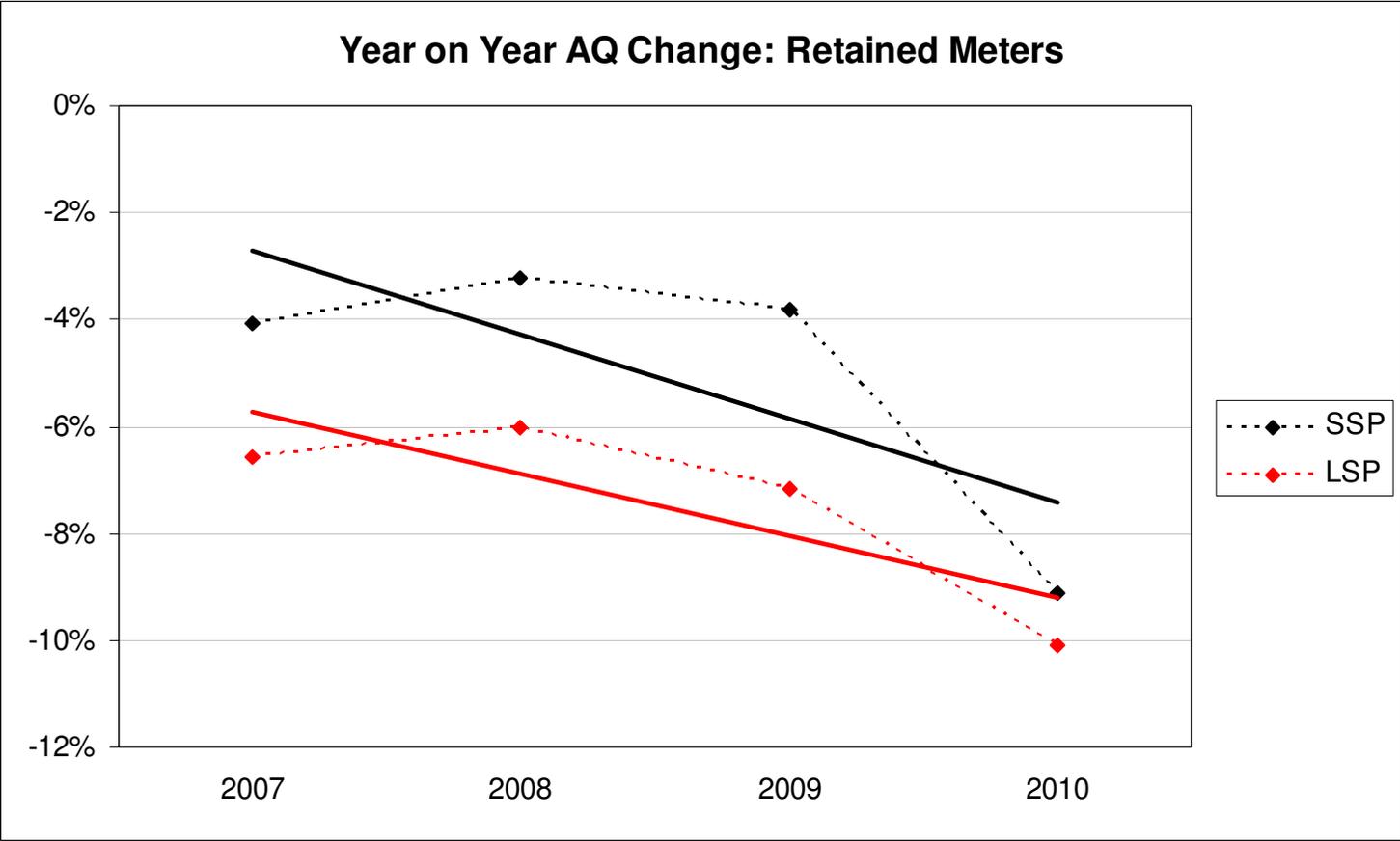
The remainder is calculated by subtraction

- Balancing Factor (equal to Theft plus Other)

## Unidentified Gas – Location

- Allocation process assigns UG to both LSP and SSP sectors
- LSP-assigned UG
  - Consists of UG *arising* from both LSP and SSP sectors
  - Accounts for the majority of total UG
  - Can be calculated using available data
- SSP-assigned UG
  - Consists of UG *arising* from both LSP and SSP sectors
  - Is likely to be small
  - Cannot be calculated using currently available data

# Unidentified Gas – Allocation Bias due to AQ Change



# Unidentified Gas – Effects of Allocation Bias

Existence of allocation bias means that

- Not all of RbD is Unidentified Gas
- Majority of Unidentified Gas is assigned to LSP sector

