

THE IMPLEMENTATION OF AMR METERING AT VODAFONE UK

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Energy Manager

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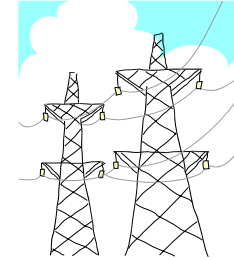


VODAFONE UK - HISTORY

- On 1 January 1985 we made the UK's first mobile call. It marked the launch of the mobile industry and transformed global communications.
- Today Vodafone is the world's leading international mobile telecommunications group with equity interests in 27 countries across 5 continents, 186.8 million proportionate customers and 33 partner networks*.
- We have rapidly grown over the past 23 years. We now have a UK property portfolio consisting of the following numbers of sites in the UK
 - A network of 12,000 Radio Base Stations (RBS).
 - 40 Mobile Telephone Exchanges (MTX) sites
 - 5 Data Centres
 - 50 Offices & Call Centres
 - 350 Retail Stores



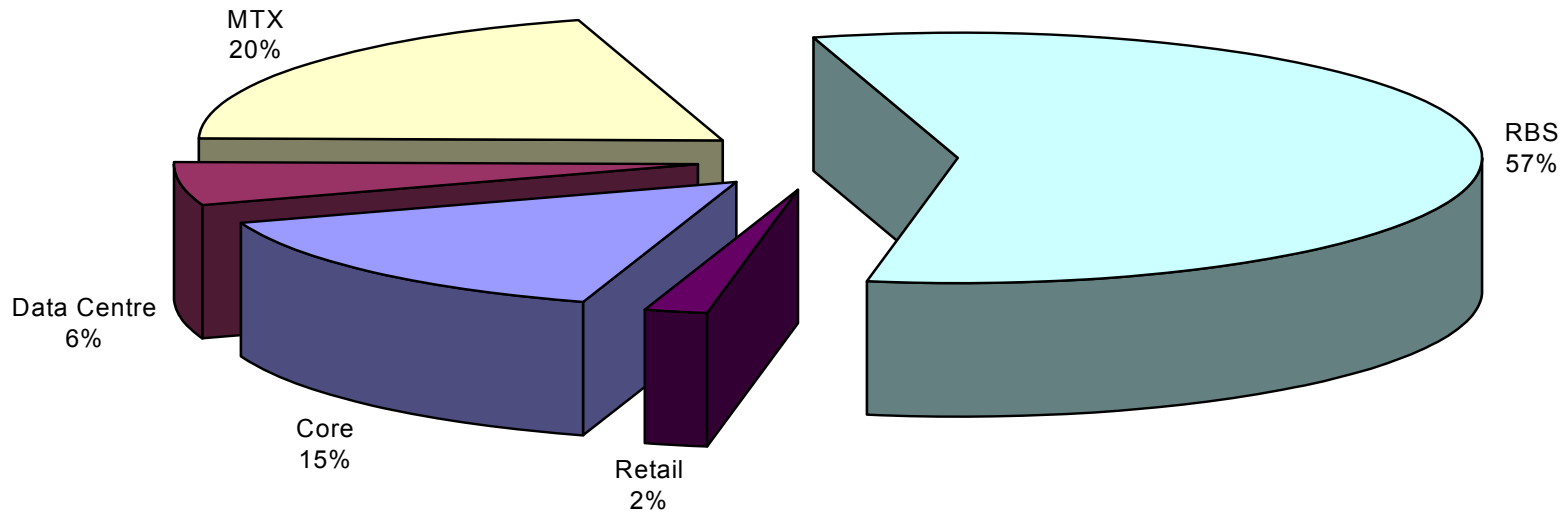
VODAFONE UK ENERGY USAGE



- Vodafone UK uses 438 gigawatt Hours (438,643,534 kWh) of energy pa
- The majority of this is electricity (95%).
- 83% of this is used in our Network i.e. Radio Base Stations (RBS) aka Cell Sites, Mobile Telephone Exchanges (MTX) and Data Centres.
- The other 17 % is used in our Offices, Call Centres and Retail Stores.
- Vodafone UK has an energy reduction target of 12.5% between 2005/2006 & 2008/2009.
- During 2006/2007 we reduced our energy consumption by 3%.



