Energy is a critical and essential input to all Defence activities. Reliable supplies of energy are needed to fuel air-craft, ships and other military vehicles, to transport and house Defence personnel and to power our offices, computer centres and laboratories.

Defence’s energy requirements are significant and we have a responsibility to manage our energy use in a way that delivers value for money and minimises the impacts of our operations on the environment. We must also ensure that our energy supplies are secure and continuously available to support capability.

The Defence Estate Energy Strategy includes initiatives under four themes:

- Improving the Efficiency of Existing Assets and Equipment
- Providing Efficient New Infrastructure and Equipment
- Using Energy from Renewable and Alternative Sources
- Driving Energy Saving Behaviour

The goals identified in the Strategy under these themes complement existing energy related programs and projects and will allow Defence to achieve significant improvements in energy performance, while enhancing the security of energy supplies, over the next five years.

All Defence personnel have a role in delivering this Strategy. By their nature Defence activities are energy intensive. However, within the constraints of sustaining and building Defence capability, there are opportunities for us to improve energy performance. Collectively and individually we can take responsibility for implementing specific goals where relevant, considering energy consumption in daily decision making and managing our own energy consumption behaviours.

The energy efficiencies and enhanced security achieved through these measures will contribute to funding and supporting capability and will enable us to efficiently deliver our mission of defending Australia and its interests into the future.

Michael Healy
A/HEAD INFRASTRUCTURE
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Introduction

In 2012-13, Defence consumed 17,032,001 GJ1 of energy to fuel vehicles and operate the Defence Estate. The reliable and continuous supply of energy is critical to capability, enabling Defence to develop and maintain its ability to defend Australia and its interests.

In 2011-12 Defence’s annual spending on energy exceeded $607 million ($483m for fuel and $124m for electricity) with projections that this will increase in the future. Therefore, even moderate efficiency improvements can deliver substantial cost savings, contributing to Defence’s Strategic Reform Program (SRP) cost reduction targets and enabling reinvestment of funds in other strategically important areas.

Defence energy use represents close to 0.42% of Australia’s total energy consumption2 and over 70% of the energy used by the Australian Government as a whole3.

Defence recognises that it has a responsibility to identify and implement effective approaches to reduce energy consumption. Improving energy efficiency and harnessing energy from alternative sources will allow Defence to deliver value for money, reduce climate change impacts and minimise other environmental consequences arising from fossil fuel use.

Providing a secure and continuous supply of reticulated electricity and gas to Defence facilities is also paramount, and these sites are often located in remote areas and subject to supply interruptions. Delivering energy security is therefore a key consideration in this Strategy.

This Defence Estate Energy Strategy replaces the previous Defence Energy Strategy (2007). The Strategy describes how Defence plans to manage its energy requirements and how it will identify and implement energy saving initiatives across the wide range of assets and activities it controls over the next five years. The scope of the Strategy is defined by three parameters:

- Geography: The Strategy considers initiatives related to Defence’s energy consumption within Australia. Energy consumption arising from Defence operations overseas is outside the scope of this Strategy and is being considered through other programs. Some of these programs are described in the discussion on Current Approach to Fuels Management later in this Chapter.
- Included energy sources and activities: The Strategy considers all energy sources including electricity, natural gas, liquid fuels (for energy generation) and renewable energy resources. The primary focus of the Strategy is on energy used to operate and maintain the Defence Estate; this energy includes electricity, natural gas, and Liquefied Petroleum gas (LPG) and liquid fuels for remote power generation and passenger vehicles. Not included in the scope of this Strategy are fuels used for onshore operations and training typically liquid fuels such as avgas, jet fuel, diesel and petrol.

Ownership and responsibility for coordinating the implementation of the Strategy lies with the Environment and Engineering Branch in Infrastructure Division, Defence Support and Reform Group (DSRG). The Branch is responsible for Defence’s environment and engineering policy, and in doing so helping achieve Defence’s environmental vision: to be a leader in sustainable environmental management to support the Australian Defence Force’s capability to defend Australia and its national interests.

Government Policy and Regulatory Environment

The Australian Government Energy White Paper 2012, Australia’s energy transformation, describes the policy framework for production of clean, affordable energy in the Australian energy sector. The White Paper identifies four priority action areas:

- delivering better energy market outcomes for consumers
- accelerating clean energy transformation
- developing Australia’s critical energy resources, particularly gas resources and

1 Defence’s total onshore energy consumption for FY2012/13
2 Based on Australia’s 2009/10 annual consumption figure of 3,701 petajoules (Schultz & Petchey, 2011)
3 Department of Climate Change and Energy Efficiency, 2012
The Defence Estate.

targets related to energy on the commitments, objectives and sits below the DESP.
The Defence Environmental strategies, policies and plans.