Based on available data

- Long-term RbD bias can be estimated
- Allocation bias can be estimated
- Total LSP-assigned UG can be estimated
  - This can then be split between market sectors

## Unidentified Gas – Balancing Factor

$$\begin{aligned}\text{LSP Assigned UG} &= \text{Average RbD} - \text{Algorithm Bias} \\ &= \text{Shipperless UG} + \text{iGT CSEPs UG} + \text{Meter Error UG} + \\ &\quad \text{Balancing Factor}\end{aligned}$$

- Shipperless, iGT CSEPs and Meter Error calculated directly
- Balancing Factor calculated by subtraction
- Balancing Factor is:
  - Theft
  - Shrinkage estimate error
  - Open bypass valves
  - Meters passing unregistered gas
  - Unknown sites

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## Initiatives to Improve estimate of UG



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## Initiatives to improve estimate of UG

- Consumption data
- Sites with AQ=1
- WCF
- Lost/new sites
- Change in Seasonal Normal (incl. Mod254)
- Theft

## Consumption Data

- Need enough data to **accurately** estimate the following for each LDZ
  - SSP and LSP metered consumptions
  - SSP and LSP aggregate allocations
- Actual metered consumptions are still unknown due to missing data

$$\text{Total UG} = (\text{Alloc SSP} + \text{Alloc LSP}) - (\text{Metered SSP} + \text{Metered LSP})$$

- Calculation requires as much data as possible for both metered consumptions and allocations

# Consumption Data

Data issues are as follows

- Sites with no/insufficient meter reads (at least 10% of population)
- Sites in CSEPs

What remains is a (large) sample of the whole LDZ

- We can therefore calculate both the best estimate and a Confidence Interval for the LDZ total metered consumption
- The larger the sample, the narrower the Confidence Interval

# Consumption Data

Full statistical principles described in AUGS

- Calculate Confidence Interval for average consumption, using
  - Central Limit Theorem
  - Finite Population Correction

Sample average consumption is Normally distributed, with a mean of  $\bar{x}$  and a Standard Error of  $S/\sqrt{n}$ , where  $\bar{x}$  is the mean of the sample taken and S is the Standard Deviation.

- Confidence Interval for average consumption given by

$$\bar{x} \pm 1.96 \times \frac{S}{\sqrt{n}} \times \sqrt{\frac{N-n}{N-1}}$$

## Consumption Data

- Multiply by population size to get Confidence Interval for aggregate load
- The larger the sample, the more accurately we will be able to estimate actual load
- Range for actual loads feeds into total UG calculation and gives range for this
  - Best estimate
  - 95% high and low limits

### Risks

- UG range includes negative values
- Uncertainty in load estimate dwarfs UG meaning no estimate can be made

