

# **Energy Management Practices in the Ministry of Defence: The British Army**

---

Jennifer Rose Clayton

November 2009

Thesis submitted in partial fulfilment for the degree of Masters in Philosophy in Energy Management School of Architecture, Design & the Built Environment, Nottingham Trent University

## **Abstract**

### i. Problem

Inconsistencies in levels of energy management in some areas of the British Army (Army) have been identified, which if left unchecked, may lead to ineffective energy management practices and inefficiencies which are common in many organisations. This will have financial and environmental implications for the organisation and requires further action to properly address their use of finite energy resources and the release of carbon dioxide emissions (CO<sub>2</sub>).

### ii. Objective

The objective has been to identify and improve the effectiveness of energy management practices in the Army, by building upon existing energy management structure, policy and procedures and examine the value of auditing processes.

### iii. Methodology

A review of existing energy management practices has been undertaken with the objective of reviewing a previously issued section covering utility management issues in the Army's mandatory Logistic Support Inspection (LSI). A new and improved LSI section called 'Utilities Management' has been produced and has been trialled as part of Army LSI's in two regional Army Brigades. The outcome of the trial is documented and subsequent recommendations made for the improvement of future energy management practices within the Army.

### iv. Achievements

A successful trial of the new and improved section on 'Utilities Management' has been undertaken which actively supports the work programme of Army Divisional and Brigade Energy Advisors in compliance with Army Policy and Regulations, as well as providing guidance and support to Army unit utility programmes. Land Command, who has responsibility for the management and administration of the Army's LSI, is reviewing the new and improved section for incorporation into the mandatory inspection Army wide.

## **Acknowledgements**

I would like to thank my Supervisor Professor Jo Darkwa, the research office staff for their invaluable help and the great support from my husband and family. I would also like to show my appreciation to Rob Macpherson for his professional support in trialling the Logistic Support Inspection audit within his area of responsibility.

I would like to say thank you to my previous employer, Babcock Infrastructure Services for providing the training and financial support in order for me to complete this research.

## Table of Contents

	Page
Abstract	i
Acknowledgements	iii
 CHAPTER ONE – INTRODUCTION	
1.1 Background	10
1.1.1 Overview of Regional British Army: Headquarters 49 (East) Brigade	12
1.2 Aim and Objectives of the Study	14
1.3 Research Methodology	15
1.4 Structure of Thesis	22
 CHAPTER TWO – THE REQUIREMENT FOR ENERGY MANAGEMENT PRACTICES	
2.1 Introduction	25
2.2 Global Warming and Climate Change	27
2.3 International Perspective of Climate Change	31
2.4 The UK and Climate Change	38
2.5 UK Progress in addressing Climate Change	41
2.6 UK Energy Policy and Strategy	43

2.7	History of Energy Management Practices in the UK	46
2.8	Public Sector Energy Management Practices	52
2.9	Auditing Tools	54
2.10	Concluding Remarks	59

### CHAPTER THREE - THE MINISTRY OF DEFENCE AND BRITISH ARMY

3.1	Introduction	63
3.2	The Ministry of Defence	63
3.2.1	The Ministry of Defence Vision	64
3.2.2	The Royal Air Force	65
3.2.3	The Royal Navy	66
3.3	The British Army	66
3.4	Organisational Structure of the British Army	69
3.4.1	British Regional Forces	69
3.4.2	British Army Divisions in the UK	71
3.4.3	Regional British Army Brigade: Headquarters 49 (East) Brigade	73
3.5.1	Background: Headquarters 49 (East) Brigade	76
3.5	Concluding Remarks	77

### CHAPTER FOUR – ENERGY MANAGEMENT PRACTICES IN THE BRITISH ARMY

4.1	Introduction	79
4.2	The History of Energy Management – The British Army	80
4.3	Current British Army Energy Management Structure	85
4.4	British Army Energy Management Policy, Strategy and Action Plans	87
4.5	A Regional British Army Brigade - Headquarters 49 (East) Brigade: Energy Management Practices	89
4.6	Additional Energy Management Practices	96
4.7	Concluding Remarks	98

## CHAPTER FIVE – THE LOGISTIC SUPPORT INSPECTION AND UTILITIES MANAGEMENT

5.1	Introduction	99
5.2	The Logistic Support Inspection – Accommodation Services	99
5.3	Review of Accommodation Services Section - Logistic Support Inspection	102
5.4	Updated Section and Aide Memoire for Utilities Management – Logistic Support Inspection	104
5.5	Concluding Remarks	108

## CHAPTER SIX – TRIAL OF NEW LOGISTIC SUPPORT INSPECTION: UTILITIES MANAGEMENT SECTION

6.1	Introduction	109
-----	--------------	-----

6.2	Trial of New Logistic Support Inspection: Utilities Management	110
6.3	Trial Evaluation and Observations – 2 Infantry Brigade	112
6.4	Trial Evaluation and Observations – 49 (East) Brigade	114
6.5	Logistic Support Inspection: Utilities Management – Trial Conclusions	115
6.6	Concluding Remarks	120

## CHAPTER SEVEN – - CONCLUSIONS AND RECOMMENDATIONS

7.1	Conclusions	121
7.2	Recommendations	124
7.3	Future Research	125

REFERENCES	127
------------	-----

APPENDICES	136
------------	-----

1.	Land Command Regional Forces Divisional Boundaries - April 2005, April 2007 & April 2012.	137
2.	Map of 49 (East) Brigade Area – Regular Units	140
3.	Utilities & Sustainable Development Department - Building Energy Certificate	141

4.	Top 220 MoD Energy Consuming Sites	142
5.	Commander Regional Forces Foreword – Army Utilities Directive 2006 – 2011.	145
6.	British Army Mandatory Major Site List and Major Site Targets	147
7.	Headquarters (HQ) 4 <sup>th</sup> Division Utilities Strategy 2007/08 Overview	153
8.	Headquarters (HQ) 5 <sup>th</sup> Division Utilities Management Directive 2006 - 2011	159
9.	Headquarters (HQ) 49 (East) Brigade Energy Strategy 2004/2005	167
10.	British Energy Electricity VAT Declaration Form, DTE (East) Stanta	171
11.	Example AF F727 – Monthly meter reading data form – ATR Bassingbourn, Headquarters (HQ) 49 (East) Brigade	172
12.	Major site energy action plan – ATR Bassingbourn, Headquarters (HQ) 49 (East) Brigade	173
13.	Headquarters (HQ) 49 (East) Brigade Administrative Audit of a Unit – Energy Performance	177

14.	4 <sup>th</sup> Division Utility Target for 04/05 – 49 (E) Brigade	181
15.	4 <sup>th</sup> Division Utility Target for 05/06 – 49 (E) Brigade	182
16.	Headquarters (HQ) 49 (East) Brigade Major Site Benchmarking Exercise 2005/06	183
17.	Major Site Electricity consumption graph – ATR Bassingbourn, Headquarters (HQ) 49 (East) Brigade	184
18.	Key Performance Indicators – Headquarters (HQ) 49 (East) Brigade Energy Advisors Contract 2007/08	185
19.	Introductory letter to Headquarters (HQ) 49 (East) Brigade sites – New Logistic Support Inspection section on Utilities Management	193
20.	Example of Best practice – 2 (South East) Brigade, Lydd, Folkestone, Eco-friendly Project	195

## List of Figures and Tables

<u>Figures</u>	Page
Figure 2.1    The Greenhouse Effect	29
Figure 2.2    Earth Temperature Changes Graph	30
Figure 2.3    Global Images relating to Climate Change	40
Figure 2.4    Energy Analysis Technique	48
Figure 3.1    5th Division Boundary Area - April 2007	74
Figure 4.1    British Army Energy Profile 2001 – 2011	79
Figure 4.2    Illustration of British Army sites by definition of energy related CO <sub>2</sub> emissions	87

<u>Tables</u>		Page
Table 5.1	Logistic Support Inspection Accommodation Services (Sections 8 – 11)	197
Table 5.2	Updated Logistic Support Inspection Section – Utilities Management	204
Table 5.3	Updated Logistic Support Inspection Section – Utilities Management Aide Memoire	211
Table 6.1	Logistic Support Inspection Programme 2006/07	226
Table 6.2	Logistic Support Inspection – Utilities Management: 25 Training SP Regiment, Princess Royal Barracks	227
Table 6.3	Logistic Support Inspection – Utilities Management: 36 Engineer Regiment, Invicta Barracks	229
Table 6.4	Logistic Support Inspection – Utilities Management: ATR Pirbright	230
Table 6.5	Logistic Support Inspection – Utilities Management: 39 Engineer Regiment, Waterbeach Barracks	232

Table 6.6	Logistic Support Inspection – Utilities Management: Reserves Training & Mobilisation Centre (RTMC), Chilwell Station	234
Table 6.7	Logistic Support Inspection – Utilities Management: Electronic Reporting Format	236

## CHAPTER ONE

### Introduction

#### 1.1 Background

The British Army (Army) is part of the British Armed Forces and is one of the UK's Tri-services. The Army is the largest energy user of the Ministry of Defence (MoD), the collective annual spend for the provision of domestic utilities for non-operational use, has increased from £80 to £100 million pounds from 2004 to 2007.

These domestic utilities include Natural Gas, Electricity, Water, Fossil Fuel Oil and Liquid Petroleum Gas. This figure does not include any operational fuel and light requirements of the Army so this cost is purely associated with the Army's infrastructure's requirements in the UK and Germany, supporting the Army's numerous site portfolios. In order to manage the utility requirements of these sites, an organisational management structure has been established within the Army.

The Defence Utilities Policy and Review Group (DUPARG) now renamed the Estates Utility Board (EUB), is the Committee within Defence Estates (DE). It forms the top level policy making organisation within the MoD and its Tri-services and is known as a 'Purple' Organisation. It is called as such as the EUB transcends all the Tri-services and the colour purple is a blend of all three colours of the Tri-services uniforms. This Committee is responsible for setting

Army policy translated from UK Government and MoD policies and procedures. The Army Utilities Management Board (AUMB) now known as the Utilities & Sustainable Development (U&SD) department forms the next link in the chain. It is the Army's governing organisation for the implementation of Army utility policy. This direction and dissemination of policy is passed through the senior command of the Army, Headquarters (HQ) Land Command based in Salisbury, Wiltshire. This HQ is the head of the military chain of command to Divisional, Brigade and Major site level. HQ Land Command provides direction and orders to the four Army Divisions and their respective Brigades within the Army's Regional Forces.

The focus of the research is regional Army Brigades and their Major sites but principally – HQ 49 (East) Brigade situated in Nottingham, to illustrate the application of energy management practices in the Army. The Brigade area covers the East Midlands and East Anglia as far south as Essex and has nine 'Major sites' which are also known as Army Camps or Barracks. The Brigade has recently been transferred from the 4<sup>th</sup> Division to the 5<sup>th</sup> Division of the Army as from 01 April 2007. Prior to this date the Brigade received its direction from 4<sup>th</sup> Divisional utility efficiency strategies but now work is programmed to apply to 5<sup>th</sup> Division utility policy and strategy.

Even though energy efficiency has not always been part of the Army's core business and in some cases is only to varying degrees as with many organisations, it is an issue that affects their infrastructure and requires great priority and attention. The key issues highlighted below are based upon the

early development of energy management and its apparent polarity to the Army's core business. (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor).

#### 1.1.1 Overview of Headquarters 49 (East) Brigade

Prior to 2004, the 4<sup>th</sup> Division Utility Efficiency Strategy had not been interpreted adequately at Brigade level and this approach had not been related closely enough to the Brigade's activities. This caused feelings of apathy and a lack of enthusiasm for energy efficiency within the management and staff at the Brigade. However, progress was made with the production of a Brigade Energy Strategy in 2005, detailing the Brigade's own key energy management issues in short, medium and long term objectives.

The Brigade had not received any significant investment for energy efficiency improvements of their buildings or 'Invest to Save' funding up to this date. Monies received for this purpose was viewed by the Brigade management structure as not being put to its best use, due to the lack of monitoring of actual energy and financial savings from such investment, also hampered by a lack of utility metering for measurement purposes. If an energy saving or 'Invest to Save' project was given the go-ahead, the true benefit could not be adequately demonstrated. This bred a lack of faith and confidence in the benefits of energy management within the upper echelons of the Brigade. The purpose of the Brigade's Energy Strategy 2004/2005 was to address the previous shortcomings of the programme and reverse this negative trend.

The Brigade's Energy Strategy was able to put in to place short, medium and long term steps for change. The short term actions taken were to ensure the management of utility payment were managed economically to bring financial savings to the Brigade. In the medium term, some financial investment was needed to improve the metering and monitoring of utility usage, so any overuse could be detected and corrected. With this improved ability to monitor energy consumption, the benefit of future 'Invest to Save' investment could become tangible and financial savings factual, giving greater credibility and purpose to Brigade energy management practices.

By applying an integrated plan of action for energy management, political resistance to energy efficiency could be overcome and the limitations of the financial structure and systems of the Army could be lessened. The lack of available funds for Invest to save measures and the complicated procedure to spend such funding have acted as formidable barriers to achieving improvements in energy efficiency. These far reaching factors can be harder to influence but good work in energy management may be merited and rewarded by further investment in the future. Greater energy efficiency in the Army will make it more effective and efficient in its operations, by directing valuable funding away from the overuse of utilities to areas of greater need, as well as addressing its environmental impact. This will allow for current achievements in energy management practices achieved by Brigades to be built upon further. (Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

## 1.2 Aim and Objectives of the Study

### Aim

The aim of the study was to identify and establish more effective energy management practices in the Army.

### Objectives

The objectives of the study were:

- i. Completion of a preliminary study, including a literature review of existing practices and guidelines relating to energy management practices within the public sector and the Army. This included reporting upon the Army's structure and organisation including its approach to energy management.
- ii. A critical appraisal of the Army's Brigades approach to energy management and the development of a framework for establishing effective energy management practices.
- iii. To apply and evaluate an established practice which was the Logistic Support Inspection (LSI) to devise a 'Utilities Management' section, to make improvements in energy management practices at Brigade and Major site level.
- iv. The results of the investigation were analysed followed by a conclusion of the outcome of the investigation, towards confirmation

of whether energy management practices been improved upon, made effective and further established in the Army.

### 1.3 Research Methodology

The aim of the study was to identify and establish more effective energy management practices at regional Army Brigade level. The study was initiated by a thorough investigation of international and other UK organisations, the MoD, the Army's energy management and utility policy and the corresponding energy management practices which have been put into place. This allowed for good energy management practice or indeed any shortcomings in the approach to energy management to be identified. The research was developed from first hand work experience and documentation available to support the study.

A means of how existing energy management practices could be improved upon within the Army was undertaken and a chosen method was selected to benefit the Army's approach to energy management in the future. This method took the form of an existing Logistic Support Inspection (LSI) of an Army unit, resident at Brigade Major sites in the form of one on one interviewing. This inspection is administered by a regional Army Brigade and was adapted to inspect a Brigade's unit on its merits in its approach to energy management. The new and improved LSI section covering energy management would give a more mandatory approach to the area of energy management and could potentially lead to a unit failing its inspection, if its approach to energy

management was lacking or inadequate compared to Army utility policy. A trial of the updated section detailed in Chapter 5 was undertaken in two regional Army Brigades to identify if its implementation would benefit the energy management programme of a Brigade and its sites and across the Army as a whole. The findings of the study were detailed and resultant recommendations documented.

Chapter 5 details that the trial of the LSI incorporating the new and improved utilities management section should take the form of an Interview process. This conclusion was made due to the existence of site visits by Energy Advisors who were already asking relevant questions in person allowing the subject of energy management to be discussed at different intervals in time. The benefit of Energy Advisors discussing any arising issues in person with the site/unit energy manager as part of their site visits allowed for greater understanding of the subject and the site specific issues.

*'Tell me and I forget,*

*Show me and I remember,*

*Involve me and I understand'.*

This proverb by Dewey the American philosopher who believed in progressive education for young people, summarises an educational teaching principle but one that can be used to demonstrate the benefit of engaging and including individuals in a process for a more favourable outcome. (Source [Http: //www.audioenglish.net/dictionary/dewey.htm](http://www.audioenglish.net/dictionary/dewey.htm) Accessed 16/10/09)

This philosophy extends to how the site/unit energy managers have been engaged in an LSI programme for their unit or site, towards their greater understanding of the benefits of good energy management practices and policy compliance.

This interview method is also used by the team conducting the LSI's as a programme of site visits and gave further grounding for the way the trial of the utilities management section was conducted. However, it was pertinent for the author to explore the principles of social science research methodologies to ensure the most appropriate and effective research method was being utilised.

It was decided that a qualitative research method was the most appropriate, best suiting the requirements of the study and the predetermined method of data collection as an interview process. Qualitative research methods have been described by Firestone (1987) as *“reality is socially constructed through individual or collective definitions of the situation”*. Firestone purports that the purpose of such research is to understand the current situation from the participants' perspective.

(Source [Http: //www.lamp.ac.uk/mit/pdf/report6.pdf](http://www.lamp.ac.uk/mit/pdf/report6.pdf) Accessed 15/10/09)

Similarities can be drawn from the definition above and the research study as it was the authors intention to not only demonstrate the usefulness of including 28 questions based upon energy management practices and policy within the British Army setting of the LSI from a management perspective, but to gauge

subjectively if the participants being interviewed were of the opinion that the LSI section on energy management would be of assistance to them in their role as site/unit energy managers.

A quantitative method of research would not have been appropriate for this research study as these methods favour the reliance upon statistical techniques aided by computational algorithms and software packages.

(Source [Http: //www.lamp.ac.uk/mit/pdf/report6.pdf](http://www.lamp.ac.uk/mit/pdf/report6.pdf) Accessed 15/10/09)

The following gives a definition of Quantative research methods:-

*“Quantative data are data which can be sorted, classified, measured in a strictly ‘objective’ way – they are capable of being accurately described by a set of rules or formulae or strict procedures which then make their definition (if not always their interpretation) unambiguous and independent of individual judgements.”*

(Prof. David R. Harvey 2002) (Source <http://www.lamp.ac.uk/mit/pdf/report6.pdf> Accessed 15/10/09)

From the author’s knowledge of the LSI audit process it would be difficult to conclude that individual judgements could be removed from the LSI audit process, as the LSI process would be reliant on the experience and expertise of the team assessing the management ability of the Army unit under assessment. This would be the basis on which the author concludes that quantitative methods would not fit well with the LSI audit process. It is also documented in this study that the Brigade Energy advisors that conducted the

trial of the utilities management section and therefore the interview process; also used their own opinions and judgement to score the outcome of the question and answer process.

However, it is acknowledged that a quantitative method of data collection was utilised in the final analysis stage in the form of the Logistic Support Inspections Application for Units Risk Analysis' (LAURA) and the Army Review Management System (ARMS) traffic light system to quantify the answers given for the utilities management section within the LSI process. The basis of this was to 'score' the Army unit on its success and failures with regards to demonstrating their energy management practices during the interview process. Quantitative measurements often rely on qualitative assumptions, about which constructs are worth measuring and conceptualising. These qualitative measurements can include viewing transcripts, interview recordings and notes of focus groups or participant research. (Source [Http://www.lamp.ac.uk/mit/pdf/report6.pdf](http://www.lamp.ac.uk/mit/pdf/report6.pdf), Accessed 15/10/09)

The author has further identified that the method of research for the LSI trial could be described as 'Evaluation' Research which is also known as descriptive research within the realms of quantitative research methodology. Evaluation research is explained as *'the focus is on evaluating an event by means of research and to make a judgement about its usefulness'*. This type of research is probably not truly quantitative due to the elements of value judgements made by the researcher, thereby supporting the author's assessment of a qualitative method of research being the most appropriate for

the trial study process. (Mokhtar Ismail, 16 Dec 2005) (Source: <http://www.radiodpb.org/relatednotes/Mokhtar%20Ismail%20-%20Qualitative%20research%20methodology.pdf>. Accessed 15/10/09)

To summarise, a social science research methodology should consist of:-

1. Formulating research questions
2. Sampling
3. Measurement
4. Research design
5. Data analysis
6. Writing research paper

(Social Science Research Methods. Source <http://www.socialresearchmethods.net/kb/> Accessed 06/09/2009)

The step by step guide above was utilised by the author to produce the conclusions of the LSI trial of the utilities management section. These steps will now be discussed in greater detail.

Point 1 had been defined by the 28 questions selected for inclusion in the LSI section on utilities management and were selected due to their relevance to the Army's energy/utility management policy and existing programme. They were also based upon the original LSI questions relating to energy

management practices taken from the Accommodation Services Section's 8 – 11.

Point 2, the sampling stage had taken the form of the trials selected at two British Army Brigades which were already placed to utilise the new utilities management section via their Brigade Energy Advisors' programmes. Sampling is the process of selecting units (e.g. people, organisations) from a population of interest so that by studying the sample we may fairly generalise our results back to the population from which they were chosen, in this case the Army community within Land Command.

Point 3. Measurement is the process of observing and recording the observations that are collected as part of a research effort. The fundamental ideas involved in measuring and the different types of measuring must be understood. This has been demonstrated by the interview process that demonstrates 'survey research' which took place as part of the trial of the updated section of the LSI and the subsequent interviews of the site/unit energy managers.

Point 4. Research design represents how all the elements of the research project are held and brought together. This includes the samples taken which in the research study's case is the selection of site/unit energy managers within two British Army regional Brigades, the method of measurement which is the interview process with the analysis using the LAURA and ARMS applications, and the treatments or programs which represents the

implementation of the updated LSI section on utilities management and the process or product being investigated.

Point 5. The data analysis stage represents the way which the Energy Advisors findings following the interview process, and the interpretation of the outcome from the scoring method, is presented. (LAURA & ARMS).

Point 6 is of course clearly the write up of the research aims and objectives, the methodology, the outcome and the research findings. (Source <http://www.socialresearchmethods.net/kb/measure.php> Accessed 06/09/09)

#### 1.4 Structure of Thesis

There are seven chapters within the thesis. The current chapter has introduced the background of the study, defined the research statement, presented the aims and objectives, the methodology, the contributions and scope of the research. The other Chapters are summarised as follows:

Chapter 2 details the backdrop to why there is the need for energy management practices. This is central to the purpose of the research and goes into detail about the impact climate change has on the global and UK environment and how energy management practices are key to addressing the reduction of carbon dioxide emissions (CO<sub>2</sub>). A demonstration of how different parts of the public sector is applying energy management practices within their organisations is discussed and how auditing through accredited energy

management systems are being utilised, to formalise and maximise their efforts, showing the benefit of auditing at all levels.

Chapter 3 investigates the MoD and Army's organisational structure to set the scene for the investigation of the complex organisation, not normally accessible by the general public. This allows the framework of energy management policy, procedures and strategies to be better understood as detailed in Chapter 4.

Chapter 4 goes into great detail to describe the energy management structure in place in the Army, giving particular reference to the energy management practices at regional Army Brigade level. Additional scope to build upon existing energy management practices is detailed to conclude the chapter.

Chapter 5 reviews the Army's Logistic Support Inspection (LSI) as an additional management process to employ more effective energy management practices. A new section entitled 'Utilities Management' is devised to be incorporated into the LSI process.

Chapter 6 details the social science research methodology employed to carry out the trial of utilising the new LSI section for utilities management at two regional Army Brigades in the form of interviews and the data analysis of the outcome. The findings and conclusions detail its suitability to assist the Army in being more effective in its energy management practices, in support of

future auditing for the accreditation to Environmental Management Systems (EMS) to conclude the Chapter.

Chapter 7 covers the conclusions, recommendations and opportunities for future research.

## CHAPTER TWO

### **The Requirement for Energy Management Practices**

#### 2.1 Introduction

The following details the background to the national and global requirement for energy management practices. The position of the UK and the issue of Climate change will now be discussed in setting the scene to why it is becoming increasingly necessary to adopt energy management practices, and in particular detail the adoption of energy management within the British Army (Army).

The accelerated global warming of the planet and resultant climate change is a challenge to which all countries need to actively seek a solution. Energy management practices form part of that solution, and to that end, global conferences have cast the spotlight on the issues of global warming and climate change and linkages with poverty, to inspire action to combat the harmful effects on the human population and our environment.

This came initially with the Earth Summit held in Rio de Janeiro in 1992, focusing world attention on man's impact on his environment and the acceleration of global warming resulting from his activities. The Johannesburg Summit of 2002 marked the ten year anniversary of global awareness of climate change and further reinforced attention as part of the debate on

sustainable development. (Friends of the Earth. (2007) Briefing – Earth Summit, From Rio to Johannesburg. <http://www.foe.co.uk/resources/briefings/earthsummit.pdf>. Date accessed 23/08/07)

Energy management practices were first employed over thirty years ago following the 1970's oil crisis which resulted in the 'dash for gas'. This caused the first global concerns for the security of supply of energy resources as a result of our move to fuel our power stations and homes with gas, as oil and coal resources began running low causing prices to rise steeply. The depletion of our energy resources, in particular fossil fuel have led to energy management practices being a means of making better use of what resources we have by and highlighting the need to look for alternative energy sources. (Fawkes, Dr Steven. (2007) History of Energy Management. <http://www.vesma.com>. Date accessed 25/07/07).

Energy management practices build upon an existing management structure in an organisation to formulate and action policy and strategy to reduce the organisation's energy consumption needs. A review of the energy consumption baseline of the organisation will give the necessary visibility to identify the minimum energy requirements and areas of overuse, to tackle ways to reducing consumption. This may be addressed by reducing the hours of utility use to better suit the needs of the organisation, encourage users to change the way they use utilities by raising awareness to be less wasteful or by changing a process or way of operating to allow the organisation to function

more efficiently. This will reduce the organisation's utility costs and use of energy resources, saving the organisation money, reducing the emission of carbon dioxide (CO<sub>2</sub>) emissions and impact on the global and local environment. (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

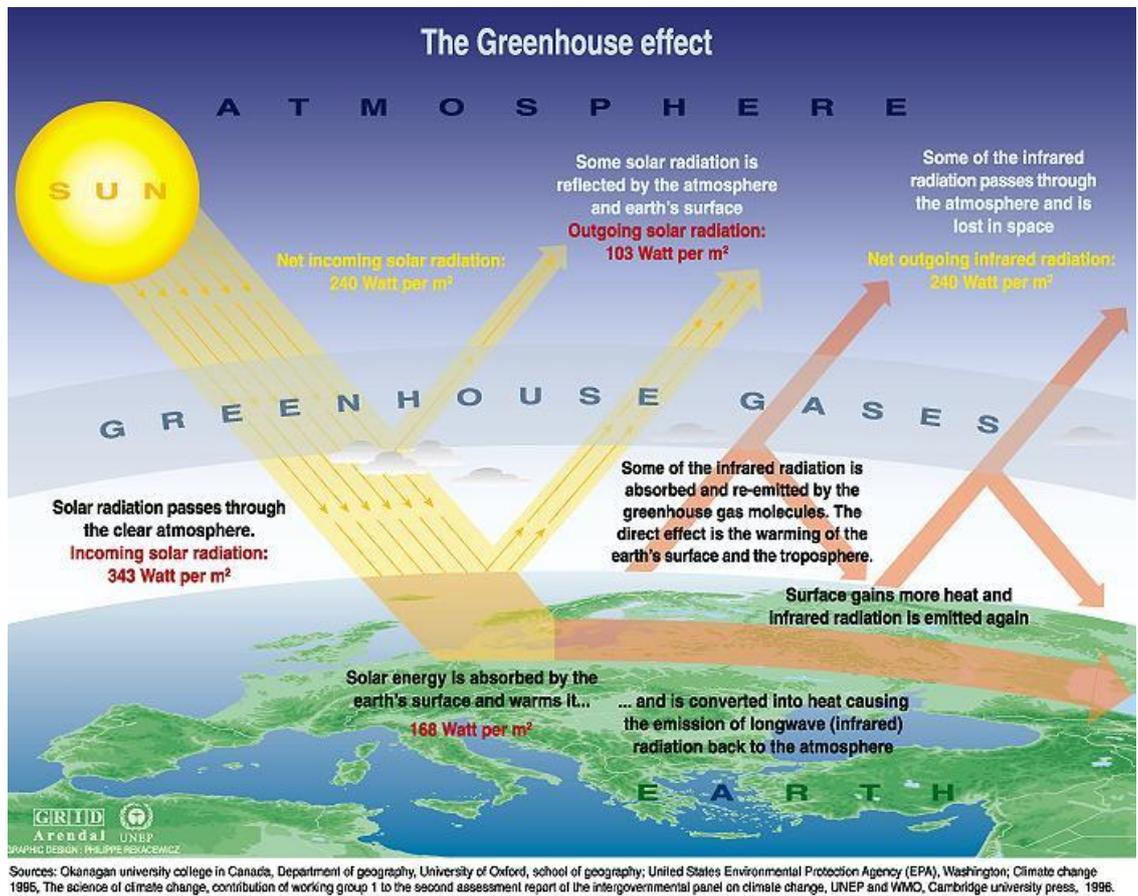
## 2.2 Global Warming and Climate Change

The Earth's climate has been relatively stable since the end of the last ice age, which was some 10,000 years ago, but our earth's climate is now undergoing an accelerated change. There are natural causes for the climate to change overtime, such as the interaction between the ocean and the atmosphere, changes in the Earth's orbit, fluctuations in energy received from the sun and volcanic eruptions. However, scientific research into the earth's climate over the last thirty years and indeed since the early 1900's, has identified that average global temperature is rising and the general scientific consensus is there are human causes for this. The main human influence on global climate is likely to be emissions of greenhouse gases such as CO<sub>2</sub> and methane. At present, about 6.5 billion tonnes of CO<sub>2</sub> is emitted globally each year, mostly through the burning of coal, oil and gas for energy. (UK Climate Impacts Programme. (2007) [http://www.ukcip.org.uk/climate\\_change/default.asp](http://www.ukcip.org.uk/climate_change/default.asp). Accessed 16/05/07).

The greenhouse gases produced from man's activities are causing the thinning of the Earth's ozone layer which protects the earth from the sun's harmful rays,

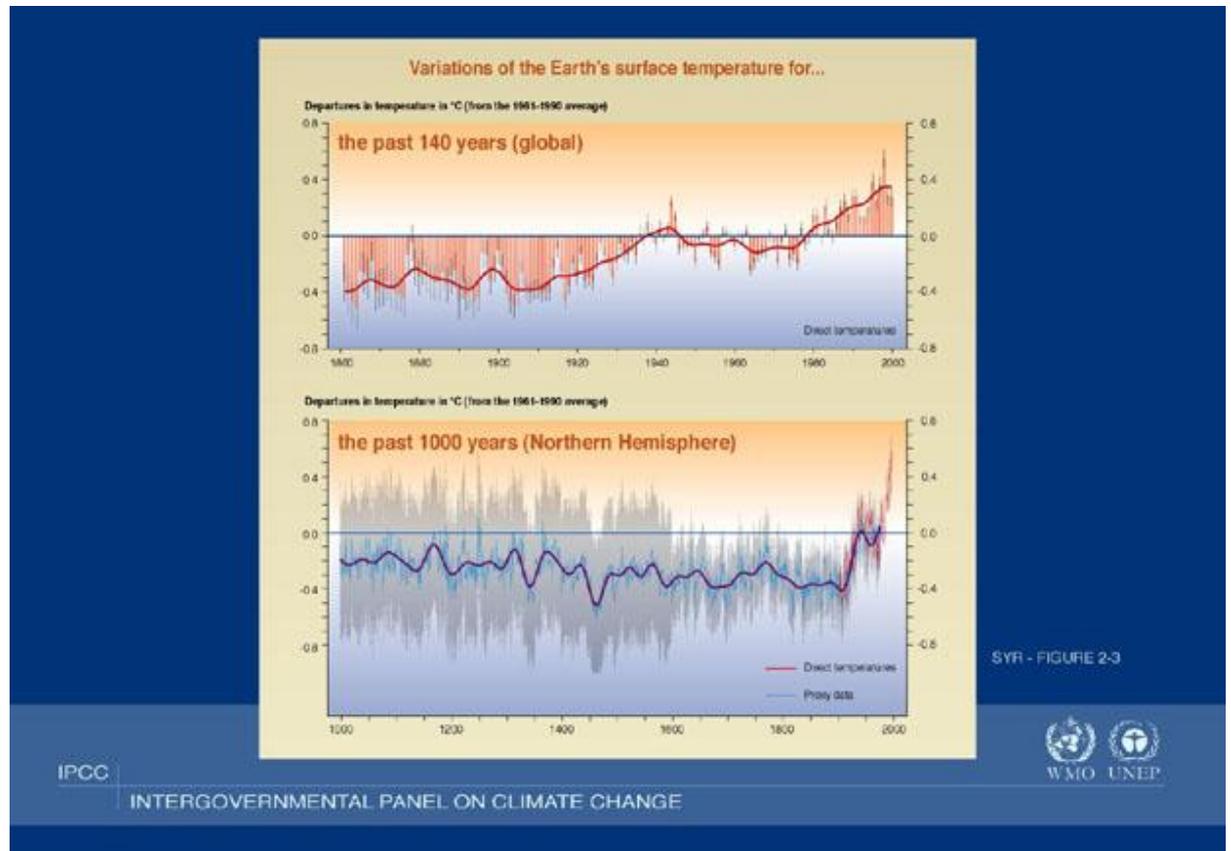
allowing more heat to penetrate the earth and heat up the atmosphere. This blanket of gases is trapping more and more of the sun's energy causing 'Global warming', which is the accelerated form of the natural phenomenon – The Greenhouse effect. The earth's Greenhouse effect works as the name suggests, a greenhouse traps and stores heat, but this process is being sped up and changing the earth's climate at an accelerated and unprecedented rate. The heat normally allowed to escape from the earth's atmosphere is being trapped by the greenhouse gases causing the earth to heat up. The earth's temperature is increasing more rapidly in a shorter period of time than it has in thousands of years, as the greenhouse effect has maintained the world's temperature at an optimum, up until about 200 years ago at the advent of the industrial revolution. Figure 2.1: The Greenhouse Effect. Okanagan University College, Canada. 1996.

FIGURE 2.1 THE GREENHOUSE EFFECT



This change was witnessed in the 20<sup>th</sup> Century as records have shown that the 1990's was probably the warmest century in the last 1,000 years. This century saw a 0.6<sup>0</sup>C increase in average temperature, with the land warming more than the sea making the 1990's the warmest decade in the last 100 years. Figure 2.2: details the Earth Temperature Changes Graph and a brief explanation of the illustrated trends. (Scottish Government Publications 2007. <http://www.scotland.gov.uk/Publications/2006/03/30091039/21>)

FIGURE 2.2 EARTH TEMPERATURE CHANGES



The rapid increase in the Earth's surface temperature seen above is causing local climates to change by increasing incidences of drought and disease, coastal erosion from rising sea levels, extreme weather events (flooding, tornadoes etc), and changes to normal weather patterns (e.g. much warmer summers). Many of these changes are a result of the temperature changes affecting rainfall patterns. Changes in precipitation are causing sea levels to rise, glaciers are melting and retreating; sea ice is thinning and flooding is affecting the environment and the survival of animal and plant ecosystems as well as potentially threatening future human habitation and survival. (Energy

Saving Trust. (2007) You're Impact on Climate Change.  
<http://www.energysavingtrust.org.uk>. Accessed 25/07/07).

An Expedition to the Arctic in 2009 has found that Arctic warming predictions are even more serious and greater carbon cuts are needed. Declining Arctic sea ice is leading to more absorbent warm waters and a faster rate of melting. The sea ice loss occurring at a much faster rate than was even predicted to the last Intergovernmental Panel on Climate Change (IPCC) in 2007, which will influence atmospheric circulation worldwide, affecting temperature and precipitation patterns, and thus water supplies and agriculture. The realisation that there will be no more ice during the summer months and winter ice only has startlingly brought the seriousness of the climate change issue into focus. (Pg 3, Energy World Journal - October 2009, Energy Institute).

### 2.3 International Perspective of Climate Change.

The issue of Climate change, policy towards addressing and mitigating the effects and possible solutions such as the use of different renewable sources will now be explored in an international setting.

Human activities now match and often exceed the natural forces within the Earth System, with implications for human society and the Earth as a whole. Forty years ago, it was already recognised that the adverse impacts of human activity must be understood and addressed. (Rik Leemans & Anand Patwardhan, August 2009)

Global warming is a worldwide problem that is growing in importance. Carbon released during fossil fuel burning is the primary contributor to greenhouse gas (GHG) emissions and cap and trade programmes are actively being developed worldwide to provide a sound economic framework for reducing carbon emissions. Cap and trade programmes have been used successfully in several emissions related undertakings, such as the U.S. effort to control acid rain by limiting sulphur dioxide emissions and the transition from leaded to unleaded gasoline. Today, carbon trading programmes are already being implemented for selected sectors, such as electric utilities. Encouraged by the past success of emissions trading programmes, many energy and environmental specialists are looking to implement carbon trading across all carbon sectors. (John German, 2006).

The business as usual case for global affairs suggest that some very disturbing trends are apparent today and could lead to significant changes by 2050. By then, the global population will have grown by around 40 percent. The number of megacities will grow considerably and the number of vehicles in the world will increase from 700 million to 2 billion. The global demand for energy will increase two and threefold and energy security will become an increasingly significant issue, with the cost of energy remaining high. These trends will be particularly marked in the developing world. One of the greatest challenges posed by the current trends is to address the increasing build up in the atmosphere of CO<sub>2</sub> emissions and other greenhouse gases associated

with increased use of fossil fuels as the world's primary energy source, causing global climate change. (Duncan Eggar. 2006).

Further illustrating energy security as a possible consequence of climate change, in February 2004, the Department of Defense released 'An Abrupt Climate Change Scenario and its Implications for United States National Security. The study outlined possible future with climatic conditions similar to those 8200 years ago and speculated on implications related to the subsequent availability of food, water and energy. (Futures, Volume 37, Issue 6. August 2005).

There is a growing interest in reducing energy consumption and the associated greenhouse gas emissions in every sector of the economy of individual countries and nations. The residential sector is a substantial consumer of energy in every country and therefore a focus for energy consumption efforts. (Lukas G. Swan, V. Ismet Urgursal, 2009).

The Japanese commercial sector currently accounts for 16% of its national CO<sub>2</sub> emissions and its emissions have increased by 29% from 1990 to 2000. A clear gap exists between the current increasing trend in CO<sub>2</sub> emissions and the reduced level required to achieve long term sustainability. In order to bridge this gap, it is increasingly important to specify the available options by understanding the structure of energy use and to quantify the potential reduction in CO<sub>2</sub> emissions. (Y. Yamaguchi, Y. Shimoda, M.Mizuno, 2007).

Developing an understanding and awareness of how energy efficiency and how policy must pave the way for countries to address their contribution to global CO<sub>2</sub> emissions is explored below.

The importance of energy efficiency was first realised following the two oil crises of the 1970's. The world has trimmed its energy budget by utilising higher efficiencies, while still growing economically and has realised the importance of protecting the environment. (Arif Hepbasli & Nesrin Ozalp, 21 January 2002).

Energy efficiency is a term widely used, often with different meanings in public policy making. A clear distinction between energy efficiency and energy conservation is that the former refers to an adoption of a specific technology that reduces overall energy consumption without changing relevant behaviour, while the latter implies merely a change in consumer's behaviour.

(V. Oikonomou, F.Becchis, L. Steg & D. Russolillo, 5 July 2009).

These two components; energy efficiency and energy saving are becoming increasingly important components of government policy around the world in response to a range of challenges including perceptions of resource scarcity, high energy prices, security of energy supply and environmental protection.

(Philip Andrews, 22 January 2009).

Using the example of the growing nation of China, their system of environmental governance is changing rapidly, resulting in new environmental

institutions and practices. State authorities rule increasingly via laws and decentralise environmental policymaking and implementation. (Arthur P J Moi, October 2009).

This may be due to the increasing pressure on China to reduce its greenhouse gas (GHG) emissions, as its development continues as a growing nation. (Shaojun Zeng, Yuxin Lan & Jing Huang, July 2009).