Figure 1
Related Defence Policies and Strategies

The actions, roles and responsibilities for delivery of the Strategy are outlined in the Defence Estate Energy Strategy Implementation Plan.

Profile of Defence Energy Use

In 2012-13 Defence energy consumption was 17,032,001 GJ.

Fuel used for by aircraft, tanks, ships, and other vehicles, to support training exercises and other Defence activities within Australia, represents over 75% of this total (see ‘Other Fuels’ in Figure 1-2).

Approximately 24% of the remaining energy consumption arises from electricity, natural gas and LPG consumption in offices, laboratories, computer centres, and other facilities, including accommodation facilities, across the Defence Estate.

Fuel consumption in passenger vehicles (including passenger cars, light commercial vehicles, mini-buses and the Senate Executive Services (SES) fleet), totals 0.6% of Defence energy use.

Some of the key fuel initiatives being undertaken are described below:

- A program to reduce the fuel consumption associated with fuel for Navy vessels. Defence has installed instrumentation on Navy Patrol Boats and is monitoring fuel consumption over time from various sea trials. The data will inform the Navy on more efficient vessel operation, improved fuel efficiency and fuel efficiency are also considered at a strategic level by the

Adapting flight paths where possible for fuel conservation: RAAF pilots are trained in Continuous Descent Approaches (CDA), as a means to improve efficiency; typically this training is used as extension exercises for more experienced students. Note that the location and proximity of Military airfields to major airfields, airspace and air traffic requirements often does not allow for CDA.

Air Lift Group Standing Instructions encourage the use of cruise at optimum altitude and efficient airspeeds (such as long range cruise) to minimise fuel consumption wherever operationally practical. Ongoing development of fuel efficient profiles continues on newly acquired platforms.

- Considering energy performance in selection of new military platforms: The DMO’s Defence Procurement Policy Manual (DPPM) provides guidance on environmental considerations such as fuel efficiency. Procurement decisions consider value for money over the life of purchased assets, energy security and fuel infrastructure requirements amongst a variety of considerations. Fuel is considered through the risk management, quality assurance, interacting policies, reporting and asset disposal assessments undertaken when purchasing new military platforms.

- Research into biofuels: Defence is actively exploring the feasibility, cost, energy security and interoperability benefits of using biofuels for its operational requirements. The Strategic Logistics Branch works closely with the Defence Science and Technology Organisation (DSTO) to coordinate research into alternative fuels. Substitution of between 30-50% of fossil fuels with renewable fuels is thought to be possible.

- Forming partnerships with other Defence agencies: The Royal Australian Navy has signed an agreement with the US Navy, which is moving toward the general use of a 50/50 blended biofuel product by 2020. Through this agreement the Australian and US Navies will co-operate on research into alternative fuels for the naval fleet. Defence has representation, and currently chairs, the Quadrilateral Logistic Forum (QLF) Energy Working Group which comprises representatives of the UK, US, Canadian and Australian Defence forces.

- Securing energy supplies to Deployed Operating Bases: Approximately 50% of all non-aviation fuel consumed in ground based activity, in support of current operations, is used to generate electricity to power infrastructure systems. Fuel supply chains are complex, costly and labour intensive. The QLF is currently researching methods for producing, storing and optimising energy for Deployed Operating Bases (DOBs). The work of the QLF Energy Working Group will also have application for onshore operational fuel and training, and stationary energy applications. The QLF Energy Working Group has also been invited to participate in the NATO Smart Energy Team (SENT). SENT’s role is to bring together and align international activities by NATO member countries on energy efficiency and renewable energy initiatives in the military.

- Establishing principles and a strategy for biofuels: The Strategic Logistics Branch is currently developing principles that will define the approach that Defence takes to building the proportion of biofuels used for operational purposes. The principles will explore parameters including interoperability, equipment compatibility, energy security, infrastructure requirements and commercial viability.

Electricity and Gas Use and Management

Electricity and gas account for a quarter of the total energy used on the Defence Estate. Increasing energy prices and in efficiencies arising from ageing Defence infrastructure, if unmanaged, will drive stationary energy costs up further in the future.

Electricity, natural gas and LPG are used to heat, cool, ventilate and light buildings; to power computer centres; and to operate office equipment, laboratory facilities and residential appliances.