VODAFONE UK ENERGY CONSUMPTION 2005/2006



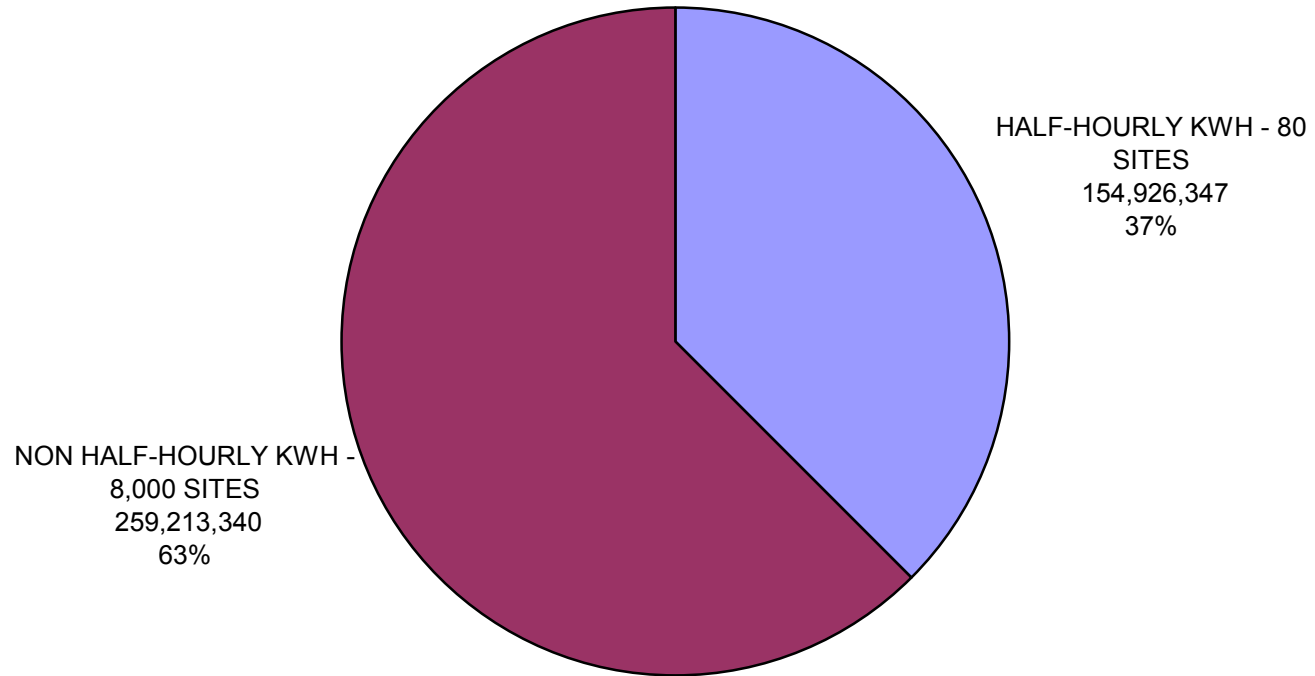
Target to reduce 2005/2006 consumption by 12.5% by end 2008/2009.

Network Energy is >83% of total consumption.

Therefore large focus on energy reduction in Network !



VODAFONE UK ELECTRICITY CONSUMPTION SPLIT



ESTIMATED BILLING ISSUES FOR RBS (NON HALF-HOURLY SITES)

- For the NHH sites, 98% of the billing is estimated pa.
- This is because the RBS sites are unmanned and are generally in remote/difficult locations
- The sites are also securely locked up thus meter readers cannot gain access without VF keys even if they went to the sites !
- The fact that greater than 60% of our billing is estimated
 - Significantly impacts the ability to meet energy consumption/carbon emissions reduction targets. Some previous projects did not consider that the bills are estimated and therefore projected consumption cost savings were not seen.
 - Means that the billing costs are inaccurate with the potential for large overpayments and therefore budget inaccuracies. The projected costs for RBS sites = £16 million pa
 - Means that energy tariffs and profiles are based on inaccurate information
 - The forthcoming CRC (Carbon Reduction Commitment) in 2010, is likely to include the NHH sites and the estimated billing will be a significant disadvantage to Vodafone.
 - Therefore there is a need to address this issue



WHY AMR ?