With this increasing pressure to curb carbon emissions and the increased need for energy have forced China to develop an 'energy saving and emission reduction' (ESER) plan. ESER has become China's basic national policy and a guideline for China's energy and environmental issues for the 11<sup>th</sup> Five-Years Plan (2006-2010). (Qiang Wang & Yong Chen, January 2010).

The ability to sustain sources of power and fuel provides the development momentum of a country's industrialisation, which is indispensable to every country at present. This is particularly pertinent to China, as the largest developing country in the world. With the rapid development of economy and society, energy demand of Chinese society is increasing in an incredible speed. Their growing use of fossil fuels to meet their energy needs is not allowing them move towards sustainable development. Fortunately, China has large country area and there are abundant solar resources. (Solar Renewable and Sustainable Energy Previews. Volume 14, Issue 1, January 2010).

Consumer pressure is usually considered as one of the major drivers for more environmental friendly products such as renewable technologies. During the last decade an increasing focus on public procurement has emerged as an important contributor to that pressure. (Ottar Michelson & Luitzen de Boer, October 2009).

The use of renewables in reducing our reliance of fossil fuels is an area which needs to expand rapidly in all corners of the world, to properly address the threat of climate change.

Formulation of an energy model will help in the proper allocation of widely available renewable energy sources such as solar, wind, bio energy and small hydropower in meeting future needs in India. During the last decade several new concepts of energy planning and management such as decentralised planning, energy conservation through improved technologies, waste recycling, integrated energy planning, introduction of renewable energy sources and energy forecasting have emerged. (S Jebaraj & S. Iniyar, 2006).

Expansion of wind energy installed capacity is poised to play a key role in climate change mitigation. However, wind is also susceptible to global climate change. Some changes associated with climate evolution will likely benefit the wind energy industry while other changes may negatively impact wind developments, with such gains and losses depending on the region under consideration. (S.C. Pryor & R.J.Barthelmis, January 2010).

Countries such as Pakistan, as many nations around the world are engaging in effective planning and exploitation of renewable resources and use of technologies. Renewables are of great interest and use to Pakistan but are also equally important for other third world countries, in contributing to their growing need and use of energy supplies. (Munawar A. Sheikh, January 2010)

The use of solar energy in recent years has reached a remarkable edge. The continuous research for an alternative power source due to the perceived scarcity of fossil fuels continues is its driving force. The earth receives in just one hour, more energy from the sun than what we consume in the whole of the globe in one year. Its application was proven to be most economical, as most systems in individual uses requires but only a few kilowatt of power. (Mirunalini Thirugnanasambandam, S. Iniyar & Ranko Goic, January 2010)

Wind power is another valued renewable resource but requires a certain amount of time putting in to investigating its application when potential locations are being considered. Statistical analysis is required to assess wind speed and the positioning of wind turbines and farms. Wind data, consisting of hourly wind speeds records over a five year period. (Y. Himri, S. Himri & A. Boudghene Stambouli. January 2010)

The Province of Vojvodina is an autonomous province in Serbia. Vojvodina is located in the North of the country and is an energy-deficient region. Energy plays a pivotal role in socio-economic development by raising the standard of

living. Biomass has been used by mankind as an energy source for thousands of years, utilising traditional fuels like firewood, dung and crop residues, still used as everyday energy sources in rural and low-income urban households in Vojvodina. Renewable energy sources make up a total consumption of less than 1% of the overall energy consumption and biomass is being explored e.g. in the form of biodiesel as a more sustainable resource.

(Sinisa N. Dodic, Stevan D. Popov, Jelena M. Dodic, Jovana A. Rankovic, Zoltan Z. Zavargo & Mirjana T. Golusin, January 2010)

The global experience of climate change and how policy and renewable technologies are being used is not untypical and is common to most developing and already developed countries. The following section will explore more closely the UK experience and perception of climate change and the threat it presents.

#### 2.4 The UK and Climate Change

There is still time to reduce the impact we are having on our climate if we act now. But if we don't, the unpredictable weather variations we are already experiencing will become more severe'. (Energy Saving Trust. (2007) Your Impact on Climate Change. <http://www.energysavingtrust.org.uk/>. Accessed 25/07/07).

The effects of climate change can be increasingly seen in our every day lives. During the last forty years, the UK's winters have grown warmer, with heavier

bursts of rain. The summers are growing drier and hotter – one of the starkest changes over the last 200 years is UK summers have become drier causing widespread water shortages. August 2003 saw the hottest temperature ever recorded in the UK of 38.5<sup>0</sup>C, in Kent.

The UK has also experienced more unpredictability and extreme weather patterns, in the form of tornadoes in cities such as Birmingham and flooding now and in recent years which are unprecedented and ill-prepared for events. The most recent floods being experienced in the summer of 2007 saw the city of Tewkesbury being hardest hit, isolating the city by cutting off energy, food, water supplies and transport routes. The UK is now facing an urgent need to invest more in flood defences to adequately address the affect climate change is having. Figure 2.3: Global Images relating to Climate Change provides a collage as a visual representation of our environment. Google Search Engine Images. (April 2007).

FIGURE 2.3 IMAGES RELATING TO CLIMATE CHANGE



We contribute to climate change through the emissions of CO<sub>2</sub>, the most highly produced greenhouse gas. These emissions come from energy we use everyday – at home, when we travel and at our places of work. The average household in the UK creates around 6 tonnes of CO<sub>2</sub> a year which is contributing to our changing climate and damaging the environment. In 2004, the total UK CO<sub>2</sub> emissions were almost 560 million tonnes illustrating that the developed world including the UK is seriously contributing to the problem of climate change.

(Energy Saving Trust. (2007) You're Impact on Climate Change. <http://www.energysavingtrust.org.uk/>. 25/07/07).

## 2.5 UK Progress in addressing Climate Change

The Kyoto Protocol of 1997 became the highly significant global agreement to address climate change and was ratified by 15 EU countries, which alone are responsible for 14% of global greenhouse emissions. Since becoming a signatory Country, the UK is legally bound to meet the target of reducing the six Major greenhouse gas emissions by 12.5% below 1990 levels, by 2008-2012. The UK has also set a target to reduce CO<sub>2</sub> emissions by 20% by 2012 (CO<sub>2</sub> is believed to be a significant cause of global warming, resulting from the large quantities released and the time it remains in the atmosphere).

The Stern Review, released in October 2006, announced that whilst the UK is ahead of the Kyoto target, CO<sub>2</sub> emissions continue to rise. For the current rise in emissions to stop, a reduction of 60% in the UK's CO<sub>2</sub> emissions must be achieved by 2050.

To address the issue of Climate change and reverse the effects of global warming, the UK must take strong, progressive policy decisions, make immediate practice changes and supplant our reliance on fossil fuels. To achieve this aim, the UK Government has agreed a 20% reduction in CO<sub>2</sub> emissions by 2020 during the Summit in Brussels (March 2007) and priorities also include to source 10% electricity from renewable sources by 31 March 2008. The latter will be achieved by purchasing renewable electricity and the self generation of renewable electricity. (Department for Business Enterprise & Regulatory Reform. (2007) Climate Change and Energy.

<http://www.berr.gov.uk/energy/environment/climate-change/index.htm>. Date accessed 12/02/07).

These targets are being facilitated via the UK's Department of Trade and Industry's (DTI) Low Carbon Building Programme which provides match funding for the purchase of renewable energy technology, such as wind turbines and photovoltaic's. (The Carbon Trust Low Carbon Programme. (2007) <http://dti.gov.uk/lowcarbonbuildings/> Accessed February 2007).

This target setting is both timely and emotive, with even the Government's own Chief Scientific Adviser, Sir David King, stating that, in the long term, *"...climate change is a more serious threat to UK interests than even terrorism"*.

Other Governmental bodies also acknowledge the need for immediate change: *"the debate over the science of climate change is well and truly over"*, asserted David Millband from the Department of the Environment, Food and Rural Affairs (DEFRA) on seeing the recent report by the Intergovernmental Panel on Climate Change. He continues: *"Man-made climate change poses an increasing risk to people and businesses across the globe. It will have disastrous consequences if we don't act now."* Whilst he believes that tackling the challenge is both *'achievable and affordable'*, he adds: *"What's now urgently needed is the international political commitment to take action"*. He concluded that *"2007 needs to be the year that the politics starts to catch up with the science – with faster action in all of our countries, and renewed*

*momentum in the drive for agreed action between our countries.*” (Department of Environment, Food and Rural Affairs (DEFRA) (2007) Sustainable Development Notice. <http://www.defra.gov.uk/environment/sustainable/index.htm>. Date accessed 12/02/07).

## 2.6 UK Energy Policy and Strategy

The Government DTI Energy White Paper: “Our energy future – creating a low carbon economy”, details the UK’s current Energy Policy which is summarised below:

- b. As previously detailed, to put ourselves on a path to cut the UK’s CO<sub>2</sub> emissions by some 60% by about 2050, with real progress by 2020;
- c. To maintain the reliability of energy supplies;
- d. To promote competitive markets in the UK and beyond helping to raise the rate of sustainable growth and to improve productivity;
- e. To ensure that every home is adequately and affordably heated.

The Government’s Climate Change programme has taken practical action in the domestic, public and commercial sectors by implementing the following:-

- Introducing mandatory Energy Performance Certificates for the sale/purchase of homes brought in initially for four bedroom dwellings from 1<sup>st</sup> August 2007, to be extended to the rest of the housing market at a later date.
- The Government is working with energy suppliers who, through the Energy Efficiency Commitment, provide grants to householders to help them improve the efficiency of their homes.
- A network of Energy Efficiency Advice Centres provides advice to householders and assists them in purchasing more efficient boilers and fitting loft and cavity wall insulation.
- The Government introduced the Climate Change Levy (CCL), whereby businesses including the public sector, pay an additional tax on their energy use, unless exempted by their use of renewable energy.
- The Renewables Obligation is where electricity suppliers must provide 10% of the energy they sell from renewable sources by 2010.
- Lowering VAT from 17.5% to 5% on some energy saving materials (insulation and heating controls), if they are fitted by professional installers.
- Funding micro-generation grant schemes to the amount of £80 million. This includes the low carbon buildings programme which provides grants towards installing micro-generation technologies.
- Encouraging local authority planning departments to adopt micro-generation targets for new buildings.

- Over 160 Councils have signed up to the Nottingham declaration which shows their commitment to tackling climate change and by actively engaging their communities to be more energy efficient.
- The Carbon Trust is working together with UK business to reduce CO<sub>2</sub> emissions from their transport and business establishments.
- The Government is also working with the Building Industry through the enforcement of Building Regulations, and Best Practice Programmes, encouraging energy efficiency at building design and new build stage.
- The UK is subject to the EU Emissions Trading Scheme 2005, which requires qualifying sites to purchase permits to legally emit CO<sub>2</sub> emissions. The objective is to encourage the site to reduce the amount of energy used; with a commensurate burning of less fossil fuel, utility costs and CO<sub>2</sub> emissions and thereby requiring fewer permits to be procured each year.

(Department of Trade and Industry, UK Energy White Paper (2003) <http://berr.gov.uk/files/file10719.pdf>. Date accessed 25/03/07).

Other European legislation influencing the UK's Energy Policy includes the EU Energy Performance of Buildings Directive (EPBD) 2006, encompassed within the UK's Part L section of the Building Regulations 1991 and its subsequent amendments, the most recent on the 6<sup>th</sup> April 2006. This places more stringent requirements on business for effective building utility management in force and provides a tool for setting minimum energy performance standards and calculating energy use. The performance is demonstrated as a certificate

when the building is sold or leased, and in the case of public buildings, is displayed. The legislation is intended to increase awareness as well as increase investment in the energy efficiency of buildings. (Cunningham, J. (2004 – 2007) Work programme of 49 (East) Brigade Energy Advisor).

In 2007, the Government is taking steady steps in their approach to addressing climate change, setting an example to the rest of the world. As part of its Climate Change Bill, the Government is considering setting a five year carbon cap for the UK, meaning the Government could find itself facing not only court action, but also incurring financial penalties should these targets not be met.

## 2.7 History of Energy Management Practices in the UK

Part of the solution in addressing the impact of climate change is to employ the discipline of 'Energy Management'. Energy management practices have passed through different phases of development over the last 25 years, as a result of technological, social and economic trends impacting upon the work of energy managers.

The management of energy and improving energy efficiency has long been important for industry and commerce. Energy management as a separate discipline began to evolve after the first oil crisis of 1973 and really came into effect after the second oil crisis of 1979 following the Iranian Revolution, when real energy prices rose dramatically. The three phases that best describe the evolution of modern energy management can be identified as:

- Phase 1 – ‘Save it’ (1973 – 1981)

The ‘Save It’ approach came as a response to the sudden increases in energy supplies and problems with supplies. Energy conservation as it was known then was undertaken at the time mostly by engineers as an addition to their existing roles and no commonality in approach existed, in addressing the issue. Investments in energy saving technologies were in its infancy and the encouragement of staff to ‘switch off’ through the promotional material was seen to have limited results. Energy supplies were almost totally from the nationalised utilities, British Gas, British Coal and the 12 Regional Electricity Companies which gave little scope for negotiating more competitive energy prices for large energy users.

- Phase 2 – ‘Manage It’ (1981 – 1993)

This period saw the development of ‘Energy Management’ as a separate recognised discipline and the rise of full time Energy managers. The UK also supported regional energy management groups which were a successful way of spreading information, sharing resources and best practice. The term ‘Energy management’ was more commonly used to describe the discipline and effective energy models were developed to allow wider implementation. These models exist now and involve the basic ‘Energy Analysis’ Technique

## ENERGY ANALYSIS TECHNIQUE

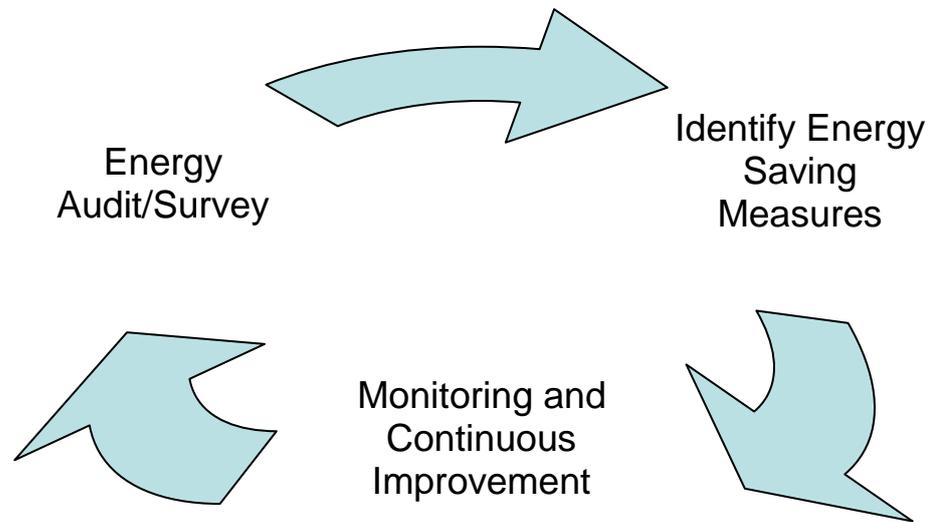


Figure 2.4. Fawkes, Dr Steven, Energy Analysis Techniques. History of Energy Management. <http://www.vesma.com>. Date accessed 25/07/07.

The Energy Analysis process includes conducting an energy audit and survey to collect utility and billing information to establish the energy profile of a building or site to confirm the energy baseline and any periods of energy wastage. The energy survey is the physical inspection to identify the outputs of the energy use and where energy is wasted. This may be prioritised by having the energy audit information before hand and energy saving measures may be identified at this stage. The identification and implementation of energy saving measures and technologies follows to readdress the balance between the amount of energy used and the amount of energy needed. Energy use requires monitoring to confirm the benefits of any actions taken

through the intervention of energy saving measures. This will allow any further action required to be identified in line with energy reduction targets.

Computerised Monitoring and Targeting systems were also being developed during this period, which enabled utility bill analysis and the monitoring of energy consumption. 'Energy Performance Indicators' were also being devised, as a guide to what building's energy requirements should be, to allow high consuming buildings to be identified. 'Building Energy management Systems' (BEMS) were also becoming available, so organisations with large building portfolios, such as local authorities and the Ministry of Defence (MoD), could manage their heating and electrical controls centrally. Energy management consultancy services were on the rise and energy auditing and project management could be bought in to establish and accelerate an organisation's energy management programme.

- Phase 3 – 'Purchase It' ( 1993 – 2000)

During this period, Energy management entered a decline in popularity which came as a result of a reduction in energy prices following the decentralisation of the energy market in the UK during 1994 - 1998. This meant both the domestic and business sectors now had the ability to shop-around for a gas or electricity supplier and could move away from the monopoly of their regional electricity and gas suppliers to benefit from more competitive rates. This gave less return on

investment in energy saving measures and greater savings with less risk could be achieved from energy procurement. Government activity shifted away from financial subsidies to encouraging management approaches through management tools and voluntary agreements such as 'Making a Corporate Commitment'. This became a way of instilling an energy management culture into and marketing an organisation to demonstrate their commitment to energy management. Energy management became absorbed into an organisation's environmental programme, but left much potential for improved efficiency remained untapped.

The UK currently finds itself in a Fourth Phase spanning the year 2000 to 2010, which can be best entitled – 'Response to the Climate Change Issue'. The UK has felt the effects of fiscal measures such as the Climate Change Levy (CCL) tax, which levies additional costs on utilities, to encourage companies to make clear commitments to reduce energy consumption and their overheads or face the penalties of failing to do so. The Carbon Trust and The Energy Saving Trust are the Government organisations responsible for running programmes to step up support to the business and domestic sectors for renewables and energy efficiency as global warming becomes more of an issue. Additional carbon credit schemes and environmental taxes may well be introduced in the near future.

The Carbon Reduction Commitment (CRC) is indeed leading the way from 2010 and the Government mandatory carbon credit scheme is not only

encouraging the public and private sector to reduce their CO<sub>2</sub> emissions through investment in technology but there must be an overall commitment to a strategy, to manage their requirement for carbon credits and future energy requirements to avoid financial penalties. Cal Bailey, Sustainability Director with the company NG Bailey also explains there are three priorities; the first is to measure energy consumption which is increasingly required by law and allows for effective energy management and control. The second is to manage this lower energy use of buildings. Poorly maintained and monitored buildings waste energy and generate unnecessary cost and carbon emissions. The third priority is engaging stakeholders and the workforce and creating a culture to encourage people to get behind a carbon reduction strategy. (Modern Building Services Journal: March 2009 Pg 9)

The future (2010 - 2020) is looking ahead towards a drive for 'Clean Technology'. The uptake of renewable energy sources being more widely available is integral to the Government's Energy Strategy and targets for energy reductions. Technological innovations in advanced clean technologies such as Fuel cells are under development and should be available to main stream users.

(Fawkes, Dr Steven. (2007) History of Energy Management. <http://www.vesma.com> Date accessed 25/07/07).

## 2.8 Public Sector Energy Management Practices

Public sector organisations such as local authorities, universities, hospitals and the Ministry of Defence are becoming increasingly at the fore of energy management due to their responsibility for providing local services as Government departments, being funded by the tax payer and their key place within the local community. This may be through their ability to procure competitively priced utilities, working with local organisations to promote domestic energy efficiency, social, environmental and health issues or putting an energy management programme in place for their own building portfolio.

The Government agency, the Carbon Trust provides a number of services to public and private organisations and promotes 'a structured and formal energy management policy'. It provides advice and support in implementing such a policy and getting top level organisational commitment, motivating staff to save energy in the workplace, identifying good housekeeping methods, understanding where and how energy is used within an organisation and how utility metering and consumption monitoring is key.

(Source Carbon Trust Website,  
[http://www.carbontrust.co.uk/energy/startsaving/tech\\_energy\\_management\\_introduction](http://www.carbontrust.co.uk/energy/startsaving/tech_energy_management_introduction) Accessed 06/09/2009)

Examples of public sector organisations and their approach to energy management practices will now be documented.

Bristol City Council has a designated Energy Management Unit (EMU) which has implemented the city council's Energy Strategy 2007. Targets include a 10% reduction in energy consumption, produce 15% of the city council's electricity from renewables and achieve the Government's 60% reduction in CO<sub>2</sub> emissions. The city council has signed the Nottingham Declaration on Climate Change which links their policies and achievements into a national agreement. They are driving down energy consumption and costs by investing in energy saving measures, energy awareness raising and training and investment in renewables such as the wind project at Avonmouth, a prime location for taking advantage of wind power. (Bristol City Council: Sustainability: Energy Management. Source <http://www.bristol.cov.uk/ccm/content/Environment-Planning/sustainability/energy-management> Accessed 06/09/2009)

The University of Glasgow has made a commitment to the protection of the environment, conservation of natural resources and to sustainable development. Their main tool has been an energy awareness campaign to their building users to cut utility costs and promote good practice. The university has invested £2.5m in the last 12 years into sustainability projects to improve the energy efficiency and sustainability of their academic buildings. University of Glasgow: Energy awareness (Source <http://www.gla.ac.uk/events/energy> Accessed 16/10/09)

Guy's and St Thomas' Hospital launched their 'Earthcare and Energy Campaign' in 2007. The aim is to reduce their CO<sub>2</sub> emissions by 10% by 2011 and awareness amongst staff, all supported by top level management. Changes in staff behaviour were monitored before and after the campaign, to measure the success of the campaign, which includes energy awareness training for staff by mentors across the organisation. Nifes Consulting Group. (Source <http://www.nifes.co.uk/casestudies05.html> Accessed 04/10/2009)

## 2.9 Auditing Tools

As environmental management has become a core issue for many sectors, including local government, a growing number of local authorities are recognising the benefits of implementing a robust and externally certified environmental management system (EMS). A local authority can use an EMS to help reduce its environmental impacts, improve resource efficiency, reduce costs and demonstrate that it is managing its environmental risks and liabilities responsibly. It is more thorough than an ad-hoc basis such as recycling paper, using low energy light bulbs or installing low-flush toilets because it puts management systems in place which are audited regularly, to ensure that the council has a genuine and positive impact on the environment.

Government recommends that all types of organisations, including public sector bodies, should use a robust and credible EMS, which is externally certified to a national or international standard and be audited by an

independent certifier accredited by the United Kingdom Accreditation Service (UKAS). There are the following recognised standards:-

- ISO 14001: This international standard for environmental management systems which specifies the requirements necessary to identify, evaluate, manage and improve performance.
- BS EN 16001: 2009 Energy Management Systems has recently been introduced to enable organisations to establish systems and processes to improve energy efficiency, rather than look at the whole environmental picture as part of one accreditation.
- Eco Management and Audit Scheme (EMAS): EMAS is a voluntary EU wide scheme, which requires organisations to produce a public statement and focuses on legislative compliance.
- BS8555: A new British Standard allows phased implementation of an EMS leading to full accreditation to ISO14001 or registration for EMAS. Breaking up ISO 14001 into specific stages makes it much easier for organisations with limited resources to put in place an EMS.
- Carbon Trust Standard previously known as the Carbon Trust's Energy Efficiency Accreditation Scheme (EEAS).

(Institute of Environmental Management & Assessment. (iema)  
[http://www.iema.net/ems/local\\_publicauthinfo/](http://www.iema.net/ems/local_publicauthinfo/) Accessed 16/10/09)

Commonly private organisations have the finance to spend on the more expensive ISO14001 accreditation where public organisations may choose to accredit departments at a time to segment the cost or go for the EMAS or CTS.

An example of a public sector organisation who has achieved EMAS accreditation is the local authority Rushcliffe Borough Council, Nottinghamshire. It has shown its level of commitment in reducing its energy use by its accreditation and their EMAS annual public statement. They have achieved a reduction in CO<sub>2</sub> emissions of 402 tonnes over the last three years by setting targets to reduce CO<sub>2</sub> emissions and the environmental impact from their operational buildings, reducing consumption of finite fossil fuels via energy saving measures and good housekeeping, increasing use of renewable energy and reducing water consumption. The council has produced an Energy Strategy 2000/10 for a ten year period, to adopt a target a 10% reduction in CO<sub>2</sub> emissions. (Energy Strategy – Rushcliffe Borough Council, Source <http://www.rushcliffe.gov.uk/doc.asp?cat=10218> Accessed 16/10/09)

In 1991, Leeds City Council adopted its Green Strategy with the aim of integrating environmental concerns into its daily work. Two years later Leeds was designated as an 'Environment City'. In 2002 Leeds City Council registered for EMAS becoming the largest EMAS registered public sector organisation in Europe.

To become EMAS compliant Leeds City Council has had to analyse the way it deals with all significant environmental aspects including waste, energy efficiency and the protection of the countryside.

(EMAS – The Eco Management and Audit Scheme. Source [http://ec.europa.eu/environment/emas/local/projects\\_en.htm#pr1](http://ec.europa.eu/environment/emas/local/projects_en.htm#pr1) Accessed 18/10/2009)

The Carbon Trust Standard, previously known as the Carbon Trust's Energy Efficiency Accreditation Scheme (EEAS) has been developed to not just include the audit of energy management practices but to extend to an accredited environmental management system. The financial group HSBC became the 100<sup>th</sup> accredited Carbon Trust Standard Company and have demonstrated their management systems have cut CO<sub>2</sub> emissions.

(The Carbon Trust Standard. Source (<http://www.carbontruststandard.com/latestnews/Inthenews/tabid/166/language/> Accessed 16/10/2009)

Harry Morrison, from the Carbon Trust has explained the importance of independently audited energy management practices and the expression 'Green washing' by companies and businesses. This is used to describe the experience that the general public as consumers who are undergoing a media bombardment of the green credentials advertised by many organisations. It has become confusing to really recognise what their green credentials are and their achievements in reducing CO<sub>2</sub> emissions. There is no way of measuring one company against another, without some kind of unbiased monitoring and audit process. This is where the Carbon Trust Standard comes in, so consumers can gain trust in what a company, business or public sector

organisation claims in relation to reducing its environmental impact. (Energy World Journal: December 2008. Energy Institute, Pg 14)

The Highland Council is one of only three Councils in Scotland to receive Carbon Trust Standard certification in recognition of the progress it is making in reducing carbon emissions. Since 2006-7, CO<sub>2</sub> from Council buildings have reduced by 12%. The Council has recently undergone a formal assessment by the Carbon Trust to demonstrate how it has been measuring; managing and reducing CO<sub>2</sub> emissions through initiatives such as its Energy Management and Performance Plan (EMPP) and the Carbon Management Strategy and Implementation Plan.

(The Highland Council. Source <http://www.highland.gov.uk/yourcouncil/news/newsreleases/2009/February/2009-02-10-04.htm> Accessed 18/10/2009)

The Spirit Group, part of the Taverns Company has also received audits on 51 of their pubs identifying behavioral and technical solutions to reduce their energy usage and carbon emissions. This Carbon Management plan by the Carbon Trust then rolled out this scheme to all 850 pubs to show that the Spirit group could save 17% of its projected energy costs by 2010, saving 24,000 tonnes of CO<sub>2</sub> a year. This case study shows the true value of the auditing process common in many energy or environmental management schemes. (Energy World Journal: December 2008, Energy Institute Pg 14)

It is now widely accepted that Europe-wide standards are on their way to helping organisations set up processes and systems to improve energy efficiency. Prof Martin Fry looks at progress in this area and concludes that the development of the first European Standard for 'Energy Management Systems', BS EN 16001, comes at a time when it is more critical than ever to evaluate and manage the energy being used within the everyday operations of a business or service. (Energy in Buildings & Industry Journal, October 2009 Issue)

## 2.10 Concluding Remarks

The UK Government is taking action in addressing Climate change but the UK needs to step up the pace of its programme to meet the 60% reduction in CO<sub>2</sub> emissions target by 2050. A cultural change is needed, encouraged by financial incentives and more central Government investment in the domestic and business sectors.

Energy management practices have evolved over the last 25 years in the UK and similarly this evolution has occurred in the MoD and the Army; particularly during the last few years. It is now apparent that the need for energy management is increasing in 2007. This can be reinforced by the current climate of increasing energy prices and the said effects of Climate change in the UK, in the form of the erratic unpredictable weather being currently experienced, e.g. heavy summer rainfall with subsequent flooding and tornados.

The UK's approach to the issue of energy management has a direct impact on how public organisations such as the Ministry of Defence (MoD) conduct their business and execute their energy policy and strategies. Public organisations have a varied building portfolio to manage and responsibility for their environmental impact on their local communities. The UK's Energy Policy and Strategy are providing the policy direction for the MoD to address the issue of their energy use and subsequent CO<sub>2</sub> emissions. The issue of Climate change from the effects of global warming needs urgent attention and action by the MoD. Greater investment is needed to help deliver the UK's and MoD's energy policy.

The article entitled 'Financing energy saving technologies in the public sector' in Energy World October 2009 issue, the Energy Institute's Journal explains how a new finance mechanism is being opened up by the Government to the public sector. The Government has come to realise that lack of up front investment in energy saving and carbon reduction measures is as much a barrier in the public sector, if not more so than in other organisations. This funding in the form of interest free loans if the project criteria is met, to be repaid over a four year period provided that organisations deliver energy efficiency savings and reduce costs. 1,800 projects have so far benefited across the public sector from the Government's SALIX Finance. (Energy World Journal: October 2009. Energy Institute)

It is documented that a number of public organisations are addressing their own energy use as well as encouraging energy efficiency within their communities through a number of methods. It is also clear that an ad-hoc basis is no longer sufficient but a more structured plan and audited processes are needed to address the issue of climate change and that the need to use our natural resources and energy more wisely, is essential in preserving our future needs.

Many public organisations such as Local authorities, Universities and the Ministry of Defence have done or plan to employ the equivalent of the Eco – management and Accreditation Scheme or the Energy Efficiency Accreditation scheme (EEAS) now Carbon Trust Standard (CTS) to gain national and European accreditation. This involves an audit of their management processes to demonstrate their responsible management of their energy, waste and transport streams with a continual review and improvement required. This correlates with the Army's intention to utilise an auditing process to become accredited to the Carbon Trust Standard (CTS) (formerly Energy Efficiency Accreditation scheme (EEAS) for their energy, waste and transport management practices. This is in readiness for the obligations of the Carbon Reduction Commitment (CRC) coming into effect in the UK in April 2010. This will assist the Army in reducing the financial impact the carbon permit system will have on the organisation.

To set the scene in investigating energy management practices within the public sector in greater detail, the next Chapter will investigate the organisational structure of the MoD and in particular the Army.

## CHAPTER THREE

### The Ministry of Defence and British Army

#### 3.1 Introduction

The Ministry of Defence (MoD) is responsible for the defence infrastructure in the UK and comprises of the services, the Royal Air Force (RAF), the British Army (Army) and the Royal Navy (RN). These 'Tri-services' form the defence network for air, land, and sea respectively.

It is important to document the structure of the MoD and in particular the Army, to fully appreciate the complexity of the organisation and illustrate the extent of its environmental impact as a result of its energy requirements. Thus this structure will have an impact on the energy management practices in place to manage and control energy usage and resultant carbon dioxide (CO<sub>2</sub>) emissions.

#### 3.2 The Ministry of Defence

The MoD is both a policy-making Department of State, like any other central government department, as well as being the highest level military headquarters in the UK, providing political control of all military operations. The MoD Headquarters (HQ) is located at Whitehall, on the River Thames in London and is responsible for managing the financial resources for the Armed

Forces which comes to a total of £30 billion per year. Within it and across the MoD, military and civilian personnel work together to deliver Britain's defence mechanism.

The MoD comprises of three Services referred to as the 'Tri-Services', the RAF, Army and the RN, headed by the Secretary of State, the Rt Hon Des Browne MP. The other Ministers responsible for the UK's Defence network include the Minister of State for the Armed Forces, Adam Ingram MP, Minister of State for Defence Equipment and Support Lord Drayson and Under-Secretary of State for Defence and Minister for Veterans Derek Twigg MP. The Government Ministers are supported by the Chief of the Defence Staff and their military advisors and senior officials. The Chief of the Defence Staff is the professional head of the UK Armed Forces and the principal military adviser to the Secretary of State for Defence and the Government. Within his staff are the Professional Heads of the RAF, the Army and the RN. (Ministry of Defence (2007) The Ministry of Defence Internet Home Page. <http://www.mod.uk>. Accessed June 07)

### 3.2.1 The Ministry of Defence Vision

The vision of the MoD is called the 'Defence Vision' which details the key principles which provide the basis of work for Defence:-

- Defending the United Kingdom and its interests.
- Strengthening international peace and stability.

The main objective of the MoD is to be a force for good in the world by the Tri-Services working together on core tasks to produce battle-winning people and equipment that are:

- Fit for the challenge of today.
- Ready for the tasks of tomorrow.
- Capable of building for the future.

The MoD has stated:-

“We have shown we succeed in what we do. We must continue to adapt to a more uncertain world. We will be flexible and creative, harnessing new technologies and ideas to make best use of our resources”. (Ministry of Defence (2007) The Ministry of Defence Internet Home Page. <http://www.mod.uk>. Accessed June 07)

The Ministry of Defence and in particular, the RAF, the RN and the Army infrastructure and their functions have been investigated in greater detail.

### 3.2.2 The Royal Air Force

The RAF provides flexible air power wherever it is needed and to achieve this, the RAF has a wide variety of specialist aircraft in its inventory. The RAF's vision is *'An agile, adaptable and capable Air Force that, person for person, is*

*second to none and that makes a decisive air power contribution in support of the UK Defence Mission*'. The RAF provides air support to Army operations and is coordinated within the MoD. (Ministry of Defence (2007) The Ministry of Defence Internet Home Page. <http://www.mod.uk>. Accessed June 07)

### 3.2.3 The Royal Navy

The RN and its fleets are deployed in home waters as well as across the world on operations and humanitarian missions. The fleet comprises of Trident missile-equipped submarines whilst other hunter-killer submarines are on patrol in various locations and its fleet ships, HMS Ark Royal is currently the Fleet Flagship. The Royal Navy is made up of different factions including the Royal Marines which includes the Commando Group and the Fleet Air Arm which provide search and rescue and Lynx helicopter flights to ships. The RN is also supporting the Army operation 'OP TELIC' in the Middle East. (Ministry of Defence (2007) The Ministry of Defence Internet Home Page. <http://www.mod.uk>. Accessed June 07)

### 3.3 The British Army

The Army will be examined in particular detail, as the focus of this study. The Army's fighting capability ensures that the UK has the means and the will to fight if and when required. There are 70,000 Regular soldiers, 10,000 civil servants and 40,000 Territorial Army (TA) soldiers in the Army. The Army is commanded by 'Land Command', the HQ based in Wiltshire and the overall

military head is the Commander in Chief (CinC). (British Army. Land Command Intranet Homepage, 2007. <http://www.army.r.mil.uk/plans/land/pages/index.htm>. (Accessed March 07)

Land Command is in command of the factions or departments within the Army, which provide the essential organisational functions for the Army to operate successfully. These factions are referred to as 'Corps', examples of which include the Intelligence Corps which provides intelligence and security support, Adjutant General Corps providing personnel and manning support and the Royal Logistics Corps which provides the logistics support capability for the Army.

The main Corps of the Army include:-

- Household Cavalry and Royal Armoured Corps (RAC)
- Army Air Corps
- Royal Regiment of Artillery
- Corps of Royal Engineers
- Royal Corps of Signals
- Intelligence Corps
- Royal Army Chaplain's Department
- Royal Logistic Corps
- Royal Army Medical Corps
- Royal Army Dental Corps
- Corps of Royal Electrical and Mechanical Engineers

- Adjutant General Corps
- Royal Army Veterinary Corps
- Small Army School Corps
- Army Physical Training Corps
- Queen Alexandra's Royal Army Nursing Corps
- Corps of Army Music
- Territorial Army

The Army's operations are coordinated by the Corps working together and demand a significant budget which is currently in the region of £5 Billion to carry out their operational commitments. Land Command has Regular and TA soldiers operating in the UK and deployed on active tours of duty worldwide, in locations such as Iraq, Afghanistan and the Balkans. These operations are given an operational name, for example the current Army presence in Iraq is known as Op TELIC, 'Op' being short for 'Operation'. Op HERRICK is the Army initiative in Afghanistan. The Army has other operations and detachments in other countries including Belize, Sierra Leone, Cyprus, Nepal, Gibraltar and Brunei, conducting inter country operations, projects and support to local communities. (British Army. Land Command Intranet Homepage. (2007) <http://www.army.r.mil.uk/plans/land/pages/index.htm>. (Accessed July 07)

### 3.4 Organisational Structure of the British Army

Land Command is responsible for both the Regional Forces and the Field Army. These two branches form the main structure of the Army and are subdivided into regional Army Divisions, which receive their military orders and direction from Land Command. The Regional Forces arm of the Army is led by Commander Regional Forces (CRF) and comprises of 2<sup>nd</sup> Division, 4<sup>th</sup> Division, 5<sup>th</sup> Division, London District, UKSC (G) Web which is the Home of United Kingdom Support Command (Germany), HQ Adventurous Training Group (Army) and the Army Infrastructure Organisation (AIO). The Field Army are organised into the 1<sup>st</sup> (United Kingdom) Armoured Division, 3<sup>rd</sup> (United Kingdom) Division, HQ Theatre Troops, HQ Field Army and Training Branch, and the Land Warfare Centre Command. (British Army. Land Command Intranet Homepage, 2007. <http://www.army.r.mil.uk/plans/land/pages/index.htm>. Accessed July 07)

#### 3.4.1 British Regional Forces

The Army's Regional Forces are the focus of the study, as they provide the main regional infrastructure of the Army in the UK. The AIO is the main organisation within Regional Forces responsible for promulgating energy management practices adopted by its Army Divisions. The AIO has a number of departments covering the Infrastructure Development, Commercial, Estate Plans, Facilities Management and Utilities & Sustainable Development (U&SD) concerns of the Army. (British Army. Land Command Intranet Homepage,

2007. <http://www.army.r.mil.uk/plans/land/pages/index.htm>. Accessed July 07)

It is within the U&SD department that utilities and energy management policy and strategy are developed and implemented by Land Command through the Chain of Command. The Army's Regional Forces are organised into Army 'Divisional' areas located within the UK and Germany. The 1<sup>st</sup> Division being UKSC(G) is located in Germany, and the 2<sup>nd</sup>, 5<sup>th</sup> and 4<sup>th</sup> Divisions run from North to South of the UK in this order. Maps detailing the geographical position of the Divisions on the UK Map in 2004, post 2007 and as predicted in 2012 as detailed in the Appendices Pg 137.

A recent reorganisation in 2007 has seen the changes in Divisional Boundaries described above. The UK has now been divided into three bands with 2<sup>nd</sup> Division covering Scotland, 5<sup>th</sup> Division in the centre running from Wales across to East Anglia and 4<sup>th</sup> Division covering the South East and South West, with London District remaining. The change has seen a geographical alignment being drawn to simplify the Divisional boundaries of the Army, but this re-alignment has seen Army Divisions undergo change in their geographical areas of responsibility. (British Army. Land Command Intranet Homepage, 2007. <http://www.army.r.mil.uk/plans/land/pages/index.htm>. (Accessed July 07)

### 3.4.2 British Army Divisions in the UK

The UK Regional Forces Divisions include the three Divisions and London District. These Divisional boundaries are further split down into regional Army Brigades. Each Division area has an average of four regional Army Brigades under its command and a single Brigade can cover a number of Major sites over a substantial geographical area or be a more condensed area similar to the size of a town, such as an Army Garrison. A regional Army Brigade has administrative (ADMINCOM) and some operational (OPCOM) responsibilities for its resident units which occupy the Major sites known as Army camps. OPCOM responsibility means that the Brigade will be in direct command of the 'units' resident at those particular Major sites, where ADMINCOM responsibility means they have no authority over these units, providing administrative support only. The Brigade areas will have smaller sites and buildings within their responsibility in addition to their Major sites, including TA and Army Cadet Centres.