Defence has established a program of electricity sub-metering on Defence sites, in line with the EEGO requirements, to improve the quality and resolution of data on energy consumption for particular facilities.

Defence Groups and Services have also implemented a number of programs to improve energy efficiency and harness renewable energy resources. These programs are detailed in Chapter 3, under the relevant strategy themes, and include:

- establishing an Ecologically Sustainable Development (ESD) program to fund energy initiatives
- using renewable energy at some remote sites to improve the continuity and security of power supplies
- equipping many existing and new facilities with solar roof-top photovoltaic and solar hot water systems
- implementing capital delivery review processes to ensure energy initiatives are identified and captured and

Defence Estate Energy Use by End-use Category (2012-13)

Fuel Use and Management

Fuel consumption represents a large proportion of total Defence energy use. Total spending on fuels for this purpose totalled $483 M in 2011/12.

Air Force is the largest consumer of fuel across Defence, followed by the Navy and Army. Fuel is also used for remote power generation and to operate the passenger vehicle fleet.

Fuel use and Defence capability are fundamentally related. Accordingly, the individual Defence Services have direct responsibility for managing fuel budgets, while achieving capability requirements, and each service has multiple initiatives in place to improve fuel efficiency and secure energy supplies.

The procurement of new military platforms will also impact on the overall defence fuel consumption. The Defence Materiel Organisation (DMO) considers fuel efficiency, as one of a number of factors, in procurement of new military platforms and the Defence Science and Technology Organisation (DSTO) conducts research into alternative fuels and technologies to improve energy efficiency. Alternative fuel sources and fuel efficiency are also considered at a strategic level by the Strategic Logistics Branch, Joint Logistics Group.

As outlined in the Introduction, consumption of liquid fuel for uses other than power generation is not included in the scope of this Strategy. There are a number of initiatives being undertaken by Groups and Services to address operational fuel use.

Figure 1-2 Defence Energy Use by End-use Category (2012-13)

- OFFICE
- LABORATORIES
- PASSENGER VEHICLES
- COMPUTER CENTRES
- OPERATIONS
- DEFENCE ESTABLISHMENTS

Office equipment, laboratory facilities and residential appliances.

- Fuel supply chains are complex, costly and labour intensive.
- The QLF is currently researching methods for producing, storing and optimising energy for Deployed Operating Bases (DOBs).
- The work of the QLF Energy Working Group will also have application for onshore operational fuel and training, and stationary energy applications.
- The QLF Energy Working Group has also been invited to participate in the NATO Smart Energy Team (SENT).
- SENT’s role is to bring together and align international activities by NATO member countries on energy efficiency and renewable energy initiatives in the military.

- Establishing principles and a strategy for biofuels: The Strategic Logistics Branch is currently developing principles that will define the approach that Defence takes to building the proportion of biofuels used for operational purposes. The principles will explore parameters including interoperability, equipment compatibility, energy security, infrastructure requirements and commercial viability.

- Electricity, natural gas and LPG are used to heat, cool, ventilate and light buildings; to power computer centres; and to operate office equipment, laboratory facilities and residential appliances.

- Defence has established a program of electricity sub-metering on Defence sites, in line with the EEGO requirements, to improve the quality and resolution of data on energy consumption for particular facilities.

- Defence Groups and Services have also implemented a number of programs to improve energy efficiency and harness renewable energy resources. These programs are detailed in Chapter 3, under the relevant strategy themes, and include:

  - establishing an Ecologically Sustainable Development (ESD) program to fund energy initiatives
  - using renewable energy at some remote sites to improve the continuity and security of power supplies
  - equipping many existing and new facilities with solar roof-top photovoltaic and solar hot water systems
  - implementing capital delivery review processes to ensure energy initiatives are identified and captured and

- Under EEGO, Defence is required to develop a comprehensive energy management strategy and roll out a program to install sub-meters at Defence bases to capture 80% of Defence electricity consumption. EEGO also requires Defence to report annually on energy use against specific end use categories and provides the opportunity for Defence to work with other Government agencies to improve energy performance across specific facilities.

- The EEGO Policy:

  - requires Commonwealth Departments and Agencies to report annually on energy performance
  - sets targets and objectives for power use in offices and
  - aims to set future targets for other building types.

Related Defence Policies and Strategies

Figure 1-1 shows how the Defence Estate Energy Strategy aligns with other relevant strategies, policies and plans.

Defence has produced an Environmental Policy, which is implemented through the Defence Environmental Strategic Plan (DESP).