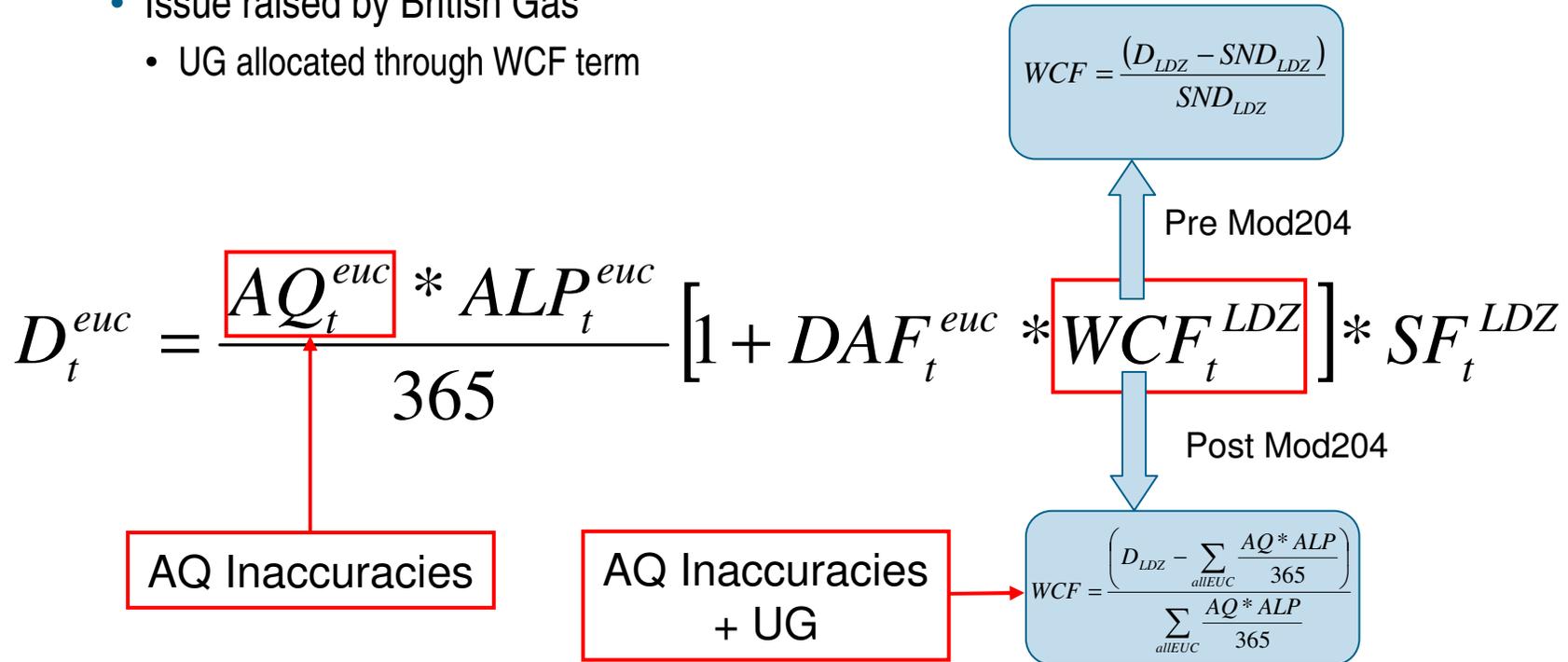
## Consumption Data

If primary analysis fails, the following alternatives are available

- Use results of consumption analysis to estimate SSP-assigned UG as a percentage of LSP-assigned UG
  - % factor described in 2012/13 AUGS