- Problem – 98 % of RBS bills are estimated.
- Many RBS sites have never been read. Many sites have very large bills that bear little resemblance to reality !
- There are 12,000 RBS sites representing 64% of Vodafone electricity consumption.
- Energy saving projects need to target this area i.e. RBS cooling improvements & equipment efficiency changes – thus there is a need to measure savings accurately !
- Potential duplicate 3rd party meters billed on some sites i.e. we are paying other companies bills e.g. O2, T-Mobile, Orange etc
- At least 500 at last count costing £840k pa.
- High cost of providing access for statutory meter reads & inspection. At least £50 per visit.





AMR METERING TRIAL



- An AMR (Automated Meter Reading) trial has been underway since December 2005
- Initially 50 sites were installed
- AMR is the standard for all new site connections
- During 2007 - we have installed another 650 sites.
- A Business case is being developed for funding to cover an extension of AMR – potentially retrofitting across all NHH mpan sites.
- Landlord supplied sites (may be covered by a further project) – benefits are less clear on some of these i.e. these may not be in the CRC



VODAFONE AMR METERING TRIAL COSTS V BENEFITS

Approx Costs (Actual Costs Not Used For Contractual Reasons)

- £120-£140 pa per meter on 5 year rental agreement including installation & data provision on web page day plus one.
- Average RBS site bill = £1,700 pa