The Defence Estate Energy Policy sits below the DESP. The policy describes Defence’s commitments, objectives and targets related to energy on the Defence Estate.

The Defence Estate Energy Strategy describes how the objectives of the Defence Estate Energy Policy will be met over the period 2014-2019.

Defence Environment Strategic Plan (DESP)
• using passive systems such as suitable vegetation or artificial solar load control on new buildings.

Electricity and natural gas bills are paid centrally by Defence Support Operations and data on facility energy consumption is also collected centrally. Energy costs will be reflected in future Net Personnel Operating Costs (NPOCs) incurred by Defence facilities and this provides a financial driver for improving site efficiency, although this is an indirect NPOC cost pass-through that will occur sometime after the efficiencies have been achieved.

Opportunities and Challenges

Defence faces a number of challenges that could impact on the successful implementation of the Strategy and delivery of energy initiatives. Some of these challenges are unique to Defence while others are commonly encountered by other organisations seeking to improve energy performance.

Similarly, the size, diversity and environment in which Defence operates provide many opportunities to implement energy initiatives to improve efficiency, reduce costs, reduce reliance on fossil fuel resources and improve energy security.

Some key opportunities and challenges, and the way they are addressed in the Strategy and supporting Implementation Plan will include:

• Size and diversity of the Defence Estate: The extent and diversity of the Estate can make it difficult to implement standardised approaches to energy management. However, the diversity of viable energy resources available at Defence sites (e.g., land, wind, sun, waste and geo-thermal/heat) provides opportunities for renewable energy generation.

• Age of the Defence Estate: The Defence Estate comprises a large portfolio of ageing infrastructure and assets, which are typically less efficient than newer equipment and facilities.

• Operational tempo: Future energy use trends will be dictated in part by changes in operational tempo. For example, increased base usage and training, resulting from lower levels of troop deployment, may lead to increases in Defence energy consumption even with the Strategy successfully implemented.

• Fuel and Electricity trade-offs: Savings in fuel use due to changes in activities or training practices can lead to increases in consumption of other sources of energy including electricity and/or gas. For example, an increase in the use of aircraft simulators will reduce fuel use during training however will increase the amount of electricity used to power training simulators.

• Funding and other Resource Constraints: Budget and resource constraints may limit the number of initiatives that can be implemented. The Defence Estate Energy Implementation Plan will include estimates of the cost and benefit of implementing the Strategy and identify resources required. This will allow funding for initiatives that can be prioritised or additional resourcing allocated if warranted.

Strategy Objectives and Principles

This Strategy aims to deliver the objectives of the Defence Estate Energy Policy namely:

• Measuring and Monitoring Energy: Ensure infrastructure and processes are in place to measure and manage energy consumption and generation effectively.

• Less Energy: Reduce the energy requirement for Defence by maximising energy efficiency in all aspects of Defence business.

• Cleaner Energy: Transition to cleaner (lower-emission), more sustainable and more secure energy sources.

There are a number of principles that underpin the Strategy and these factors have influenced both the approach taken to strategy development and the strategic goals identified. These underlying principles specify that the Strategy should:

• Align with the core role of Defence: Defence’s mission is to defend Australia and its interests. Energy initiatives must not compromise Defence’s capability, activities, or its ability to achieve its mission. Defence does not intend to deviate from its core role by becoming an energy utility provider.

• Provide cost effective solutions: Strategy initiatives must provide value for money and/or deliver tangible energy security benefits.

• Link with existing initiatives: Existing initiatives, along with planned future activities, for reducing domestic energy consumption have been considered and incorporated where appropriate into the Strategy.

• Be readily implemented: To deliver tangible outcomes, the Strategy must be achievable and able to be implemented within Defence budget and resource constraints and must utilise proven technologies.

• Have wide endorsement: Successful implementation of the Strategy will require collaboration across Defence Groups and Services, a common understanding of the drivers and benefits for energy initiatives and endorsement of the Strategy by senior Defence officials. Accordingly, the Strategy has been developed in close consultation with internal and external stakeholders.

• Built on the experience of others: Other Defence and Government agencies and private sector organisations have developed and implemented energy strategies. The strategies and programs of a number of these organisations, including the US and UK Defence agencies, have been examined in detail to identify successful strategies and factors that contributed to implementation of initiatives.