  - An estimate rather than a robust statistical approach
  - Erring on the side of caution necessary
- 
- Final option if all else fails is to leave the percentage factor at zero, as in the 2012/13 analysis

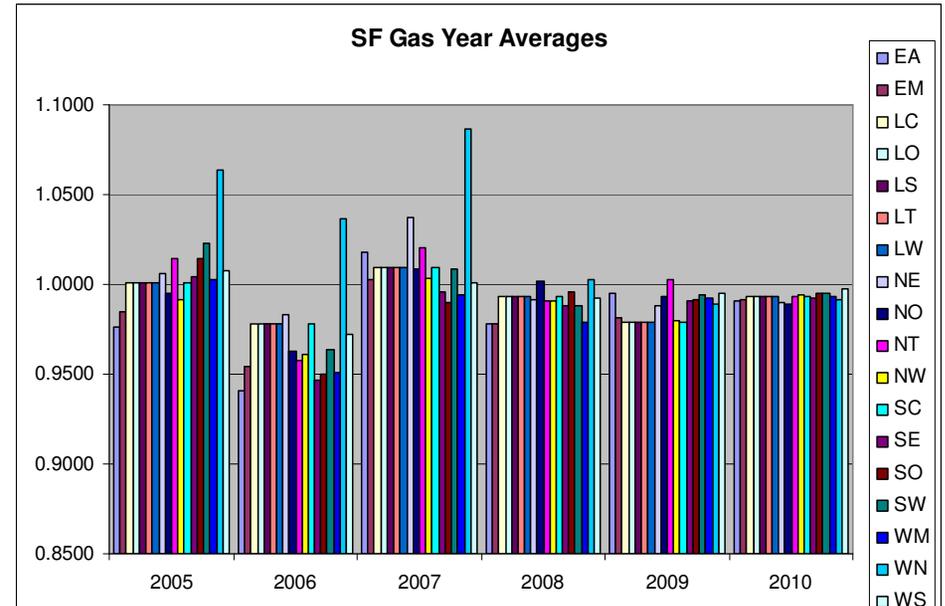
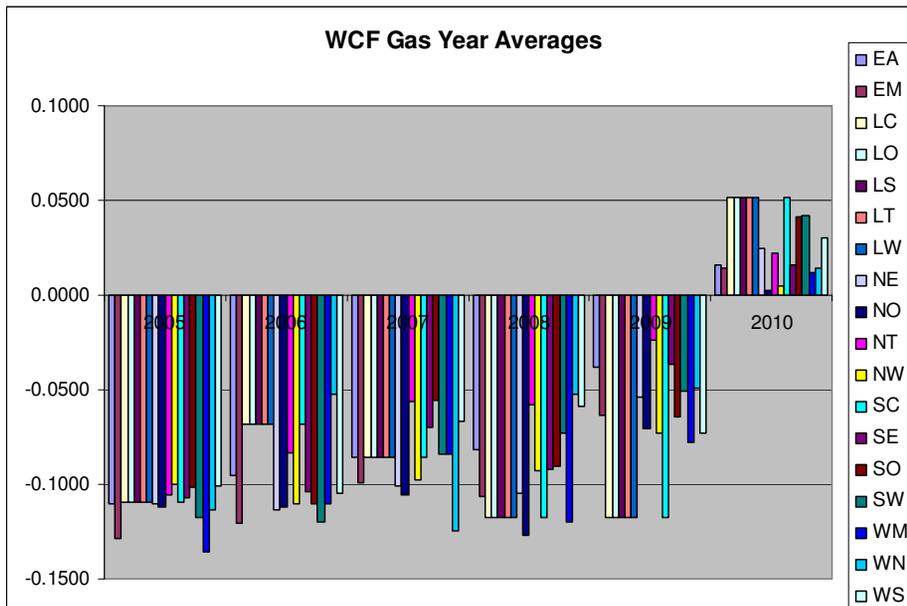
# WCF