For the purposes of this study, the term "Unit" is a generic term and is an organisation that may vary considerably in size, ranging from a small specialised organisation of tens of people, up to a Battalion size strength of up to 600/700 personnel. A unit is responsible for the site management of the Major sites within the regional Brigade boundaries. (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

## The UK Regional Forces Divisions:-

- 2<sup>nd</sup> Division

The 2<sup>nd</sup> Division is based in the North of the UK and Scotland has responsibility for 15 (North East) Brigade, 42 (North West) Brigade, 51 (Scottish) Brigade and Catterick Garrison. The remaining Divisions, the 5<sup>th</sup> and 4<sup>th</sup> Divisions of the Army are the focus of this study.

- 5<sup>th</sup> Division

Post April 2007 sees the 5<sup>th</sup> Division having divisional command for three regional Army Brigades and an Army Garrison. 5<sup>th</sup> Division is responsible for 160 (Wales) Brigade, the HQ in Brecon, 143 (West Midlands) Brigade based in Shrewsbury which is also the HQ of 5<sup>th</sup> Division, 49 (East) Brigade the HQ of which are in Nottingham and Colchester Garrison. For the purposes of this study, HQ 49 (East) Brigade is the Brigade under particular focus.

- 4<sup>th</sup> Division

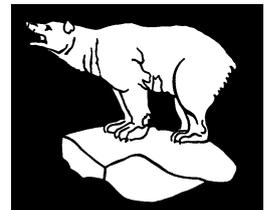
The 4<sup>th</sup> Division has three regional Army Brigades in the UK, 2 Infantry Brigade, 43 Wessex Brigade and 145 Home Counties Brigade. The Division has two detachments abroad, the British Gurkhas, Nepal and Brunei Garrison.

- London District

The London District can be compared to a Garrison, but covers the district of the City of London. It is responsible for the same level of operational activity as other Divisional areas and is to deliver the necessary military capability, recruiting, infrastructure and Army in society activity in order to meet the Commander in Chief's (CinC's) operational requirements.

(British Army. Land Command Intranet Homepage, 2007. <http://www.army.r.mil.uk/plans/land/pages/index.htm>. Accessed July 07)

### 3.5 Regional British Army Brigade: Headquarters 49 (East) Brigade



HQ 49 (East) Brigade, is a regional Army Brigade within 5<sup>th</sup> Division based in Nottingham and covers the East Midlands and East Anglia. It is the regional Army Brigade which forms the main focus of this study. Figure 3.5, (Pg 165) illustrates the location of the Brigade within 5<sup>th</sup> Division boundary area. (British Army. Land Command Intranet Homepage, 2007. <http://www.army.r.mil.uk/plans/land/pages/index.htm>. Accessed 15/06/07).

FIGURE 3.1. 5<sup>TH</sup> DIVISION BOUNDARY AREA. APRIL 2007



A regional Army Brigade is typically a busy organisation with a number of functions and corresponding branches. These branches have a number of functions including training, managing TA and Cadet Organisations, the administration of the Brigade's HQ operations, providing transport and equipment, to emergency planning for the Brigade area for fire and flooding incidences. The work associated with a Brigade HQ is varied and requires skilled military and civilian staff to fulfil these obligations on behalf of the Brigade Commander.

The Brigade's energy management practices have been adopted and developed during the last four years and the Brigade makes reference to its commitment to energy management in its Brigade Plan.

The Brigade has gone further by devising specific strategy to achieve good energy management practices in the form of the Brigade's Energy Strategy 2005. The Brigade has nine Major sites within its boundaries for which it has administrative responsibility for and provides energy management support to the site's Energy manager via the Brigade's Energy Advisor post. The Brigade's Major sites and their main resident units are detailed in table below, the locations of which are illustrated in a Map of 49 (East) Brigade's area detailing the Regular units. (Pg 140 of the Appendices). (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

**49 East Brigade Major Sites and Units**

<b>UNIT</b>	<b>MAJOR SITE</b>
3 <sup>rd</sup> Battalion of the Duke of Lancaster Regiment	St Georges Barracks, North Luffenham, Rutland, Leicestershire
The Light Dragoons	Robertson Barracks, Swanton Morley, Norfolk
HQ Chilwell Station	Chetwynd Barracks, Chilwell Station, Chilwell, Nottingham
HQ ATR Bassingbourn	ATR Bassingbourn, Royston, Hertfordshire
5 Training Regiment RLC	Prince William of Gloucester Barracks, Grantham, Lincolnshire
33 Engineer Regiment	Carver Barracks, Wimbish, Saffron Walden, Essex
39 Engineer Regiment	Waterbeach Barracks, Cambridge
DISC Support Unit	Chicksands, Shefford, Bedfordshire
DTE (East) Stanta	West Tofts Camp, Thetford, Norfolk

### 3.5.1 Background: Headquarters 49 (East) Brigade

49 (East) Brigade was born out of 49 Division which was formed on the 1<sup>st</sup> April 1908; one of 14 Territorial Divisions and the Division that became the 49<sup>th</sup> was the West Riding Division.

The 49<sup>th</sup> Division comprised of three Infantry Brigades which saw extensive action during the First World War at Ypres and the Somme. The Division returned to action in World War Two as part of AVON FORCE in Norway. It occupied Iceland in May 1940 and it was there that the Divisional Polar Bear insignia was introduced.

The famous white polar bear, the Brigade's emblem, originally appeared in a natural attitude – face lowered to look into a hole in the ice, preparing to grasp his next meal. Whilst it was known that Polar Bears hunt fish with their heads down to see claw and grasp their prey; they also lower their heads before charging. But it was in 1943, that the then General Officer in Command (GOC) Major General Bubbles Barker felt that the lowered head indicated a lack of martial intent. He wrote: 'The Bear is too submissive. I want a defiant sign for my division, lift its head up and make it roar.' So, 16,000 soldiers were issued new aggressive Polar Bear badges.

The Division remained in Norway for two years before returning to England to prepare for the invasion of Europe. The Polar Bears became notorious to German troops and merited a vicious attack by Lord Haw Haw, the nickname given to William Joyce, a German radio propaganda broadcaster during World War II and the Normandy campaign. He called them the Polar Bear Butchers

and the insult formed the basis of a 49<sup>th</sup> Divisional Christmas Card for 1944. The Division returned to Nottingham in April 1947 as an Armoured Division, reverting to its infantry role in 1956 before being disbanded in 1967.

The 49<sup>th</sup> Infantry Bde was reformed in 1982 and comprised 5000 TA soldiers from units across the UK. 49 (East) Brigade was formed on the 1<sup>st</sup> April 1995 following the merger of 49 (East Midlands) Brigade and 54 (East Anglia) Brigade who were based in Colchester.

Speaking at a Polar Bear Dinner in 2006, the Brigadier said: “For me, the Polar Bear symbolises the best of the British Army – a formation that has always drawn its soldiers from the society that it represents, forged them into effective professional military force and sent them on their way to do the Queen’s business – either in France in 1914, in France again in 1944, or as today in Iraq and Kabul. We now hold the baton of this reputation and we should be proud to do so. We each have in our hands the reputation of an Army that dominates the world stage, respected by friends and foe alike. We also hold the reputation of the polar bear..... and our polar bears remind us daily of this duty.” (HQ 49 (East) Brigade Intranet Homepage, 2007. [www.army.r.mil.uk/plans/land/pages/index.htm](http://www.army.r.mil.uk/plans/land/pages/index.htm). Accessed 28/07/07)

### 3.6 Concluding Remarks

The organisational structure and geographical location of the Army, its Divisions and regional Army Brigades sets the scene of this study. It also highlights how the MoD and the Army conduct their business and indeed how

they are able to execute and implement their energy policy and strategy across the military chain of command within this structure. These energy management practices are to be studied in greater detail at regional Brigade level within the 4<sup>th</sup> and 5<sup>th</sup> Divisions in the next Chapter, with particular reference being given to HQ 49 (East) Brigade.

In 2007, the Brigade has a large geographical area under the command of the Brigade Commander, covering 12 Counties across the East Midlands and East Anglia. There are nine Major sites dispersed across this particular Brigade which reflect the main energy use for that area. Despite the Brigade's steeped military history, it continues to evolve and is facing the challenges of war and peace time in the 21<sup>st</sup> Century which include the threat and challenges climate change poses. The Army and its Brigades need to give a robust response to their own environmental impact as well as how they will need to serve the community, as part of future emergency planning against the affects of climate change.

## CHAPTER FOUR

### Energy Management Practices in the British Army

#### 4.1 Introduction

Perhaps not surprisingly, as the largest of the Tri-services, the British Army (Army) is the greatest energy consumer of this large public sector organisation and has a hugely significant impact on the UK's environment. Figure 4.1 details the Army's Energy Profile 2001 – 2011. (Army Infrastructure Organisation (AIO). (25 April 2006, AUEC/EARWIG PowerPoint presentation)

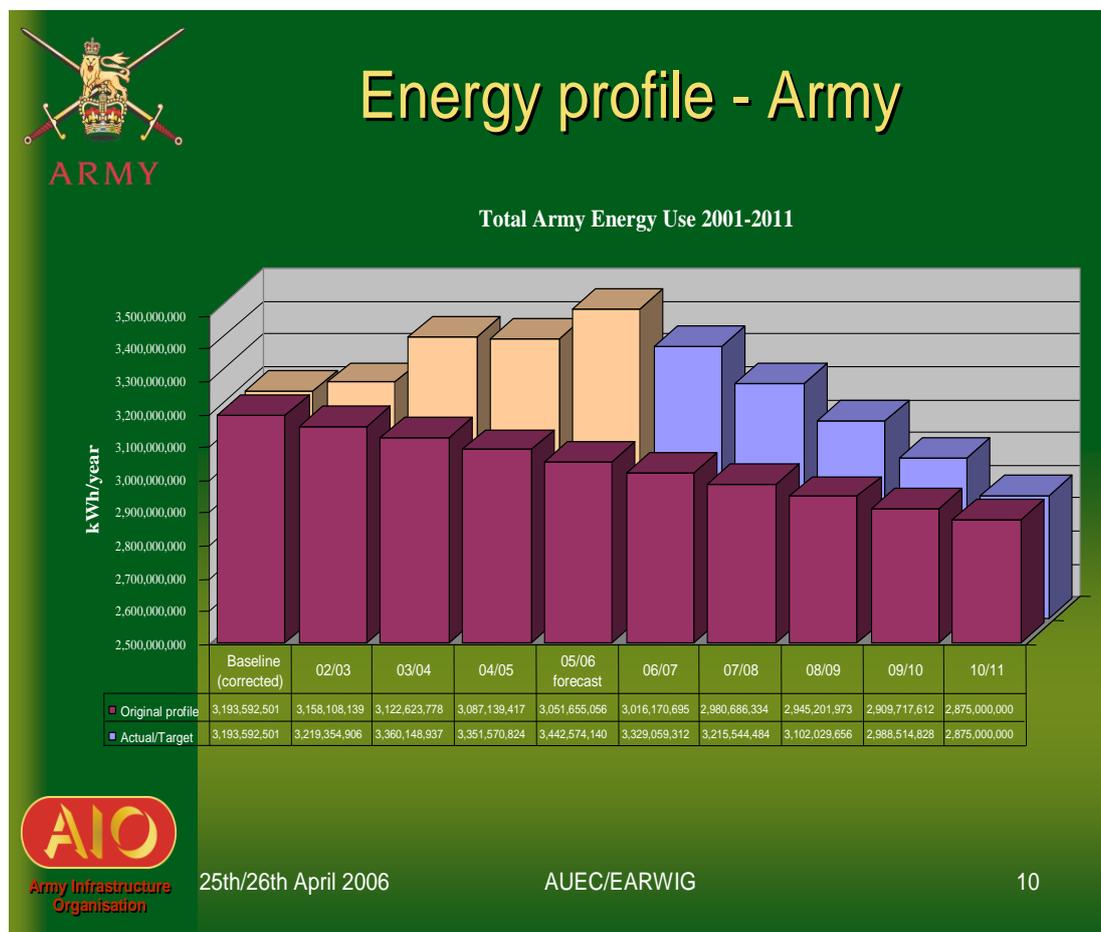


Figure 4.1: Energy profile – Army 2001 – 2011. Army Infrastructure Organisation (AIO)

With its infrastructure spread across the UK in the form of Army camps, sprawling Garrisons the size of towns and isolated buildings such as Territorial Army (TA) Centres. It is a Major contributor to carbon dioxide emissions (CO<sub>2</sub>); responsible for 26.2% of CO<sub>2</sub> and 38.7% of CO<sub>2</sub> emissions from the Government Estate (2003/04) amounting to 875,000 tonnes released each year. (Army Infrastructure Organisation (AIO) (25 April 2006) AUEC EARWIG Army Utilities Directive PowerPoint presentation).

The Army's energy consumption detailed above in Figure 4.1 shows the Energy cap placed upon the Army by Land Command and its performance against this benchmarked energy allocation.

#### 4.2 History of Energy Management – The British Army

The last thirty years have seen an increasing awareness relating to the problem of climate change and the phenomenon of global warming in the UK. The causes of global warming and climate change as detailed in Chapter Two are principally the production of CO<sub>2</sub> emissions from the use of fossil fuels for energy production. The Army as a significant energy user attracted a review by the Defence Utilities Policy and Review Group (DUPARG) over five years ago, which revealed that the Ministry of Defence (MoD) was suffering from inefficiencies in its energy management procedures. This was a damning

assessment of the Army at the time and became an important catalyst for change.

The Utilities & Sustainability Development (U&SD) development that were called the Army Utilities Management Branch (AUMB) at the time, part of the AIO, responded by establishing energy policy and procedures in place and this was headed by Project 'ENMAN'. This put the requirement for Divisional and Brigade Energy Advisors in place to address the lack of energy management practices in the Army at the time.

The Estates Utility Board (EUB), the Defence Estates Committee, has replaced DUPARG and is the organisation now charged with providing the strategy for utilities and energy management across the MoD. The U&SD department have defined the term 'Utilities' or 'Energy' to be of the same meaning in the context of the MoD and are used collectively to cover energy and water consumed in MoD buildings or on sites anywhere on the defence estate, UK and overseas. 'Utilities' does not include energy used for the propulsion of vehicles, aircrafts or ships. They are all utilities recorded by primary revenue meters, or product delivered to site, as a direct result of MoD activities at permanently owned sites or those leased to MoD for such activities. (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

The EUB has now replaced the DUPARG and addresses issues surrounding the increases in utility prices and increasing certainty on the causes and likely

impacts of climate change. They have also been involved in the investigation of management of energy and responding by providing strategic coordination and direction for the MoD. The aim being to reduce consumption, minimise spend and reduce environmental impact. The AUMB which was re-established in 2006 as the U&SD department forms part of the AIO, responsible for the management of Army utility policy and energy management in the Army. (Defence Estates Intranet, Estates Utility Board Homepage, 2007. <http://deintranet.de.r.mil.uk>. Accessed 05/06/07).

The U&SD fulfils its element of the energy management structure of the Army by holding biannual conferences for key Army stakeholders to attend. These include military staff involved in energy management and estates issues, Divisional and Brigade Energy Advisors, Defence Estates representatives and the Regional Prime Contractors (RPC) responsible for the maintenance and rebuild of the Army's Estate. As part of a U&SD conference held on 11<sup>th</sup> and 12<sup>th</sup> September 2007, the U&SD briefed the chain of command on current and new UK regulatory schemes which will affect the Army infrastructure, detailed below:-

- The Energy Efficiency Accreditation Scheme (EEAS). In a move to developing the utility management culture further, the Army is to gain accreditation to EEAS at Divisional and regional Brigade level. To succeed, the Army will have to demonstrate its energy management, performance and organisation is of a specific standard to deliver energy efficiency, in order to receive the accolade of accreditation to the

scheme. This type of best practice is already evident in the Army, as Osnabrück Garrison, Germany received its accreditation in 2006 and 2 Infantry Brigade in Kent has also recently had a site accredited in 2007 as part of the scheme.

- EU Energy Performance of Buildings Directive 2006. The UK's compliance with the Energy Performance of Buildings Directive (EPBD) 2006 is still under development, but it is anticipated that all Army sites which meet the Directive's criteria will need to be in compliance by January 2008. This is viewed as an ambitious deadline and is expected to change, as Government computer assessment software and trained assessors are not yet available to allow for national compliance to the Directive. The EPBD Directive requires all buildings with a heated floor area of over 1,000 sqm have an energy audit carried out to assess its annual energy consumption to measure its energy performance. Those public buildings which fall into the selected criteria must display an Energy performance certificate already referred to in Chapter 2, showing the building's energy rating to building users. (Pg 141 of the Appendices details an example of an Energy performance certificate).
- Carbon Reduction Commitment. The Government programme previously named 'Making a Corporate Commitment' has been replaced by the Carbon Reduction Commitment. This new scheme was based upon public sector and commercial organisations previously pledging their support to the national scheme by demonstrating how they intend

to reduce their CO<sub>2</sub> emissions. This programme has been revised as a 'Cap and Trade Scheme' and will apply to organisations which use over 6,000Mwhs per annum. This will mean that 5,000 Army sites will be required to purchase allowances for their expected energy consumption and then join an auction if there are any shortfalls or gains in allowances. In short, an organisation will be required to pay for their energy consumption and CO<sub>2</sub> emissions so the incentive is there to reduce consumption and their impact on the environment. Compliance with the programme is required by April 2010 and will involve the MoD and Army finding £5 million to ensure compliance with the scheme.

- Energy Auditing of top 220 MoD energy consuming sites. The EUB and U&SD department has tasked the Brigade Energy Advisors to implement an energy audit programme of all of its Major sites by March 2008. This date is likely to move to the right, as Brigades have differing levels of assistance to coordinate the task and varying numbers of audits to complete. The outcome of the audits will be a will be a costed list of energy efficiency measures which can be used to bid more easily and successfully for AIO funding on an annual basis.

The U&SD also reinforced the need for regional Army Brigades to ensure energy management issues are included in a Major site's 'Integrated Estate Management Plan' (IEMP), with support from Brigade Energy Advisors. These are strategic plans put together by the Estates team within a Brigade, which detail each site's operations and will document the condition of the site's

estate, to ensure a review can monitor if the estate has improved over time through the RPC maintenance programmes. This provides the opportunity to document all the key estate issues and concerns into a strategic document, so Defence Estates can use the information for the future planning and development of a site.

#### 4.3 Current British Army Energy Management Structure

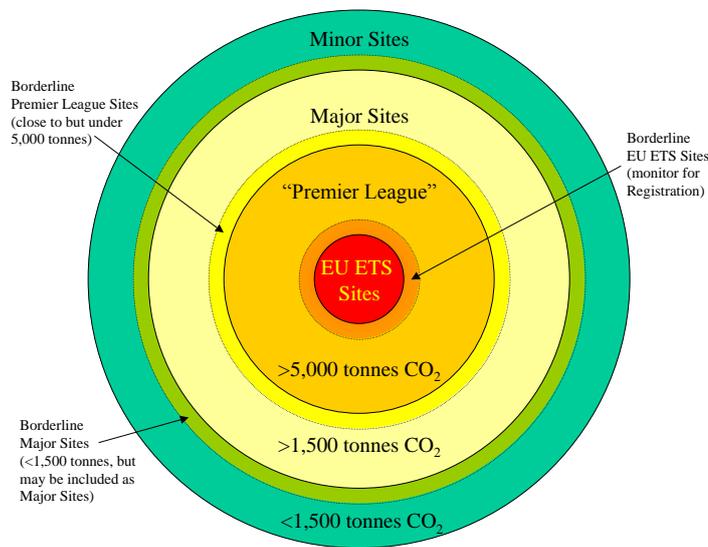
Much of the Army's infrastructure dates back to the post Second World War era, and with it, all the inherent funding requirements that come with maintaining such a diverse building portfolio. The Army's annual spend on domestic utilities is approximately £150M and is set to rise if current utility charges increase further. Necessary repairs and maintenance have been implemented on the Army's estate to comply with health and safety requirements, but funding restrictions have until recently, relegated improvements to energy efficiency to a lower priority (B2 category – Military Estates Management rating). Maintenance work arrangements have now been categorised into Minor new works with a value of below £250k and project works coming over this figure, to increase the profile of these measures.

Across the Army, there are 150 Major sites central to this study (within the UK and Germany), which Army regulations Joint Service Publication (JSP) 418 defines a 'Major Site' as "one that has an annual energy related carbon emissions of 500 tonnes or greater and is contained within its own boundary

fence with its own discrete main entrance and its own DE Spec 024 Establishment Code”. The 150 Major sites have been sub-divided by the U&SD’s Army Utilities Directive 2006 – 2011, into the following three categories:-

- a. Sites registered under the EU Emissions Trading Scheme (EUETS) are capped in the levels of CO<sub>2</sub> that they are permitted to emit, with any excess over this cap having to be paid for in the form of emissions permits.
- b. Premier League Sites are defined as sites with energy related CO<sub>2</sub> emissions of more than 5,000 tonnes per annum. These are the Army’s biggest energy users, and are also likely to be amongst the largest water users.
- c. The remaining Major sites are sites with annual energy related CO<sub>2</sub> emissions of between 1,500 – 5,000 tonnes per annum.

Figure 4.2. Illustration of British Army sites by definition of Energy related CO<sub>2</sub> emissions.



Source: Army Utilities Directive 2006 – 2011. Chapter 8, Pg 68. September 2006.

A list of the 220 top MoD energy consuming sites has recently been issued by the EUB, which includes the 150 Army Major sites referred to above. (Appendices Pg 142). (Gray, David. Army Utilities Management Branch. (2006) Army Utilities Directive 2006 – 2011. September 2006).

#### 4.4 British Army Energy management Policy, Strategy and Action Plans.

Army Utility Policy is committed to meeting UK Energy Policy requirements and Governmental Sustainability targets set out under the Sustainable Development in Government (SdiG) framework. This includes targets for reducing energy and water use and for increasing the utilisation of low or zero Carbon (LZC) energy resources, in the pursuit of a carbon-*lite* or carbon neutral environment. The Government's agreed priority areas are as follows:

- Integrating sustainable development into decision making;
- Improving performance of the Government Estate; and
- Promoting understanding of sustainable development across Government.

The Army Utilities Directive 2006 – 2011 has translated UK Energy Policy from the Ministry of Defence document – ‘Framework for Sustainable Development on the Government Estate: Ministry of Defence Sustainable Development Delivery Strategy for Non-Operational Energy, May 2005 (Defence Estates)’ and acknowledged that the Army’s estate needs to be managed in such a way that allows it to evolve and adapt to cope with a future climate different from what we are used to now; this commitment is demonstrated by the Commander Regional Forces (CRF) in his Foreword for the Directive detailed in the Appendices (Pg 145).

The Army Utilities Directive 2006 – 2011 not only translates UK and MoD Utility Policy, but directly supports the requirement for effective utility management as directed in Army Regulations. These Regulations include the plethora of Joint Service Publication’s (JSP) that form the back bone to Army procedures and the Material Regulations known as ‘Mat Regs’. JSP 418 Volume 2 Leaflet 17 – Utilities Management (April 2005) is the main Army regulatory reference and details the requirement for the creation of an energy management structure and strategy, including terms of reference for those personnel with key roles in the management structure.

The Army Utilities Directive 2006 – 2011 details the Army's utility targets and sub-divides them as follows:

- Sustainability targets (S-Targets) in line with the SDIG framework,
- Performance Targets (P-Targets)
- Major Site targets (M-Targets).

Each regional Army Brigade is required to report against the Major site targets on a quarterly basis to their respective Army Division, by monitoring energy performance at Major site level. See Appendices for Major site list and corresponding Major site targets (Appendices, Pg 147). (Gray, David. Army Utilities Management Branch, 2006. Army Utilities Directive 2006 – 2011. September 2006).

Land Command also issues 'Standing Orders' which are military orders that concentrate on the practical implementation of Army Policy and Regulations. A recently issued Land Command Standing Order gives instruction on appropriate energy management techniques, detailing the practical steps all Land Command staff must take to reduce energy, such as sensible use of office equipment and lighting to reduce excessive wastage.

#### 4.5 A Regional British Army Brigade – Headquarters 49 (East) Brigade: Energy Management Practices

Looking more closely at specific Army Divisions and regional Army Brigades, the challenge has been to translate the Army Utilities Directive 2006 – 2011

further down the Army chain of command to ensure it can be realistically achieved at a local level. Army Divisions and regional Brigades are responsible for the implementation of the Directive objectives at Brigade level.

A new 4<sup>th</sup> Division Utilities Directive issued March 2007 has been based upon the Army Utilities Directive 2006 – 2011. The Strategy Overview is detailed in Appendices (Pg 153). Revisions of Brigade Energy Strategies within 4<sup>th</sup> Division are now required in line with the updated Divisional Energy Strategy for 2007/08. The HQ 49 (East) Brigade's Energy Strategy 2005 illustrates how policy is translated through the chain of Command, but has not yet been updated in line with the 5<sup>th</sup> Division Utilities Management Directive 2006 – 2011 as required from April 2007. See Appendices (Pg 159) for inserts of the Directive's first two chapters on Political & Economic Issues and Army Policy. The 5<sup>th</sup> Division Directive requires updating to include 49 (East) Brigade within its command. This indicates greater work is needed at Divisional and Brigade level to maintain the strategic management of energy management practices.

The current HQ 49 (East) Brigade's Energy Strategy dated November 2004 detailed in Appendices (Pg 167), details short, medium and long term objectives to direct the Brigade's Major sites and their units in meeting its requirements. A summary of the Brigade's Energy Strategy is detailed below:-

- The short term approach taken in the Brigade Strategy has been to target no cost solutions such as encouraging energy efficiency through energy awareness campaigns; finding financial savings by ensuring

VAT Declaration certificates are registered with utility suppliers on a site by site basis thus sites pay the correct level of Climate Change Levy and split of domestic and commercial VAT (Appendices Pg 171 gives an example of an electricity VAT Declaration Certificate), reviewing time and temperature settings and extending leave (holiday) stand down periods to reduce the demand for utilities, as well as imposing a management and reporting structure into the Army's hierarchy. Energy action meetings are in place at Divisional, Brigade and Unit level either on a biannual or quarterly basis.

- In the medium term, AF F727 monthly utility metering data collected by each Major site on a monthly basis. This energy consumption data is monitored quarterly by the Division and Brigade, allowing feed back on the highlighted energy trends from the unit. Appendices (Pg 172), gives an example of an AF F727 monthly (Primary electricity only) meter reading form for ATR Bassingbourn, submitted to the bill payers for validation and the AIO for monitoring purposes. Some financial investment was needed to improve the metering and monitoring of utility usage, to improve the number of buildings that had utility sub-metering, allowing any overuse to be detected and suitably corrected.
- Long term, with this improved ability to monitor energy consumption, third party energy users such as catering contractors on each site, can be recharged for their utility usage, bringing revenue back to the Army.

The true benefit of future 'Invest to Save' funding for energy saving measures can therefore become tangible and financial savings factual.

The Brigade's Energy Strategy has encouraged the need for a consistent approach from Major sites and their units and despite the implementation of an energy management structure at Brigade level, Brigade units at Major sites need to take a more robust and active approach to utilities management. With this statement, it must be acknowledged that some restructuring of Brigade management structure in the form of changes to the format of Brigade Utility Efficiency Committee (BUEC) meetings has occurred over a period of four years, which may have not provided a consistent structure for the Brigade's Major sites.

This is due to a biannual BUEC meeting becoming part of an annual Brigade conference in previous years which was cancelled in 2007 to make cut backs on 'Travel and Subsistence' costs across the Brigade area. BUEC meetings need to be re-established in the 49 (East) Brigade area to follow on from Divisional Utility Efficiency Committee (DUEC) meetings, even though a 5<sup>th</sup> Division meeting has not yet been scheduled for 2007. This provides the meeting and reporting structure necessary to continue an energy management structure within this part of the Army.

The energy management performance of a unit and their site are monitored and measured by the Brigade Energy Advisor by a number of means. There are a number of outputs that can be used to measure the success and

effectiveness of a Major site's energy management programme. These include a Major site demonstrating they have an energy management culture and practices in place. This is demonstrated by current site/unit energy strategies and energy action plans, biannual or quarterly energy action meetings minutes, having a list of 'Invest to Save' measures identified, a proactive energy awareness campaign at intervals during the year, how much funding the site actively attracts, their annual energy consumption performance and their response to Brigade reporting requests. This information is gathered by the Brigade Energy Advisor by the following means:-

- Brigade Energy Advisor site visits made twice a year.
- Major site energy awareness campaigns e.g. ATR Bassingbourn regularly send emails to all site users copied to the Brigade Energy Advisor, to highlight those electricity wasting buildings and praising efficient building users.
- Receiving copies of unit strategy and energy action plans (reviewed on an annual basis) (Appendices Pg 173), details ATR Bassingbourn's Site Energy Action Plan.
- Copies of Minutes from quarterly site energy action meetings detailing energy management issues.
- The Brigade Energy Advisor collates information on energy management practices via the annual Brigade 'Administrative

Audit of a Unit' (AAU) performed by a Brigade, which incorporates a measure of unit energy performance against divisional energy reduction targets for monitoring purposes by the Brigade Energy Advisor. Appendices Pg 177. Pg 181 – 182 of the Appendices details the subjective assessment of energy performance by a unit followed by their performance against the Divisional utility target during the financial years 2004/05 and 2005/06.

- Monitoring of site energy performance by Brigade Energy Advisors via energy performance benchmarking utilising the Government Energy Consumption Guide 75 (ECON 75). Appendices (Pg 183), details the benchmarked energy figures for 7 of the 9 Major sites within HQ 49 (East) Brigade.
- Quarterly monitoring of Major site energy consumption and feedback from unit. See Appendices Pg 184 for an example of a 49 (East) Brigade's Major site electricity consumption graph. Only five of the nine Major sites within HQ 49 (East) Brigade responded to a request by the Brigade Energy Advisor for feedback on their energy consumption for Jan – March 2007, which highlights some inconsistency to the task of energy management at Major site level.

(Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

On this evidence whilst there appears to be some pro-activeness and consistent approach to the task, the effectiveness of energy management practices will differ from site to site if some areas are not given consistent attention. This can depend on the activities of the Army unit, whether they are on site or away due to operational deployments, and work prioritisation by those designated responsibility for the task and their interest in the subject.

Historically there have not been full time energy managers in post at Major site level, with specific responsibility for utility management and the role forming a secondary duty to an existing position. This is an issue that requires address at higher level, possibly within the U&SD department and AIO, to provide the resources needed for full time site energy managers, as required in the Army Utilities Directive 2006 – 2011. Invariably the role sits with military personnel who are already busied with routine and operational commitments, meaning energy management can fall to the bottom of the priority list. As well as core activities, this highly diverse and fluid tempo of responsibilities places resident Major site units under considerable pressure.

Consequently, there remains an isolated and inconsistent approach to energy management, instead of a common “best-practice” standard across a Brigade area. This is not an acceptable situation, as energy efficiency is an important concern, likened to other issues such as health and safety. Energy management practices may not be seen to have life threatening consequences if neglected unlike health and safety, but from a national and global

perspective, human life, social wellbeing and the environment can and will be adversely affected.

Brigade energy strategies are written and implemented on the behalf of regional Army Brigades, through the employment of Divisional and Brigade Energy Advisors as in-house consultants. This has been the case for the last four years as part of a contract with Babcock Infrastructure Services and Johnsons Controls across the 4<sup>th</sup> and 5<sup>th</sup> Division areas. The work programme of Babcock Energy Advisors is detailed in the Appendices (Pg 185) in the form of 'Key Performance Indicators (KPI's), devised to monitor the contract obligations of the Energy Advisor's and their Brigade's progress towards Army based energy management targets, born out of the requirements of the Army Utilities Directive 2006 – 2011. (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

#### 4.6 Additional Energy Management Practices

Energy management policy and strategy are in place within the Army but it has become clear that this policy does not benefit from any mandatory status. As guidance only, the policy requires the support within the Army's chain of command. This of course can be subject to varying degrees of commitment at Divisional, regional Brigade and Major site level. However, in an effort to identify other opportunities to improve the consistency and standard of energy management practices within the Army, a management procedure has been identified. An existing mandatory procedure embedded within regional Army

Brigades management structure has in the past been utilised to audit a site/unit's ability to manage their energy and this will be reviewed with the aim of improving the effectiveness of energy management practices within the Army.

The regional Army Brigade comprises of specialist Branches, much like a corporate Head Office has specialist departments. Within these areas lies the Logistic Support Branch. This Branch is responsible for inspecting Brigade units and their sites every two years for their performance in various management areas and is called the Logistic Support Inspection (LSI). The Brigade LSI can potentially provide a more mandatory approach to supporting the Brigade and unit/site energy management programmes, ensuring tighter compliance with Army policy and regulations.

The "Fuel and Water" section as it was named, and therefore the "Utilities" element of the LSI, was previously contained within the "Accommodation Services" section and in the past has not been uniformly implemented across all regional Army Brigades. The rationale for this is unclear, but the unavailability of a subject matter expert within the LSI team may well have been an underlying factor. Access to a subject matter expert for energy management became available as Brigade Energy Advisors were employed by the Army four to five years ago. The Accommodation Services section has since been dropped by Land Command from the latest version of the LSI, dated July 2006.

Land Command's review of the entire LSI document has been timely and allowed the author to develop a new updated version of a 'Utilities Management' section to include a review of energy management performance, as part of the existing Brigade LSI inspection process, to improve energy management practices at Major site level. Once complete, the new section will be put forward to Land Command for inclusion in the LSI across the Army, following a trial period in two regional Army Brigades. (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

#### 4.7 Concluding Remarks

The energy management structure of the Army has been investigated and the energy management practices in place have been documented within a regional Army Brigade. There are shortcomings in a Major site's energy management programmes and inconsistency can occur from site to site. In the following Chapters, it is the aim of the author to review, develop and implement the Army's LSI with a view to include a new section covering 'Utilities Management', to improve the effectiveness of energy management practices in the Army.

## CHAPTER FIVE

### **Logistic Support Inspection and Utilities Management**

#### 5.1 Introduction

The Logistic Support Inspection (LSI) is a military audit of a British Army (Army) unit which is carried out by the Logistic Support Branch within a regional Army Brigade. It is seen as a solution to ensuring a unit complies with Army policy on energy and utility management, as even though an energy management structure is in place, an inconsistent approach to the issue is common across a Brigade area. The purpose of the LSI is to investigate, collect evidence and assess an Army unit's ability to manage its site, organisation and its activities. The unit may belong to any of a number of Army Regiment or Corps depending on their function (e.g. infantry, armour, engineers, staff and personnel, physical training or security). The unit is ordinarily given six months notice of a Brigade LSI which is undertaken as a site visit. The LSI will be conducted every two years and the level of support and intervention in a Unit's organisation will depend on their performance following the LSI assessment.

#### 5.2 The Logistic Support Inspection – Accommodation Services

The existing LSI audit document used to conduct the review is entitled 'Accommodation Services' and the LSI team use this format to assess and

grade the unit on their performance based on the responses given and the documentation provided as evidence. The LSI audit document is split into other subject headings in addition to Accommodation Services including, Food Hygiene, Budget Management and Transport. The Accommodation Services element of the LSI previously contained four sections relating to utility management. Sections 8, 9, 10 and 11 were included to address a number of issues in an Army unit, including the management of Fuel and Water, Electrical Equipment, Energy Conservation and New Builds and Services. The Accommodation Services Sections 8 – 11, Serials No.44 to No.68, are detailed in Table 5.1 (Pg 197). They were aimed at investigating and assessing the level of energy management structure and organisational processes in place. The Accommodation Services section was part of the previous LSI audit document and Aide memoire until July 2006.

Land Command is responsible for setting the requirements of the mandatory LSI. However, it is the responsibility of the regional Army Brigade or Garrison to carry out the inspection itself for its units within the Brigade or Garrison boundary. The inclusion of the LSI Sections 8 – 11 would have relied on a subject matter expert being part of the Logistic Support Branch and part of the LSI team to undertake the section review. Each subject matter expert would interview the relevant personnel to assess the unit in the different areas for evaluation.

The outcome of the LSI is articulated using the assessment tool 'LAURA', which stands for 'Logistic Support Inspections Application for Units Risk

Analysis'. LAURA is imbedded into a computer programme, so an electronic assessment can be made based upon the subjective appraisal of the LSI team, but based on facts and the provision of evidence to allow an informed assessment to be made. The response to a question and overall completed section is graded by using a key. Currently, unit LSI performance is analysed and graded against LAURA. To ensure the 'Utilities Management' section remains consistent (if adopted) a similar analysis grading will be used.

'LAURA' grading key:

E	-	Excellent
G	-	Good
F	-	Fair
U	-	Unsatisfactory
N/I	-	Not Inspected
N/A	-	Not Applicable

British Army LSI Assessment Tool, Logistic Support Branch Manual. 2006.

The LSI assessment tool is used to grade the unit, rating each section within each LSI subject heading. A satisfactory grading, or "pass", would be reflected by awarding a grading of Fair, Good or Excellent. If the unit received an 'Unsatisfactory' grading, the unit would fail their inspection. The unit would receive feedback and support from the LSI team and more regular inspections

until its performance was deemed at an acceptable level. The other two grades; 'Not Inspected' or 'Not Applicable' indicate a subject heading or inspection may not be relevant to a unit.

In an attempt to move away from LAURA, Land Command is currently scoping an improved system in 2007, moving towards the "universal" traffic-light indication system called 'ARMS', known as the 'Army Review Management System'. This assessment tool provides a more transparent and graphic indication of unit performance. The traffic-light indication system associated with ARMS has been replicated in the electronic format of the new LSI section Aide Memoire detailed in Chapter 6. (Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

### 5.3 Review of Accommodation Services Section – Logistic Support Inspection

A review of the previous Accommodation Services Sections 8 to 11 has been undertaken, as historically it has been under utilised in the Army for the purposes of utility management. The Sections on Fuel and Water, Electrical Equipment, Energy Conservation and New Builds/Services were written prior to the current Army Utilities Directive 2006 – 2011, which is a five year plan that has significantly updated the approach of the Army to utility management. This in turn has caused interest in a review and amendment of the utilities element of the LSI process at all levels of the Army chain of command.

The new LSI Aide Memoire was issued by Land Command in July 2006 and was based on existing templates. However, unlike previous iterations, the new LSI Aide Memoire did not provide for Accommodation Services (which previously accounted for Fuel and Water, Electrical Equipment, Energy Conservation and New Builds/Services) or Utilities management, affording the author opportunity for a timely and purposeful review of the section. This now means that utility management is not reviewed at unit level as part of the LSI.

This now leaves a gap in the LSI process when the effectiveness of energy management should be being strengthened more than ever. Tackling energy management as part of the LSI would be beneficial, to address the issue of inconsistency in the application of energy management practices at unit level. Reasons for this inconsistency include a lack of resources at site level and a lack of financial incentive for action to be taken to reduce utility use, as sites and individual units are not directly responsible for their utility budget. The utilities management structure would therefore benefit from the support of the LSI mandatory inspection, as units would undoubtedly better focus on their utility management processes and systems if there was potential to fail a mandatory inspection.

A new and improved LSI section entitled 'Utilities Management' is to be formulated upon the previous Accommodation Services sections and modified to expand upon its content using the expertise, experience and knowledge of Brigade Energy Advisors. These subject matter experts have already implemented their own work programme at Divisional and Brigade/Garrison

level and know what is required of the units in relation to Army Utility Policy, making them best placed to include all the essential components for successful energy management practices. (Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

#### 5.4 Updated Section and Aide Memoire for Utilities Management – Logistic Support Inspection

To update and renew a section to cover utility management issues is seen as an opportunity to clarify what is required of a unit or site in line with Army utility policy, by demonstrating compliance to military orders and regulations. It would form part of a mechanism for giving clear guidance on the obligations of the units and their sites as regulated by the regional Army Brigade or Garrison. It is also an opportunity for a unit or site to demonstrate their best practice and showcase their achievements in energy management.