• Provide the foundation for continuous improvement and innovation: Understanding and prioritising energy efficiency opportunities requires good data, comprehensive data management procedures, robust analysis and regular reporting of findings. Defence has an electricity sub-metering program in place and is working towards the EEGO target of sub-metering to measure 80% of Defence energy consumption. A key focus of this Strategy is installing the necessary metering and enhancing the data collection and management initiatives to enable Defence to identify improvement initiatives and incorporate these into future revisions of the Strategy.
Defence Estate Energy Strategy

The Strategy comprises a comprehensive set of strategic goals and actions under four broad themes:

- **Improving the Efficiency of Existing Assets and Equipment:** Defence manages a diverse and unique asset portfolio. This theme explores opportunities for Defence to improve the overall energy performance of the Defence Estate and equipment in an environment of ageing infrastructure and constrained budgets.

- **Providing Efficient New Infrastructure and Equipment:** Infrastructure and equipment built or purchased today will be in service for many years to come. This theme identifies how Defence can ensure that capital planning and procurement decisions deliver energy efficient assets, where this provides value for money and meets capability requirements.

- **Using Energy from Renewable and Alternative Sources:** Defence has access to solar, wind, geothermal, wave and waste resources. This theme identifies how Defence can expand its renewable energy program and increase the proportion of electricity and fuel sourced from these non-fossil reliant resources, where this is cost-effective.

- **Driving Energy Saving Behaviour:** This theme includes actions to build an enabling culture that supports delivery of the Strategy and ensures that Defence staff and contractors have the capacity to identify and implement energy saving initiatives.

It is important to note that the initiatives identified in this Strategy will take a number of years to implement.

The following sections of this Chapter describe the intent and goals identified under each of these themes.

---

6 The Defence SMART Infrastructure Manual will replace the now rescinded Defence Green Building Requirements Part 1 and Part 2.
The Strategy also proposes trialling an alternative approach to funding and implementing energy efficiency initiatives through Energy Performance Contracting (EPC).

The ten goals for Improving the Efficiency of Existing Assets and Equipment are detailed in Table 3-1.

**Table 3-1: Improving the Efficiency of Existing Assets and Equipment**

<table>
<thead>
<tr>
<th>GOAL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Continue to fund the availability, quality and resolution of energy usage data through the energy sub-meter program. Complete the current roll-out of energy meters through the energy sub-meter program. Expand the energy sub-meter program across the Estate by including contractor facilities which exceed annual energy consumption thresholds and sites where cost recovery is feasible. Develop a business case for implementing a sub-meter program for gas (reticulated Natural Gas and bulk LPG).</td>
</tr>
<tr>
<td>1-2</td>
<td>Establish standardised data collection guidelines and scope a data management system. Develop data collection guidelines that define data collection objectives and roles and responsibilities. The guidelines will also stipulate data quality requirements, and specify required analysis and reporting outputs. Examine the requirements and assess the feasibility of a centralised Data Management System to drive continuous improvement. The scope of the system would include both utility and sub-meter energy consumption data to enable better verification and improved understanding of energy consumption and costs.</td>
</tr>
<tr>
<td>1-3</td>
<td>Determine energy intensity consumption targets and track performance against targets for facilities. Develop benchmarks for similar facilities across the Estate to determine the relative energy intensity performance of each facility type and track improvement of facilities against an agreed benchmark. (Occupancy data is needed to calculate energy intensity on a megajoule/person basis. Building size also needs to be known to calculate energy intensity on a megawatt/hour basis. Processes for collecting and retaining this information will be developed in parallel with the sub-meter program.)</td>
</tr>
<tr>
<td>1-4</td>
<td>Establish standardised protocols for tracking and communicating energy performance and cost to base and facility managers. Establish and implement a standardised reporting template to communicate to base and facility managers total energy consumption and cost, benefits arising from energy initiatives and performance against benchmarks.</td>
</tr>
<tr>
<td>1-5</td>
<td>Provide guidance on energy standards for operation and maintenance of facilities. Incorporate guidance on operation and maintenance of facilities for energy efficiency in the SMART Infrastructure Manual. Work with facility managers, including Base Services Contractors, to support them in implementing the SMART Infrastructure Manual.</td>
</tr>
<tr>
<td>1-6</td>
<td>Demonstrate an Energy Performance Contract (EPC) to achieve energy efficiency objectives. Investigate the applicability of EPCs for the Defence Estate and, if feasible, pilot an energy efficiency program using the EPC model at a selected site. Should the pilot be deemed successful, set up a panel of providers to identify and implement future energy initiatives under the EPC model.</td>
</tr>
<tr>
<td>1-7</td>
<td>Implement a supported energy audit program targeting high energy use facilities each year. Execute a national audit program targeting high energy use facilities each year to identify opportunities to improve energy efficiency. Identify buildings that require recommissioning or refurbishing. Program would incorporate recommendations from current energy review processes, e.g. TaPI Review Audit. Prioritisation by the Director of Energy and Safety, which ensures potential savings from reducing off peak consumption. Provide guidance, technical support, and business case skills to assist regions to identify and progress initiatives identified through the audit program.</td>
</tr>
<tr>
<td>1-8</td>
<td>Continue to fund cost-effective retrofits while examining feasibility of a self-funded program. Continue to fund energy savings initiatives through the EPC Program utilising the existing competitive process to prioritise projects and ensuring that project priorities are aligned with the Strategy themes. Investigate the feasibility of a self-funded reinvestment program stemming energy savings to top-up the existing EPC Program and fund new and energy efficient retrofit projects.</td>
</tr>
<tr>
<td>1-9</td>
<td>Support and communicate progress and impact of initiatives on Defence fuel consumption. Communicate with Defence Groups and Services regarding their fuel saving initiatives and impact on fuel consumption.</td>
</tr>
<tr>
<td>1-10</td>
<td>Develop Energy Management Plans (EMPs) for all regions and priority sites. Prepare standardised templates. Develop EMPs for high priority sites.</td>
</tr>
</tbody>
</table>