- Issue raised by British Gas
  - UG allocated through WCF term



# WCF

- Sensitivity Analysis
  - What do WCF & SF tell us about UG?
- EWCF
  - What does WCF-EWCF tell us about UG?



## New/Lost MPRs

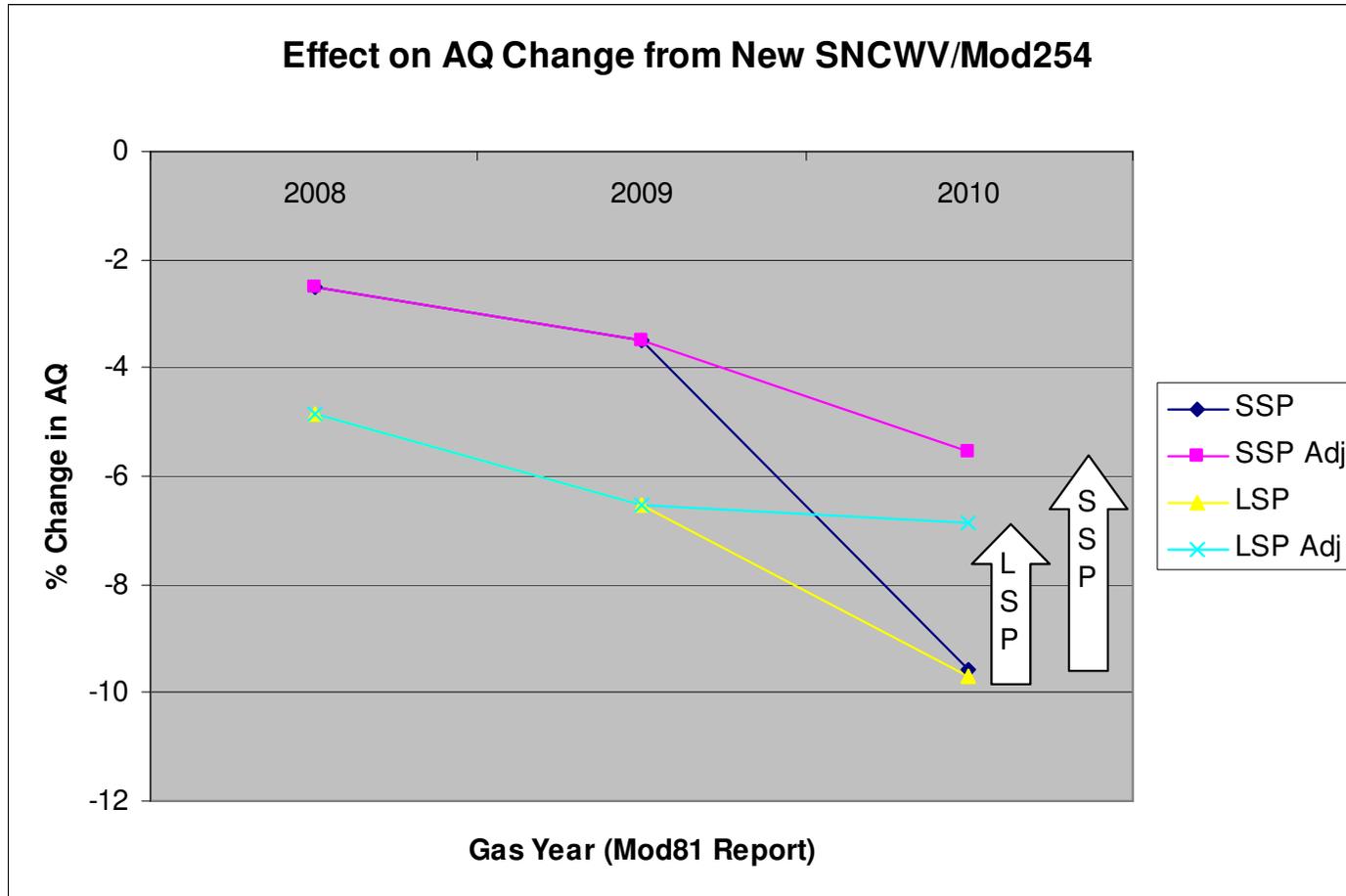
- Allocation Algorithm Error (AQ Bias)
  - Allocation with Base AQ – Allocation with 'Best' AQ
- Base AQ & Best AQ do not vary through gas year
  - Assess impact of this assumption