The work programme and information required by Brigade Energy Advisors from units has strongly dictated the design of the updated LSI section on Utilities management as well as the key regulatory documents for the Army. With the current Defence climate, many of the Single Service Regulations and Material Regulations have been superseded by a series of Joint Service Publications (JSP). In the context of this study, the relevant JSP is the Ministry of Defence (MoD) – Sustainable Development and Environment Manual, JSP 418 produced by the Directorate of Safety and Claims. This sets out the mandatory policy requirement and contains Volumes on such areas as

Environmental Packaging (Leaflet 12), Travel and Transport (Leaflet 16) and Utilities Management (Leaflet 17).

The references and individual questions in the new LSI section on Utilities management as mentioned have been updated and brought in line with the Army Utilities Directive 2006 – 2011 and Divisional and Brigade Utility Efficiency Strategies, to provide a generic form for Logistic Support Departments in all regional Army Brigades and Garrisons to use. The new section has utilised the Defence Utilities Policy and Review Group (DUPARG) Utilities Questionnaire contained in Annex 8D of the Army Utilities Directive 2006 – 2011 and each question has been cross referenced against the Major site targets from the Directive. As an added benefit, the new LSI section on 'Utilities Management' is seen as an audit trail and evidence collecting exercise to demonstrate a site's compliance with the Major site targets, as detailed in a unit's own energy action plan.

The new LSI format entitled 'Utilities Management' is detailed in Table 5.2 (Pg 204). It sees the number of pertinent questions increased from 25 compared to the old Accommodation Services section to 28. Now more dynamic and better focussed, the section encompasses all the necessary investigations pertaining to utilities at each Army unit. Section headings have been rationalised, grouping questions in a more structured and coherent way, allowing the question and answer process to flow and inform more readily. The updated version of the 'Utilities Management' section, consisting of the 28

questions, has been afforded multiple choice answers in the Aide Memoire in order to gauge unit performance.

The 28 questions are divided into the following headings;

LSI Section: Utilities Management

- Section 1: Utility Policy
- Section 2: Energy Awareness
- Section 3: Utility Management
- Section 4: Utility Efficiency Measures

The subject matter expert, commonly the Brigade Energy Advisor will progress through the questions with the unit representative (most probably the unit or site energy manager).

To supplement the new LSI section for utilities management there is a requirement for an Aide Memoire to assist the question and answer aspect of the LSI inspection process. The overall LSI Aide Memoire was reviewed and an updated draft was produced in July 2006 by Land Command. The Aide Memoire for the new 'Utilities Management' section, Table 5.3 (Pg 211) is also divided into the four section headings; 'Utility Policy', 'Energy Awareness', 'Utility Management' and 'Utility Efficiency Measures' with each individual question giving a range of two to four possible answers for the interviewee to

select from. Some questions are weighted to give a more accurate and fair assessment of a unit.

For example, those questions which are a regulatory requirement and are viewed as an essential component of energy management practices are more likely to have a greater weighting than those detailed as Army policy for directional purposes. This also assists with the assessment for the outcome of the inspection. These areas are seen as the critical information areas required from units with the evidence produced to demonstrate the unit's approach to utilities management, their performance and ultimately, their effectiveness.

The end results will determine the frequency of subsequent Brigade visits; those performing well will be allowed greater autonomy, whilst those struggling to achieve the required standard will receive both guidance as well as more frequent liaison in order to measure and ensure improvement.

In light of their previous involvement in devising the LSI format, the draft section on 'Utilities Management' was submitted to the Army Utilities Management Branch (AUMB) now the Utilities & Sustainable Development (U&SD) department for feedback. Mr David Gray, Army Utilities Manager at the AUMB has described the new section on Utilities management as 'an excellent piece of work' (Email correspondence dated 03 Nov 06). Suggested improvements have been incorporated into the section prior to its integration as part of a trial programme, to be scheduled into inspections planned over a period of three months.

The success of the trial will be measured by evaluating the Brigade Energy Advisors' findings as well as feedback from the unit's inspection reports. Areas of strength and weakness will be identified, providing both the Brigade staff as well as the unit management with appropriate information in order to make future improvements in energy management practices. (Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

### 5.5 Concluding Remarks

The objective has been to improve on the current effectiveness of the Army's energy management practices and the review of the Accommodation services section and production of a 'Utilities Management' section as part of the LSI looks to build upon the work already carried out in the implementation of an energy management structure throughout the Army to date.

A Trial of new LSI section: 'Utilities Management' is undertaken in two regional Army Brigades in the next Chapter. The 'Utilities Management' Aide Memoire has been utilised in the next Chapter, as it is the basis for the computer programme for unit performance assessment purposes, to closely replicate the ARMS methodology used by the Army across other areas of their business. This will allow for consistency in how the new section can be assessed in line with the rest of the LSI process.

## CHAPTER SIX

### Trial of New Logistic Support Inspection: Utility Management Section

#### 6.1 Introduction

In further detail, the new Logistic Support Inspection (LSI) section format for 'Utilities Management' has been piloted across two regional British Army (Army) Brigade areas; with 2 Infantry Brigade in Folkestone, Kent and 49 (East) Brigade in Nottingham. With no two Brigade site organisational structures exactly the same, producing a series of generic questions to meet every requirement was a particular challenge. For example, a single site within 49 (East) Brigade may house a main unit and several sub-units, all providing different and independent functions, but with only one unit being ultimately responsible for utilities across the whole site. Within 2 Infantry Brigade however, each single unit is the main unit for the site and occupies its own independent location thus retaining utilities autonomy. The constraint therefore, was tailoring questions to meet the diversity of functional areas encountered by the Brigade LSI team; critical if implementation across the whole of the Army's utilities management field was to be realised.

To summarise, the LSI is conducted at unit level and these Brigade units are either responsible for the management of a Major site as a main unit, or they are a sub-unit at a site with responsibility for their own buildings only and no overall site responsibility.

By virtue of their size and intrinsic utility demands, certain aspects of the LSI must therefore be exclusive and there is reference to certain questions which only apply if the unit is responsible for the site as a whole. As one might expect, 'Major sites' remain the Army's largest energy and water consumers and even relatively modest percentage savings at these sites have a significant impact on overall Army consumption.

Whilst the Army Utilities Directive 2006 – 2011, Annex 8C, sets mandatory targets for Major sites and Annex 8B lists those Major sites to which the targets relate, the visibility and accuracy of monitoring is currently under review by the U&SD department. By cross referencing and aligning section questions to Major site targets therefore, the LSI process can provide informed "early warning" to the Chain of Command to evidence in reporting site progress against targets. This however will mean that every question asked of a unit will not be relevant if the LSI is being conducted at sub-unit level. Any questions not relevant will be indicated as a question for a resident unit responsible for a Major site.

## 6.2 Trial of New Logistic Support Inspection Section: Utilities Management

The previous chapters have detailed the division of the new LSI section for Utilities management which has been developed to assess a unit's performance and effectiveness in this area. The next important step has been to user-test the new LSI section. As the assessment of unit performance is conducted at Brigade level, two regional Army Brigades have been selected

from within the organisational structure of the 4<sup>th</sup> and 5<sup>th</sup> Divisions of the Army, 2 Infantry Brigade and 49 (East) Brigade. The trial of the new section on Utilities management will be incorporated into the existing LSI programme for 2006/07. Table 6.1 details the LSI programmed visits for this period for 49 (East) Brigade (Pg 226). A Brigade letter detailed in the Appendices (Pg 193) was forwarded to the units concerned within the 49 (East) Brigade area, to give notice of the proposed trial at each of the Major sites, prior to the inspection process. It provides an introduction to the new LSI section on Utilities Management. The overall objective is blanket implementation of the updated LSI section on Utilities Management and universal acceptance at unit level.

The subject matter experts from these two Brigades, the Brigade Energy Advisors, have conducted their element of the LSI inspection through their own independent site visits or by accompanying the relevant Brigade LSI team. A total of five user-trials of the new 'Utilities Management' LSI section have been conducted overall throughout the two Brigade trials. The Energy Advisors' observations, recommendations and grading as a result of the five trials LSI using the utilities management section, have been recorded in a standard table format detailed in Tables 6.2 – 6.6. (Pg 227 – 235) (Cunningham, J. (2004 – 2007) Work programme of HQ 49 (East) Brigade Energy Advisor)

### 6.3 Trial Evaluation and Observations – 2 Infantry Brigade

The Brigade Energy Advisor for 2 Infantry Brigade, based in Folkestone, Kent, carried out an LSI on Utilities management at the following three Army units. All three units have autonomy in utility management at their respective sites and can be described as the main unit.

- **25 Training Support Regiment, Princess Royal Barracks, Deepcut.** 25 Trg Sp Regt is the principal unit at Princess Royal Barracks and the new question and discussion process revealed some particular shortcomings. The unit had no Site utility strategy in place; a particular concern for a main site unit; an individual had been designated the role of Unit Energy Manager, but was only allocating 5% of their time to utility management. In addition, the electronic format of the Fuel and Light return was not being utilised for their monthly submission of meter readings, over a year into the latest format being issued. The Brigade Energy Advisor provided recommendations and remedial actions to rectify these shortcomings, thereby allowing for performance to be improved upon. The effectiveness of utility management practices at Deepcut were deemed 'SATISFACTORY' by the assessor, but when using the assessment tool Logistic Support Inspections Application for Units Risk Analysis (LAURA), this grading translates to 'Fair' rating for performance. This grading would require the Brigade or Garrison to offer assistance in

making improvements to their performance, but they would have passed this element of the inspection. See Table 6.2 (Pg 227).

- **36 Engineer Regiment, Invicta Barracks, Maidstone.** The site assessment for Utilities management found 36 Engr Regt to be performing well. The Energy Advisor gave the unit a LAURA grading of 'Excellent' as their utility management practices are sound and well established. The only required improvements were in training for the Unit Energy Manager and identifying the top ten energy consuming buildings at the site. Table 6.3 (Pg 229).
- **ATR Pirbright.** ATR Pirbright is a Phase 1 soldier training establishment and is the main unit occupying its site. The site is to address the lack of a utility management structure, by utilising the Brigade Energy Strategy and dedicating an individual to the role of Unit Energy Manager. There is no list of Invest-to-Save measures at the unit, which demonstrates a lack of awareness on what action needs to be taken to make energy efficiency savings at the site. The unit was given a 'SATISFACTORY' grading for its utility management performance, translated to 'Fair' under the LAURA assessment tool. Table 6.4 (Pg 230).

(Macpherson, R. 2006. Work programme of HQ 2 Infantry Brigade Energy Advisor).

#### 6.4 Trial Evaluation and Observations – 49 (East) Brigade

The Brigade Energy Advisor for HQ 49 (East) Brigade, based in Nottingham, has carried out the following two Army LSI trials for utilities management.

- **39 Engineers Regiment, Waterbeach Barracks, Cambridge.** 39 Engineer Regiment are the main unit for Waterbeach Barracks and have an established utility management structure. However, the Unit Energy manager still requires utility management training even though they are over half way through a two year posting. The approach to utility management has been giving a 'Good' rating as detailed in the electronic format to replicate the Army Review Management System 'ARMS' assessment tool used for LSI assessment detailed later in this chapter. Table 6.5 (Pg 232).
- **Reserves Training and Mobilisation Centre (RTMC), Chilwell Station.** RTMC is a sub-unit occupying Chetwynd Barracks, Chilwell Station, Chilwell in Nottingham. The unit has a key role and is responsible for the mobilisation of troops onto operations worldwide, including Iraq and Afghanistan. Operationally, and for the vast Majority of budgetary aspects, the sub-unit takes its direction from much higher authority, but for site specific issues they

receive direction from the unit with overall managerial management of the site, namely Headquarters Chilwell Station. The Quartermaster responsible for the overall management of RTMC is extremely enthusiastic to make efficiencies and actively supports energy management practices. Greater support at Brigade and site level is required to assist the unit in achieving a robust energy management culture. Table 6.6 (Pg 234).

(Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

#### 6.5 Logistic Support Inspection: Utilities Management – Trial Conclusions

The following details the conclusions made by the two Brigade Energy Advisors following the five trials of the 'Utilities Management' section at the two regional Army Brigades, 2 Infantry Brigade and 49 (East) Brigade.

- It has been found that while it can take approximately one hour to carry out the assessment step by step, the LSI section on utilities management can be completed as part of a scheduled site visit or as part of the wider LSI team visit.
- Feedback from the Brigade Energy Advisors to the unit will only concentrate on any shortcomings and recommendations for remedial action, as detailed feedback on each individual question would be too

lengthy to undertake (general discussion will have already taken place during the course of the interview process). The military style of written communication is concise and to the point and the feedback represents this style of presentation.

- The overall feedback from the Brigade Energy Advisors at Brigade and Divisional level has been positive and supports the application of the new LSI section Army wide. This is a significant step, as the inclusion of the Utilities management section would require Brigade Energy Advisors or managers potentially becoming involved in the LSI site visits.
- The Brigade Energy Advisors and the units interviewed agreed the trial a success and beneficial, as it actively supports their work programme in compliance with the Army's Utility Directive 2006 – 2011 and Army regulations on utilities management.
- As with all human involvement, subjectivity will effect the grading of this element of the inspection, as a result of the differing experiences of the different Energy Advisors. Performance may be viewed differently from unit to unit, so some form of training or induction may be beneficial for Brigade Energy Advisors to implement this element of the LSI successfully.
- It is also important to acknowledge that the assessment process should promote that even though the LSI are assessing the unit for its

management structure, it is important that the LSI team offers their assistance where necessary to improve upon a units performance.

- An important observation has been to identify that some elements of unit performance are from external factors and out of the unit's direct control. For example, funding for energy efficiency measures originates from the Army Infrastructure Organisation (AIO) and not unit or Brigade level.
- Overall assessment can differ when using 'LAURA' and 'ARMS'. For example, 39 Engineers Regiment, Waterbeach Barracks received a subjective assessment of 'Fair' as part of the LSI trial, but when using 'ARMS'; the traffic light indication system gave the performance rating as 'Good'.
- The use of a computer programme for analytical purposes is a move towards removing some of the subjectivity inherent in the LSI assessment process. However, the human perspective is an important element of the assessment and should not be removed completely. The outcome of the assessment will also be dependent on the combination of findings of each LSI, which will of course differ from unit to unit.
- The LSI Aide Memoire section on Utilities management has been produced electronically and has followed the Army's approach and moved away from the 'LAURA' assessment tool. The electronic format

of the new Utilities management section has been designed to include and replicate the 'ARMS' system in the analysis of the outcome of the LSI questionnaire. Consequently, there is less reliance on hard copies of the inspection and analysis is immediate when conducting the question and answer process out in the field.

- 'ARMS' has been introduced Army wide for a number of analytical processes, e.g. the progression of maintenance programmes, progress towards targets detailed in the Army Utilities Directive 2006 – 2011, and of course, is utilised by the LSI process. This move away from LAURA in the LSI seeks to standardise the measurement of a unit's performance. It was previously difficult to demonstrate performance question by question, and an assessment was made at the end of each section. The traffic light indication system is able to remedy this and can demonstrate progress in a graphical way for each question in the form of a traffic light colour system. Green is associated with an 'Excellent' grading, yellow represents 'Good', amber is a 'Fair' or 'Satisfactory' grading and red gives an 'Unsatisfactory' assessment. This provides an immediate indication of how well or poorly the unit has performed, to both the inspecting team and the unit at the time of the LSI.
- The excel spreadsheet LSI Utilities Management – Electronic Format Table 6.7 (Pg 236), details the LSI Utilities management aide memoire in the electronic format. The example from the inspection conducted at

39 Engineers Regiment, the resident unit at Waterbeach Barracks has been used to demonstrate how the computer programme functions and the traffic light indication system adopted from 'ARMS'.

- The questions asked under each subject heading, will differ in their level of importance and have therefore been weighted accordingly. This has also been influenced by whether the requirements are regulatory ones whereas others may be Army policy, but are for guidance only, thus holding less weight in the assessment process. As a guide, a Major site question which has a regulatory reference will be doubled to weight the question. For example, if an answer given warrants the colour red, a double red will be applied. At the end of the question and answer process, the numbers of each traffic light colour are counted and positioned in order in terms of the colour and an average will be taken to give the overall grading of the section.
- There is also provision for 'Comments', allowing explanations against the selected answer to supplement the rating given. They are also invaluable in the feedback process in order to encourage discussion between the unit representative and the Brigade Energy Advisor.

(Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

## 6.6 Concluding Remarks

The overall feedback from the Brigade Energy Advisors and the participating Army units was that the trial was a positive step towards more robust energy management practices at Brigade and unit/Major site level. It makes the requirements for energy management clear to the unit, and the Brigade is able to make a standard assessment of progress against Army policy and regulations, in line with other Brigade departments. It is seen that no more work or input is being required from a unit than is already being asked for, but the LSI is providing a vehicle for a unit to document their efforts in energy management, therefore demonstrating and building upon their energy management practices to date and in the future.

## CHAPTER SEVEN

### Conclusions and Recommendations

#### 7.1 Conclusion

The development of an energy management structure for the proper management of utilities in the British Army (Army) has progressed considerably over recent years. A robust energy management structure is in place at all levels of the Army's Chain of Command. However, some weakness is evident at Brigade and Major site level; but nevertheless, examples of best practice are also evident at Army sites.

The implementation of Energy Efficiency Accreditation Scheme (EEAS) in Osnabrück Garrison and now at 2 Infantry Brigade demonstrates the level of good practice being achieved at some regional Army Brigades and Garrisons. 2 Infantry Brigade, now referred to as 2 (South East) Brigade, have also utilised renewable energy technologies as solutions to supplying more isolated sites with power, heat and lighting. The renewable energy project called the 'Lydd Eco-friendly Project' is detailed in Appendices Pg 195. Chief Environment and Safety Officer. (2007) Army Safety and Environment Matters Issue 25 – Summer 2007. (Macpherson, R. (2006) Work programme of HQ 2 Infantry Brigade Energy Advisor)

Unit performance at Major sites is measured and monitored at regional Army Brigade level. The objective has been to assist further improvements in

bringing the standard of utilities management to the same level across individual regional Army Brigade and Garrisons. A method of addressing this issue has been to develop a Logistic Support Inspection (LSI) section and Aide Memoire for the subject area 'Utilities Management'. This provides a mandatory requirement upon an Army unit that is currently missing from the existing energy management structure, to ensure compliance with the requirements of Army Regulations and policy for effective utilities management. A computer programme has also been developed to assess the outcome of the section inspection process to replicate the Army's traffic light indication system, Army Review Management System 'ARMS'.

The LSI assessment process involves a question and answer process, the outcome of which is graded as an assessment of a unit's utility management performance. Brigade Energy Advisors will draw upon their individual work experiences when assessing a unit and are in a key position to make an assessment based upon their expertise and knowledge. If applied across the Army LSI process, the Brigade Energy Advisors as subject matter experts may benefit from training on how to conduct the Utilities management section of the LSI, in line with any training received by the LSI team. This will allow the success of the inspection process to be maximised and be at the forefront in highlighting the key issues to flag up any areas that require improvement on the part of the Army unit. It is also the responsibility for the Brigade Energy Advisor to address any shortcomings on the part of the Army Brigade.

It is expected that the inclusion of the new and improved section in the LSI on Utilities management into the Army-wide inspection process, will instil greater focus from the Army unit's position in addressing the issue of climate change and the Army's contribution to the problem. With the support of regional Army Brigades it is hoped more effective energy management practices will be encouraged and employed in the Army's units to further enhance the management structure already in place.

To conclude, the production and trial of a new section for Utilities management as part of the LSI has led to the conclusion that the outcome of the investigation has been successful. The project investigation has provided a valuable insight into the workings of the Ministry of Defence (MoD) and the Army, which otherwise stays hidden from the general population, due to the secure nature of its business. The trial of a mandatory inspection incorporated into the energy management practices of the Army will ensure greater compliance with the Army's Utility Directive 2006 – 2011 and the energy management work programme of a regional Army Brigade. An Army unit could potentially fail their LSI section which is seen as unacceptable to most hardworking Army units. It can be concluded that the addition of a mandatory inspection into the existing energy management structure will make for a more effective approach to energy management practices by Army units. If adopted, this element to the LSI will improve upon and further establish energy management practices in the Army. It will also contribute as an audit trail towards the future Army accreditation process of the Carbon Trust Standard.

(Cunningham, J. (2004 – 2007), Work programme of HQ 49 (East) Brigade Energy Advisor)

## 7.2 Recommendations

A shortcoming of the inclusion of a utilities management section in the LSI has been identified, as a unit will be judged upon their performance on elements of a utility management programme they may not have direct control or responsibility for. This will mean that it will be at the inspecting teams' discretion on the assessment of some elements of utilities management in the LSI section, but these elements should be kept in the section to address all the key areas with the unit where applicable. This use of the section could also be expanded to include Territorial Army (TA) units who also undergo an LSI inspection.

Another factor to note is that the management of the LSI format must be flexible to include future updates and changes in European, Government, Ministry of Defence and Army energy policy. Therefore additional questions and issues may need to be revised, replaced or omitted in the future LSI inspection process.

The new and improved section on utilities management has been submitted to the Army Utilities Management Board (AUMB) now the Utilities & Sustainable Development (U&SD) department and has received positive feedback to include a new section on utilities management into the LSI process across the

Army. It was in fact an objective of their own to perform a review of the LSI's place in improving energy management practices in the Army. The LSI team at Land Command have received the new section for their consideration and feedback, and their agreement to include in future mandatory LSI inspections. A continuous review of the LSI section on 'Utilities Management' will be required for further improvements and inclusion of updates in Army policy and regulations.

It is a recommendation to utilise the new and updated section on Utilities Management in the LSI, as the basis for seeking accreditation to Energy Efficiency Accreditation Scheme (EEAS) now known as the Carbon Trust Standard (CTS), which is planned to be achieved by the April 2010, in readiness for the obligations of the Government's Carbon Reduction Commitment. This will form a valuable evidence collecting exercise during the LSI's over the two years and will provide the foundations for gaining accreditation to the Carbon Trust Standard across the Army.

### 7.3 Future Research

The possibilities for future research are a proposed project to monitor and review progress of the implementation of the new 'Utilities Management' LSI section across the Army, to assess its implementation and compare the consistency in application of energy management practices across Army units. This will give a further insight into the Army's organisation and how it will

evolve to address the growing importance of energy management and its impact on the environment.

This future research will be of particular interest as the Army is subject to the Government's Carbon Reduction Commitment (CRC) and is required to commit funding to this programme by 2010. This commitment to reduce its energy consumption year on year will work towards reducing the initial financial outlay of carbon credits expected in 2010, which will cost millions of pounds. The Government's Energy Efficiency Accreditation Scheme, now known as the 'Carbon Trust Standard' (CTS) is seen as a key mechanism to achieving these energy savings. Implementing such an environmental management system should see the Army reducing its energy consumption and accreditation to CTS will be easier to gain with the use of the LSI, which will demonstrate the already audited energy management practices within the Army.

## References

- [1] Cunningham, J. Work programme of HQ 49 (East) Brigade Energy Advisor, 2004 – 2007.
  
- [2] Dewey Definition. <http://www.audioenglish.net/dictionary/dewey.htm>. Accessed 16/10/09
  
- [3] Research Methods Assignment 2 (Part 5) <http://www.lamp.ac.uk/mit/pdf/report6.pdf> Accessed 15/10/09.
  
- [4] Mokhtar Ismail (16 Dec 2005) [http://www.radiodpb.org/related notes/Mokhtar%20Ismail%20%20Qualitative%20research%20methodology.pdf](http://www.radiodpb.org/related%20notes/Mokhtar%20Ismail%20%20Qualitative%20research%20methodology.pdf). Accessed 15/10/09.
  
- [5] Research Methods Knowledge Base (2008) <http://www.socialresearchmethods.net/kb/>. Accessed 16/10/09.
  
- [6] Friends of the Earth. (2007). Briefing – Earth Summit, From Rio to Johannesburg. <http://www.foe.co.uk/resources/briefings/earthsummit.pdf>.
  
- [7] Fawkes, Dr Steven (2007) History of Energy Management. <http://www.vesma.com>.

- [8] UK Climate Impacts Programme. (2007)  
[http://www.ukcip.org.uk/climate\\_change/default.asp](http://www.ukcip.org.uk/climate_change/default.asp).
- [9] Scottish Government Publications 2007.  
<http://www.scotland.gov.uk/Publications/2006/03/30091039/21>.
- [10] Energy Saving Trust. (2007) You're Impact on Climate Change.  
<http://energysavingtrust.org.uk/>.
- [11] Energy World Journal – December 2008 & October 2009 Issue, Energy Institute
- [12] The Inaugural issue of Current Opinion in Environmental Sustainability.  
Rik Leemans & Anand Patwardhan. (August 2009)
- [13] Reducing Vehicle Emissions through Cap-and-Trade Schemes. John German. Driving Climate Change. (2006).
- [14] Toward a Policy Agenda for Climate Change: Changing Technologies and Fuels and the Changing Value of Energy. Duncan Eggar. Driving Climate Change 28 (2006).
- [15] Whether the weather; Comments on 'An abrupt climate change scenario and the implications for United States national security'. Futures, Volume 37, issue 6 (August 2005).

- [16] Modelling of end-use energy consumption in the residential sector: A review of modelling techniques. Lukas G. Swan, V. Ismet Urgursal. *Renewable and Sustainable Energy Reviews* 13 (2009).
- [17] Proposal of a modelling approach considering urban form for evaluation of city level energy management. Y. Yamaguchi, Y. Shimoda, M.Mizuno, *Energy and Buildings* 39 (2007).
- [18] Arif Hepbasli & Nesrin Ozalp. Development of energy efficiency and management implementation in the Turkish industrial sector. (21 January 2002)
- [19] (Energy saving and energy efficiency concepts for policy making. V. Oikonomou, F.Becchis, L. Steg, D. Russolillo. *Energy Policy* 37 (5 July 2009).
- [20] Philip Andrews-Speed, China's ongoing energy efficiency drive: Origins, progress and prospects (22 January 2009).
- [21] Urban environmental governance innovations in China. Arthur P J Moi. *Current Opinion in Environmental Sustainability*. Volume 1, Issue 1. (October 2009).

- [22] Mitigation paths for Chinese iron and steel industry to tackle global climate change. Shaojun Zeng, Yuxin Lan & Jing Huang. (July 2009).
- [23] Energy saving and emission reduction revolutionising China's environmental protection. Qiang Wang & Yong Chen. *Renewable and Sustainable Energy Reviews*. Volume 14, Issue 1. (January 2010).
- [24] Solar energy development in China – A review. *Renewable and Sustainable Energy Reviews*. Volume 14, Issue 1, (January 2010).
- [25] Green procurement in Norway; a survey of practices at the municipal and county level. Ottar Michelson & Luitzen de Boer. *Journal of Environmental Management*, Volume 91, Issue 1 (October 2009).
- [26] A review of energy models. S Jebaraj, S. Iniyar. *Renewable and Sustainable Energy reviews* 10 (2006).
- [27] Climate change impacts on wind energy: A review. S.C. Pryor & R.J.Barthelmis. *Renewable and Sustainable Energy Reviews*, Volume 14, Issue 1 (January 2010).
- [28] Energy and renewable energy scenario of Pakistan. Munawar A. Sheikh. *Renewable and Sustainable Energy Reviews*, Volume 14, Issue 1 (January 2010)

- [29] A review of solar thermal technologies. Mirunalini Thirugnanasambandam, S. Iniyar & Ranko Goic. Renewable and Sustainable Energy Reviews, Volume 14, Issue 1 (January 2010)
- [30] Wind power resource in the south-western region of Algeria. Y. Himri, S. Himri & A. Boudghene Stambouli. Renewable and Sustainable Energy Reviews, Volume 14, Issue 1 (January 2010)
- [31] An overview of biomass energy utilisation in Vojvodina. Sinisa N. Dodic, Stevan D. Popov, Jelena M. Dodic, Jovana A. Rankovic, Zoltan Z. Zavargo & Mirjana T. Golusin. Renewable and Sustainable Energy Reviews, Volume 14, Issue 1 (January 2010)
- [32] Department for Business Enterprise & Regulatory Reform. (2007) Climate Change and Energy. <http://www.berr.gov.uk/energy/environment/climate-change/index.htm>
- [33] The Carbon Trust Low Carbon Programme (2007) <http://www.dti.gov.uk/lowcarbonbuildings>. February 2007.
- [34] Department of Environment, Food and Rural Affairs (DEFRA), Sustainable Development Notice, February 2007.
- [35] Department of Trade and Industry. (2003) UK Energy White Paper. <http://berr.gov.uk/files/file10719.pdf>.

- [36] Modern Building Services Journal: March 2009 Issue.
- [37] The Carbon Trust Website.  
[http://www.carbontrust.co.uk/energy/startsaving/tech\\_energy\\_management\\_introduction](http://www.carbontrust.co.uk/energy/startsaving/tech_energy_management_introduction) Accessed 06/09/2009)
- [38] Bristol City Council: Sustainability: Energy Management  
<http://www.bristol.cov.uk/ccm/content/Environment-Planning/sustainability/energy-management> Accessed 06/09/2009)
- [39] University of Glasgow: Energy awareness  
<http://www.gla.ac.uk/events/energy> Accessed 16/10/09
- [40] Nifes Consulting Group. <http://www.nifes.co.uk/casestudies05.html>  
Accessed 04/10/2009
- [41] Institute of Environmental Management & Assessment. (iema)  
[http://www.iema.net/ems/local\\_publicauthinfo/](http://www.iema.net/ems/local_publicauthinfo/) Accessed 16/10/09
- [42] Energy Strategy – Rushcliffe Borough Council  
<http://www.rushcliffe.gov.uk/doc.asp?cat=10218> Accessed 16/10/09

- [43] EMAS – The Eco Management and Audit Scheme.  
[http://ec.europa.eu/environment/emas/local/projects\\_en.htm#pr1](http://ec.europa.eu/environment/emas/local/projects_en.htm#pr1)  
Accessed 18/10/2009
- [44] The Carbon Trust Standard.  
<http://www.carbontruststandard.com/latestnews/Inthenews/tabid/166/language/> Accessed 16/10/2009
- [45] The Highland Council. Source  
<http://www.highland.gov.uk/yourcouncil/news/newsreleases/2009/February/2009-02-10-04.htm> Accessed 18/10/2009
- [46] Energy in Buildings & Industry Journal: October 2009 Issue
- [47] Ministry of Defence. (2007) The Ministry of Defence Internet Homepage.  
<http://www.mod.uk>.
- [48] British Army Intranet. (2007) Land Command Intranet Homepage.  
<http://army.r.mil.uk/lans/land/pages/index.htm>.
- [49] Army Infrastructure Organisation (AIO) (25 April 2006) AUEC EARWIG Army Utilities Directive PowerPoint presentation.
- [50] Defence Estates Intranet. (2007) Estates Utility Board, Defence Estates Homepage. <http://deintranet.de.r.mil.uk>.

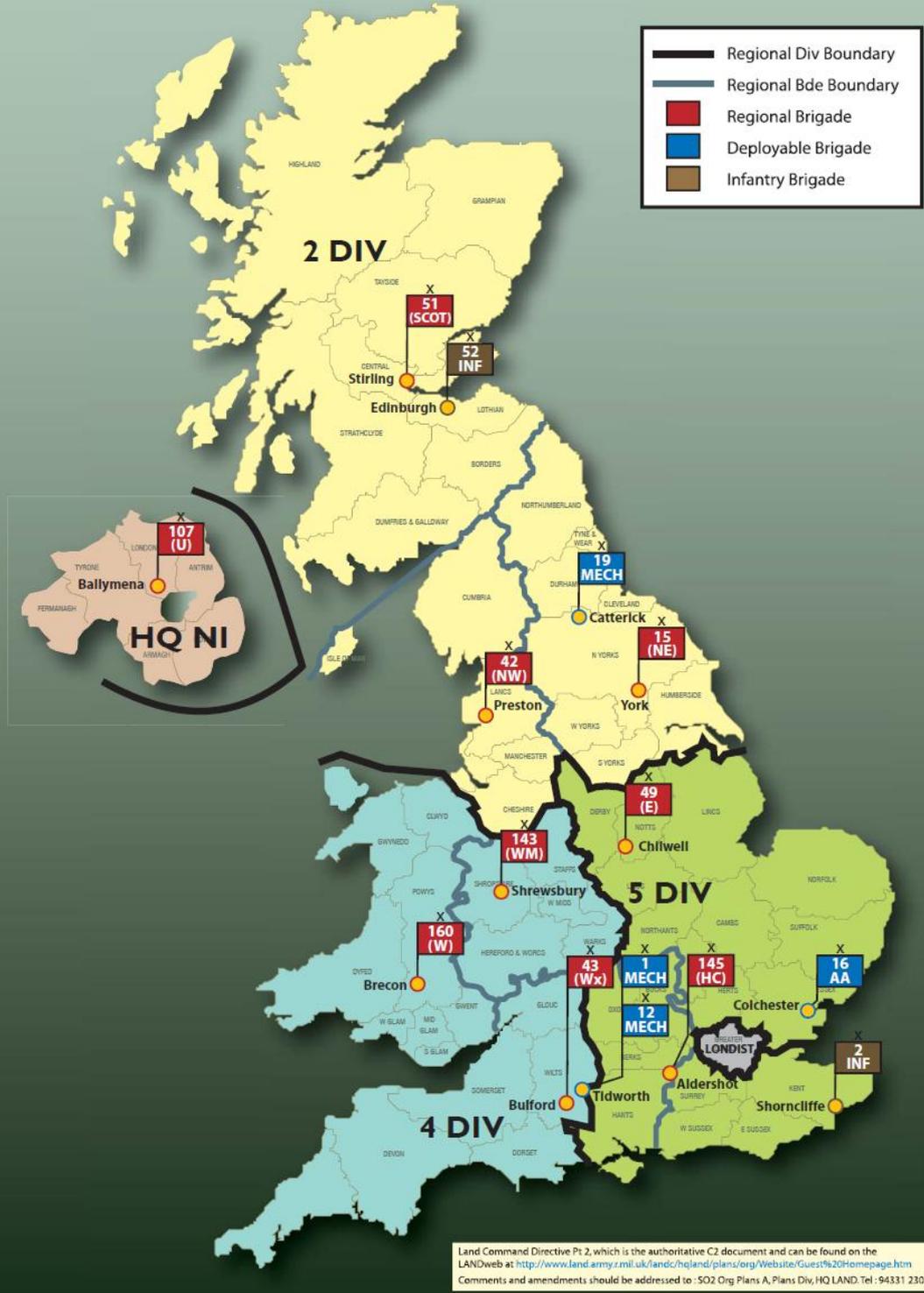
- [51] Gray, D. (2006) Army Utilities Management Branch (AUMB), Army Infrastructure Services (AIO). Army Utilities Directive 2006 – 2011, September 2006.
- [52] Framework for Sustainable Development on the Government Estate: Ministry of Defence Sustainable Development Delivery Strategy for Non-Operational Energy, May 2005 (Defence Estates)
- [53] Directorate of Safety and Claims. (April 2005) Joint Service Publication (JSP) 418, Volume 2, Ministry of Defence Sustainable Development and Environment Manual, Leaflet 17 – Utilities Management.
- [54] British Army Material Regulations. (2000) Volume 6 Pamphlet 2, Domestic Fuel and Water.
- [55] Gray, David. Army Utilities Manager, Army Utilities Management Branch. (2006) Email correspondence dated 03 Nov 06
- [56] British Army Land Command. Logistic Support Inspection. Accommodation Services section and full Aide Memoire, July 2006.
- [57] British Army Land Command. Logistic Support Branch. Logistic Support Inspections Application for Units Risk Analysis (LAURA) Manual. 2006.

- [58] British Army Land Command. Logistic Support Branch. (2007). Army Review Management System (ARMS) Manual.
- [59] Macpherson, R. (September – November 2006). Work programme of HQ 2 Infantry Brigade Energy Advisor.