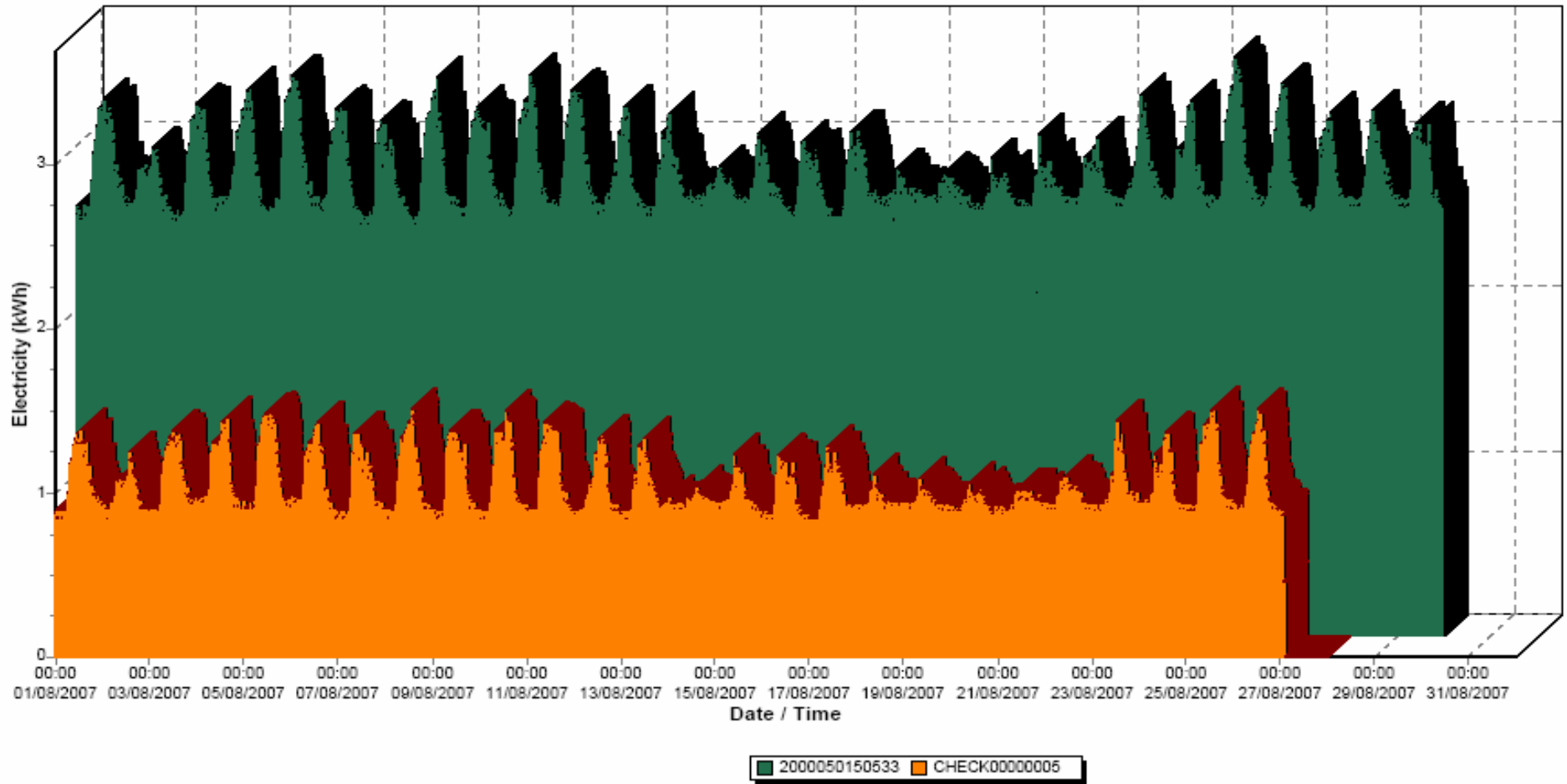
Benefits

- The initial 700 Trial sites achieved exceptional average savings
- The Actual kWh measured is 40% less than previous estimated billing.
- However this is not likely to be typical savings. 10% seems achievable across the portfolio.
- There is a Potential future Tariff saving. This is subject to Ofgem regulatory changes i.e. there could be a new profile class for AMR. Could be up to 5% i.e. another £100 per site pa.
- Avoided manual reading costs up to £50 per site pa.
- Availability of 24/7 ½ hourly energy profile data.
- This is the Key to achieving energy/CO2 saving targets.
- Alarm options to RMC (Control Room) & GS Hall (Maintenance Contractor) for notification of power failure.
- Improved SLA & timescales for RBS rollout as a result of single meter operator instead of 16.
- Potential payback in less than a year
- Additional one-off cost benefits from AMR site visits leading to recovery of duplicate or non existent mpans. E.g. up to £840k pa
- Potential future CRC benefits from AMR. Without AMR we will not be able to make savings under the CRC.