## Seasonal Normal Definition (Mod254)

- Definition of Seasonal Normal updated in 2010
  - This included the ability to use forecast weather data (Mod254)
- AQ Calculated as Measured Consumption Corrected to SN
  - Same consumption -> Different AQ
  - Mod81 Report – Change in AQ

<b>Mod81 Report</b>	<b>PrevAQ</b>	<b>CurrAQ</b>
2008	Old SN	Old SN
2009	Old SN	Old SN
2010	Old SN	New SN
2011	New SN	New SN

# Seasonal Normal Definition (Mod254)



## Theft - update

Receive and validate data

Calculate and assign theft to year in which it occurred

Identify prevailing AQ prior to estimated start date

where  $AQ=1$  use previous years AQ

if no  $AQ \neq 1$  found ultimately use current AQ (which can also be 1)

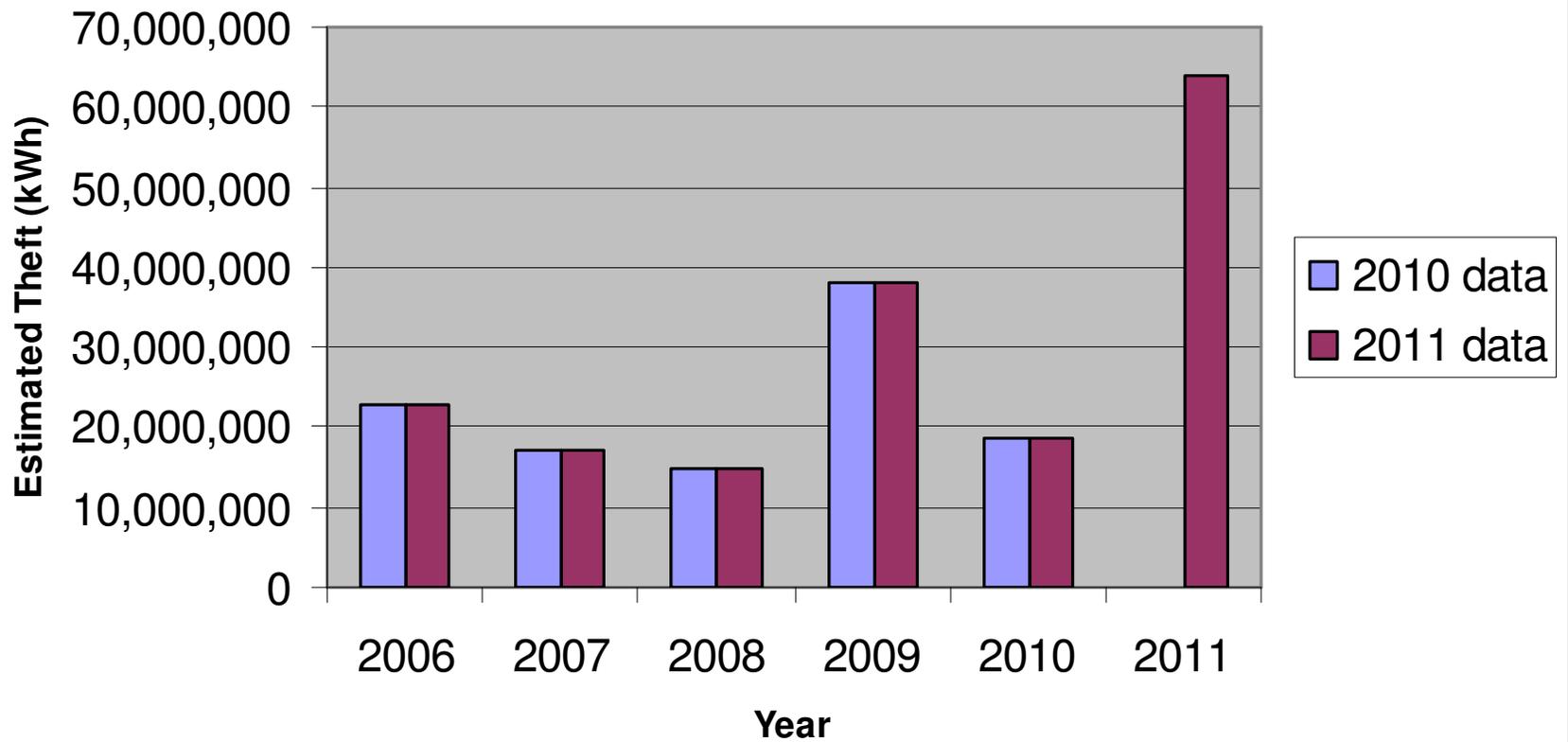
Assign to market sector

**proposed change: where  $AQ=1$  and annual theft  $>73,200\text{kWh}$  per annum set market sector to LSP**

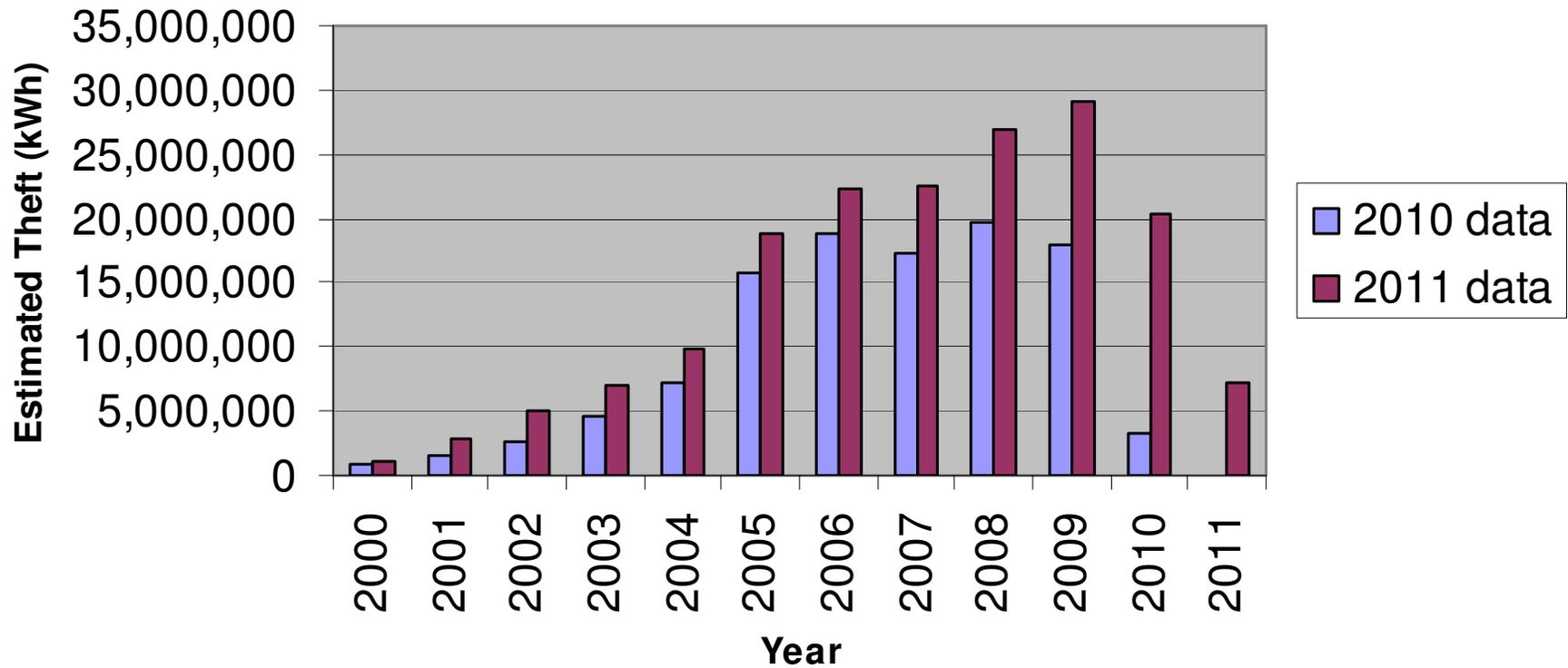
Aggregate by sector by year

Calculate average over 2008-2010

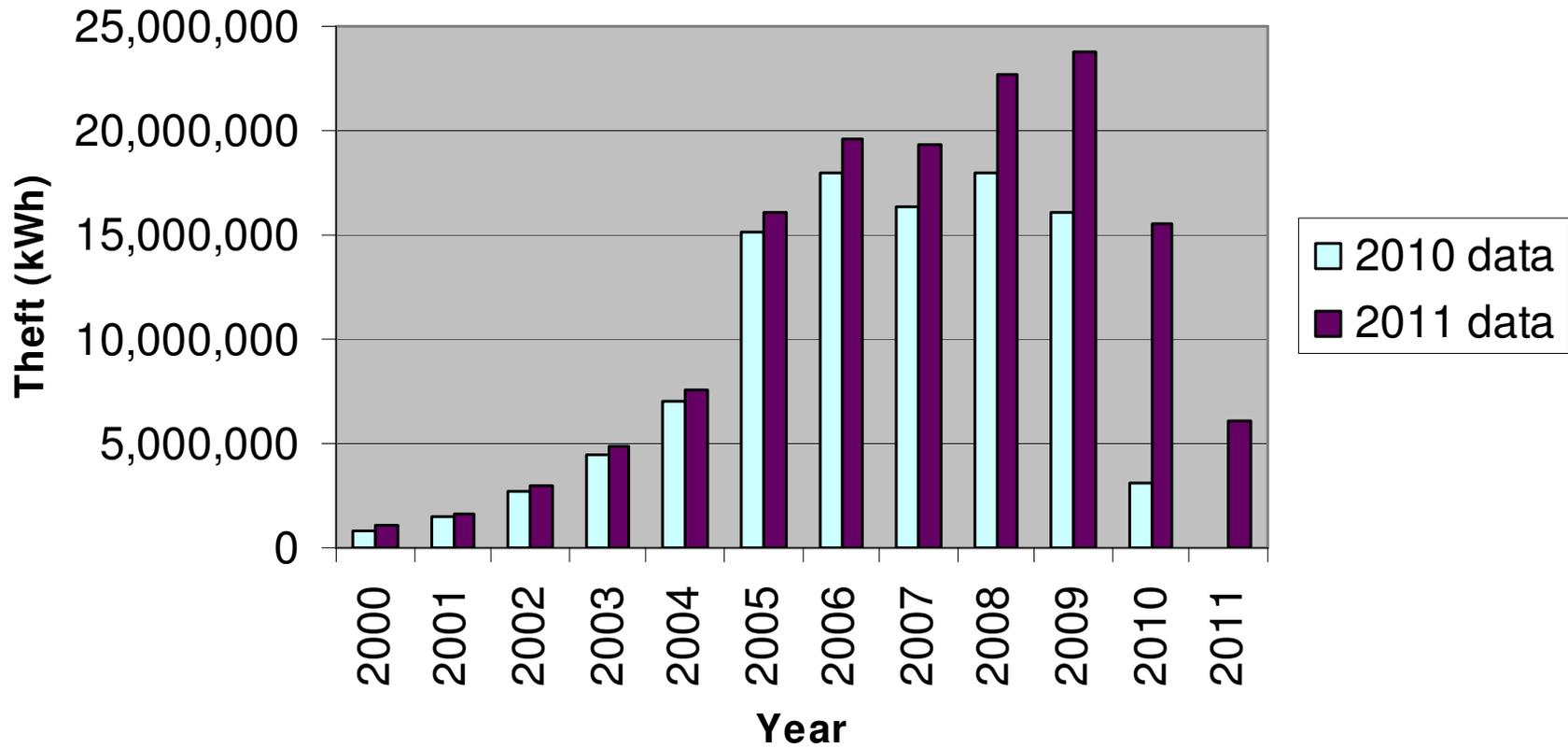
## Total detected theft by year of detection