## **Appendices**

# LAND COMMAND REGIONAL FORCE BOUNDARIES IN THE UK ON 1 APRIL 2005

(As at 01 April 2005)



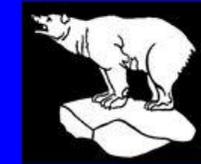
Land Command Directive Pt 2, which is the authoritative C2 document and can be found on the LANDweb at <http://www.land.army.mil.uk/landc/hq/land/plans/org/Website/Guest%20Homepage.htm>  
Comments and amendments should be addressed to: SO2 Org Plans A, Plans Div, HQ LAND, Tel: 94331 2308







# 49 (East) Brigade Regular Units



As at Wednesday, 11  
November 2009

Headquarters 49 (East) Brigade  
Military Works Force  
Reserve Training Mobilisation Centre  
Chilwell Station  
Army Technical Support Agency  
Equipment Support 52a (Census)

Joint Service Signals Unit  
Joint Air Warfare Centre

East Midlands Training Area

Headquarters  
Defence Animal Centre

CHILWELL BECKINGHAM  
DIGBY

Headquarters Royal Logistic Corps (TA)  
5 Training Regiment RLC

1st Battalion, The  
Royal Regiment of Fusiliers

MELTON MOWBRAY  
GRANTHAM  
N LUFFENHAM

SWANTON MORLEY 9th/12th Royal Lancers

Headquarters Army  
Training Estates (East)

Army Training Regiment

THETFORD  
HONNINGTON

Joint NBC Regiment  
(1 Royal Tank Regiment)

Defence Intelligence and Security Centre  
Joint Arms Communication Implementation Group

WATERBEACH  
BASSINGBOURN  
CHICKSANDS  
WIMBISH

Headquarters  
12 (Air Support) Brigade  
39 Engineer Regiment



33 (EOD) Engineer Regiment

WATTISHAM

3 & 4 Army Air Corps  
7 Battalion REME

COLCHESTER

16 AA Brigade Headquarters & Units



U&SD DEPARTMENT – BUILDING ENERGY CERTIFICATE



Asset Ref:	ERSK-01-012345	Certificate Number	654321
Building Name:	Main Building	Issued	25 <sup>th</sup> May 2005
Organisation:	HQ LAND		
Address:	Erskine Bks Wilton Salisbury Wilts SP2 0AG		

Energy Certificate

**Building Energy Performance**

**Building Type** Office

**Calculation Method**  
Very energy efficient

*Not energy efficient*

CO <sub>2</sub> emissions	(kg CO <sub>2</sub> m <sup>-2</sup> treated floor area per annum)	Predicted	Actual
<b>CO<sub>2</sub> emissions</b>		<b>108</b>	<b>177</b>
<b>Energy Use by system</b>	<b>(kWh m<sup>-2</sup> treated floor area per annum)</b>		
Heating Systems	176	176	176
Cooling Systems	0	0	0
Auxiliary Equipment	3	120	120
Lighting	92	92	92
Hot Water	8	8	8
<b>Total Energy Use</b>	<b>(kWh m<sup>-2</sup> treated floor area per annum)</b>		
Electricity	103	220	220
Fossil Fuels	176	176	176

**Further information can be found in the Building Log Book**

GB 2005

Top 220 MoD Energy Consuming Sites

DE Code	Site	TLB	Site Energy Consumption (kWh) in FY 04/05					
			Brown Electricity	CCL Exempt Electricity	Natural Gas	LPG	Coal	FFO
MLTN	Mooltan Barracks	LAND	2,008,496 kWh	139,628 kWh	5,145,831 kWh	0 kWh	0 kWh	29,180 kWh
FULW	Fulwood Barracks	LAND	1,580,588 kWh	109,880 kWh	6,309,204 kWh	0 kWh	0 kWh	0 kWh
DREG	Dreghorn Barracks	LAND	0 kWh	0 kWh	7,824,988 kWh	0 kWh	0 kWh	0 kWh
VICZ	Victoria Barracks	LAND	153,344 kWh	10,660 kWh	0 kWh	0 kWh	0 kWh	396,900 kWh
ASSY	Assaye Barracks	LAND	984 kWh	68 kWh	7,326,389 kWh	0 kWh	0 kWh	47,156 kWh
ELIZ	Elizabeth Barracks	LAND	1,344,851 kWh	93,492 kWh	5,865,759 kWh	0 kWh	0 kWh	0 kWh
DKGD	Brigade Ghurkas Transit Centre	LAND	2,105,662 kWh	146,383 kWh	0 kWh	0 kWh	0 kWh	647,325 kWh
STGN	St Georges Barracks	LAND	3,833,723 kWh	266,516 kWh	352,841 kWh	0 kWh	11,141,975 kWh	587,003 kWh
LILL	Lille Barracks	LAND	3,259,263 kWh	226,580 kWh	6,518,768 kWh	0 kWh	0 kWh	88,935 kWh
MSYB	York Barracks	LAND	3,160,293 kWh	219,699 kWh	10,157,150 kWh	72,440 kWh	0 kWh	0 kWh
ALGM	Aldershot Garrison Misc	LAND	598,185 kWh	41,585 kWh	7,124,374 kWh	95,059 kWh	0 kWh	1,079,400 kWh
CONN	Connaught Barracks	LAND	165,373 kWh	11,497 kWh	5,839,015 kWh	0 kWh	0 kWh	34,608 kWh
HFWE	Wentworth Barracks	LAND	1,656,448 kWh	115,154 kWh	2,705,400 kWh	0 kWh	0 kWh	0 kWh
ALVO	Aldergrove Airfield	GOCNI	15,493,418 kWh	1,077,083 kWh	0 kWh	1,071,029 kWh	0 kWh	36,684,732 kWh
SHAC	Shackleton Barracks	GOCNI	10,659,180 kWh	741,013 kWh	0 kWh	753,801 kWh	0 kWh	22,338,897 kWh
THIP	Thiepval Barracks	GOCNI	9,809,735 kWh	681,960 kWh	21,421,571 kWh	32,958 kWh	0 kWh	1,053,833 kWh
PALC	Palace Barracks	GOCNI	5,055,884 kWh	351,479 kWh	22,984,016 kWh	13,002 kWh	0 kWh	761,933 kWh
BKLB	Kinnegar Station	GOCNI	3,915,968 kWh	272,233 kWh	11,786,630 kWh	1,369 kWh	0 kWh	0 kWh
ABRC	Abercorn Barracks	GOCNI	5,311,440 kWh	369,245 kWh	0 kWh	950,732 kWh	0 kWh	6,906,974 kWh
LISN	Lisanelly Barracks	GOCNI	3,708,430 kWh	257,805 kWh	0 kWh	734,938 kWh	0 kWh	8,595,815 kWh
MASS	Massereene Barracks	GOCNI	3,343,936 kWh	232,466 kWh	0 kWh	3,858,246 kWh	0 kWh	5,675,250 kWh
ALEX	Alexander Barracks	GOCNI	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DMAD	Drumadd Barracks	GOCNI	2,501,488 kWh	173,900 kWh	0 kWh	321,579 kWh	0 kWh	3,962,616 kWh
BESB	Bessbrook	GOCNI	2,212,079 kWh	153,781 kWh	0 kWh	640,273 kWh	0 kWh	3,768,450 kWh
MAHR	Mahon Barracks	GOCNI	3,307,124 kWh	229,907 kWh	0 kWh	230,589 kWh	0 kWh	2,847,096 kWh
ABYW	Abbey Wood	DPA	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
NBPS/NELS	HMNB Portsmouth/HMS Nelson	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
NBFL	HMNB Clyde	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
ADCP	RNAD Depot Coulport	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
BODD	DSDC Donnington	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DPDY/DRAK	HMNB Devonport/HMS Drake	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
BODB	DSDC Bicester	DLO	12,731,208 kWh	885,057 kWh	1,415,125 kWh	2,628,496 kWh	0 kWh	48,491,310 kWh
ADBE	DM Beith	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
BASI	Basil Hill	DLO	0 kWh	0 kWh	0 kWh	0 kWh	0 kWh	0 kWh
AVDA	DSDC Ashchurch	DLO	4,526,250 kWh	314,659 kWh	4,701,190 kWh	1,274,461 kWh	0 kWh	15,958,268 kWh
ADGP	DM Gosport	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
AQMG	DLO Andover	DLO	9,249,878 kWh	643,040 kWh	11,576,372 kWh	0 kWh	0 kWh	0 kWh
ENSL	Ensligh	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
BFOX	MOD Foxhill	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
KTNQ	DM Kinton	DLO	2,477,824 kWh	172,255 kWh	0 kWh	0 kWh	0 kWh	9,157,523 kWh
CSEL	DSDC Llangennech	DLO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
INGL	Inglis Barracks	DLO	1,914,072 kWh	133,064 kWh	2,320,748 kWh	0 kWh	0 kWh	4,630,500 kWh
SAAR	Sennybridge Army Field Training Centre	DE	2,325,282 kWh	161,651 kWh	0 kWh	5,997,292 kWh	0 kWh	0 kWh
STAN	Stanford Army Field Training Centre	DE	702,509 kWh	48,838 kWh	0 kWh	9,389,711 kWh	0 kWh	0 kWh
QUEL	Queen Elizabeth Barracks	DE	2,125,905 kWh	147,790 kWh	11,077,871 kWh	0 kWh	0 kWh	21,000 kWh

DE Code	Site	TLB	Site Energy Consumption (kWh) in FY 04/05					
			Brown Electricity	CCL Exempt Electricity	Natural Gas	LPG	Coal	FFO
FTGR	Fort George	DE	2,236,361 kWh	155,469 kWh	269,409 kWh	263,912 kWh	0 kWh	6,641,450 kWh
SPTC	Westdown Training Camp	DE	1,842,779 kWh	128,108 kWh	0 kWh	13,129,297 kWh	0 kWh	1,293,023 kWh
LYCA	Lydd Camp	DE	2,260,860 kWh	157,172 kWh	6,350,657 kWh	1,006,473 kWh	0 kWh	486,297 kWh
CMNR	Castlemartin Ranges	DE	1,525,135 kWh	106,025 kWh	0 kWh	3,948,575 kWh	0 kWh	2,407,220 kWh
WCTC	Warcop Army Field Training Centre	DE	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DE HQ	DE Sutton Coldfield	DE	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DIGG	RAF Digby	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DISC	DISC, Chicksands	CTLB	8,237,432 kWh	572,656 kWh	2,308,856 kWh	620,852 kWh	0 kWh	12,977,034 kWh
DFAC	The Defence Academy, Shrivenham	CTLB	8,316,728 kWh	578,168 kWh	16,024,420 kWh	0 kWh	0 kWh	0 kWh
CREG	Credenhill, Hereford	CTLB	5,108,457 kWh	355,203 kWh	9,829,631 kWh	0 kWh	0 kWh	0 kWh
KEOG	Keogh Barracks, Aldershot	CTLB	2,439,049 kWh	169,560 kWh	10,248,423 kWh	0 kWh	0 kWh	0 kWh
DENI	Denison Barracks, Thatcham	CTLB	1,899,052 kWh	132,020 kWh	0 kWh	328,460 kWh	0 kWh	6,715,002 kWh
OSUF	Feltham Garrison (Mil Svy), Feltham	CTLB	2,165,806 kWh	150,564 kWh	7,431,667 kWh	0 kWh	0 kWh	319,032 kWh
HDCT	DMRC Headley Court	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
LOMB	MoD Main Building	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
OWOB	Old War Office	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
HASL	Royal Hospital Haslar	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
MDPW	MDPGA HQ Wethersfield	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
DOLP	Fort Blockhouse	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
LSGE	St Georges Court, London	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
WILT	Defence School of Languages	CTLB	668,874 kWh	46,499 kWh	1,088,652 kWh	0 kWh	0 kWh	4,932,218 kWh
BAWR	PPPA Warminster Rd, Bath	CTLB	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
WARR	Northwood PJHQ	CJO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
CEPS	BF Episkopi	CJO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
CDHK	Dhekelia Garrison	CJO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
RMAS	RMA Sandhurst	AG	8,603,209 kWh	598,084 kWh	32,205,883 kWh	0 kWh	0 kWh	0 kWh
BLAN	Royal School of Signals	AG	11,247,889 kWh	781,939 kWh	22,369,156 kWh	92,024 kWh	0 kWh	0 kWh
AAAC	Army Air Corps Centre	AG	6,548,431 kWh	455,238 kWh	27,335,094 kWh	0 kWh	0 kWh	0 kWh
HZBK	Hazebrouck Barracks	AG	2,226,150 kWh	154,759 kWh	32,723,043 kWh	0 kWh	0 kWh	0 kWh
VIMY	Vimy Barracks	AG	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
LFNY	DST Leconfield	AG	7,672,724 kWh	533,398 kWh	23,017,433 kWh	0 kWh	0 kWh	199,500 kWh
BRMP	Brompton Barracks	AG	7,045,496 kWh	489,794 kWh	51,187,849 kWh	0 kWh	0 kWh	4,800,170 kWh
GIBR	Gibraltar Barracks	AG	5,092,866 kWh	354,049 kWh	16,269,909 kWh	145,564 kWh	0 kWh	695,226 kWh
BASS	ATR Bassingbourn	AG	5,233,713 kWh	363,841 kWh	2,294,901 kWh	1,199,634 kWh	0 kWh	13,220,624 kWh
AGCD	RHQ AGC Worthy Down	AG	5,346,751 kWh	371,699 kWh	9,821,306 kWh	0 kWh	0 kWh	314,108 kWh
ALXB	ATR Pirbright	AG	3,495,072 kWh	242,973 kWh	25,468,841 kWh	0 kWh	0 kWh	0 kWh
BOVC	Bovington Camp	AG	3,749,657 kWh	260,671 kWh	17,444,171 kWh	51,063 kWh	0 kWh	0 kWh
TREN	Trenchard Lines	AG	3,843,030 kWh	267,162 kWh	0 kWh	322,688 kWh	0 kWh	6,673,716 kWh
SJM2	Sir John Moore Bks Winchester	AG	214,818 kWh	14,934 kWh	9,849,997 kWh	7,141 kWh	0 kWh	0 kWh
PRRO	Princess Royal Barracks	AG	1,925,552 kWh	133,862 kWh	3,923,756 kWh	261,189 kWh	0 kWh	6,968,112 kWh
ALBK	Larkhill Alanbrooke Barracks	AG	119,786 kWh	8,327 kWh	14,044,535 kWh	88,543 kWh	0 kWh	3,916,584 kWh
DERG	Dering Lines	AG	2,069,004 kWh	143,834 kWh	10,438,665 kWh	0 kWh	0 kWh	0 kWh
WHIT	ATR Lichfield	AG	3,410,393 kWh	237,086 kWh	6,548,548 kWh	0 kWh	0 kWh	0 kWh
OMER	Army School of Catering	AG	2,468,857 kWh	171,632 kWh	1,437,606 kWh	0 kWh	0 kWh	0 kWh
LWGS	Lulworth Guntery School	AG	1,892,554 kWh	131,568 kWh	0 kWh	2,551,764 kWh	0 kWh	4,073,496 kWh

DE Code	Site	TLB	Site Energy Consumption (kWh) in FY 04/05					
			Brown Electricity	CCL Exempt Electricity	Natural Gas	LPG	Coal	FFO
DYMS	Duke Of York's Royal Military School	AG	1,531,754 kWh	106,486 kWh	10,266,763 kWh	0 kWh	0 kWh	0 kWh
MCTC	Military Corrective Training Facility	AG	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
GLKH	Kentigern House	AG	1,872,155 kWh	130,150 kWh	4,042,757 kWh	0 kWh	0 kWh	0 kWh



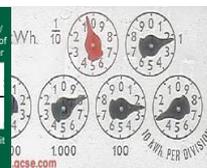
# Army Utilities Directive 2006-2011



Energy		Washing machine
Manufacturer Model		
More efficient		<b>A</b>
A		
B		
C		
D		
E		
F		
Less efficient		
G		
Energy consumption kWh/Cycle	1.55	
Washing performance	A	
Spin drying performance	A	
Capacity (cotton) kg	8.0	
Water consumption	5.5	
Noise (dB(A) re 1 pW)	52	
Washing Spinning	7.6	



Profile Type	Meter / Time switch details	Line loss factor/distribution use of system identifier
S	02 123 456	
	03 1234 5678 478	
	Distributor Unique Identifier Reference	Unique Check Digit Reference



I require the Ministry of Defence and the Armed Forces to...

...use resources, including energy and water, as efficiently as possible

*Safety Health and Environmental Protection in the Ministry of Defence  
Policy Statement by the Secretary of State for Defence, Para 3.1.c*

---

## **FOREWORD**

Hardly a week goes by without some mention in the news of the increasing cost and the increasing concern over the supply of energy and water, or of the impact of climate change. These are issues of national concern, increasingly reflected in legislation and Government policy. These issues are also having an increasing impact on MOD and Army business.

The Army spends a significant sum keeping the lights on, buildings heated, meals cooked, computers running, supplying hot water, and a multitude of other uses for 'domestic utilities'. The Army's annual utilities bill is approaching £150M, a significant proportion of the total MOD bill and a major element of our annual expenditure. Over the STP period the bill is set to rise by over £30M per year without any increase in our funding levels, the impact on wider Army business is very significant.

The Secretary of State's policy (above) makes it clear that all Military personnel and Civil Servants should do their utmost to reduce spend on unnecessary use of domestic utilities. Money spent on wasted energy and water is money that is not available for operational training or support needs. But in addition to squandering a valuable financial resource, excessive use of energy and water has increasing environmental consequences. The Army's current use of energy derived from fossil fuels generates around 100 tonnes of Carbon Dioxide (CO<sub>2</sub>) an hour, or the equivalent weight of a Challenger II MBT every 40 minutes. This is a significant contribution to climate change, the consequences of which are increasingly affecting the world in which we live and operate.

So for both sound financial reasons, and for the sake of our children and successors, it is in our best interests to reduce our use of energy and water, and the unavoidable consequences of this, to the minimum necessary for comfort and current needs. This Directive sets out practical measures on what we can all do to minimise our use of energy and water, to spend only on essential use, to ensure that we can continue to meet our energy and water needs, and to minimise our impact on the environment. It sets demanding targets in a particularly difficult financial climate, but progress in achieving them will deliver improvements – both financial and environmental – that will benefit us all.



J C McColl  
Lt Gen  
Commander Regional Forces/  
Inspector General Territorial Army  
Sep 06

## ARMY MAJOR SITES

(ANNEX 8B TO ARMY UTILITIES DIRECTIVE 2006 – 2011. SEPTEMBER 2006

### ARMY UTILITY MANAGEMENT BRANCH)

(Dated as at May 2006)

Rank <sup>1</sup>	DE Code	Location	Establishment	TLB	Div/Dist	Bde	Total kWh	% Total	Total CO <sub>2</sub> (t)
1	HOHE00	Hohne	Hohne Camp <sup>2</sup>	LAND	BA(G)	Hohne Garrison	97,344,519	3.08%	17,411
2	FBFL00	Fallingbostel	Fallingbostel Camp	LAND	BA(G)	Hohne Garrison	93,017,971	2.94%	14,301
3	BGTA01	Suffield	British Army Training Support Unit Suffield (BATUS)	LAND	Canada	Suffield	68,940,306	2.18%	10,049
4	<i>BODB04</i>	<i>Bicester</i>	<i>DSDC Bicester</i>	<i>DLO</i>	<i>4 Div</i>	<i>145 (HC) Bde</i>	<i>66,530,614</i>	<i>2.10%</i>	<i>11,623</i>
5	PBNM01 NMLW CTG01	Sennelager	Normandy Barracks (LWCTG(G))	LAND	BA(G)	Paderborn Garrison	65,954,039	2.09%	8,790
6	PPBK	Bordon	Prince Phillip Barracks	AG	4 Div	145 (HC) Bde	58,010,250	1.84%	10,755
7	GTPR00	Gutersloh	Princess Royal Barracks	LAND	BA(G)	Gutersloh Garrison	57,173,470	1.81%	13,576
8	WATT	Ipswich	Wattisham Station	LAND	4 Div	Colchester Garrison	49,200,744	1.56%	8,612
9	RMAS01	Camberley	RMA Sandhurst	AG	4 Div	145 (HC) Bde	44,545,980	1.41%	7,424
10	RATF	Bulford	RATFYN (WARD03) <sup>3</sup>	LAND	5 Div	43 (Wx) Bde	42,926,201	1.36%	13,203
11	ALVO02	Aldergrove	Aldergrove Airfield	GOCNI	NI	107 (U) Bde	40,564,916	1.28%	8,094
12	BLAN01	Blandford	Royal School of Signals	AG	5 Div	43 (Wx) Bde	38,180,662	1.21%	7,084
13	PBBA01	Paderborn	Barker Barracks	LAND	BA(G)	Paderborn Garrison	37,648,627	1.19%	5,838
14	AACC02	Middle Wallop	Army Air Corps Centre	AG	4 Div	145 (HC) Bde	35,818,909	1.13%	5,503
15	THIP01	Lisburn	Thiepval Barracks	GOCNI	NI	107 (U) Bde	32,738,997	1.04%	6,140
16	BENS01	Benson	RAF Benson	LAND	4 Div	145 (HC) Bde	32,061,436	1.01%	4,876
17	HZBK	Reading	Hazebrouck Barracks	AG	4 Div	145 (HC) Bde	31,952,267	1.01%	4,867
18	SHAC01	Ballykelly	Shackleton Barracks	GOCNI	NI	107 (U) Bde	30,831,389	0.98%	6,489

<sup>1</sup> By Total kWh energy use

<sup>2</sup> Covers all DE Codes in Hohne, needs further breakdown

<sup>3</sup> Represents all Tidworth, Bulford, and Larkhill sites electricity consumption, needs further breakdown

Rank <sup>1</sup>	DE Code	Location	Establishment	TLB	Div/Dist	Bde	Total kWh	% Total	Total CO <sub>2</sub> (t)
19	OSME00	Osnabruck	Mercer Barracks	LAND	BA(G)	Osnabruck Garrison	30,336,668	0.96%	4,520
20	VIMY	Catterick	ITC Catterick	AG	2 Div	Catterick Garrison	28,467,051	0.90%	4,804
21	HRDN02	Catterick	Duchess of Kent Psychiatric Hospital	LAND	2 Div	Catterick Garrison	28,276,558	0.89%	3,477
22	DFAC01	Shrivenham	The Defence Academy	CENTRE	4 Div	145 (HC) Bde	27,986,078	0.89%	4,915
23	CGIF01	Catterick	Catterick Garrison Misc <sup>4</sup>	LAND	2 Div	Catterick Garrison	27,796,815	0.88%	6,290
24	AVDA	Tewkesbury	DSDC Ashchurch	DLO	5 Div	43 (Wx) Bde	27,438,346	0.87%	4,116
25	DISC	Chicksands	Defence Intelligence And Security Centre	CENTRE	4 Div	49 (E) Bde	27,070,509	0.86%	4,792
26	WMTC	Warminster	Warminster Training Centre	AG	5 Div	43 (Wx) Bde	27,022,607	0.85%	5,555
27	ODIM01	Odiham	RAF Odiham	LAND	4 Div	145 (HC) Bde	26,116,766	0.83%	3,657
28	LFNY	Leconfield	DST Leconfield	AG	2 Div	15 (NE) Bde	25,476,124	0.81%	4,897
29	BRMP01	Chatham	Brompton Barracks	AG	4 Div	2 Inf Bde	25,188,299	0.80%	3,703
30	DALT01	Abingdon	Dalton Barracks	LAND	4 Div	145 (HC) Bde	24,192,937	0.77%	3,583
31	GIBR01	Minley	Gibraltar Barracks	AG	4 Div	145 (HC) Bde	23,048,044	0.73%	3,748
32	AZIG	Colerne	Azimghur Barracks	LAND	5 Div	43 (Wx) Bde	21,511,322	0.68%	3,507
33	GTMA01	Gutersloh	Mansergh Barracks	LAND	BA(G)	Gutersloh Garrison	21,096,936	0.67%	3,521
34	GACK	Bramcote	Gamecock Barracks	LAND	5 Div	143 (WM) Bde	21,058,685	0.67%	3,285
35	BOVC	Bovington	Bovington Camp	AG	5 Div	43 (Wx) Bde	20,933,276	0.66%	2,809
36	AQMG01	Andover	DLO Andover	DLO	4 Div	145 (HC) Bde	20,931,721	0.66%	4,566
37	CTWY	Beeston	Chilwell Station	LAND	4 Div	145 (HC) Bde	20,614,921	0.65%	2,367
38	ALXB	Pirbright	ATR Pirbright	AG	4 Div	2 Inf Bde	20,514,044	0.65%	3,107
39	AGCD01	Winchester	RHQ AGC Worthy Down	AG	4 Div	145 (HC) Bde	18,977,480	0.60%	3,256
40	REDI02	Edinburgh	Redford Infantry Barracks <sup>5</sup>	LAND	2 Div	51 (Scottish) Bde	18,777,526	0.59%	3,079
41	BASS	Royston	ATR Bassingbourn	AG	4 Div	49 (E) Bde	18,647,827	0.59%	3,671
42	BRLN	Catterick	Bourlon Barracks	LAND	2 Div	Catterick Garrison	18,561,053	0.59%	2,844
43	ALBK	Larkhill	Larkhill Alanbrooke Barracks	AG	5 Div	43 (Wx) Bde	18,487,399	0.58%	2,331
44	CETB00	Celle	Trenchard Barracks	LAND	BA(G)	Hohne Garrison	18,318,174	0.58%	3,392
45	OSRB00	Osnabruck	Roberts Barracks	LAND	BA(G)	Osnabruck Garrison	18,317,143	0.58%	3,130

<sup>4</sup> All non-metered Catterick sites, needs further breakdown

<sup>5</sup> includes electricity for REDC Redford Cavalry Barracks?

Rank <sup>1</sup>	DE Code	Location	Establishment	TLB	Div/Dist	Bde	Total kWh	% Total	Total CO <sub>2</sub> (t)
46	PALC01	Hollywood	Palace Barracks	GOCNI	NI	107 (U) Bde	17,988,279	0.57%	3,280
47	HULL	Hullavington	Buckley Barracks	LAND	5 Div	43 (Wx) Bde	17,553,373	0.56%	2,949
48	BKLB	Hollywood	Kinnegar Station	GOCNI	NI	107 (U) Bde	17,492,797	0.55%	3,025
49	WTRB01	Waterbeach	Waterbeach Barracks	LAND	4 Div	49 (E) Bde	17,483,354	0.55%	2,852
50	WELL	London	Wellington Barracks	LAND	LONDIST		17,149,761	0.54%	3,105
51	MSYB01	Munster	York Barracks	LAND	BA(G)	Osnabruck Garrison	17,036,031	0.54%	2,827
52	SJM2	Winchester	Sir John Moore Bks Winchester	AG	4 Div	145 (HC) Bde	16,907,568	0.53%	2,636
53	CRED	Hereford	Credenhill	CENTRE	5 Div	143 (WM) Bde	16,240,379	0.51%	3,008
54	MCML01	Marchwood	McMullen Barracks	LAND	4 Div	145 (HC) Bde	15,641,266	0.49%	2,210
55	KIRK	Colchester	Kirkee Barracks	LAND	4 Div	Colchester Garrison	15,580,568	0.49%	2,108
56	CGGE01	Colchester	Colchester Garrison Misc <sup>6</sup>	LAND	4 Div	Colchester Garrison	15,082,413	0.48%	2,405
57	MRNE	Catterick	Marne Barracks	LAND	2 Div	Catterick Garrison	14,935,749	0.47%	2,929
58	JHQR01	Mönchengladbach	JHQ Rheindahlen <sup>7</sup>	LAND	BA(G)	Rhine Garrison	14,857,559	0.47%	4,751
59	PBAH01	Sennelager	Athlone Barracks	LAND	BA(G)	Paderborn Garrison	14,598,487	0.46%	2,374
60	BAKE	Thorney Island	Baker Barracks	LAND	4 Div	145 (HC) Bde	14,484,774	0.46%	2,342
61	PBAB01	Paderborn	Alanbrooke Barracks	LAND	BA(G)	Paderborn Garrison	14,458,226	0.46%	2,241
62	OSQB00	Osnabruck	Quebec Barracks	LAND	BA(G)	Osnabruck Garrison	14,288,746	0.45%	2,427
63	PBDB01	Sennelager	Dempsey Barracks	LAND	BA(G)	Paderborn Garrison	14,215,694	0.45%	2,350
64	PRRO01	Deepcut	Princess Royal Barracks	AG	4 Div	2 Inf Bde	14,174,531	0.45%	2,698
65	OSBE00	Osnabruck	Belfast Barracks	LAND	BA(G)	Osnabruck Garrison	13,991,473	0.44%	2,169
66	MSOB01	Munster	Oxford Barracks	LAND	BA(G)	Osnabruck Garrison	13,950,239	0.44%	2,429
67	DERG	Brecon	Dering Lines	AG	5 Div	160 (W) Bde	13,848,248	0.44%	2,001
68	BICA01	Bielefeld	Catterick Barracks	LAND	BA(G)	Gutersloh Garrison	13,837,927	0.44%	2,523
69	PWGL	Grantham	Prince William Of Gloucester Barracks	LAND	4 Div	49 (E) Bde	13,781,294	0.44%	2,257
70	LDTA	Bordon	Longmoor Camp	LAND	4 Div	145 (HC) Bde	13,481,265	0.43%	1,889
71	SAAR	Sennybridge	Sennybridge Army Field Training Centre	LAND	5 Div	160 (W) Bde	13,273,223	0.42%	2,035
72	HMGB01	Hameln	Gordon Barracks	LAND	BA(G)	Paderborn Garrison	13,059,619	0.41%	2,149

<sup>6</sup> Combined 'old' non-metered Colchester Garrison sites

<sup>7</sup> figure now excludes SFA

Rank <sup>1</sup>	DE Code	Location	Establishment	TLB	Div/Dist	Bde	Total kWh	% Total	Total CO <sub>2</sub> (t)
73	TREN	Upavon	Trenchard Lines	AG	5 Div	43 (Wx) Bde	13,034,113	0.41%	2,520
74	MEEA01	Colchester	Meeanee Barracks	LAND	4 Div	Colchester Garrison	12,859,293	0.41%	1,769
75	KEOG	Aldershot	Keogh Barracks	CENTRE	4 Div	2 Inf Bde	12,832,520	0.41%	2,194
76	ABRC01	Ballykinler	Abercorn Barracks	GOCNI	NI	107 (U) Bde	12,666,803	0.40%	3,028
77	LISN01	Omagh	Lisanelly Barracks	GOCNI	NI	107 (U) Bde	12,645,356	0.40%	2,609
78	KTNQ	Kineton	DMC Kineton	DLO	5 Div	143 (WM) Bde	12,607,341	0.40%	2,308
79	MASS01	Antrim	Massereene Barracks	GOCNI	NI	107 (U) Bde	12,292,760	0.39%	2,362
80	CAWD	Pembroke	Cawdor Barracks	LAND	5 Div	160 (W) Bde	12,250,776	0.39%	2,146
81	CARV	Saffron Walden	Carver Barracks	LAND	4 Div	49 (E) Bde	12,095,200	0.38%	1,736
82	ERSK01	Wilton	Erskine Barracks	LAND	5 Div	43 (Wx) Bde	12,063,155	0.38%	2,533
83	SJM101	Shorncliffe	Sir John Moore Barracks	LAND	4 Div	2 Inf Bde	11,881,543	0.38%	1,697
84	STAN06	Thetford	Stanford Army Field Training Centre	LAND	4 Div	49 (E) Bde	11,870,847	0.38%	2,097
85	ROMN01	Colchester	Roman Barracks	LAND	4 Div	Colchester Garrison	11,282,902	0.36%	1,868
86	BEAC	Chepstow	Beachley Barracks	LAND	5 Div	160 (W) Bde	11,066,977	0.35%	1,881
87	SPTC89	Tilshead	Westdown Training Camp	LAND	5 Div	43 (Wx) Bde	11,002,266	0.35%	1,731
88	DOGB	South Cerney	Duke of Gloucester Barracks	LAND	5 Div	43 (Wx) Bde	10,913,350	0.35%	1,996
89	HYDP	London	Hyde Park Barracks	LAND	LONDIST		10,622,604	0.34%	1,901
90	ALEX01	Aldergrove	Alexander Barracks	GOCNI	NI	107 (U) Bde	10,402,385	0.33%	1,981
91	CLIV	Tern Hill	Clive Barracks	LAND	5 Div	143 (WM) Bde	10,367,005	0.33%	1,570
92	PBNM01 NMGU01	Sennelager	Normandy Barracks (Gar Units)	LAND	BA(G)	Paderborn Garrison	10,285,679	0.33%	1,650
93	WHIT	Lichfield	ATR Lichfield	AG	5 Div	143 (WM) Bde	10,212,644	0.32%	1,853
94	HFHM00	Herford	Hammersmith Barracks	LAND	BA(G)	Gutersloh Garrison	10,088,304	0.32%	1,886
95	CHEL	London, Chelsea	Chelsea Barracks	LAND	LONDIST		9,766,716	0.31%	1,784
96	DENI01	Hermitage	Denison Lines	CENTRE	4 Div	145 (HC) Bde	9,699,182	0.31%	1,987
97	WLRS07	London, Woolwich	RA Barracks	LAND	LONDIST		9,526,937	0.30%	1,649
98	VICB	Windsor	Victoria Barracks	LAND	LONDIST		9,422,226	0.30%	1,528
99	LYCA	Ashford	Lydd Camp	LAND	4 Div	2 Inf Bde	9,394,810	0.30%	1,595
100	BOAR	Bovington	ABRO Bovington	ABRO	5 Div	43 (Wx) Bde	9,270,130	0.29%	1,528

Rank <sup>1</sup>	DE Code	Location	Establishment	TLB	Div/Dist	Bde	Total kWh	% Total	Total CO <sub>2</sub> (t)
101	WILT01	Beaconsfield	Defence School of Languages	Centre	4 Div	145 (HC) Bde	9,030,754	0.29%	1,528
102	QUEL	Strensall	Queen Elizabeth Barracks	LAND	2 Div	15 (NE) Bde	8,977,637	0.28%	1,970
103	SMRO	Swanton Morley	Robertson Barracks	LAND	4 Div	49 (E) Bde	8,852,716	0.28%	1,679
104	CLAR01	Ripon	Claro Barracks	LAND	2 Div	15 (NE) Bde	8,569,197	0.27%	2,009
105	ALBM	Newcastle upon Tyne	Albermarle Barracks	LAND	2 Div	15 (NE) Bde	8,549,526	0.27%	1,973
106	FTGR	Inverness	Fort George	LAND	2 Div	51 (Scottish) Bde	8,459,298	0.27%	1,932
107	BATT	Warminster	Battlesbury Barracks	LAND	5 Div	43 (Wx) Bde	8,276,095	0.26%	1,563
108	IMPH01	York	Imphal Barracks	LAND	2 Div	15 (NE) Bde	8,110,886	0.26%	1,774
109	ELJB01	Elmpt	Javelin Barracks	LAND	BA(G)	Rhine Garrison	7,701,648	0.24%	2,016
110	WEET01	Blackpool	Weeton Camp	LAND	2 Div	42 (NW) Bde	7,396,800	0.23%	1,597
111	TDIZ	Tidworth	Tidworth Industrial Zone	LAND	5 Div	43 (Wx) Bde	7,150,630	0.23%	2,082
112	OMER01	Aldershot	Army School of Catering	AG	4 Div	145 (HC) Bde	6,201,564	0.20%	1,914
Total all Major Sites							2,367,699,020		
Total all Army sites							3,160,950,426		
							75%	74.90%	

Annex 8C to Army Utilities Directive 2006 – 2011. September 2006.  
Army Utilities Management Branch

<b>Major Sites (M) -</b>	
<b>Major Sites Tier 1 - Get the basics right</b>	
M1/06	Identify all Army Major Sites, and ensure that AUMB has all required standing data on these sites.
M2/06	Ensure all Major Sites are on the correct utility supply contracts, and that these contracts reflect actual utility use and profiles at each Major site.
M3/06	Ensure all UK Major Sites have an up-to-date VAT certificate, which takes due account of a recent assessment of the domestic/ commercial split at the site.
M4/06	Where appropriate, ensure that all (UK) complying supplies and generating equipment are registered for Climate Change Levy (CCL) exemption.
M5/06	Complete and maintain a register of all domestic utility supplies supporting each Major Site, including any on-site electricity generation.
M6/06	Complete and maintain a register of meters, sub-meters, and utilities reporting points (eg oil tank gauges), located on or associated with each Major Site.
M7/06	Identify and measure all domestic utility supplies to third parties from Major Sites.
M8/06	Ensure accurate and timely submission of AF F727 returns (or equivalent) for all meters/ reporting points for all Major Sites
M9/06	Identify and maintain a register of all 'combustion installations' within each Major Site, and from this, determine the total rated thermal input capacity for each Major Site
<b>Major Sites Tier 2 - Actively manage</b>	
M10/ 06	Where a domestic utility supply cable or pipe enters or leaves a Major Site, ensure that it is metered at the site boundary.
M11/ 06	Ensure that all primary electrical meters at all Major Sites are capable of being remotely or electronically read.
M12/ 06	Identify and monitor the largest energy/ water users at each Major Site.
M13/ 06	Benchmark each Army Major Site, using ECON75, including the ten largest energy-consuming buildings at each Major Site.
<b>Major Sites Tier 3 - Reduce consumption and emissions</b>	
M14/ 06	Develop a site-level strategic plan for energy and water management and reduction of usage (and associated emissions) at each Major Site
M15/ 06	Identify costed measures for reducing energy and water use, and energy-related Carbon emissions, at each Major Site.
M16/ 06	Review plans for the future development of each Major Site (including the IEMP) to identify opportunities for further energy and water usage reductions.
<b>EU ETS Sites Tier 4 - Stretch Targets</b>	
M17/ 06	Reduce emissions at all Army EU ETS Registered sites to allowance level



# 4<sup>th</sup> DIVISION UTILITIES DIRECTIVE 2007 - 2008





# **4<sup>TH</sup> DIVISION UTILITIES** **STRATEGY** **200/2008**



## **CONTENTS**

Overview

Annex A – Accounting and Sustainability Targets

Annex B – Brigade Quarterly Target Reporting Template

Annex C – Major Sites

Annex D – Major Site Targets

Annex E – Schedule of details required for each major Site

Annex F – Schedule of Major Site consumption & suggested targets

Annex G – Major Site Quarterly Return Template

Annex H – 4<sup>th</sup> Div Utilities Efficiency Committee Terms of Reference

Annex I – Brigade Utilities Efficiency Committee Terms of Reference

Annex J – Unit Energy Action Group Terms of Reference

Annex K – Consumption Reporting Flow Chart.

Annex L – 4th Division Energy Advisors Contact Points

## OVERVIEW

References:

- A. Army Utilities Directive 2006 – 2011 published Sept 2006.
- B. National Audit Office Report HC 177 1996/1997, “Ministry of Defence: Management of Utilities”, published January 1997.
- C. Material Regulations for the Army Volume 6 Pamphlet 2.

### Introduction

1. This document details the 4<sup>th</sup> Division Strategy for the year 2007/2008. As in previous years the document lays out the methodology to be adopted in the Division to ensure the efficient management and measurement of utilities. In line with the Army Utilities Directive (Reference A) the strategy includes Brigade and Major Site targets to be reported against quarterly.

### Background

2. A National Audit Office (NAO) **investigation** into the management of utilities within the MOD (Reference B) concluded that whilst utilities savings had been made by the Department, there was further scope for improvement. In particular, the report highlighted the potential to:

- a. Maximise competitively let utilities supply contracts.
- b. Improve bill checking and contract review procedures.
- c. Realise benefit offered by energy and water surveys.
- d. Benchmark performance and improve management information.
- e. Promote stronger utilities management.

3. The UK Government has set a target to reduce the UK’s CO<sub>2</sub> emissions by 60% by 2050.

4. This strategy, as with its predecessors, is intended to implement measures to address the findings in the NAO report and implement the requirements of the Army Utilities Directive.

### Provision and Accounting

5. Specific guidance on the provision of, and accounting for, utilities within the Army can be found in the Mat Regs (Reference C).

### Reliability of Supply

6. The Army is reliant on utilities for heating, cooking and hot water supply. Extended interruptions to supplies could lead to closure of key buildings; contingency measures should be in place to ensure essential services to key buildings are maintained.

### **Environmental Targets**

7. The UK Government is signatory to a number of international agreements, including the Kyoto Protocol, intended to address the growing issue of climate change. These agreements are supported and implemented through legislation, such as the Climate Change Levy (CCL), and through targets set by the Government both for the UK economy and for Government Departments, particularly the Sustainable Development in Government (SDiG) framework. The Government outlined its current and future strategy in a recent White Paper.

### **Objectives**

8. The 2007/2008 Strategy closely ties targets in with the Directive to Army Utilities Management Balanced Scorecard reporting. The objectives outlined below are included in the LAND/CRF Balanced Scorecard.

9. The overall objective for Army Utilities Management is:

*“To ensure the supply of utilities to the Army Estate, providing reliability of supply, best value for money, and meeting environmental objectives.”*

10. Within this overall objective, there are three sub-objectives, covering the main areas of responsibility for Army Utilities Management.

a. Provision of utilities

*“Provide utilities to meet the needs of the Army Estate at best value for money.”*

b. Reliability of Supply

*“Ensure reliability of supply for utilities at key locations within the Army estate.”*

c. Environmental targets

*“Meet environmental objectives for utility consumption within the Army Estate.”*

11. The 2007/2008 Strategy reflects these objectives, with targets set in each area. These are specified in detail at Annex A.

### **Reporting**

12. Ref C outlines the requirements to validate utility bills using independently obtained consumption information. It is essential that utility bills are correctly checked against consumption figures before payment is authorised, as detailed in the flow chart at Annex K. Monthly reports for all Army utility consumption must also be submitted to Army Utilities Management (AUM). All units shall submit monthly consumption figures on an AF727 to the Accommodation Services Unit (ASU) by no later than the 7<sup>th</sup> of the month following the month being reported. The ASU shall report consumption by DE code area to the Div focal point by no later than the 15<sup>th</sup> of the month preceding the month being reported.

13. Brigade areas should report progress in achieving the targets detailed in Annex A through the preparation and submission of a quarterly return, indicating the position against each target for the quarter in question and a forecast for the end-of-year position. This will use a traffic light system, ranging from Green (satisfactory progress) to Red (critical failure). Any status other than Green will require an explanatory comment.

14. A template for quarterly reporting is at Annex B. Brigade's shall use this template to report on progress against each target in their adcom area, Division will address Division wide progress and report to AUM.

15. Specific targets set out at Annex C make reference to major sites, which are defined as sites producing 1500 tonnes of CO<sub>2</sub> or more per year. A schedule of major sites within 4<sup>th</sup> Division is shown at Annex F.

16. Quarterly returns are required for the P&S targets for the Brigade (Annex A) and for Major Site Targets on the template at Annex G, for each site in the Brigade AOR from:

145 Brigade

2 Infantry Brigade

43 (Wx) Brigade

17. The timetable for submission of quarterly returns from Brigade areas listed above is:

APR – JUN	-	23/07/07
JUL – SEP	-	22/10/07
OCT - DEC	-	21/01/08
JAN – MAR	-	21/04/08

18. Division will complete a collated report on receipt of all Brigade returns, which will feed into the AUM Balanced Scorecard who will publish a quarterly Army-wide summary of progress and issues.

### **VAT Certificates**

19. Brigades shall ensure that VAT certificates are issued to Div focal point for each Natural Gas, Electrical, LPG and Oil invoicing point within their adcom area. All VAT certificates shall be reviewed every 12 Months. (Guidance on completion of VAT certificates may be obtained from Brigade/Division Energy Advisor - see annex L)

### **Meetings**

20. A 4<sup>th</sup> Division Utilities Efficiency Committee will meet at least twice a year. The committee's terms of reference are detailed at Annex H.

21 Brigades shall hold Utilities Efficiency Committee meetings at least twice a year. The committee's terms of reference are detailed at Annex I.

22. Unit Energy Action Groups shall meet at least twice a year. The terms of reference for the action groups are as detailed at Annex J.