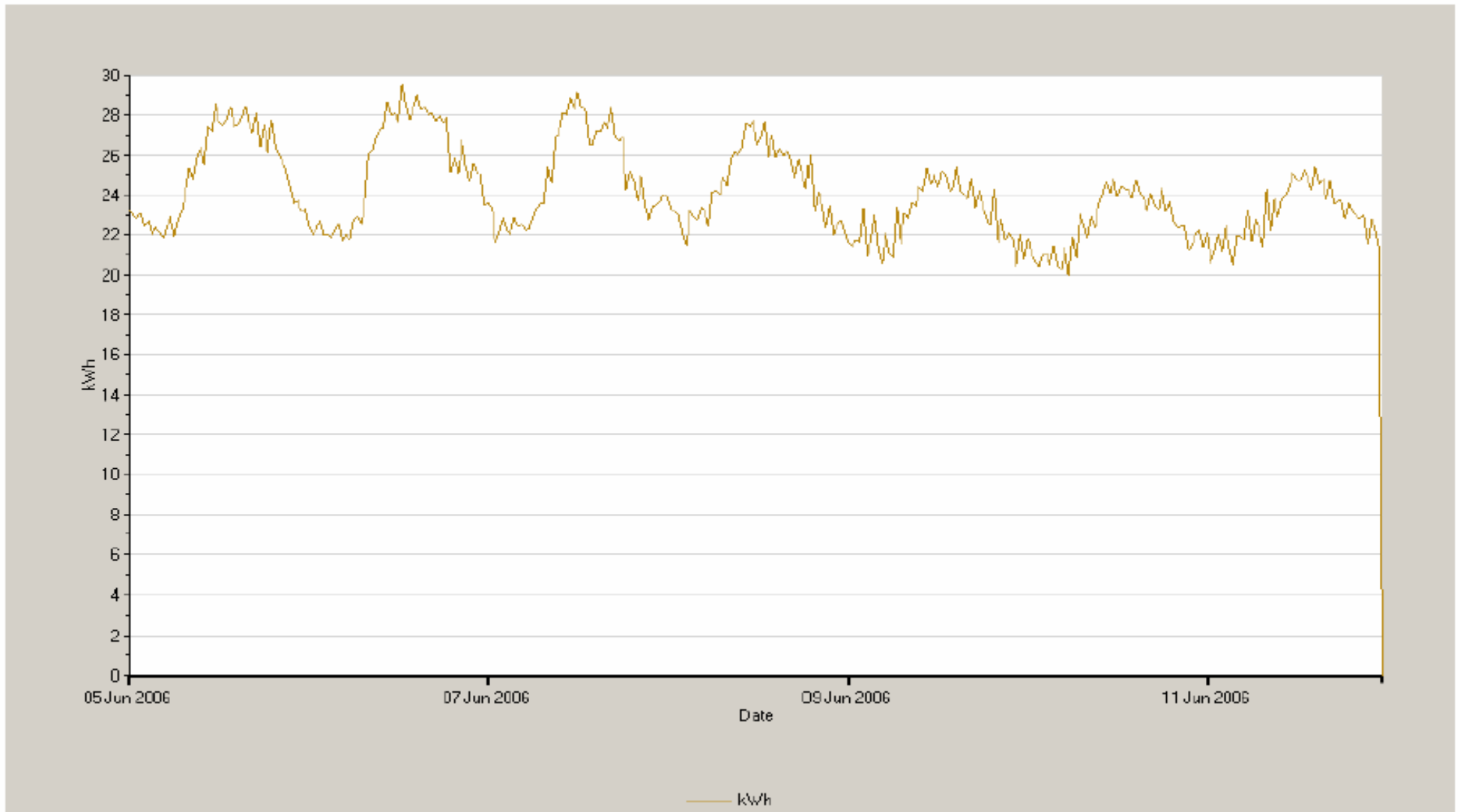


ELECTRICITY AMR HALF-HOURLY DATA

Site YATTENDON / 565C1
HH Meter Multiple HH Meters Selected
Period Single Month AUG/2007