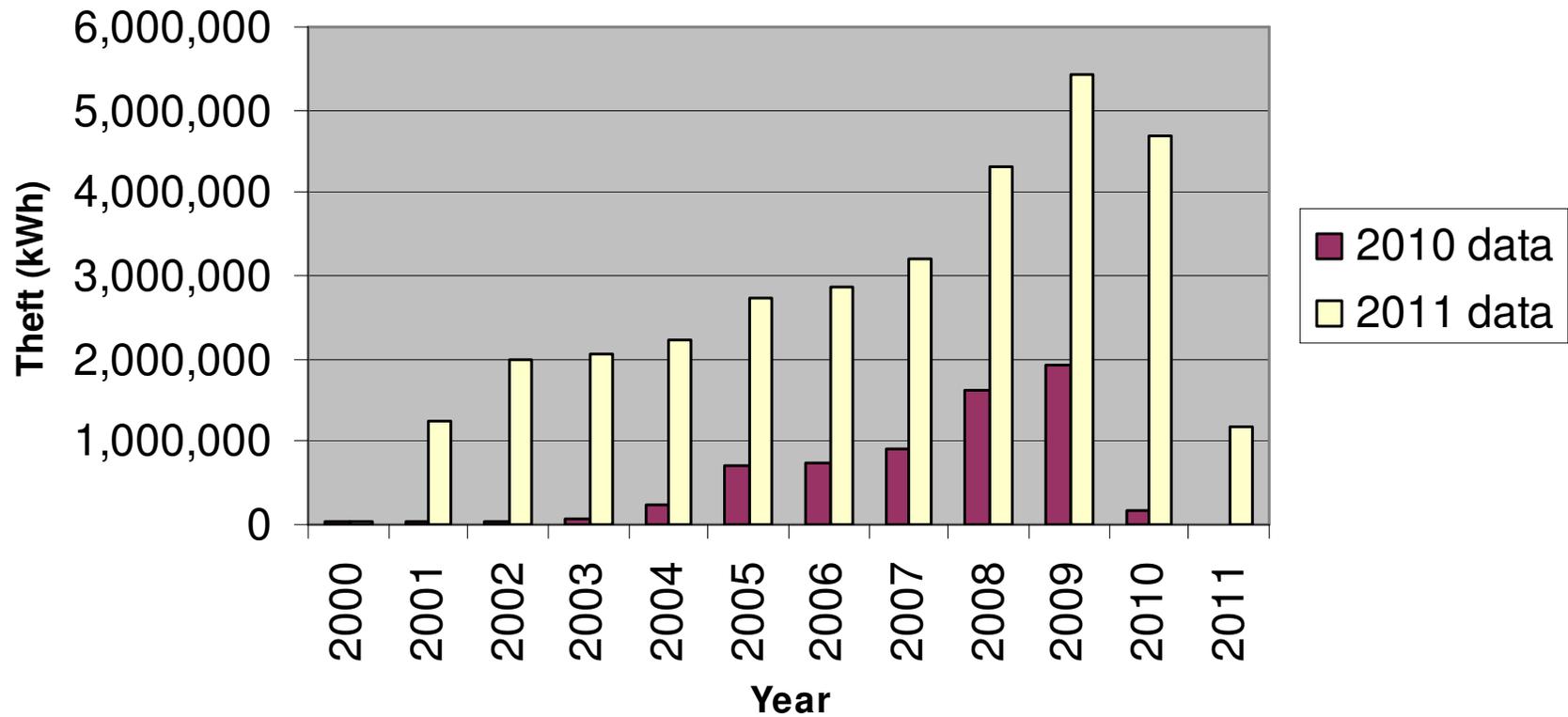
## Total detected theft by year of occurrence



### SSP Theft by year of occurrence



### LSP Detected theft by year of occurrence



## LSP/SSP Theft split

Initial figures based on data received up to 31/12/2011

Will be updated with detections up to 30/6/2012

2011 not used although currently this has a 19.8% LSP split

	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>Average</b>
<b>LSP %</b>	17.2	20.3	23.8	<b>20.4</b>
<b>SSP %</b>	82.8	79.7	76.2	<b>79.6</b>

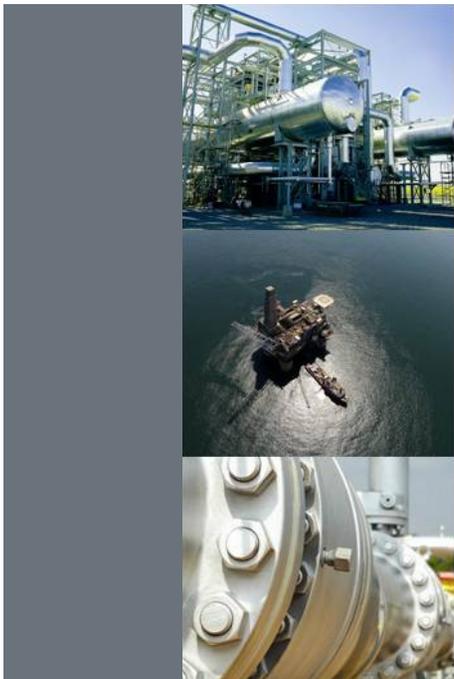
## First Draft 2012 AUGS for 2013/14

- Opportunity to raise initial clarification questions

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**Thank you for your attention**



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