**Utilities Efficiency Awards**

23. To encourage and further promote better utilities management HQ 4<sup>th</sup> Div will run a Utility Efficiency Award Competition. Each Brigade shall submit an entry to the award competition by the closing date of the 1<sup>st</sup> December 2007. The award will be presented to the Unit that can demonstrate a good energy management structure and a commitment to achieve significant energy savings during the year 07/08.

**5<sup>th</sup> DIVISION  
UTILITIES MANAGEMENT  
DIRECTIVE 2006-2011**

**Includes:**

**2005/6 Energy Report and 2006/7  
Allocations**

## CONTENTS

<b><u>Chapter</u></b>	<b><u>Item</u></b>	<b><u>Page</u></b>
1.	<b>POLITICAL &amp; ECONOMIC ISSUES</b>	
	0102 Security	4
	0105 Prices	4
	0107 MOD Independence	4
	0113 Renewables	6
2	<b>ARMY POLICY</b>	
	0205 Governance	7
	0206 Fuel & Light charges	8
	0207 EU ETS	8
	0208 Monitoring & Targeting	8
	0209 Performance Monitoring	8
	0210 Progress of achievements to date	9
	<b>ANNEXES</b>	
	A. VAT & CCL Regulations	10
	B. Army Performance Targets	11
	C. Progress of achievements to date	12
3	<b>DIVISIONAL ACTION PLAN</b>	

0302	Organisation
14	
0304	‘Major’ sites
14	
0307	Governance
15	
0308	Sustainability
16	
0310	Contracts & Accounting
17	

## CHAPTER 1 : POLITICAL & ECONOMIC ISSUES

0101. 2005/6 has been a dramatic year for energy, both in increases in fuel prices and in security of supply issues. The increasing public and governmental interest in energy in the UK, and internationally, has led to a more active and vigorous approach to utility management.

### SECURITY

0102. A number of occurrences have highlighted the UK’s poor position in relation to guaranteed energy supplies. The most recent security issue was highlighted in December 2006 when, in an attempt to make the Ukraine pay higher rates for its mains gas, the Russians reduced the supply to the European distribution pipeline. The Ukrainians, in response, simply kept the reduced supply for themselves and prevented other European countries from receiving theirs, this affected Moldova, Hungary, Austria and Italy, amongst others. These countries were forced to put diplomatic pressure on the Russians to restore full supplies and, although the issue between Ukraine and Russia has been resolved, the potential for further disruption is apparent.

0103. The worsening political situation in Iraq, Iran and Nigeria, has exacerbated the current, very high oil costs. The decision by Bolivia to nationalise its gas and oil industry, along with Venezuela increasing extraction taxes on foreign companies, has also served to increase market nervousness over supply. This has further been exacerbated by Ecuador taking legal action against a USA oil company, which breached local laws on selling government loaned land assets, provoking the USA to take economic sanctions. The situation with South American suppliers means that the USA is joining with China and India in buying up surplus supplies, reducing available stock for other users and increasing prices.

0104. Security of supply is a very important issue now; with companies scrabbling to secure what reserves can be identified to protect future profits. The recent announcement by the US Arctic Survey to provide scientific data to oil and gas companies to consider drilling in the Arctic region shows a short sighted desperation to

protect business interests and a tacit admission by the USA that global warming is happening, despite official reluctance to discuss the issue.

## PRICES

0105. 2005/6 produced some of the highest price increases since the oil crisis during the Arab/Israeli wars in the 1970s, with fuel costs bringing about higher generation costs for electricity. This has forced the MoD to take a more proactive approach to energy management in the period 2006/7 and for the foreseeable future.

0106. The probability of further price increases in the future are very high, though some action can be taken to mitigate this via long term contracts, which allow greater spread of costs. The present and future contracts established by the EPD (Energy Procurement Department of DLO), are now based on this, and the increased length of the contracts allows more emphasis on a long term sustainable approach to secure supplies.

## MOD INDEPENDENCE

0107. The above mentioned issues, coupled with the Government's stated aim of reducing emissions and the move to a more environmentally sustainable and secure energy future, provides the MoD with an ideal opportunity to develop and implement a policy of obtaining an autonomous energy supply; this will reduce the reliance on increasingly foreign imports and eventually be independent in energy terms.

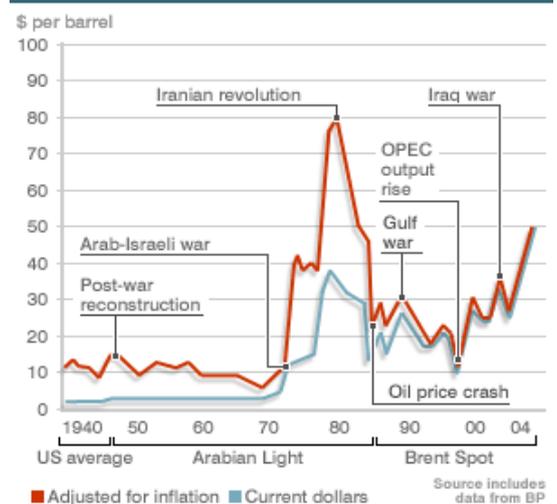
0108. The increasingly urgent question of energy procurement and security of supply has been brought sharply into focus. Accordingly, to understand how these issues affect the MOD we must look at them from a global viewpoint in relation to our budget situation.

### 0109. Oil & Liquid Petroleum Gas (LPG).

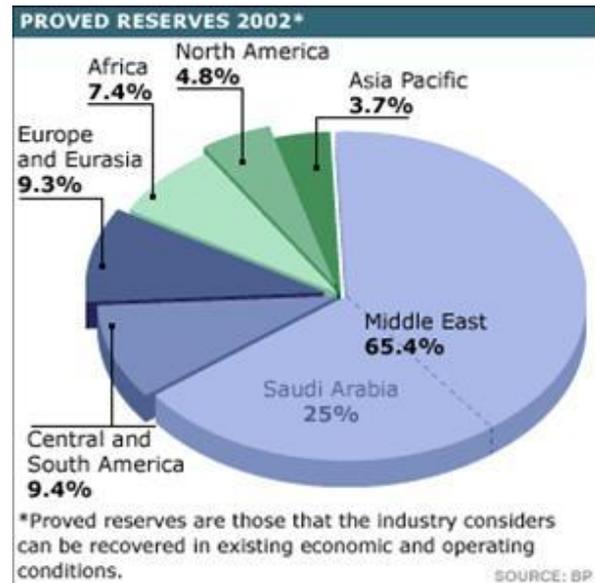
World demand for petroleum products has risen sharply in the last five years, and is likely to continue to do so for the foreseeable future, with the USA, China and India requiring large stocks both to meet demand and in the case of China and India, increasing affluence and material wealth. The USA, despite only having 8% of the worlds population, uses 45% of the worlds oil stocks, and appears to be making very little effort (apart from a limited number of individual States and Interest Groups' actions) to mitigate this consumption rate. China has increased its

need for oil by 65% in the last seven years, and will continue to grow for at least another five, assuming they continue with their planned economic expansion. India is also beginning to follow this path, with an especially high demand for diesel stocks. Accordingly, a stable and secure oil production market is needed, but unfortunately, at this moment in time this simply does not exist. The situation in Iraq has not improved, with the pipelines being almost continually attacked and large quantities of oil being

**CRUDE OIL PRICES SINCE THE END OF WORLD WAR II**

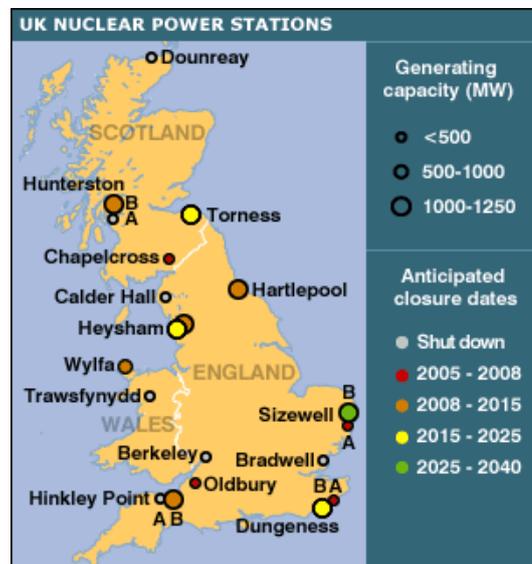


smuggled or diverted illegally; the deteriorating political situation with Iran, with the possibilities of economic sanctions and even military action, has made the oil market very jittery, and has served to push prices to an all time high of \$100 a barrel (US Crude standard). The move by Venezuela's President Hugo Chavez in nationalising oil and gas production, and with Ecuador taking a more anti-USA stance in enforcing its laws, has served to make prices climb. Hedge fund's tactics of buying oil reserves and keeping them out of the market to artificially force prices up has significantly destabilised them and made current supply erratic. The MoD's main contractor's difficulty in obtaining stocks for our demands is evidence of this. However, this situation is partly outside their influence, as it is driven by global trading patterns, which are increasingly taking a Far Eastern emphasis.



0110. Gas. Europe's reliance on mains gas has left it open to economic threats from the nations which hold the bulk stocks or act as relays in the pipeline. Accordingly, dealers and government have been looking at alternative sources to supply gas, such as Norway and central Asian countries like Uzbekistan and Armenia. The difficulty with this approach is the sheer cost in technical and financial terms as well as requiring good political relationships. But this requires the European Parliament to ignore some legal and political rules in relation to some countries governmental systems, such as poor legal protections and corruption. The increasing demand for gas by China and Russia has forced prices higher and although the use of Liquefied Natural Gas (LNG) to bypass the pipelines is beginning to help, this is really only a short term solution. Accordingly, the outlook for prices is still poor, with British Gas announcing rises in prices of 17% in May 2006 and another 12% in July 2006. The MoD is protected from these immediate rises by having longer term contracts than previously negotiated but, this only serves to delay the rise and make the inevitable increase at contract renewal even steeper.

0111. Coal. With the majority of coal sources in this country now redundant, the bulk of our supply is imported, mainly from South Africa, Chile/Colombia and Russia. However, as the requirement for 'clean coal' power stations rises, then the potential for reopening the mines in the UK is becoming more economically attractive. This would also serve to protect the UK's energy supply for at least 15 years and would mitigate the economic and security stranglehold of foreign suppliers.



0112 Electricity. The Stern Report has drawn attention to a number of problems with the UK's energy supply, especially in relation to bulk generation, as our aging fleet of nuclear reactors is closing. We presently import 15% of our electricity from the French nuclear industry and rely on gas fired generation for 60% of the remainder, with 15% of this being imported. The need to secure electricity supplies for MoD establishments is a priority, with the options being either dedicated standby generation, onsite primary generation (Solar/PV or Fuel cell) or dual purpose Combined Heat and Power systems. Long-term investment in secure power supplies has to be a priority issue, especially with new build, though this should be considered only after efficiency measures have reduced energy usage to the minimum. This will reduce the investment required and permit more targeted funding to have a greater effect.

## RENEWABLES

0113. In part we can mitigate some issues by increasing MoD's use of renewable energy sources:

- Wind power - This country has the best potential for wind power in Europe. We could actually supply 85% of our energy needs with this technology, but the current main stumbling block is Nimbyism; people want the convenience of cheap energy to maintain their lifestyle but are not prepared to accept any responsibility for the consequences.
- Bio fuels - The potential is good, but only if done in a sustainable manner, as demonstrated by the Malaysians who are destroying rain forests to grow bio crops, so saving one bit of the environment by destroying another.
- Solar power - Limited potential in this country, due to the low sun factor and long pay back periods. It is also one of the least sustainable energy systems as it uses non-recyclable materials.
- Hydro power - Already we have much exploited all of the land based sites, such as lakes and rivers, but the scope for sea based systems is enormous and as we are an island, we are in a perfect position to use this.

But the best method of all is to reduce what we use to start with and then to look at the best way of provisioning our requirement using a combination that 'evens out' the use of the planet's finite resources.

## CHAPTER 2 - ARMY POLICY

### GENERAL

0201. The Army spends a significant sum keeping lights on, buildings heated, meals cooked, computers running, supplying hot water and a multitude of other uses for 'domestic utilities'. The Army's annual utilities bill is approaching £150M, or approximately the cost of one Challenger II MBT every eleven days.

0202. The Secretary of State's policy ("I require the Ministry of Defence and the Armed Forces to use resources, including energy and water, as efficiently as possible") makes it clear that all Military personnel and Civil Servants should do their utmost to reduce the spend on any unnecessary use of domestic utilities. Money spent on wasted

energy and water is money that is not available for operational or training support needs.

0203. Army policy is a reflection of wider governmental policy, driven by national and trans-national legislation and agreements, and by accounting and contract regulations. The Army policy on effective and efficient management of domestic utilities replicates MOD policy. The Army is a significant user of domestic utilities, accounting for half of MOD and a third of Central Government energy use.

0204. As a Government Department, the MOD is committed to meeting governmental sustainability targets set out under the Sustainable Development in Government (SDiG) framework, which includes targets for reducing energy and water use, and for increasing the utilisation of Low or Zero Carbon (LZC) energy sources. The supply and use of domestic utilities is therefore an area of significant importance to the Army, but it is an area that is notoriously difficult to manage. Whereas most commodities are demanded through established approval procedures and set against budgets, a commitment to pay for the use of domestic utilities can literally be incurred through the flick of a switch, with the cost and consequences rarely impinging directly on the person operating that switch. Nothing less than a complete culture change will therefore persuade staff and personnel to naturally conserve energy and water, but there are measures that can be taken to encourage greater economy through education and awareness, and through the appropriate use of technology. This is what we must strive to achieve.

#### GOVERNANCE

0205. The supply of domestic utilities to the Army Estate will normally be through centrally negotiated MOD/Army contracts, managed by a central TLB office, Energy Procurement Department (EPD) at Glasgow; individual sites are not normally authorised to contract for their own utility supplies. The Army Utilities Management Branch (AUMB) will collate all contract detail and act as the Army Focal Point in all matters. Domestic utilities are an accountable commodity and all Commanding Officers are to account for their use by prompt and accurate completion of AF F727 forms (or agreed electronic equivalents) and the submission of the necessary VAT and Climate Change levy (CCL) paperwork. The requirement for completing this certification is outlined at Annex A. Utility bills for UK Army sites will be verified by Accommodation Services Units (ASU) and paid by the Defence Billing Agency (DBA). Reserve Forces & Cadets Associations (RFCAs) currently run their own contracts, managed by EPD and paid through DBA. Verification must include an independent check of the quantities consumed and confirmation that the correct contractual elements and rates have been applied in calculating the bill. The Divisional Regional Utilities Management & Tariff Analysis Cell (RUMTAC) which will commence work in Apr 07 will be the main part of the 5<sup>th</sup> Division governance strategy.

#### FUEL & LIGHT CHARGES (INCLUDING FUEL SUBSIDIES)

0206. The MOD is a significant supplier of domestic utilities to third parties connected to the MOD infrastructure and to PFI/privately operated facilities within MOD premises. Wherever possible, such supplies are to be separately metered and the

cost of actual utilities supplied should be recovered, at rates laid down in the annual Fuel & Light Charges letter issued by the Army Utilities Management Branch (AUMB). The use of 'all inclusive' leases (where domestic utilities are supplied without direct charge related to the quantities consumed) is to cease as soon as is practical.

### EU EMISSIONS TRADING SCHEME

0207. A number of large Army sites qualify for registration under the EU Emissions Trading Scheme. Under the scheme, a limit is set on the amount of Greenhouse Gas emissions that the site is allowed to produce (including CO<sub>2</sub> from burning fossil fuels). Any excess over this allowance must be covered by the purchase of permits, costing up to €25 per tonne. Any energy efficiencies at ETS registered sites thus achieve a triple benefit; cost savings in reduced fossil fuel purchase, cost savings in reduced purchase of emissions permits and a reduction in Greenhouse Gas emissions. These sites will therefore be given the highest priority for energy efficiency measures. Army sites registered under the EU Emissions Trading Scheme (EU ETS) are to conform to the requirements of the scheme to monitor, report and verify their emissions, and to surrender sufficient emissions permits to cover actual fossil fuel use. Single Service arrangements have been developed for Phase 1 of EU ETS (2005-2007), with 4<sup>th</sup> Division as the Army lead. An integrated single-MOD approach is being developed for Phase 2 (2008-2011) and beyond.

### MONITORING & TARGETING

0208. *"If you can't measure it, you can't manage it"*. This is never more so than for domestic utilities; where accurate knowledge of what is being consumed, where, and why, is critical for the effective management of consumption. Savings of 5%-10% are possible as a result of taking effective action by using meters. The key word is action; as improved information is of no value if not acted upon. For historical reasons, the Army Estate is very poorly metered therefore, improving the level and quality of metering and monitoring, particularly at EU ETS and 'Major' sites, will be a high priority.

### PERFORMANCE REPORTING

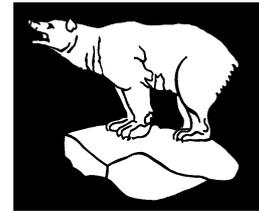
0209. The Army has laid down a number of Performance Targets to measure the management of domestic utilities. These targets will be monitored by the Bde Energy Management Advisors who will advise Bde HQs on the action that ought to be taken. They will also advise Division on the achievement of targets on a quarterly basis. These targets are at Annex B to this chapter and include:

- a. Provisioning and Accounting targets derived from legislation and MOD/Army accounting regulations.
- b. General energy and water sustainability targets derived from the SDiG framework
- c. Targets specific to Major Sites in 3 tiers.
- d. Targets specific to Major Buildings in 3 tiers.
- e. Targets specific to EU ETS sites.



**ARMY**

**Telephone** 0115 957 2680  
**Switchboard** 0115 925 4811  
*Fax* 0115 957 2846  
**E-Mail** [polarbde@gtnet.gov.uk](mailto:polarbde@gtnet.gov.uk)



---

Reference: Brigade Energy Strategy

16 Nov 04

---

Reference:

A. 4th Division Strategy for the Management and Efficient Use of Fuel and Water 2004/05.

1. Mission. 49 (E) Bde is committed to the conservation of energy in all its activities, operations, training and infrastructure support. This will be achieved by reducing the consumption of fuels and water through improved efficiency, thereby minimising emissions and reducing the impact of the Brigade's activities on the environment.

### BACKGROUND

2. The Army Utilities Management Branch (AUMB)<sup>1</sup> Directive is the source of Army Energy Policy and lays down Government and Service targets for the reduction of annual utility consumption and emissions. Its prime objective is:

*'to ensure the supply of domestic utilities to the Army Estate, providing reliability of supply, best value for money and meeting environmental objectives'*

3. The 4 Div Strategy for the Management and Efficient Use of Fuel and Water 2004/05 sets out a management framework for utilities management. It tasks Brigades and units with establishing Utility Efficiency Committees to devise and plan how departmental targets are to be communicated and achieved, to monitor progress, to identify possible funding and to promote the integration of energy conservation into all strands of military life and business.

4. The role of the Brigade Energy Advisor (BEA) is to provide professional energy management to the Commander, as well as guidance and training to the Headquarters and unit staff within the Brigade AOR. The BEA is responsible for drafting and managing the Brigade Energy Strategy, which allows all organisations within the Brigade to progress towards the given departmental targets and sets

---

<sup>1</sup> The LAND AUMB has transferred to the Army Infrastructure Organisation (AIO) and provides proactive guidance on utilities management.

challenging, yet realistic objectives. The BEA work programme for 2004/05 is attached at Annex A.

5. Aim. The aim of the Strategy is to reduce consumption and thereby reduce cost, emissions and environmental impact.

6. Concept of Ops. We will attend to energy efficiency in the short, medium and long term. In the short term, those maintaining and occupying buildings across the Brigade are to practise good housekeeping: ensure that buildings are only lit and heated when they need to be and then to a sensible degree. Also in the short term we will improve our measurement of consumption and assess this against benchmarks to identify and eradicate waste. Quick spends will be used to improve our ability to measure consumption, particularly from funds which themselves have resulted from energy savings. In the medium term we will continually monitor progress, using unit quarterly returns as directed by the 4 Div Strategy for the Management and Efficient Use of Fuel and Water 2004/05. This will enable us to attend to those areas of the Brigade's infrastructure, which have lacked investment. In the long term energy efficiency will be a central element of any new building or refurbishment design.

7. Objectives.

a. Short Term Objectives.

(1) Effective Procurement of Energy and Water. The Brigade benefits from competitive utility contract prices and we will continue to support 6% of the electricity supply from renewable energy sources, procured by the Energy Procurement for Defence (EPD) department.

(2) Improve the Quality of Energy Data. Currently, utility metering is not installed extensively within Brigade units and therefore measuring energy use of individual buildings, thereby allowing benchmarking of their performance is difficult. Installing utility sub-meters in unit kitchen areas is a priority, as they are a source of high energy-use. Fitting new metering will help identify any savings associated with the waste of energy use and ensure the Brigade is able to accurately re-charge catering contractors.

(3) Cost Avoidance Measures. Cost avoidance measures include reductions and rebates in VAT following recalculations of qualifying use<sup>2</sup>. This has already provided substantial financial return. Ensuring sites and individual buildings are on the appropriate tariffs, including the investigation into reduction of peak energy and water use, will deliver cost savings associated with maximum demand and capacity availability. Users are to consider rescheduling operations and reducing long heating warm up time so load shedding is possible at the start and end of the day, thus minimising usage and cost at peak times.

---

<sup>2</sup> Qualifying use is domestic use of electricity and fuel, which is charged at 5% domestic rate of VAT.

(4) Non Entitled Users/Cost Recovery. Units are to ensure monies spent on energy consumed by non-entitled users, including civilian contractors and NAAFI, are recovered and billed appropriately. HQ 49 (E) Bde should be approached for advice if units are unsure how to do this.

(5) Invest to Save. Some small Invest To Save measures have been completed to date and further investment will be actioned dependent on an annual underspend of the utilities budget. The annual building survey reviews the condition of the infrastructure and the remedial works required for maintaining it to an acceptable level. Finite funding dictates that Propman priorities are steered by the need to meet all statutory and mandatory requirements. Category B1 and B2 energy efficiency and minor works are therefore secondary.

b. Medium Term.

(1) Monitoring and Targeting System (M&T). Good data collection and energy monitoring will lead to corrective action, with the use of an M&T tool<sup>3</sup>. This system analyses consumption data and highlights anomalies and periods of overuse. Such a system should pay for itself in year from anomalies in utility bills alone.

(2) Benchmarking of Brigade Buildings. As an M&T system enables consumption to be monitored, it provides a system whereby benchmarking of energy use between buildings and their sites can be performed. (DETR ECG 75 – Energy Use in MoD Establishments). Benchmarking allows existing energy performance to be compared against typical use, providing a starting point to set targets for improvement. This process will identify the high energy using buildings/sites and prioritise for remedial action.

(3) Unit Energy Management and Training. Each unit is to designate a lead on utility efficiency and on-site Energy Wardens to assist. Energy Management training is available for those persons responsible for energy management. Two training courses are planned for 2004/05, enabling 40 new and existing energy wardens to receive training. This course will be available to each unit from Apr 05, should any unit require on-site training.

(4) Aquatrine/Water Management. The identification of assets to be used by Aquatrine contractors is to be undertaken by HQ 49 (E) Bde to ensure utility costs are recovered. There are 2 priorities:

---

<sup>3</sup> An M&T tool is an analytical computer program capable of identifying billing and energy consumption anomalies. An example of such a billing error was demonstrated at Chetwynd Bks, when a fault with the site's electricity meter caused the account to be overcharged. The electricity supplier subsequently credited the account for 20k. This would have been a financial loss to the Brigade if it had gone unchecked.

- (a) The identification of water leaks to reduce expenditure and re-claim sewerage charges.
- (b) The promotion of water conservation to building users.

c. Long Term.

(1) Invest To Save. Continuous development of a 5-year investment plan for Invest To Save measures to upgrade the Brigade's infrastructure is underway. This long-term plan will be affected by Regional Prime Contracting coming into effect in 2006. It is yet to be decided whether energy management will become a responsibility of the contractor or remain with the Brigade under the BEA.

(2) On-Site Energy Generation. An investigation has been conducted into the application of Combined Heat and Power (CHP) technology at Brigade sites. CHP provides efficient, cheaper, cleaner electricity generation using gas or oil fired technology. Electricity from the national grid is produced at a lower efficiency and loses further efficiency from its transportation. The by-product of heat can also be utilised by the site. Therefore, any heating refurbishments or new builds taking place in the future will have CHP or renewable energy solutions considered as part of the planning process.

8. Conclusions. The Brigade's energy use has an environmental impact and costs a good deal financially. There is considerable scope for reducing the amount of energy we use thus saving money and reducing environmental impact. Gas and electricity prices may rise by as much as 50%, heightening the need for improved efficiency and continuous improvement. HQ 49 (E) Bde is setting the foundations of its strategy, by identifying its energy use and developing a programme to improve the efficiency of its utility billing and usage. The savings are being invested in utility metering enabling more accurate measurement and monitoring of energy consumption to take place. This Invest to Save information will uncover energy wastage where it exists and provide further cost savings.

(Original signed)

S CARAFFI  
Brig  
Comd

Certificate to Supplier of Fuel and Power in respect of Premises Qualifying for  
Five Per Cent VAT Rating

- |    |   |   |
|----|---|---|
| 1. | Address of Qualifying Premises:         | WEST TOFTS CAMP<br>THETFORD<br>NORFOLK<br>IP26 5EP<br>ACC NO: A3A004100 |
| 2. | Name or Organisation:                   | MINISTRY OF DEFENCE   |
| 3. | MPAN:                                   | 0084508401014572900510  |
| 4. | VAT Registration No:<br>(if registered) | N/A   |
| 5. | Percentage of Total Bill Qualifying:    | 44% DOMESTIC  |
| 6. | Date from which applicable:             | JULY 2007   |
| 7. | Full name of Signatory & Status Held:   | K.T. BOWMAN<br>Finance Manager<br>DTE EAST                              |

**DECLARATION**

I certify that the information given is correct and complete. I undertake to inform British Energy Direct Ltd if there is any significant change in circumstances. I understand that any incorrect statement may make me liable to a financial penalty under Value Added Tax Act 1994 as amended.

Signed: 

Date: 18 Jul 2007.

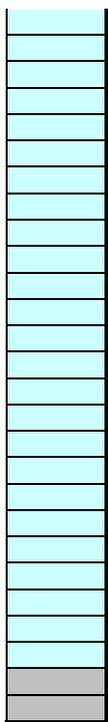












**ATR (B) Energy Action Group – Site Energy Action Plan**

Serial	Requirement	Action	Required by	Complete	Comments
(a)	(b)	(c)	(d)	(e)	(f)
1	<b><u>Management</u></b> Appoint Unit Energy Manager (UEM).	CO			RQMS has been appointed
2	Review the requirement for Energy Wardens (EW) and appoint accordingly.	UEM	OCT 05		Trawl Currently in progress
3	Review and establish training needs of UEM and EWs. Communicate training requirements to Bde SO2 Log Sp.	UEM			UEM course has been bid for. Once Wardens are identified courses will be booked accordingly
4	Chair unit Energy Action Group (EAG) meeting twice yearly to operate as a sub-committee to the Brigade Utilities Efficiency Committee meeting.	UEM			
5	Compile site-specific energy action plan to address the Divisional and Brigade Energy Strategy objectives. Update and review at EAG.	EAG		05 Sep 05	BEA has received a copy
6	Communicate Divisional, Brigade and site energy targets and plans to all personnel.	EAG		05 Sep 05	Distributed as detailed in Unit action plan
7	Attend Brigade UEC and prepare verbal performance report based upon progress against targets and action plan items.	UEM			
8	<b><u>Consumption Reporting</u></b> Report consumption of utilities to ASU/LSU within 7 days of the end of the accounting period on AF F727 or agreed alternative.	UEM			This is standard practice as for all returns

9	Notify OC ASU/LSU and BEA of any difficulties with obtaining non-operational fuels and water primary meter consumption data.	UEM			As required
10	Document changes to the built estate and occupancy having an impact on the consumption of utilities and provide details on AF F727.	UEM			As required
11	<b><u>Efficiency Targets</u></b> Establish 5-year site-specific utilities efficiency target based upon ECG 75 benchmark and Divisional Energy Strategy objectives and communicate to CO through Bde Comd.	BEA			
12	Monitor utility consumption against target and report progress to Brigade UEC.	UEM			Target requires to be identified first?
13	Notify BEA of significant deviations in the consumption of utilities.	UEM			As required
14	<b><u>Invest to Save</u></b> Identify and review opportunities for invest to save within the Property Management budget to reduce the consumption utilities.	EAG supported by BEA			
15	Report initiatives and savings to Brigade UEC.	UEM			Once ATR (B) action plan is up and running, hopefully these will be identified.
16	Submit costed business cases for all un-funded energy efficiency invest to save initiatives to Brigade.	EAG supported by BEA			
17	<b><u>NO/LOW Cost Efficiency Measures</u></b> Establish effective reporting procedure to ensure that defects resulting in the waste of fuel and water receive priority attention.	EAG			

18	Rationalise use of accommodation blocks so that buildings can be isolated or heated to frost protection levels only.	UEM			All measures will be taken to minimise use of accom were practicable, the main problem is with having recruits, several blocks may be in use due to different training teams and timetables.
19	Isolate wherever possible parts of system not in use e.g. seasonal.	UEM supported by WSM			All measures will be taken to minimise use of the system, however be aware that Bassingbourn is occupied 50 weeks of the year.
20	Reduce use of supplementary electric heaters and fans.	UEM			As appropriate
21	Raise end-users awareness of how they can ALL help improve efficiency.	UEM supported by BEA			Campaign underway as per Unit action plan
22	Ensure replacement of expired lighting tubes ordered from LSU is low energy type.	UEM			Will consult PROM/ACCOM stores
23	Isolate immersion heaters during the winter and install time controls.	PROM			Informed
24	Label light switches so that when rooms are not in use lighting is switched off.	UEM			Underway
25	Check that heating system, time switches, programmers, optimum start controls & weather compensation controls are set up and operating correctly.	PROM		Sep 05	Heating system reads internal and external temperatures and automatically adjusts accordingly.
26	Establish a system to check control settings, especially when they may have been overridden in response to unexpected circumstances.	UEM & PROM			Will consult PROM
27	Review DHWS temperature accuracy and settings periodically.	PROM			Will consult PROM
28	Ensure plant and equipment is regularly and correctly maintained.	PROM			Will consult PROM

29	Ensure equipment is used appropriately e.g. don't use oven hobs or ovens for heating.	PROM, EWs		Sep 05	Include in Unit action plan
----	---	-----------	--	--------	-----------------------------

## **AAU Main Unit Energy performance – HQ 49 (East) Brigade**

1. The following information details energy performance indicators concerning HQ 49 (East) Brigade's nine main units, responsible for overall utilities management at the major sites listed below:-

Main unit by Major site  
(East Anglia)

- Unit: 33 Engineers Regiment (EOD)  
Carver Barracks, Saffron Walden, Essex
- Unit: Defence Intelligence and Security Centre  
Chicksands, Bedfordshire
- Unit: 39 Engineer Regiment  
Waterbeach Barracks, Cambridge  
Unit: DTE (East) STANTA  
West Tofts Camp, Thetford, Norfolk
- Unit: The Light Dragoons  
Robertson Barracks, Swanton Morley, Norfolk
- Unit: ATR Bassingbourn  
Bassingbourn Camp, Royston, Hertfordshire

(East Midlands)

- Unit: 3<sup>rd</sup> Battalion Duke of Lancaster Regiment  
St Georges Barracks, North Luffenham, Leicestershire
- Unit: Chilwell Station  
Chetwynd Barracks, Beeston, Nottingham
- Unit: 5 Training Regiment RLC  
Prince William of Gloucester Barracks, Grantham, Lincolnshire

**2. Major Site performance against energy consumption reduction targets (Annex E2 and E3).** The Tables in Annex E2 and E3 detail the main units' utility performance at site level during the financial years 2004/05 and 2005/06.

The Army Utility Directive and Divisional Energy Strategy of the time required a 3 and 4% energy reduction target for 2004/05 and 2005/06 respectively compared to the baseline year of 2001/02. This annual energy reduction target has now been replaced by a 3.3% Divisional cap as detailed in the most recent Army Utilities Directive 2006 – 2011.

The following observations by unit have been made:-

Major sites – East Anglia

- 33 Engineers Regiment (EOD), Carver Barracks, met the energy reduction target in 2004/05 but not in 2005/06.
- Defence Intelligence and Security Centre, Chicksands, has made improvements and even though the target was not met in 2004/05, the target was met in 2005/06.
- 39 Engineer Regiment, Waterbeach Barracks have been unable to meet the energy reduction targets, but unreliable baseline data has made an accurate assessment difficult.

- DTE (East) STANTA, West Tofts Camp energy data was not available at the time of the assessment.
- The Light Dragoons, Robertson Barracks have met the required energy reduction target during both years.
- ATR Bassingbourn, Bassingbourn Camp has been unable to meet the energy reduction target for electricity in 2004/05 and for both electricity and fuel in 2005/06.

Major sites – East Midlands

- 3<sup>rd</sup> Battalion Duke of Lancaster Regiment, St Georges Barracks has reduced its energy consumption in line with the reduction targets during both years.
- Chilwell Station, Chetwynd Barrack's energy consumption has been within the energy target for both financial years.
- 5 Training Regiment RLC, Prince William of Gloucester Barracks met the 3% energy reduction target in 2004/05 but did not come within the 4% energy reduction target in 2005/06.

These figures provide an illustration in order for the HQ 49 (East) Brigade Energy advisor to prioritise their focus for energy performance improvement across the Brigade area. There may be other factors which have an influence on performance such as inaccurate utility baseline data and some sites experiencing more growth and development than others.

**2. Administrative Assessment of a Unit (AAU) Brigade Return.**

Conclusions from the Brigade's Energy Advisor are detailed below. These conclusions were submitted to the Brigade's Deputy Chief of Staff (DCOS) in response to the annual AAU return in 2006 and provide an illustration of conclusions drawn for the selected main units. These conclusions were made as a result of the working relationship between the Brigade Energy Advisor and the Brigade's main units in support of their utility management programmes.

**AAU Brigade Return – Energy Management of Brigade Units**

**The following figures relate to the 1<sup>st</sup> Quarter of 2006/07 (Apr – Jun 06).**

Unit: Light Dragoons, Robertson Barracks

*The Unit's performance against the 5% reduction in energy consumption required for 2006/07 compared to the baseline year of 2001/02 is evaluated below.*

*A graph shows the energy consumption for the Unit (resident at Robertson Barracks) for the 1st quarter of 2006/07 and performance against that target. The electricity consumption is of particular interest as it is noticeably high compared to the baseline year and 2005/06, indicating the target of a 5% reduction is so far not being met.*

**3. The unit's Quarter Master (QM) has had an opportunity to comment**

on the increase in electricity consumption and has concluded the following:-

- Increase in personnel on site since 2001/02.
- Increased hours of personnel in preparation for exercise and operations increasing demand on electricity.
- RPC team on site is larger than it previously has been.
- His intention is to increase the ante on energy awareness.

The following details the progress of 3<sup>rd</sup> Battalion Duke of Lancaster Barracks and 33 Engr Regt (EOD) in meeting the 5% reduction energy consumption target. This target is based upon a 5% reduction of recorded consumption in 2001/02.

**The following figures relate to the 1<sup>st</sup> Quarter of 2006/07 (Apr – Jun 06).**

3<sup>rd</sup> Battalion Duke of Lancaster Barracks, St Georges Barracks

- Gas – The 5% reduction target is being met (18% reduction in fact). Gas consumption has decreased by 13% during this quarter compared to the same period in 2005.
- Electricity – Not being met (11% over). However, please note electricity consumption has decreased by 3% during this quarter in 2006 compared to the same quarter in 2005.
- FFO – The 5% reduction target is being met (32% reduction)

Due to recent deployments, the Unit has experienced difficulties in sustaining the utilities mgt programme. Positive action has been taken during 2006 by updating the Energy Strategy for St George's Barracks and putting individuals forward for Energy Warden training during Nov 06. I visited the RQ and his team on 31 Aug 06. They have responded positively to all returns required by Brigade.

33 Engineer Regt (EOD), Carver Barracks

- Gas – The 5% reduction target is not being met (4% increase in consumption). The site has seen a nearly 10% rise in consumption when compared to the same period in 2005.
- Electricity – The site is meeting the 5% reduction required. (15% reduction). The electricity consumption has decreased by 4% compared to the same period in 2005.

I am due a visit to Carver Barracks before the end of this financial year. I have good communication with the QM but have yet to meet the new RQMS who would be the designated Unit Energy Manager. I will get in touch to assist with their role and training needs.

HQ 49 (East) Brigade Energy Advisor

**3. Benchmarking exercise.** The task of benchmarking the Brigade's Major sites has progressed as follows. Six of the Nine Major sites have been benchmarked for their energy performance using the Government best practice programme 'Energy Consumption Guide 75'. All nine will be benchmarked by the end of March 2007.

- 33 Engineers Regiment (EOD) – 15% above benchmark
- Defence Intelligence and Security Centre – 26% below benchmark
- 39 Engineer Regiment – 16% above the benchmark
- 3<sup>rd</sup> Battalion Duke of Lancaster Regiment – 15% above the benchmark
- Chilwell Station – 29% below the benchmark
- 5 Trg Regiment RLC – 20% below the benchmark

These benchmark figures offer an indication of how main units are managing their utilities at site level. However, the energy performance of a site will also be subject to other factors including the availability of funding for invest to save measures, differing unit activities & site growth and different degrees of heating and lighting controls in place at each site.