AGGREGATED ELECTRICITY CONSUMPTION PROFILE FOR 22 RBS SITES WITH AMR METERING



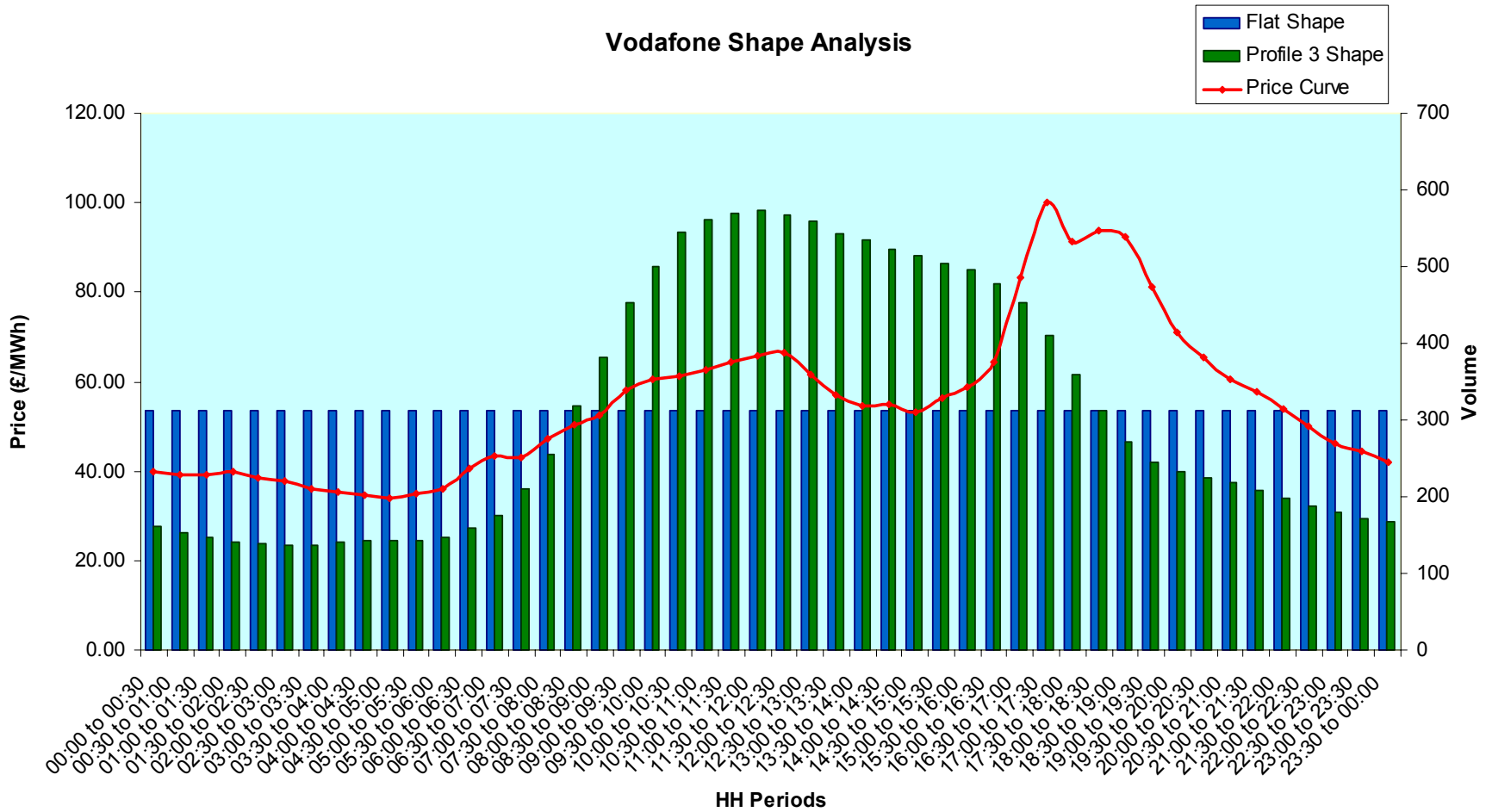
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To Date: 11 Jun 2006 23:59



NEW AMR PROFILE CLASS ?