**49(E) BRIGADE - ENERGY MANAGEMENT**

**4th DIVISION UTILITY TARGET TO REDUCE ENERGY USE AT EACH MAIN UNIT BY 3% IN 2004/05 COMPARED TO THE BASELINE YEAR (2001/02)**

INDEX	49 (E) BDE - SITE	LOCATION	OCCUPYING UNIT	BASELINE YEAR - 2001/02 TOTAL ENERGY CONSUMPTION (ELEC&FUEL) kWh	2004/05 TOTAL ENERGY CONSUMPTION (ELEC&FUEL) kWh	% ENERGY REDUCTION IN 2004/05 COMPARED TO BASELINE YEAR	HAS THE 3% REDUCTION BEEN ACHIEVED?	COMMENTS
1	CHETWYND BARRACKS	CHILWELL, NOTTINGHAM	170 ENGR REGT /HQ 49(E) BDE	16,830,014	15,917,552	5.4% REDUCTION	YES	ELEC USE DOWN, GAS USE UP
2	PRINCE WILLIAM OF GLOUCESTER BKS	GRANTHAM, LINCOLNSHIRE	5 TRG REGT RLC	13,305,156	10,770,143	19% REDUCTION	YES	GAS HEATING REFRUB
3	ST GEORGES BARRACKS	NORTH LUFFENHAM, RUTLAND	1 KORBR	19,442,222	16,622,868	14.5% REDUCTION	YES	ELEC USE UP, COAL AND GAS USE DOWN
4	ROBERTSON BARRACKS	SWANTON MORLEY, NORFOLK	THE LIGHT DRAGOONS	6,498,619	6,068,799	6.6% REDUCTION	YES	ELEC USE UP, FUEL USE DOWN
5	CARVER BARRACKS	WIMBISH, ESSEX	33 (EOD) ENGR REGT	14,556,000	10,855,125	25% REDUCTION	YES	SIG DEC IN ELEC USE
6	WATERBEACH BARRACKS	WATERBEACH, CAMBRIDGE	39 ENGR REGT	9,033,489	14,754,954	39% INCREASE	TBC	BASELINE ELEC FIGURE TOO LOW FOR COMPARISON WITH 04/05 - REQUIRES REVIEWING
7	CHICKSANDS	SHEFFORD, BEDFORDSHIRE	DISC SUPPORT UNIT	10,346,288	10,165,291	1.7% REDUCTION	NO	ELEC USE IS DOWN, GAS USE IS UP
9	ATR BASSINGBOURN	ROYSTON, HERTFORDSHIRE	ARMY TRAINING REGT	4,234,172	5,022,399	18.6% INCREASE IN ELEC	TBC	ELEC ONLY AS FUEL DATA INCOMPLETE - REQUIRES REVIEWING

**49 (E) BRIGADE - ENERGY MANAGEMENT**

**4th DIVISION UTILITY TARGET TO REDUCE ENERGY USE AT EACH UNIT BY 4% IN 2005/06 COMPARED TO THE BASELINE YEAR (2001/02)**

INDEX	49 (E) BDE - SITE	LOCATION	UNIT	BASELINE YEAR - 2001/02 TOTAL ENERGY CONSUMPTION (ELEC&FUEL) kWh	2005/06 TOTAL ENERGY CONSUMPTION (ELEC&FUEL) kWh	% ENERGY REDUCTION IN 2005/06 COMPARED TO BASELINE YEAR	HAS THE 4% REDUCTION BEEN ACHIEVED?	COMMENTS
1	CHETWYND BARRACKS	CHILWELL, NOTTINGHAM	170 ENGR REGT /HQ 49(E) BDE	16,830,014	14,292,591	15% Reduction	YES	Elec & gas consumption have decreased.
2	PRINCE WILLIAM OF GLOUCESTER BKS	GRANTHAM, LINCOLNSHIRE	5 TRG REGT RLC	13,305,156	12,971,563	2.5% Reduction	NO	Elec & gas consumption have decreased due to the continued benefit from the decentralisation of the heating system.
3	ST GEORGES BARRACKS	NORTH LUFFENHAM, RUTLAND	1 KORBR	19,442,222	14,092,845	27.5% Reduction	YES	Elec, Coal & Gas consumption have decreased. Deployment during 2005/06.
4	ROBERTSON BARRACKS	SWANTON MORLEY, NORFOLK	THE LIGHT DRAGOONS	6,498,619	5,965,418	8% Reduction	YES	Slight increase in Elec consumption but Bulk LPG consumption has decreased.
5	CARVER BARRACKS	WIMBISH, ESSEX	33 (EOD) ENGR REGT	14,556,000	14,143,732	2.8% Reduction	NO	Elec & gas consumption has decreased.
6	WATERBEACH BARRACKS	WATERBEACH, CAMBRIDGE	39 ENGR REGT	9,033,489	18,340,138	100% Increase	NO	*Consumption has doubled when compared to baseline figure. Electricity baseline figure was inaccurate so difficult to make a comparison. Gas consumption has increased.
7	CHICKSANDS	SHEFFORD, BEDFORDSHIRE	DISC SUPPORT UNIT	10,346,288	9,858,133	4.7% Decrease	YES	*Compared to 2004/05, 2005/06 figures have seen a large increase in elec consumption and a decrease in gas during a period of deployments.
8	ATR BASSINGBOURN	ROYSTON, HERTFORDSHIRE	ARMY TRAINING REGT	4,234,172	8,570,871	100% Increase	NO	Elec and gas consumption has decreased. Consumption has doubled. Elec and Bulk LPG consumption has increased.

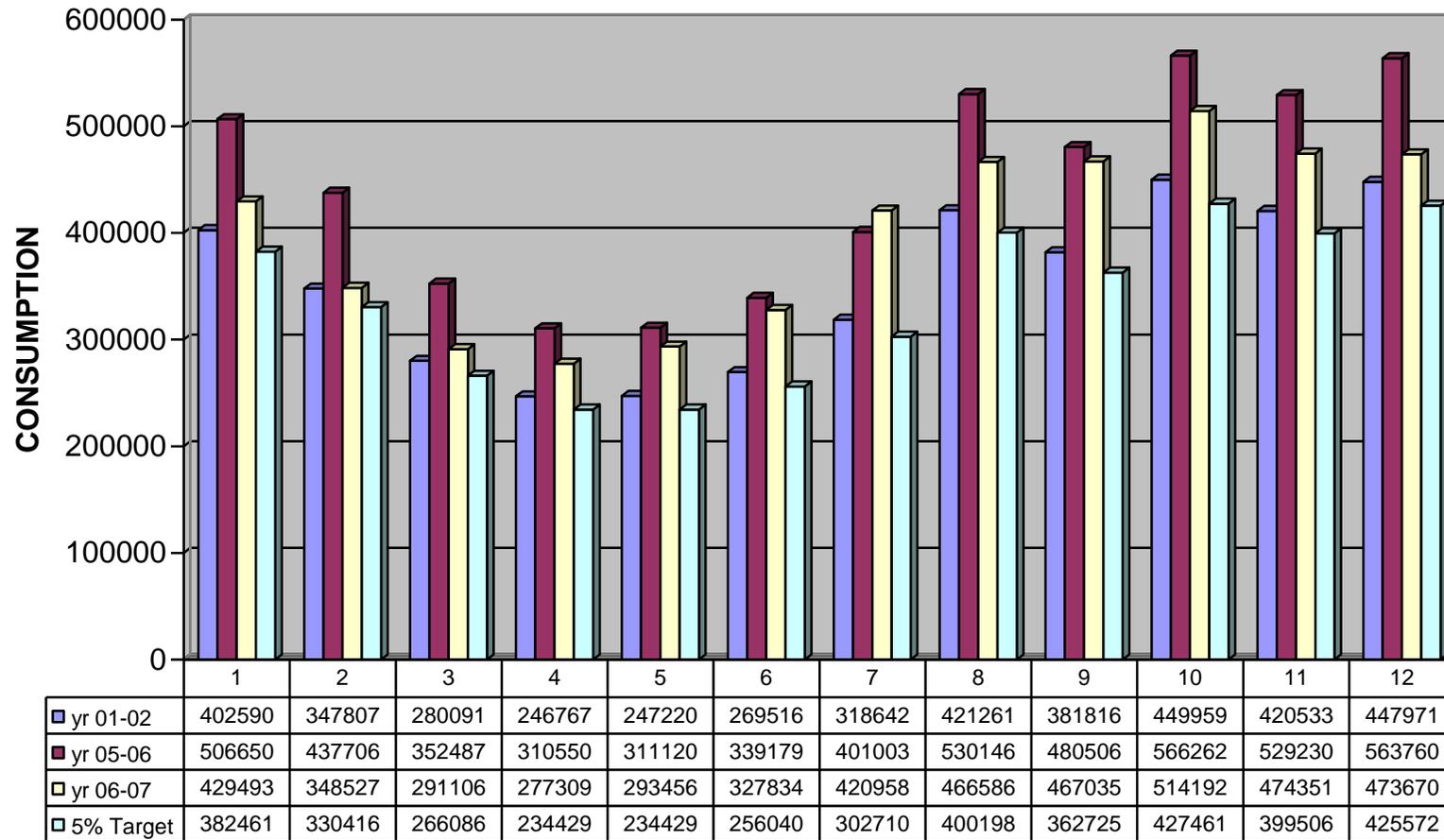
**49 (EAST) BRIGADE**  
**MAJOR SITE BENCHMARKING EXERCISE 2005/06**

1. Benchmarking of 'Major Sites'

Seven out of nine major sites have been benchmarked as a measure of energy performance. The Major Sites were benchmarked using Energy Consumption Guide 75: Energy Use in Ministry of Defence establishments. The results were as follows:

- Chetwynd Barracks – 29% below the benchmark
- Robertson Barracks – 22% below the benchmark
- Prince William of Gloucester Barracks – 20% below the benchmark
- St Georges Barracks - 15% above the benchmark
- Carver Barracks – 15% above the benchmark
- Waterbeach Barracks – 16% above the benchmark
- Chicksands - 26% below the benchmark
- ATR Bassingbourn - Pending
- DTE (East) STANTA - Pending

**ATR BASSINGBOURN ELECTRIC CONSUMPTION**



**DATE**

# **Brigade Energy Advisor (BEA) Key Performance Indicators (KPI's) 2007/08**

## **Introduction**

Achieving sustained energy performance requires organisations to commit to an ongoing, integrated and systematic approach to utility management. The Brigade Energy Advisors are embedded within the Army organisation structure, they play a vital role in ensuring that the objectives and goals set out in the Army Utility Strategy and the Sustainable Development in Government (SDiG) framework are communicated, implemented and monitored properly throughout the organisation and beyond.

Complimenting the energy and environmental targets within the Army Utility Strategy and SDiG JSP418 and 5<sup>th</sup> Division has set Key Performance Indicators for the Brigade Energy Advisors to meet. These will be reviewed on a yearly basis to reflect the Army's goals.

Monitoring performance against these KPI's will allow the BEA's not only to demonstrate the financial benefits from energy management to the organisation but also prove the importance of other non-financial activities which the BEA's are required to manage.

Each objective is Specific, *Measurable, Achievable, Relevant & Time-based* (**SMART**)

	<b>Objective title</b>	<b>Specific objective</b>	<b>Explanations &amp; measurement</b>
1.	<b>Benchmarking of 'Major Sites'</b>	<b>To benchmark ALL 'Major Sites' in area covered. Including the top ten largest facilities by 12/07</b>	To allow direct comparisons of Army sites in order to identify the areas with the greatest potential for savings. ECON 75 will be used as the standard methodology.
2.	<b>Energy Awareness Training</b>	<b>To provide energy awareness training to 30 relevant Army personnel by 12/07</b>	Raising the awareness at unit level with formal training to key personnel who have an influence of the sites energy use e.g. Energy Wardens, QM's & building custodians. RAF Halton or BEA site specific training packages will be used to provide training with a certificate issued to attendees on completion.
3.	<b>Financial Savings</b>	<b>Achieve financial savings in excess of contract fee by 12/07</b>	Achieving financial savings for the Army through utility management is now one of the key measures of the BEA. The figure will include financial savings achieved at all TLB's. Contact the 4th DEA for contract fee figures. By managing the utility 'Invest-to-Save' programme
4.	<b>VAT Certificates</b>	<b>To ensure that 80% of all sites have a VAT certificate &lt;12 months old by 06/07</b>	BEA to provide background calculations in order to prove the % domestic/commercial split for all sites. BEA to complete the relevant supplier VAT form certificate and ensure that it is signed and understood by an authorised site contact e.g. QM. Use the EPD 'Utility Details' website for utility supply information Issue the original certificates to the supplier with copies to 4 <sup>th</sup> DEA, Site & BEA file. Ensure that the bill reflects the % VAT on the certificate

5.	<b>Dissemination of key utilities information affecting the Army</b>	<b>Facilitate 2 formal Brigade Utility Efficiency Meetings per year</b>	As well as attending the two 4 <sup>th</sup> DUEC meetings per year, the BEA will disseminate information via formal Brigade Utility Efficiency Meetings (BUEC). Use the Terms Of Reference detailed in the Army strategy 2005/6, produce minutes and issue to all concerned.
6.	<b>Client Satisfaction</b>	<b>To ensure favourable references are received from the client by 12/07</b>	Seek feedback from the client and ensure that the Client Satisfaction feedback form (attached) is completed. Continually brief the client of any developments affecting utilities
7.	<b>Projects &amp; new energy &amp; environmental legislation</b>	<b>To provide timely advice on utility efficiency projects and new legislation which may affect the Army</b>	Identify utility 'Invest-to-Save' measures, seek funding and assist in delivering the projects through the relevant MoD systems (e.g. Prime Contracts) and provide reports. Provide advice on major new projects as early as possible e.g. attend project meetings. Provide advice on new energy legislation e.g. produce information bulletins for EPBD, EUETS Part L etc.
8.	<b>Quarterly Returns</b>	<b>To complete and return the Army quarterly reporting templates as required by AIO on time</b>	Complete the Army Utilities quarterly reporting template before the dates detailed in the Army Strategy 2005/6 to allow the Division to compile a collated return
9.	<b>Utility Consumption reports</b>	<b>To validate the accuracy of the utility reporting system at 30% of major sites by 06/07</b>	Complete a validation exercise of the data found in the utility reporting forms AF727 by spot-checking utility meter readings

10.	<b>Meter Utility Survey</b>	<b>Facilitate the provision of a utility meter schematic for 30% of Major Sites by 12/07</b>	Carry out root & branch surveys at 30% of the major sites in order to identify utility distribution systems
11.	<b>Brigade Utility Strategy/Directive</b>	<b>Provide direction and policy in line with Army and Divisional documents</b>	Carry out an annual review of the Brigade's Utility Strategy and Directive in line with Army policy, to be disseminated to Brigade units.
12.	<b>EUB Energy Audit Programme</b>	<b>Coordinate and carry out an energy audit programme for the Major sites</b>	Collect the necessary information from the Army units and RPC to produce an energy audit report detailing prioritised energy saving measures for future funding bids to the AIO.

	<b>Objective</b>	<b>Performance record</b>
1	<b>Benchmarking of 'Major Sites'</b>	All nine Major sites have been benchmarked for their energy performance. This will allow for sites and individual buildings to be prioritised for remedial energy saving measures. The sites will receive confirmation of their benchmark figures shortly.
2	<b>Energy Awareness Training</b>	The RAF Halton Utilities Management Course is recommended to Unit Energy Managers as part of the BEA's site visits. Two UEMs from Waterbeach and Robertson Barracks are waiting to attend the course during 2007. The Energy warden course is available online through RAF Halton with prior arrangement. A review of the Energy warden's course by Babcock BEA's is still underway to establish if it is feasible for an in-house classroom based Energy warden course to be developed.
3	<b>Financial Savings</b>	Financial savings identified for 2007/08 to date have been the pipework insulation works planned ahead of the heating season at Waterbeach (Savings TBC) and the change-out of water coolers at Chetwynd Barracks for more efficient electricity saving appliances in Sept 07 (£700 saving per year and £350 saving expected on electricity in year). The fitting of Burner Management units on Accommodation blocks/Offices at Robertson Bks has also been funded by AIO in year and has a payback of less than 3 yrs. The BEA has also been working on setting up the utility recharging of Aramark in the South of the Bde, to ensure the Brigade recovers costs from the catering contractor.
4	<b>VAT Certificates</b>	The BEA has commenced a programme of site visits and a review of electricity and fuel site VAT Certificates is being undertaken while on site. This process is ongoing and all VAT Certificates will be reviewed and updated by Nov 07.

5	<b>Dissemination of key utilities information affecting the Army</b>	The BEA is awaiting the reformulation of the 5 Div utility efficiency meeting. 49 (E) Brigade may wish to arrange review to have their own meeting. They were previously halted to be absorbed into Log Sp QM Conferences, but the last conference was cancelled due to T&S savings. Information such as Landso 6000 and the Christmas stand down instruction has been disseminated to Brigade sites.
6	<b>Client Satisfaction</b>	Client satisfaction form is due for completion in Nov 07.
7	<b>Projects &amp; new energy &amp; environmental legislation</b>	The BEA has provided a brief to the Brigade and has detailed the necessary compliance of the Brigade's sites to the Energy Performance of Buildings Directive 2006 which is due to come in to affect in April 2008. The BEA is making the necessary arrangements for this.
8	<b>Quarterly Returns</b>	The move of HQ 49 (E) Brigade to 5 Div and direction from Land being outstanding, on the advice of 5 Div, no Major site return is required for the 2 <sup>nd</sup> quarter of 2007/08.
9	<b>Utility Consumption reports</b>	Data is continuing to be validated at site level from HQ 4 Div data. Sites can be slow to respond to this request and the BEA needs to review the mechanism for getting site feedback.

10	<b>Utility Meter Survey</b>	Information to support route and branch surveys has been collected and surveys still need to be completed. This work is planned to be absorbed into the EUB requirement for all Major sites to have an energy survey by Mar 08.
11	<b>Brigade Utility Strategy/Directive</b>	The Brigade Utility Strategy/Directive has not been updated as yet and the 5 Div Strategy does not yet reflect the inclusion of 49 (E) Bde, but is still being used as a key reference document. The delay has been due to the EUB Energy Audit programme taking a higher priority.
12.	<b>EUB Energy Audit Programme</b>	A template audit report methodology has been tried and tested within 2 (South East) Brigade and is being confirmed by Utilities & Sustainable Development Department, AIO as the template to use across all Divisions. Information is being collected for the energy audit report for Chilwell Station to initiate the Brigade's energy audit programme. The deadline of completion for the work is Summer 08 at present and is to be confirmed once the first audit is complete.

## Brigade Energy Advisor - Client Feedback Form

Name of Energy Advisor.....

In terms of your level of client satisfaction, how would you rate the BEA's performance in the following?

	<b>poor</b>	<b>average</b>	<b>above average</b>	<b>excellent</b>
<b>General professional behaviour</b>				
<b>Understanding of the organisations utility goals</b>				
<b>Communication</b>				
<b>Ability to work well with others</b>				
<b>Achievement of the Army utility objectives</b>				

**Any other comments**

Name.....

Signed.....

Position.....

## Introductory letter for Major sites regarding the new Logistic Support Inspection section on Utilities Management.

	<b>Headquarters 49 (East) Brigade</b> Building 125, Chetwynd Barracks, Chilwell, Beeston, NOTTINGHAM, NG9 5HA
	<b>Telephone 0115 957 2680 Military 94451 2680</b> Switchboard 0115 925 4811 Switchboard 94451 100 <b>Fax 0115 957 2453 Fax 94451 2453</b> e-mail <a href="mailto:jenny.cunningham829@land.mod.uk">jenny.cunningham829@land.mod.uk</a> Army Mail/DEIMOS <u>49 Bde</u> – G4LogSp-EnergyAdvisor (For Unclassified correspondence only)
See Distribution:	Reference: 49B/EA/1036/LSI  01 Feb 07

### INTRODUCTION TO LOGISTIC SUPPORT INSPECTION (LSI) SECTION – UTILITIES MANAGEMENT

#### References:

#### A. Logistic Support Inspection (LSI) Section and Aide Memoire – Utilities Management

1. The area of Utilities management has previously been included in the LSI of a Unit under the heading of 'Accommodation Services' but has rarely been included in the inspection process. A Utilities Management section in the LSI has now been updated in line with the latest Army policy on utilities in the form of JSP 418 and the Army Utilities Directive 2006 – 2011.

2. The LSI section on Utilities Management has been updated to provide a clear framework for the requirements of Units to implement effective Utilities Management practices. The Brigade Energy Advisor (BEA) is in place to assist and advice the Brigade and its Units on how best to achieve this, but due to the independent nature of the BEA and the extent of the Units operations and activities, although good practice exists, an inconsistent approach to Utilities Management is being taken. Including Utilities Management in the LSI will make it clear what the Unit is currently being required to do and will provide a framework for the assessment of a Unit's performance towards this goal. It is seen to be beneficial to the Unit, the Brigade and the British Army.

3. The BEA will be part of the Brigade LSI Team to inspect the Unit as per the requirements of the Utilities Management section overleaf. This will be on an informal basis as it is forming part of a pilot project to test the new section, so the performance of the Unit in the area of Utilities Management will not form part of the final LSI report. It is however the intention of the BEA to propose the Utilities Management section is put forward to LAND for inclusion in the LSI across the British Army, following the trial period in 49 (E) Brigade and 2 Infantry Brigade.

4. The style and requirements of the Utilities Management section will be consistent with the rest of the LSI document and the Utilities Management section has four sub-headings consisting of 28 questions. The Aide Memoire is provided to assist the Unit in answering the questions and the BEA in detailing their response and judging the performance of the Unit. Evidence will be required to support the Units response to the questions and requirements of the section.

(Original signed)

J R CUNNINGHAM  
MISS  
ENERGY ADVISOR

Distribution:

QM 5 Trg Regt RLC  
QM 39 Engr Regt  
QM 33 Engr (EOD) Regt  
QM DISC Support Unit  
QM The Light Dragoons  
QM ATR Bassingbourn  
QM 3 Lancs  
QM Chilwell Station  
G4 Site Rep (Landmarc) DTE (E) Stanta

### **Free Energy Powers a Remote Building on MoD Training Range**

In January 2007 a successful Eco-friendly project was completed at Lydd Training Camp in SE Kent. Free energy, heating and water is provided for a stand-alone remote building used by the Range Wardens and troops whilst on training exercises.

The renewable energy system has replaced an old diesel generator which not only polluted the local Site of Special Scientific Interest (SSSI) but was also expensive to operate. The electrical energy is now supplied from 2 small wind turbines and a solar panel. Hot water is supplied from an integral storage vessel heated by a solar hot water 'collector' and a wood burning stove which also provides space heating. Water is no longer delivered daily by truck as it is now 'harvested'. Rain water is collected from the roof into a designated storage tank where it is filtered then pumped to more filters, including a UV filter before use.

Energy efficient appliances such as a kettle, microwave, lighting and fridge were provided and are in daily use. It is predicted that the project will reduce the harmful greenhouse gas Carbon Dioxide by about 5 Tonnes per year (the average house emits about the same) whilst reducing the operating and maintenance costs.

The project sponsor Mr Robert Macpherson stated "The project demonstrates the Army's commitment to meeting its various energy and environmental targets by investing and trialling this new technology". He also added that "The performance of the various systems will be closely monitored and reported, with a view to adopting the system either in whole or in parts, at other sites on the MoD estate"

The project was delivered by Landmarc Support Services with the main contractor and energy systems integrators being Ecolibrium Solutions Ltd and the sub-Contractor was Sustainable Technology Ltd

Please contact Robert Macpherson ([robert.macpherson388@land.mod.uk](mailto:robert.macpherson388@land.mod.uk)) MoD Energy Advisor at HQ 2 Infantry Brigade for further information.

## Tables

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

Ser	Subject and References	Remarks
(a)	(b)	(c)
44	<p><b><u>SECTION 8 – FUEL AND WATER</u></b></p> <p>Are Fuel, Light and Water Economy Orders included in Unit Standing Orders?</p> <p>References: MRs Vol 6 Pam 2 Sect 8 Annex A Para 3.</p> <p><b>Comments:</b></p>	
45	<p>Does the Unit maintain a Fuel and Light Account?</p> <p>References: MRs Vol Pam 2 Para 1203</p> <p><b>Comments:</b></p>	
46	<p>Are stocks of Fuel physically checked at the end of the Accounting period?</p> <p>References: MRs Vol 6 Pam 2 Para 1206.</p> <p><b>Comments:</b></p>	
47	<p>Is a list maintained of people authorised to check and give receipts for liquids and solid fuels?</p> <p><b>Comments:</b></p>	

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

Ser	Subject and References	Remarks
(a)	(b)	(c)
48	<p>Are the methods of checking receipts of solid and liquid fuels understood by the people responsible for receiving these into the unit?</p> <p>References: MRs Vol 6 Pam 6 Section 11.</p> <p><b>Comments:</b></p>	
49	<p>Are the Unit Fuel Efficiency Officer and Sub-Unit Fuel Wardens of an appropriate rank to be affective?</p> <p>References: MRs Vol 6 Pam 2 Appendix 2 to Annex A Sec 8.</p> <p><b>Comments:</b></p>	
50	<p>Was the Unit within its Fuel Target for the last fuel accounting year?</p> <p><b>Comments:</b></p>	
51	<p>Does the Unit maintain close control, monitor and record authorised heating and lighting via Fuel Efficiency Officers and Sub-Unit Fuel wardens?</p> <p><b>Comments:</b></p>	

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

Ser	Subject and References	Remarks
(a)	(b)	(c)
52	<p>Are supplementary forms of heating used and if so are appliances controlled centrally by QM and withdrawn for servicing at the end of March?</p> <p><b>Comments:</b></p>	
53	<p>Is the ventilation of accommodation adequate with due regard to heating costs?</p> <p><b>Comments:</b></p>	
54	<p>Is the Unit aware of the major electricity consumers within the Barracks and are separate Meters installed?</p> <p><b>Comments:</b></p>	
55	<p>Is electric kitchen equipment switched on only when it is required?</p> <p><b>Comments:</b></p>	

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

Ser (a)	Subject and References (b)	Remarks (c)
56	Do Unit Fire Orders state that fire hoses are only to be used for fire fighting and testing purposes?  <b>Comments:</b>	
57	Is the use of Water for Vehicle washing properly and effectively controlled?  <b>Comments:</b>	
58	Are the taps on vehicle wash down points in good working order?  <b>Comments:</b>	
59	Is water consumption checked at least once a month to ensure that no major leakages underground are occurring?  <b>Comments:</b>	

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

Ser (a)	Subject and References (b)	Remarks (c)
60	<p>What steps are taken by the unit to publicise the urgent need for economy in the use of fuel, light and water. (Check ROs, Posters, Policy).</p> <p>References: MRs Vol 6 Pam 2 Appendix 1 to Annex A.</p> <p><b>Comments:</b></p> <p>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</p>	
<b><u>SECTION 9 – ELECTRICAL EQUIPMENT</u></b>		
61	<p>Is electrical equipment on inventory charge registered, reviewed and updated biannually (check register)?</p> <p>References: MRs Vol 6 Pam 1 Para 2105.</p> <p><b>Comments:</b></p>	
62	<p>Is electrical equipment checked and tested at the suggested frequency vide the Electrical Act Work Regulations 1989 (EAWR's)?</p> <p>References: MRs Vol 6, Pam 1, Para 2104-2106 Annex A.</p> <p><b>Comments:</b></p>	
LAURA Grading (E) (G) (F) (U) (N/I) (N/A)		

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

Ser	Subject and References	Remarks
(a)	(b)	(c)
<b><u>SECTION 10 - ENERGY CONSERVATION</u></b>		
63	<p>Who is the Unit Fuel Efficiency Officer?</p> <p>References: MRs Vol 6 Pam 2 Appendix 2 to Annex A Para 8.</p> <p><b>Comments:</b></p>	
64	<p>Are Heating Schedules maintained up-to-date in conjunction with WSM (see Schedules)?</p> <p>References: MRs Vol 6 Pam 2 Sect 8 Appendix 2 to Annex A Para 8.</p> <p><b>Comments:</b></p>	
65	<p>What works projects are being carried out and what projects are programmed under PROPMAN new services/maintenance works services?</p> <p><b>Comments:</b></p>	
66	<p>Are EENCON posters on display?</p> <p><b>Comments:</b></p>	

**TABLE 5.1 Logistic Support Inspection - Accommodation Services**

**(Sections 8 – 11)**

**Logistic Support Branch**

67	<p>Are posters obtained direct from the Energy Efficiency Office, Dept of Blackhorse Road, London SE8 5JH?</p> <p><b>Comments:</b></p>    <p>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</p>	
----	--	--

Ser	Subject and References	Remarks
(a)	(b)	(c)
	<b><u>SECTION 11 – NEW BUILDS/SERVICES</u></b>	
68	<p>Have projected New Builds/Services or major renovations been reported to Div/Dist HQ (Log Sp) and HQ ASU/</p> <p>References: JSP 384 Ch 5, MRs Vol 6 Pam 1 Sec 11.</p> <p><b>Comments:</b></p>    <p>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</p>	

**Table 5.2 Updated LSI Section – Utilities Management**

**UTILITIES MANAGEMENT**

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
1	<p>Is the site’s utility management policy signed by the Commanding Officer and its requirements included in the Unit Standing Orders? *Major sites (Including premier and EU ETS sites).</p> <p><b>MRs Vol 6 Pam 2 Sect 8 Annex A Para 3. JSP 418 Leaflet 17 Annex C.</b></p> <p><b>Comments</b></p>	
2	<p>Does the Unit have a copy of the latest Army, Divisional and Brigade Utilities Strategies/Directive on file as reference documents?</p> <p><b>Army Utilities Directive 2006 – 2011.</b></p> <p><b>Comments</b></p>	
3	<p>Does the Unit have a Utility Strategy and Action plan in place, which is reviewed on an annual basis? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 42/Annex C. Army Utilities Directive 2006 – 2011.</b></p> <p><b>Comments</b></p>	Major Site Target - M14/06 (Annex 8C, Pg 86, Army Utilities Directive 2006 – 2011).
4	<p>Has the Unit Energy Manager (UEM)/Site Utility Manager (SUM) received the necessary training to fulfil their role?</p> <p><b>Comments</b></p>	
5	<p>Are the UEM/SUM and sub-unit energy wardens of an appropriate rank to be</p>	

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
	<p>effective?</p> <p><b>MRs Vol 6 Pam 2 App 2 to Annex A Sect 8. JSP 418 Vol 2 Leaflet 17 Para 27.</b></p> <p><b>Comments</b></p>	
6a	<p>Does the UEM/SUM hold 2 Unit Energy Action Group meetings per year? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C. Army Utilities Directive 2006 – 2011 Terms of Reference.</b></p> <p><b>Comments</b></p>	
6b	<p>Does each Unit have a copy of the site's Action plan and minutes from the Unit Energy Action Group meetings?</p> <p><b>Comments</b></p>	
7	<p>Does the UEM/SUM attend directed Brigade Utility Efficiency meetings?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27. Army Utilities Directive 2006 – 2011.</b></p> <p><b>Comments</b></p>	
8	<p>Was the site within the advised Divisional cap of the 3.3% reduction target compared to the previous year as required in the Army Utilities Directive 2006 – 2011? *Major sites (Including premier and EU ETS sites).</p> <p><b>Army Utilities Directive 2006 – 2011.</b></p> <p><b>Comments</b></p>	

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
9	<p>Does the UEM/SUM report on the monthly/quarterly reporting of utility consumption as required by the Brigade/Division? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27.</b></p> <p><b>Comments</b></p>	
10	<p>a. Is the Unit aware of the site's benchmarked performance using ECON75?</p> <p>b. Have the top-ten energy consuming buildings been identified within the Barracks?</p> <p>c. Is sub-metering installed?</p> <p>*Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex H Para 50. Army Utilities Directive 2006 – 2011.</b></p> <p><b>Comments</b></p>	Major Site Target - M13/08 (Annex 8C, Pg 85, Army Utilities Directive 2006 – 2011).
	<p><b>Utility Policy</b></p> <p><b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>	

<b>Ser</b>	<b>Section 2 – Energy Awareness</b>	<b>Remarks</b>
(a)	(b)	(c)
11	<p>Is an annual energy awareness campaign operating in conjunction with the Energy Saving Trust's and MoD's Energy Saving Week campaign?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><b>Comments</b></p>	
12	How does the Unit raise awareness of utility	

<b>Ser</b>	<b>Section 2 – Energy Awareness</b>	<b>Remarks</b>
(a)	(b)	(c)
	conservation issues?  <b>Comments</b>	
13	Does the Unit participate in the annual Brigade/Divisional Energy competition? *Major sites (Including premier and EU ETS sites).  <b>References: JSP 418 Vol 2 Leaflet 17 Annex C. Divisional and Brigade Utilities Strategies.</b>  <b>Comments</b>	
14	Does the UEM/SUM ensure the catering contractor switches off all kitchen equipment when not in use and employs good utility management practices to minimise wastage across messes?  <b>Comments</b>	
	<b>Energy Awareness</b>  <b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b>	

<b>Ser</b>	<b>Section 3 – Utility Management</b>	<b>Remarks</b>
(a)	(b)	(c)
15	Is the Fuel and Light return (AF F727) completed and sent to the ASU by the 7 <sup>th</sup> of each month and copied to Brigade Utility Focal Point? *Major sites (Including premier and EU ETS sites).  <b>MRs Vol 6 Pam 2 Sect 12 Para 1207. Army Utilities Directive 2006 – 2011. Divisional and Brigade Utilities Strategies.</b>  <b>Comments</b>	Major Site Target - M8/06. (Annex 8C, Pg 82, Army Utilities Directive 2006 – 2011).

<b>Ser</b>	<b>Section 3 – Utility Management</b>	<b>Remarks</b>
(a)	(b)	(c)
16	<p>Are stocks of LPG/FFO physically monitored on a monthly basis and delivery receipts received and kept for monitoring purposes?</p> <p><b>MRs Vol 6 Pam 2 Sect 12 Para 1206.</b></p> <p><b>Comments</b></p>	
17	<p>Are utility VAT declaration certificates reviewed and updated annually? * Major sites Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex H Para 55.</b> <b>Army Utilities Directive 2006 – 2011.</b></p> <p><b>Comments</b></p>	Major Site Target - M3/06. (Annex 8C, Pg 79, Army Utilities Directive 2006 – 2011).
18	<p>Are building heating time and temperature schedules reviewed at least once a year? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C</b></p> <p><b>Comments</b></p>	
19	<p>Does the QM's Department/UEM/SUM have access to/direct the requirements of the Building Management system? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><b>Comments</b></p>	
20	<p>Are supplementary forms of heating and cooling controlled centrally by the QM's Department/UEM/SUM?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><b>Comments</b></p>	

<b>Ser</b>	<b>Section 3 – Utility Management</b>	<b>Remarks</b>
(a)	(b)	(c)
21	<p>Is the ventilation of accommodation adequate or do any buildings suffer from overheating creating the need for building users to open windows?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><b>Comments.</b></p>	
22	<p>Does the UEM/SUM have a record of monthly site occupancy levels? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 18. Army Utilities Directive 2006 – 2011. Divisional and Brigade Utility Strategies.</b></p> <p><b>Comments</b></p>	
23	<p>Is the UEM/SUM kept informed of new build/renovations as part of major projects, particularly where new primary utility supplies are installed? *Major sites (Including premier and EU ETS sites).</p> <p><b>Comments</b></p>	
24	<p>Is water consumption monitored in buildings where sub-metering exists? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 18.</b></p> <p><b>Comments</b></p>	
25	<p>Is the use of water for vehicle wash-down and grounds maintenance effectively controlled?</p> <p><b>Comments</b></p>	

<b>Ser</b>	<b>Section 3 – Utility Management</b>	<b>Remarks</b>
(a)	(b)	(c)
	<b>Utility Management</b>	
	<b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b>	

<b>Ser</b>	<b>Section 4 – Utility Efficiency Measures</b>	<b>Remarks</b>
(a)	(b)	(c)
26	<p>Does the UEM/SUM keep a schedule of potential Invest to Save measures on file and what measures are currently programmed with the maintenance provider? *Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C &amp; H, Para 49.</b></p> <p><b>Comments</b></p>	<p>Major Site Target - M15/06 (Annex 8C, Pg 87, Army Utilities Directive 2006 – 2011).</p>
27	<p>Does the Unit have a list of no-cost utility measures?</p> <p><b>Comments</b></p>	
28	<p>Does the UEM/SUM support the promotion of using energy efficient products in standard maintenance requests where practical? E.g. use of energy efficient light bulbs to reduce utility and labour costs.</p> <p><b>Comments</b></p>	
	<b>Utility Efficiency Measures</b>	
	<b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b>	

**Table 5.3 Updated LSI Utilities Management Section – Aide Memoire**

**UTILITIES MANAGEMENT**

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
1	<p>Is the site’s utility management policy signed by the Commanding Officer and its requirements included in the Unit Standing Orders?</p> <p><b>MRs Vol 6 Pam 2 Sect 8 Annex A Para 3. JSP 418 Leaflet 17 Annex C.</b></p> <p><u>Pls</u></p> <p>a. The site’s policy is signed by the Commanding Officer demonstrating commitment to utility management and its requirements included in Unit Standing Orders. A copy dated in the last year provided as evidence.</p> <p>b. The signed policy and its requirements previously included in the Standing Orders but no reminders of the policy have been included during the last year. Copy provided as evidence.</p> <p>c. The signed/unsigned site policy and its requirements have been included in Unit Standing orders at some time but not in the last two years. A copy provided as evidence.</p> <p>d. The unsigned site’s policy and requirements have not/are not included in the Unit Standing Orders.</p> <p>e.</p>	
2	<p>Does the Unit have a copy of the latest Army, Divisional and Brigade Utilities Strategies/Directive on file as reference documents?</p> <p><b>Army Utilities Directive 2006 – 2011.</b></p> <p><u>Pls</u></p>	

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
	<p>a. The Unit has a copy of the latest documents on file. Copies provided as evidence.</p> <p>b. The unit has a copy of previous versions of the documents. Copies provided as evidence.</p> <p>c. The unit has knowledge of the documents but can provide none as evidence.</p> <p>d. The Unit does not have any knowledge or evidence of possessing the documents.</p>	
3	<p>Does the Unit have a Utility Strategy and Action plan in place, which is reviewed on an annual basis?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 42/Annex C. Army Utilities Directive 2006 – 2011.</b></p> <p><u>Pls</u></p> <p>a. Copies of the Units Utility Strategy and Action plan dated within the last year provided as evidence.</p> <p>b. Copies of the documents provided but dated more than a year ago.</p> <p>c. No documents available as evidence.</p> <p>d. No knowledge of the requirement.</p>	Major Site Target - M14/06 (Annex 8C, Pg 86, Army Utilities Directive 2006 – 2011).
4	<p>Has the Unit Energy Manager (UEM)/Site Utility Manager (SUM) received the necessary training to fulfil their role?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27. Army Utilities Directive 2006 – 2011.</b></p> <p><u>Pls</u></p>	

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
	<ul style="list-style-type: none"> <li>a. The UEM/SUM has attended the Utilities Management course at RAF Halton and provided the certificate as evidence.</li> <li>b. The UEM/SUM has attended an Energy warden course in the last two years and provided the certificate as evidence.</li> <li>c. The UEM/SUM has received some training but has no paper evidence.</li> <li>d. The UEM/SUM has not received the necessary training during the last two years.</li> </ul>	
5	<p>Are the UEM/SUM and sub-unit energy wardens of an appropriate rank to be effective?</p> <p><b>MRs Vol 6 Pam 2 App 2 to Annex A Sect 8. JSP 418 Vol 2 Leaflet 17 Para 27.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The UEM/SUM and energy wardens are of an appropriate rank to effectively influence the management of utilities at the site.</li> <li>b. They are not of an appropriate rank to be effective.</li> </ul>	
6a	<p>Does the UEM/SUM hold two Unit Energy Action Group meetings per year?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C. Army Utilities Directive 2006 – 2011 Terms of Reference.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The UEM/SUM holds two meetings per year, minutes of the meetings provided as evidence for the last two years.</li> </ul>	

Ser	Section 1 – Utility Policy	Remarks
(a)	(b)	(c)
6b	<p>b. The UEM/SUM has held two meetings during the last year, minutes of the meeting provided as evidence.</p> <p>c. The UEM/SUM has held one meeting during the last year, minutes of the meeting provided as evidence</p> <p>d. The UEM/SUM has not held a meeting during the last year.</p> <p>* Please note, these meetings may be solely utility mgt meetings or part of another meeting structure.</p> <p>Does each Unit have a copy of the site’s Action plan and minutes from the Unit Energy Action Group meetings?</p> <p>a. The Unit has a copy of the latest Action plan and all the minutes from meetings held to date as evidence.</p> <p>b. The Unit has a copy of the Action plan and some incomplete records of the minutes as evidence from the meetings held.</p> <p>c. The Unit has a copy of the Action plan but no minutes from the meetings OR no copy of the Action plan and some minutes as evidence.</p> <p>d. The Unit has no copies of the Action plan OR minutes.</p>	
7	<p>Does the UEM/SUM attend directed Brigade Utility Efficiency meetings?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27. Army Utilities Directive 2006 – 2011.</b></p> <p><u>Pls</u></p> <p>a. The UEM/SUM attends the directed meetings? Minutes</p>	

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
	<p>provided as evidence.</p> <p>b. The UEM/SUM attends the meetings when available. Minutes provided as evidence</p> <p>c. The UEM/SUM does not attend in person but sends a representative on behalf of the Unit. Minutes as evidence.</p> <p>d. The UEM/SUM does not attend the meeting.</p>	
8	<p>Was the site within the advised Divisional cap of the 3.3% reduction target compared to the previous year as required in the Army Utilities Directive 2006 - 2011?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27.</b>  <b>Army Utilities Directive 2006 – 2011.</b></p> <p>Pls</p> <p>a. The site was within the target for the last FY. Consumption figures provided as evidence.</p> <p>b. The site was just short of meeting the target for the last FY.</p> <p>c. The site was not within the target during the last FY.</p> <p>d. The site’s performance has not been measured against the target.</p>	
9	<p>Does the UEM/SUM report on the monthly/quarterly reporting of utility consumption as required by the Brigade/Division?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27.</b></p> <p><u>Pls</u></p> <p>a. The UEM/SUM replies promptly</p>	