Vodafone Shape Analysis



GAS AMR

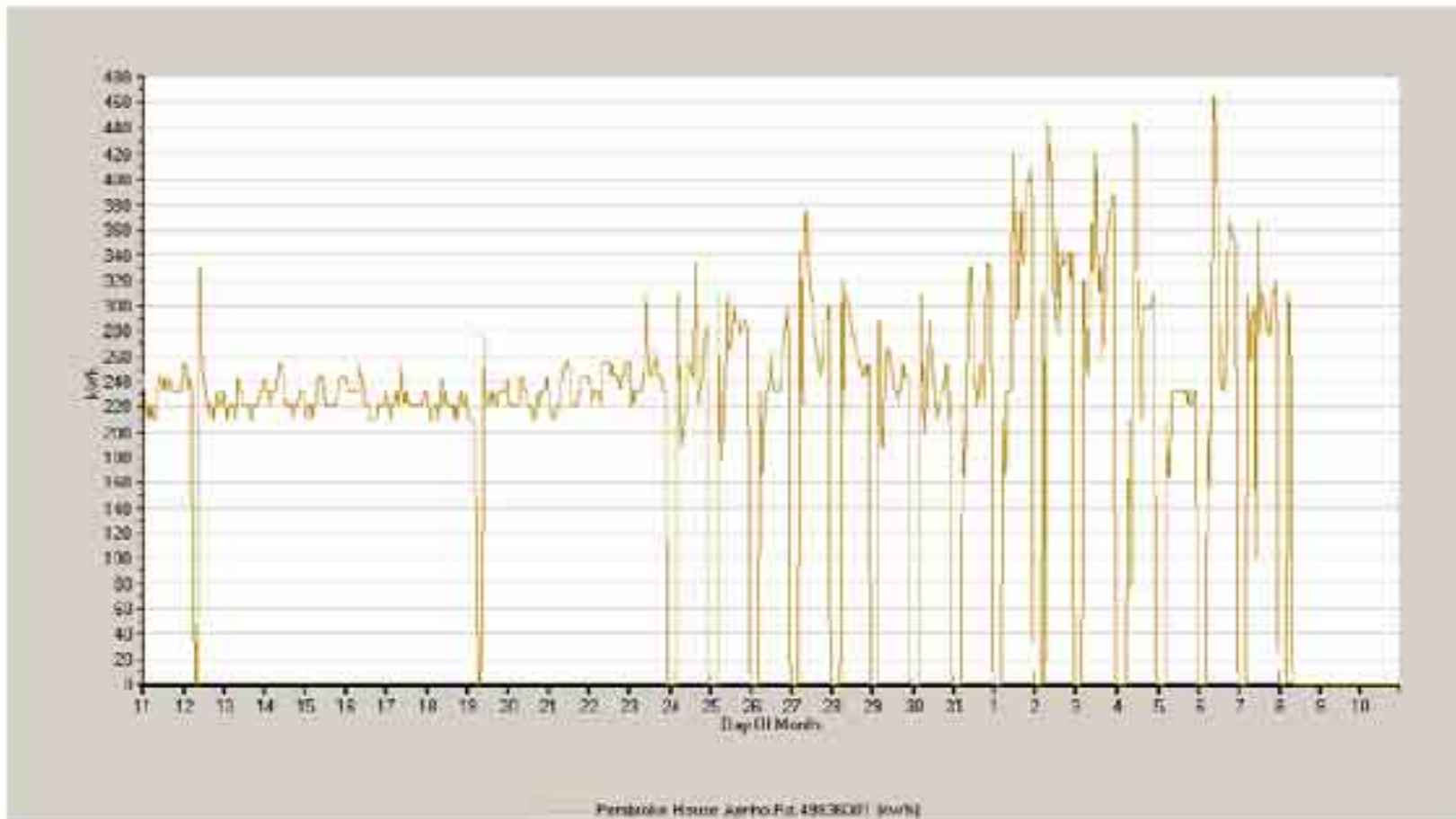
- We have also recently installed Gas AMR loggers at all our main office buildings.
- Gas AMR is a vital tool in reducing energy consumption from the half-hour data it provides. An example is shown on the following slides
- It also provides us with far more accurate billing as many of our gas bills for very large buildings are estimated !
- Paybacks for gas AMR are also often less than one year.



BANBURY - PEMBROKE HOUSE GAS kWh REDUCTION BY SWITCHING OFF BOILERS AT NIGHT – IDENTIFIED BY GAS AMR METERING

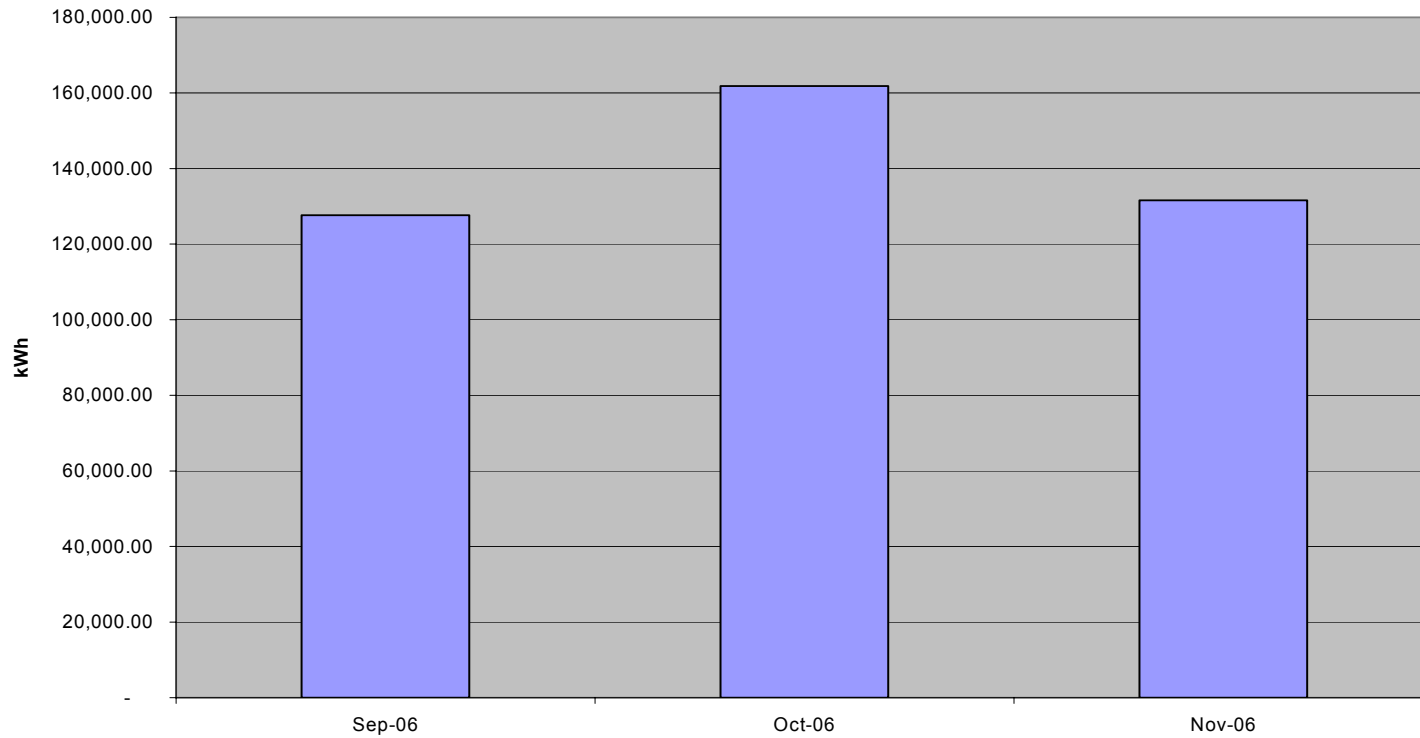
Energy Analysis

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BANBURY - PEMBROKE HOUSE GAS kWh REDUCTION BY SWITCHING OFF BOILERS AT NIGHT – IDENTIFIED BY GAS AMR METERING

Pembroke House Gas Consumption



	Monthly kWh	Gas Cost	Saving	Saving %
Sep-06	127,613.50	£ 3,909		
Oct-06	161,783.42	£ 4,955		
Nov-06	131,551.77	£ 4,029	£ 926	19%



AMR SUMMARY

- AMR has proved cost effective with paybacks of less than 1 year against previous estimated billing.
- The implementation of AMR has provided far more accurate consumption data than was previously available.
- This allows Energy Management projects to take place and further energy/CO2 savings to be actually realised.
- There are potential future tariff savings through new profile classes.
- AMR will be essential for the forthcoming CRC.
- With the large amount of half-hour data available a powerful M&T package is necessary to manage the data.



THE END OF THE PRESENTATION

- For further information please contact

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