<b>Ser</b>	<b>Section 1 – Utility Policy</b>	<b>Remarks</b>
(a)	(b)	(c)
	<p>each quarter to the return. Evidence of the return provided.</p> <p>b. The UEM/SUM does reply but after the return deadline.</p> <p>c. The UEM/SUM does report on consumption but on an annual basis</p> <p>d. The UEM/SUM does not reply to the return.</p>	
10	<p>a. Is the Unit aware of the site's benchmarked performance using ECON75?</p> <p>b. Have the top-ten energy consuming buildings been identified?</p> <p>c. Is sub-metering installed?</p> <p>*Major sites (Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex H Para 50. Army Utilities Directive 2006 – 2011.</b></p> <p><u>Pls</u></p> <p>a. The Unit is aware of the benchmarked performance of the site and the top ten consuming buildings and sub-metering is installed. Schedule provided as evidence.</p> <p>b. The Unit is aware of the top ten consuming buildings and sub-metering is not installed.</p> <p>c. The Unit is aware of some high consuming buildings.</p> <p>d. The Unit does not know which buildings use the most energy on the site.</p> <p><b>Utility Policy</b></p> <p><b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>	<p>Major Site Target - M13/08 (Annex 8C, Pg 85, Army Utilities Directive 2006 – 2011).</p>

<b>Ser</b>	<b>Section 2 – Energy Awareness</b>	<b>Remarks</b>
(a)	(b)	(c)
11	<p>Is an annual energy awareness campaign operating in conjunction with the Energy Saving Trust's and MoD's Energy Saving Week campaign?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. A campaign is operating on an annual basis. Material evidence provided.</li> <li>b. Energy awareness campaigns are arranged at least once every two years.</li> <li>c. Energy awareness campaigns are on an ad hoc basis.</li> <li>d. No energy awareness campaigns at the Unit.</li> </ul>	
12	<p>How does the Unit raise awareness of utility conservation issues?</p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The Unit uses innovative and new methods for the promotion of energy awareness. Material evidence provided.</li> <li>b. The Unit is proactive in its approach to energy awareness but does not have any evidence.</li> <li>c. The Unit is reactive in promoting energy awareness and has provided evidence.</li> <li>d. The Unit does not choose to promote energy awareness</li> </ul>	
13	<p>Does the Unit participate in the annual Brigade/Divisional Energy competition?</p> <p><b>References: JSP 418 Vol 2 Leaflet 17</b></p>	

<b>Ser</b>	<b>Section 2 – Energy Awareness</b>	<b>Remarks</b>
(a)	(b)	(c)
	<p><b>Annex C. Divisional and Brigade Utilities Strategies.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The Unit participates each year in the competition. Competition submissions for the last two years provided.</li> <li>b. The Unit has participated at least once in the competition. Submission provided.</li> <li>c. The Unit has not participated in the competition.</li> <li>d. The Unit is not aware of the competition.</li> </ul>	
14	<p>Does the UEM/SUM ensure the catering contractor switches off all kitchen equipment when not in use and employs good utility management practices to minimise wastage across all messes?</p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The UEM/SUM works with the catering contractor in ensuring good utility management and has written evidence of the requirement.</li> <li>b. The UEM/SUM works with the catering contractor to ensure good utilities management but has no written evidence.</li> <li>c. The UEM/SUM has liaised on occasion with the catering contractor in ensuring good utilities management.</li> <li>d. The UEM/SUM and catering contractor have not discussed utilities management.</li> </ul>	
	<p><b>Energy Awareness</b></p> <p><b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>	

<b>Ser</b>	<b>Section 3 – Utility Management</b>	<b>Remarks</b>
(a)	(b)	(c)
15	<p>Is the Fuel and Light return (AF F727) completed and sent to the ASU by the 7<sup>th</sup> of each month and copied to Brigade Utility Focal Point?</p> <p><b>MRs Vol 6 Pam 2 Sect 12 Para 1207. Army Utilities Directive 2006 – 2011. Divisional and Brigade Utilities Strategies.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The AF F727 is completed and returned to the ASU by the 7<sup>th</sup> of each month and copied to the Brigade. Evidence of the return provided by the Unit, ASU or Brigade.</li> <li>b. The AF F727 is completed and returned to the ASU by the required date but it is not copied to the Brigade.</li> <li>c. The Unit has been regularly late in returning the AF F727 each month.</li> <li>d. The Unit does not complete the AF F727 by the required deadline.</li> </ul>	Major Site Target - M8/06. (Annex 8C, Pg 82, Army Utilities Directive 2006 – 2011).
16	<p>Are stocks of LPG/FFO physically monitored on a monthly basis and delivery receipts received and kept for monitoring purposes?</p> <p><b>MRs Vol 6 Pam 2 Sect 12 Para 1206.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. Stocks of LPG/FFO are physically checked on a monthly basis and receipts kept. Evidence of monitoring and receipts provided from AF F727.</li> <li>b. Stocks checked less than once a month, receipts kept and evidence provided.</li> </ul>	

Ser	Section 3 – Utility Management	Remarks
(a)	(b)	(c)
	<p>c. Stocks checked occasionally and no receipts kept.</p> <p>d. Stocks rarely checked and no receipts kept.</p>	
17	<p>Are utility VAT declaration certificates reviewed and updated annually? * Major sites Including premier and EU ETS sites).</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex H Para 55. Army Utilities Directive 2006 – 2011.</b></p> <p><u>Pls</u></p> <p>a. The VAT declaration certificates have been reviewed during the last year for all utility accounts. Copies provided as evidence.</p> <p>b. Some VAT declaration certificates have been reviewed during the last year. Copies provided as evidence.</p> <p>c. Some VAT declaration certificates have been reviewed but no copies provided as evidence.</p> <p>d. No VAT declaration certificates have been completed for the site's utility accounts.</p>	Major Site Target - M3/06. (Annex 8C, Pg 79, Army Utilities Directive 2006 – 2011).
18	<p>Are building heating time and temperature schedules reviewed at least once a year?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C</b></p> <p><u>Pls</u></p> <p>a. The Unit in conjunction with the maintenance provider reviews heating time and temperature schedules annually. Evidence provided.</p>	

Ser	Section 3 – Utility Management	Remarks
(a)	(b)	(c)
	<p>b. The Unit reviews the schedules every two years. Evidence provided.</p> <p>c. The Unit reviews the schedules periodically but has no supporting evidence.</p> <p>d. The Unit does not review the schedules.</p>	
19	<p>Does the QM's Department/UEM/SUM have access to/direct the requirements of the Building Management system?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><u>Pls</u></p> <p>a. The UEM has desktop read-only access to the BMS. Evidence provided.</p> <p>b. The UEM has no access to the BMS.</p>	
20	<p>Are supplementary forms of heating and cooling controlled centrally by the QM's Department/UEM/SUM?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><u>Pls</u></p> <p>a. The UEM/SUM controls the use of all heating and cooling appliances in the Unit. Evidence provided.</p> <p>b. The UEM/SUM controls the use of appliances issued centrally, but some appliances are used which have not been issued by the UEM/SUM.</p> <p>c. The UEM/SUM does not control the use of appliances centrally.</p>	

Ser	Section 3 – Utility Management	Remarks
(a)	(b)	(c)
	d. The Unit does not use any heating/cooling appliances.	
21	<p>Is the ventilation of accommodation adequate or do any buildings suffer from overheating creating the need for building users to open windows?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p><u>Pls</u></p> <p>a. The ventilation of accommodation is adequate. Evidence provided.</p> <p>b. The ventilation of accommodation on paper is satisfactory but building users choose to open windows.</p> <p>c. The ventilation of some of the buildings is unsatisfactory.</p> <p>d. The ventilation of all the buildings is unsatisfactory.</p>	
22	<p>Does the UEM/SUM have a record of monthly site occupancy levels?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 18. Army Utilities Directive 2006 – 2011. Divisional and Brigade Utility Strategies.</b></p> <p><u>Pls</u></p> <p>a. The UEM/SUM holds records of monthly occupancy levels, in addition to the established strength figure.</p> <p>b. The UEM/SUM does not hold occupancy figures.</p>	
23	<p>Is the UEM/SUM kept informed of new build/renovations as part of major projects, particularly where new primary utility supplies are installed?</p>	

Ser	Section 3 – Utility Management	Remarks
(a)	(b)	(c)
	<p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. The UEM/SUM is kept informed and has supporting evidence. This information is forwarded to the Brigade to ensure all new supplies are included on MoD utility contracts.</li> <li>b. The UEM/SUM is kept informed but does not forward the information to the Brigade.</li> <li>c. The UEM/SUM is not kept informed.</li> <li>d. The UEM/SUM is not aware of the need to be informed.</li> </ul>	
24	<p>Is water consumption monitored in buildings where sub-metering exists?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 18.</b></p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. Building water consumption is monitored on a monthly basis where sub-metering exists.</li> <li>b. Building water consumption is not monitored, as no sub-metering exists.</li> </ul>	Major Site Target - M12/06 (Annex 8C, Pg 85, Army Utilities Directive 2006 – 2011).
25	<p>Is the use of water for vehicle wash-down and grounds maintenance effectively controlled?</p> <p><u>Pls</u></p> <ul style="list-style-type: none"> <li>a. Building water consumption is monitored and controlled on a monthly basis where sub-metering exists.</li> <li>b. Building water consumption is not monitored, as no sub-metering exists but is controlled.</li> </ul>	

<b>Ser</b>	<b>Section 3 – Utility Management</b>	<b>Remarks</b>
(a)	(b)	(c)
	<p>c. The use of water for vehicle wash-down and grounds maintenance is not monitored but controlled where practicable.</p> <p>d. The use of water is not controlled for these purposes.</p>	
	<p><b>Utility Management</b></p> <p><b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>	

<b>Ser</b>	<b>Section 4 – Utility Efficiency Measures</b>	<b>Remarks</b>
(a)	(b)	(c)
26	<p>Does the UEM/SUM keep a schedule of potential Invest to Save measures on file and what measures are programmed with the maintenance provider for the current FY?</p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C &amp; H, Para 49.</b></p> <p><u>Pls</u></p> <p>a. The UEM/SUM keeps an up to date schedule of Invest to Save measures. Schedules provided as evidence.</p> <p>b. The UEM/SUM keeps an up to date schedule but has no programmed measures for this FY.</p> <p>c. The UEM/SUM is aware of the Invest to Save measures for the Unit but they are not documented.</p> <p>d. The UEM/SUM is not aware of any Invest to Save measures.</p>	<p>Major Site Target - M15/06 (Annex 8C, Pg 87, Army Utilities Directive 2006 – 2011).</p>
27	<p>Does the Unit have a list of no-cost utility measures?</p> <p>a. The Unit has a list of no-cost utility measures. A copy provided as evidence.</p> <p>b. The Unit does not keep a list of no-cost measures.</p>	

28	<p>Does the UEM/SUM support the promotion of using energy efficient products in standard maintenance requests where practical? E.g. use of energy efficient light bulbs to reduce utility and labour costs.</p> <p>a. The UEM/SUM supports the use of energy efficient products. Works orders provided as evidence.</p> <p>b. The UEM/SUM does not use energy efficient products in standard maintenance requests.</p>	
	<p><b>Utility Efficiency Measures</b></p> <p><b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>	

**TABLE 6.1**

**HQ 49 (E) BDE - LOGISTIC SUPPORT INSPECTION PROGRAMME 2006/07**

SER	UNIT TITLE	UNIT UIN	AREA/ACCOUNTS FOR INSPECTION						INSP DATE	UIS/ LETTER SENT	DATE LSI INSPECT COMPLETED	LSI RPT COMPLETED SIGNED & POSTED	1st FOLLOW UP REPORT RECEIVED	WORKING GROUP CARRIED OUT	2nd FOLLOW UP REPORT RECEIVED (3 MTHS)
			TPT	MAT ACCT	ES	ACCN	CAT	CAO							
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(o)	(p)	(s)
1	36 (E) SIG REGT (V)	A3411A	x	x	x		x		07-Feb-06	18-Jan-06	08-Feb-06	02-Mar-06	03-Apr-06	10-Apr-06	27-Apr-06
2	HQ 15 PSY OPS	A4104A	x	x					14-Feb-06	25-Jan-06	14-Feb-06	28-Mar-06	08-May-06	22-May-06	
3	158 (R ANGLIAN) TPT REGT RLC (V)	A7050A	x	x	x		x		03-Mar-06	25-Jan-06	01-Mar-06	28-Mar-06	04-May-06	22-May-06	
4	RTMC (CHILWELL)	A5595A	x	x	x	x			07-Mar-06	25-Jan-06	08-Mar-06	24-Apr-06	24-May-06	12-Jun-06	
5	HQ CHILWELL STATION	A0078A	x	x		x	x	N	23-May-06	12-Apr-06	23-May-06				
6	14 CTT	A2688A	x	x					23-May-06	12-Apr-06	23-May-06				
7	49 BRIGADE HQ	A0393A		x					23-May-06	12-Apr-06	23-May-06				
8	5 TRG REGT RLC & 13 CTT	A1650A	x	x	x	x	x	N	01-Jun-06	8-May-06	01-Jun-06				
9	ATR BASSINGBOURN	A0643A	x	x	x	x	x	S	06-Jun-06	8-May-06	06-Jun-06				
10	NOTTINGHAM TP 721 SQN RLC	A3696L		x					13-Jun-06	8-May-06	13-Jun-06				
11	4 AEC	A2175A		x					15-Jun-06	8-May-06					
12	MINDEN BAND	A4755A		x					15-Jun-06	8-May-06					
13	HQ 12 (AIR SP) ENGR GP	A3746A	x	x	x				27-Jun-06	8-May-06					
14	CATERING SP REGIMENT	A1745A		x	x				04-Jul-06						
15	33 ENGR REGT (EOD)	A0343A	x	x	x		x	S	17-21-Jul-06						
16	EAST MIDLANDS UOTC	A4163A	x	x	x		x		24-Jul-06						
17	CAMBRIDGE UOTC	A4155A	x	x	x		x		29-Aug-06						
18	3 CTT	A2677A	x	x					30-Aug-06						
19	ARMY TRG ESTATES(E)	A2536A	x	x			x		05-Sep-06						
20	2 CTT	A2689A	x	x					05-Sep-06						
21	254 FIELD AMB RAMC (V)	A3822A	x	x	x		x		06-Sep-06						
22	1 KORBR	A0554A	x	x	x	x	x	N	12-Sep-06						
23	JERSEY FIELD SQN RE (V)	A1031A	x	x	x		x		19-Sep-06						
24	73 ENGR REGT(V)	A3346A	x	x	x		x		25-29-Sep-06						
25	170 (INFRA SP) ENGR GP RE	A0472A	x	x	x	x			04-Oct-06						
26	DEFENCE ANIMAL CENTRE	A1351A	x	x			x		10-Oct-06						
27	39 ENGR REGT	A0351A	x	x	x	x	x	S	16-20-Oct-06						

TABLE 6.2

LOGISTIC SUPPORT INSPECTION (LSI)  
25 TRG SP REGIMENT – PRINCESS ROYAL BARRACKS

**UTILITIES MANAGEMENT**

Serial	Observation/Recommendation	Action By	Progress Achieved/Further Action Required
1	<p>Observation. No 'Site Utility Strategy' in line with Bde Directive. It is important that the unit department knows of issues including security of supply and energy reduction measures.</p> <p>Recommendation. The unit requires a site utility plan with reference to the latest Army and Bde directives.</p>	QM Dept - Unit Energy Manager	ENMAN issued Bde Directive 26 <sup>th</sup> Oct 2006
2	<p>Observation. Unit requires dedicated/named Unit Energy Manager. The role, authority and management of utilities are currently carried out as approx. 5% of the overall workload of the local purchasing officer in the QM Dept.</p> <p>Recommendation. Appoint a dedicated Unit Energy Manager with appropriate skills and training to actively manage utilities better. This is a 'major site' and as such, should have a named utility manager ref: Army Utilities Strategy and JSP 418.</p>	CO or QM	
3	<p>Observation. Heating schedule return not completed. The unit should have a heating schedule for each building. This then needs checking against actual settings and improvement changes actioned through the normal RPC route</p> <p>Recommendation. Complete the 4 Div pro-forma for each</p>	QM Dept - Unit Energy	

	building (QM DEPT) then request any changes be made	Manager	
4	<p>Observation. The QM department no longer has visibility (read only) of the site Building Management System BMS. This is important for the proper management of services to buildings – especially the new builds.</p> <p>Recommendation. Meeting with RPC (SEC) to establish the current status of the BMS and provide training to QM staff.</p>	QM Dept - Unit Energy Manager	
5	<p>Observation. The unit does not maintain a list of potential 'Invest-to-Save' measures</p> <p>Recommendation. Start a list of measures, no cost, low cost and high cost. And keep track of the measures implemented and meet with the ENMAN to discuss measures which may require funding</p>	QM Dept – Unit Energy Manager	
6	<p>Observation. The utility reporting system has not been maintained over the last few years and the AF F727 needs to be completed in the new electronic format. This is the basis for managing energy on site.</p> <p>Recommendation. Ensure the RPC takes monthly readings in time for the unit to complete the AF F727 and copy to ASU &amp; ENMAN by 7<sup>th</sup> of each month.</p>	QM Dept – Unit Energy Manager	
<p><u>Summary</u></p> <p>Energy Management is graded as SATISFACTORY</p>			

TABLE 6.3

LOGISTIC SUPPORT INSPECTION (LSI)  
36 ENGINEER REGIMENT, INVICTA BARRACKS

**UTILITIES MANAGEMENT**

Serial	Observation/Recommendation	Action By	Progress Achieved/Further Action Required
1	Observation: Unit Energy Manager needs training on the RAF Halton's Utility Management course  Recommendation. Book course ASAP	QM	
2	Observation: Unit not aware of the top 10 energy users on site  Recommendation. Produce graph using site AF F727 data	ENMAN	Completed
3	Observation: Unit manages it's utilities very well  Recommendation:		
<p><u>Summary</u></p> <p>Energy Management is graded as <b>Excellent</b></p>			

TABLE 6.4

LOGISTIC SUPPORT INSPECTION (LSI)  
ATR PIRBRIGHT

**UTILITIES MANAGEMENT**

Serial	Observation/Recommendation	Action By	Progress Achieved/Further Action Required
1	<p>Observation. Unit does not have a copy of the latest 2 Inf Bde Utilities Strategy</p> <p>Recommendation. Read and implement measures accordingly</p>	ENMAN & QM Dept	
2	<p>Observation. Unit requires dedicated/named Site Utility Manager. The role, authority and management of utilities are split and unclear at present.</p> <p>Recommendation. Appoint a dedicated site utility manager with appropriate skills and training to actively manage utilities better. This is a 'major site' and as such, should have a named utility manager ref: Army Utilities Strategy and JSP 418.</p>	CO or HoS	
3	<p>Observation. Heating schedule return not completed sufficiently. The unit should have a heating schedule for each building. This then needs checking against actual settings</p> <p>Recommendation. Complete the 4 Div pro-forma for each building (QM DEPT) then request actual settings to be carried out (SEC).</p>	QM-SEC	

4	<p>Observation. The QM department no longer has visibility (read only) of the site Building Management System BMS. This is important for the proper management of services to buildings – especially the new builds.</p> <p>Recommendation. Meeting with RPC (SEC) to establish the current status of the BMS and provide training to QM staff.</p>	QM-SEC	
5	<p>Observation. The unit does not maintain a list of 'Invest-to-Save' measures</p> <p>Recommendation. Star a list of measures, no cost, low cost and high cost. And keep track of the measures implanted and meet with the ENMAN to discuss measure which require funding</p>	QM	
<p><u>Summary</u></p> <p>Energy Management is graded as SATISFACTORY</p>			

TABLE 6.5

LOGISTIC SUPPORT INSPECTION (LSI)  
39 ENGINEER REGIMENT, WATERBEACH BARRACKS

**UTILITIES MANAGEMENT**

Serial	Observation/Recommendation	Action By	Progress Achieved/Further Action Required
1	<p>Observation. The Unit Energy Manager is the acting Accommodation NCO and has not yet received the Utilities management training required to fulfil his role. This has been as a direct cause of other training being required covering his other responsibilities.</p> <p>Recommendation. UEM attend the training required at their earliest convenience.</p>	UEM	
2	<p>Observation. The UEM was not aware of the Divisional/Brigade utility competition.</p> <p>Recommendation. Support the UEM in participating in the competition.</p>	ENMAN UEM	
3	<p>Observation. Heating schedule return not completed sufficiently. The unit should have a heating schedule for each building. This then needs checking against actual settings</p> <p>Recommendation. Complete the 4 Div pro-forma for each building (QM DEPT) and request actual settings to be carried out.</p>	UEM RPC	

4	<p>Observation. The UEM does not have access to the Building Management System.</p> <p>Recommendation. This information should be more readily available to the UJEM for monitoring purposes..</p>	<p>UEM RPC</p>	
5	<p>Observation. The unit does not maintain a list of 'Invest-to-Save' measures</p> <p>Recommendation. This can be initiated by the Energy Advisor who holds a central Brigade list for the UEM to develop.</p>	<p>UEM ENMAN</p>	
<p><u>Summary</u></p> <p>Energy Management is graded as: Fair (Satisfactory)</p>			

TABLE 6.6

LOGISTIC SUPPORT INSPECTION (LSI)  
RTMC, CHILWELL STATION

**UTILITIES MANAGEMENT**

Serial	Observation/Recommendation	Action By	Progress Achieved/Further Action Required
1	<p>Observation. Unit does not have a copy of the latest 2 Inf Bde Utilities Strategy</p> <p>Recommendation. Read and implement measures accordingly</p>	ENMAN & QM Dept	
2	<p>Observation. Unit requires dedicated/named Site Utility Manager. The role, authority and management of utilities are split and unclear at present.</p> <p>Recommendation. Appoint a dedicated site utility manager with appropriate skills and training to actively manage utilities better. This is a 'major site' and as such, should have a named utility manager ref: Army Utilities Strategy and JSP 418.</p>	CO or HoS	
3	<p>Observation. Heating schedule return not completed sufficiently. The unit should have a heating schedule for each building. This then needs checking against actual settings</p> <p>Recommendation. Complete the 4 Div pro-forma for each building (QM DEPT) then request actual settings to be carried out (SEC).</p>	QM-SEC	

4	<p>Observation. The QM department no longer has visibility (read only) of the site Building Management System BMS. This is important for the proper management of services to buildings – especially the new builds.</p> <p>Recommendation. Meeting with RPC (SEC) to establish the current status of the BMS and provide training to QM staff.</p>	QM-SEC	
5	<p>Observation. The unit does not maintain a list of 'Invest-to-Save' measures</p> <p>Recommendation. Star a list of measures, no cost, low cost and high cost. And keep track of the measures implanted and meet with the ENMAN to discuss measure which require funding</p>	QM	
<p><u>Summary</u></p> <p>Energy Management is graded as Fair (Satisfactory)</p>			

**TABLE 6.7**

**Logistic Support Inspection - Utilities Management (Electronic Format)**

**Sample Unit: 39 Engineer Regiment, Waterbeach Barracks, Cambridge**

Ser	<u>Section 1 - Utility Policy</u>		<u>Comments</u>	<u>Weighting</u>
#	(b)	(c)	(d)	
1	<p><b>Is the site’s utility management policy signed by the Commanding Officer and its requirements included in the Unit Standing Orders?</b>  <b>MRs Vol 6 Pam 2 Sect 8 Annex A Para 3. JSP 418 Leaflet 17 Annex C.</b></p> <p>a. The site’s policy is signed by the Commanding Officer demonstrating commitment to utility management and its requirements included in Unit Standing Orders. A copy dated in the last year provided as evidence.</p> <p>b. The signed policy and its requirements previously included in the Standing Orders but no reminders of the policy have been included during the last year. Copy provided as evidence.</p> <p>c. The signed/unsigned site policy and its requirements have been included in Unit Standing orders at some time but not in the last two years. A copy provided as evidence.</p> <p>d. The unsigned site’s policy and requirements have not/are not included in the Unit Standing Orders.</p>	<p>Weighted</p> <p>1</p>		Double yellow
2	<p><b>Does the Unit have a copy of the latest Army, Divisional and Brigade Utilities Strategies/Directive on file as reference documents?</b>  <b>Army Utilities Directive 2006 – 2011.</b></p> <p>a. The Unit has a copy of the latest documents on file. Copies provided as evidence.</p> <p>b. The unit has a copy of previous versions of the documents. Copies provided as evidence.</p>			

c.	The unit has knowledge of the documents but can provide none as evidence.	1	
d.	The unit does not have any knowledge or evidence of possessing the documents.		
<b>3</b>	<b>Does the Unit have a Utility Strategy and Action plan in place, which is reviewed on an annual basis?</b>  <b>JSP 418 Vol 2 Leaflet 17 Contents Para 42/Annex C. Army Utilities Directive 2006 – 2011.</b>	Major Site Target - M14/06 (Annex 8C, Pg 86, Army Utilities Directive 2006 – 2011)	
		Weighted	
a.	Copies of the Units Utility Strategy and Action plan dated within the last year provided as evidence.		
b.	Copies of the documents provided but dated more than a year ago.	1	
c.	No documents available as evidence.		
d.	No knowledge of the requirement.		
<b>4</b>	<b>Has the Unit Energy Manager (UEM)/Site Utility Manager (SUM) received the necessary training to fulfil their role?</b>  <b>JSP 418 Vol 2 Leaflet 17 Contents Para 27. Army Utilities Directive 2006 – 2011.</b>	Weighted	
a.	The UEM/SUM has attended the Utilities Management course at RAF Halton and provided the certificate as evidence.		
b.	The UEM/SUM has attended an Energy warden course in the last two years and provided the certificate as evidence.		
c.	The UEM/SUM has received some training but has no paper evidence.		
d.	The UEM/SUM has not received the necessary training during the last two years.	1	
<b>5</b>	<b>Are the UEM/SUM and sub-unit energy wardens of an appropriate rank to be effective?</b>  <b>MRs Vol 6 Pam 2 App 2 to Annex A Sect 8. JSP 418 Vol 2 Leaflet 17 Para 27.</b>	Weighted	
a.	The UEM/SUM and energy wardens are of an appropriate rank to effectively influence the management of utilities at the site.	1	
b.	They are not of an appropriate rank to be effective.		
<b>6a</b>	<b>Does the UEM/SUM hold two Unit Energy Action Group meetings per year?</b>	Weighted	

Double yellow

Double red

Double green

6b	<p><b>JSP 418 Vol 2 Leaflet 17 Annex C. Army Utilities Directive 2006 – 2011 Terms of Reference.</b></p> <p>(i) The UEM/SUM holds two meetings per year, minutes of the meetings provided as evidence for the last two years.</p> <p>(ii) The UEM/SUM has held two meetings during the last year, minutes of the meeting provided as evidence.</p> <p>(iii) The UEM/SUM has held one meeting during the last year, minutes of the meeting provided as evidence.</p> <p>(iv) The UEM/SUM has not held a meeting during the last year.</p> <p><i>* Please note, these meetings may be solely utility mgt meetings or part of another meeting structure.</i></p> <p><b>Does each Unit have a copy of the site’s Action plan and minutes from the Unit Energy Action Group meetings?</b></p> <p>(i) The Unit has a copy of the latest Action plan and all the minutes from meetings held to date as evidence.</p> <p>(ii) The Unit has a copy of the Action plan and some incomplete records of the minutes as evidence from the meetings held.</p> <p>(iii) The Unit has a copy of the Action plan but no minutes from the meetings OR no copy of the Action plan and some minutes as evidence.</p> <p>(iv) The Unit has no copies of the Action plan OR minutes.</p>	<p>1</p> <p>1</p>		<p>Double red</p> <p>Double yellow</p>
7	<p><b>Does the UEM/SUM attend directed Brigade Utility Efficiency meetings?</b></p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27. Army Utilities Directive 2006 – 2011.</b></p> <p>a. The UEM/SUM attends the directed meetings? Minutes provided as evidence.</p> <p>b. The UEM/SUM attends the meetings when available. Minutes provided as evidence.</p> <p>c. The UEM/SUM does not attend in person but sends a representative on behalf of the Unit. Minutes as evidence.</p> <p>d. The UEM/SUM does not attend the meeting.</p>	<p>Weighted</p> <p>1</p>		<p>Double yellow</p>

<p><b>8</b></p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p>	<p><b>Was the site within the advised Divisional cap of the 3.3% reduction target compared to the previous year as required in the Army Utilities Directive 2006 - 2011?</b></p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27. Army Utilities Directive 2006 – 2011.</b></p> <p>The site was within the target for the last FY. Consumption figures provided as evidence.</p> <p>The site was just short of meeting the target for the last FY.</p> <p>The site was not within the target during the last FY.</p> <p>The site's performance has not been measured against the target.</p>	<p>1</p>	
<p><b>9</b></p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p>	<p><b>Does the UEM/SUM report on the monthly/quarterly reporting of utility consumption as required by the Brigade/Division?</b></p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 27.</b></p> <p>The UEM/SUM replies promptly each quarter to the return. Evidence of the return provided.</p> <p>The UEM/SUM does reply but after the return deadline.</p> <p>The UEM/SUM does report on consumption but on an annual basis.</p> <p>The UEM/SUM does not reply to the return.</p>	<p>1</p>	
<p><b>10</b></p> <p>a.</p> <p>b.</p> <p>c.</p> <p>d.</p>	<p><b>Is the Unit aware of the site's benchmarked performance using ECON75?</b></p> <p>Have the top-ten energy consuming buildings been identified? Is sub-metering installed? <i>*Major sites (Including premier and EU ETS sites)</i></p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex H Para 50. Army Utilities Directive 2006 – 2011.</b></p> <p>The Unit is aware of the benchmarked performance of the site and the top ten consuming buildings and sub-metering is installed. Schedule provided as evidence.</p> <p>The Unit is aware of the top ten consuming buildings and sub-metering is not installed.</p> <p>The Unit is aware of some high consuming buildings.</p> <p>The Unit does not know which buildings use the most energy on the site.</p>	<p>Major Site Target - M13/08 (Annex 8C, Pg 85, Army Utilities Directive 2006 – 2011).</p> <p>1</p>	

Utility Policy LAURA Grading (E) (G) (F) (U) (N/I) (N/A)	
---	--

**Section 2 – Energy Awareness**

(a)	(b)	(c)	(d)	(e)	(f)	(g)
11	<p><b>Is an annual energy awareness campaign operating in conjunction with the Energy Saving Trust’s and MoD’s Energy Saving Week campaign?</b></p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C.</b></p> <p>a. A campaign is operating on an annual basis. Material evidence provided.</p> <p>b. Energy awareness campaigns are arranged at least once every two years.</p> <p>c. Energy awareness campaigns are on an ad hoc basis.</p> <p>d. No energy awareness campaigns at the Unit.</p>	<p>Weighted</p> <p></p> <p>1</p>				
12	<p><b>How does the Unit raise awareness of utility conservation issues?</b></p> <p>a. The Unit uses innovative and new methods for the promotion of energy awareness. Material evidence provided.</p> <p>b. The Unit is proactive in its approach to energy awareness but does not have any evidence.</p> <p>c. The Unit is reactive in promoting energy awareness and has provided evidence.</p> <p>d. The Unit does not choose to promote energy awareness.</p>	<p></p> <p>1</p>				
13	<p><b>Does the Unit participate in the annual Brigade/Divisional Energy competition?</b></p> <p><b>References: JSP 418 Vol 2 Leaflet 17 Annex C. Divisional and Brigade Utilities Strategies.</b></p> <p>a. The Unit participates each year in the competition. Competition submissions for the last two years provided.</p> <p>b. The Unit has participated at least once in the competition. Submission provided.</p> <p>c. The Unit has not participated in the competition.</p> <p>d. The Unit is not aware of the competition.</p>	<p></p> <p></p> <p>1</p>				

Double amber

14	<b>Does the UEM/SUM ensure the catering contractor switches off all kitchen equipment when not in use and employs good utility management practices to minimise wastage across all messes?</b>		
	a. The UEM/SUM works with the catering contractor in ensuring good utility management and has written evidence of the requirement.		
	b. The UEM/SUM works with the catering contractor to ensure good utilities management but has no written evidence.		
	c. The UEM/SUM has liaised on occasion with the catering contractor in ensuring good utilities management.		
	d. The UEM/SUM and catering contractor have not discussed utilities management.	1	
<b>Energy Awareness</b>			
<b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b>			

**Section 3 – Utility Management**

(a)	(b)	(c)	(d)	(e)	(f)	(g)
15	<b>Is the Fuel and Light return (AF F727) completed and sent to the ASU by the 7<sup>th</sup> of each month and copied to Brigade Utility Focal Point?</b>	Major Site Target - M8/06. (Annex 8C, Pg 82, Army Utilities Directive 2006 – 2011)				
	<b>MRs Vol 6 Pam 2 Sect 12 Para 1207. Army Utilities Directive 2006 – 2011. Divisional and Brigade Utilities Strategies.</b>	Weighted				
	a. The AF F727 is completed and returned to the ASU by the 7 <sup>th</sup> of each month and copied to the Brigade. Evidence of the return provided by the Unit, ASU or Brigade.	1				
	b. The AF F727 is completed and returned to the ASU by the required date but it is not copied to the Brigade.					
	c. The Unit has been regularly late in returning the AF F727 each month.					
d. The Unit does not complete the AF F727 by the required deadline.						
16	<b>Are stocks of LPG/FFO physically monitored on a monthly basis and delivery receipts received and kept for monitoring purposes?</b>	Weighted				
	<b>MRs Vol 6 Pam 2 Sect 12 Para 1206.</b>					

Double green

a. b. c. d.	Stocks of LPG/FFO are physically checked on a monthly basis and receipts kept. Evidence of monitoring and receipts provided from AF F727. Stocks checked less than once a month, receipts kept and evidence provided. Stocks checked occasionally and no receipts kept. Stocks rarely checked and no receipts kept.			N/A
17	<b>Are utility VAT declaration certificates reviewed and updated annually?</b>  <i>* Major sites Including premier and EU ETS sites)</i> <b>JSP 418 Vol 2 Leaflet 17 Annex H Para 55. Army Utilities Directive 2006 – 2011.</b>  a. The VAT declaration certificates have been reviewed during the last year for all utility accounts. Copies provided as evidence. b. Some VAT declaration certificates have been reviewed during the last year. Copies provided as evidence. c. Some VAT declaration certificates have been reviewed but no copies provided as evidence. d. No VAT declaration certificates have been completed for the site's utility accounts.	Major Site Target - M3/06. (Annex 8C, Pg 79, Army Utilities Directive 2006 – 2011)  Weighted    1  		Double amber
18	<b>Are building heating time and temperature schedules reviewed at least once a year?</b>  <b>JSP 418 Vol 2 Leaflet 17 Annex C.</b>  a. The Unit in conjunction with the maintenance provider reviews heating time and temperature schedules annually. Evidence provided. b. The Unit reviews the schedules every two years. Evidence provided. c. The Unit reviews the schedules periodically but has no supporting evidence. d. The Unit does not review the schedules.	Weighted   1  		Double yellow
19	<b>Does the QM's Department/UEM/SUM have access to/direct the requirements of the Building Management system?</b>  <b>JSP 418 Vol 2 Leaflet 17 Annex C.</b>  a. The UEM has desktop read-only access to the BMS. Evidence provided.			

b.	The UEM has no access to the BMS.	1	
20	<b>Are supplementary forms of heating and cooling controlled centrally by the QM's Department/UEM/SUM?</b> <b>JSP 418 Vol 2 Leaflet 17 Annex C.</b>		
a.	The UEM/SUM controls the use of all heating and cooling appliances in the Unit. Evidence provided.	1	
b.	The UEM/SUM controls the use of appliances issued centrally, but some appliances are used which have not been issued by the UEM/SUM.		
c.	The UEM/SUM does not control the use of appliances centrally.		
d.	The Unit does not use any heating/cooling appliances.		
21	<b>Is the ventilation of accommodation adequate or do any buildings suffer from overheating creating the need for building users to open windows?</b> <b>JSP 418 Vol 2 Leaflet 17 Annex C.</b>		
a.	The ventilation of accommodation is adequate. Evidence provided.		
b.	The ventilation of accommodation on paper is satisfactory but building users choose to open windows.		
c.	The ventilation of some of the buildings is unsatisfactory.	1	
d.	The ventilation of all the buildings is unsatisfactory.		
22	<b>Does the UEM/SUM have a record of monthly site occupancy levels?</b> <b>JSP 418 Vol 2 Leaflet 17 Contents Para 18. Army Utilities Directive 2006 – 2011. Divisional and Brigade Utility Strategies.</b>		
a.	The UEM/SUM holds records of monthly occupancy levels, in addition to the established strength figure.		
b.	The UEM/SUM does not hold occupancy figures.	1	
23	<b>Is the UEM/SUM kept informed of new build/renovations as part of major projects, particularly where new primary utility supplies are installed?</b>		

<p>a. The UEM/SUM is kept informed and has supporting evidence. This information is forwarded to the Brigade to ensure all new supplies are included on MoD utility contracts.</p> <p>b. The UEM/SUM is kept informed but does not forward the information to the Brigade.</p> <p>c. The UEM/SUM is not kept informed.</p> <p>d. The UEM/SUM is not aware of the need to be informed.</p>		<p>1</p>	
<p><b>24</b></p>	<p><b>Is water consumption monitored in buildings where sub-metering exists?</b></p> <p><b>JSP 418 Vol 2 Leaflet 17 Contents Para 18.</b></p> <p>a. Building water consumption is monitored on a monthly basis where sub-metering exists.</p> <p>b. Building water consumption is not monitored, as no sub-metering exists.</p>	<p>Major Site Target - M12/06 (Annex 8C, Pg 85, Army Utilities Directive 2006 – 2011).</p> <p>1</p>	
<p><b>25</b></p>	<p><b>Is the use of water for vehicle wash-down and grounds maintenance effectively controlled?</b></p> <p>a. Building water consumption is not monitored, as no sub-metering exists but is controlled.</p> <p>b. The use of water for vehicle wash-down and grounds maintenance is not monitored but controlled where practicable.</p> <p>c. The use of water is not controlled for these purposes.</p> <p><b>Utility Management</b> <b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>	<p>1</p>	

<b>Section 4 – Utility Efficiency Measures</b>						
(a)	(b)	(c)	(d)	(e)	(f)	(g)
26	<p><b>Does the UEM/SUM keep a schedule of potential Invest to Save measures on file and what measures are programmed with the maintenance provider for the current FY?</b></p> <p><b>JSP 418 Vol 2 Leaflet 17 Annex C &amp; H, Para 49.</b></p> <p>a. The UEM/SUM keeps an up to date schedule of Invest to Save measures. Schedules provided as evidence.</p> <p>b. The UEM/SUM keeps an up to date schedule but has no programmed measures for this FY.</p> <p>c. The UEM/SUM is aware of the Invest to Save measures for the Unit but they are not documented.</p> <p>d. The UEM/SUM is not aware of any Invest to Save measures.</p>	Major Site Target - M15/06 (Annex 8C, Pg 87, Army Utilities Directive 2006 – 2011).				
27	<p><b>Does the Unit have a list of no-cost utility measures?</b></p> <p>a. The Unit has a list of no-cost utility measures. A copy is provided as evidence.</p> <p>b. The Unit does not keep a list of no-cost measures.</p>					
28	<p><b>Does the UEM/SUM support the promotion of using energy efficient products in standard maintenance requests where practical? E.g. use of energy efficient light bulbs to reduce utility and labour costs.</b></p> <p>a. The UEM/SUM supports the use of energy efficient products. Works orders provided as evidence.</p> <p>b. The UEM/SUM does not use energy efficient products in standard maintenance requests.</p> <p><b>Utility Efficiency Measures</b> <b>LAURA Grading (E) (G) (F) (U) (N/I) (N/A)</b></p>					

<b>Weighted questions will be apportioned as a double rating.</b>					
<b>The average colour overall will determine the grade of the section on Utilities Management</b>					
	<b>Colour</b>	<b>Number</b>			
<b>Green - Excellent</b>		10			
<b>Yellow - Good</b>		11			
<b>Amber - Fair</b>		8			
<b>Red - Unsatisfactory</b>		10			
	<b>Average colour</b>		<b>Good rating</b>		