**Table 3-2: Providing Efficient New Infrastructure and Equipment**

<table>
<thead>
<tr>
<th>GOAL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1</td>
<td>Establish energy standards for new buildings and major refurbishments. Establish and implement a standardised reporting template to communicate to base and facility managers total energy consumption and cost, benefits arising from energy initiatives and performance against benchmarks.</td>
</tr>
<tr>
<td>2-2</td>
<td>Provide guidance to facilitate adoption of energy initiatives in new projects. Incorporate guidance on operation and maintenance of facilities for energy efficiency in the SMART Infrastructure Manual. Work with facility managers, including Base Services Contractors, to support them in implementing the SMART Infrastructure Manual.</td>
</tr>
<tr>
<td>2-3</td>
<td>Incorporate energy performance considerations into Base Redevelopment Planning and Capital Facilities Infrastructure (CFI) capital planning processes. Ensure that Environment and Engineering Branch and the Regions have early input into the Base Redevelopment Planning process so that energy performance opportunities can be considered as part of the planning process. Ensure that the ESD program and Base Redevelopment, CFI planning and new audit processes are co-ordinated to allow for optimisation of ESD and energy performance. Incorporating findings of audits and CFI program plans into the Base Redevelopment and CFI planning will ensure that allocation of capital funds is optimised and that identified ESD priorities and audit findings are considered in infrastructure planning. Additionally, there is potential for use of ESD funding to supplement ‘business as usual’ capital funding in cases where this delivers a better energy outcome.</td>
</tr>
<tr>
<td>2-4</td>
<td>Review and, if required, strengthen guidance on energy use in procurement of appliances, equipment, military platforms and vehicles. Review procurement policies and guidelines including the Defence Procurement Policy Manual and Green Procurement Guidelines and refine if necessary.</td>
</tr>
<tr>
<td>2-5</td>
<td>Establish formalised asset handover and tracking of performance post-handover. Establish a formalised asset handover process to ensure energy performance requirements are met during handover and post occupancy. Report to the Estate on energy performance requirements. Establish the SMART Infrastructure Manual.</td>
</tr>
</tbody>
</table>

Building Energy Performance Manual to incorporate energy efficiency into design of new infrastructure.

The Providing Efficient New Infrastructure and Equipment theme identifies mechanisms to ensure the energy performance of new infrastructure and equipment allows for sustainable energy use into the future, while not deviating from Defence’s core role, activities, and ability to achieve its mission.

In this theme, Defence has identified significant opportunities to build upon existing initiatives to further drive consistent energy efficient decision making. There is opportunity to provide stronger guidance on energy standards for new buildings; consider energy initiatives earlier in the Estate planning process; establish thresholds for whole of life cost decision making; and track the performance of assets following their commissioning.

The five goals for Providing Efficient New Infrastructure and Equipment are detailed in Table 3-2.
Using Energy from Renewable and Alternative Sources

The size, spread and diversity of the Defence Estate provides significant opportunities for Defence to cost effectively produce energy from solar, wind, geothermal, wave and waste resources. Defence has already begun to harness these renewable resources at its facilities, with solar photovoltaic systems and solar hot water systems installed on some buildings and site scale solar generation at some remote locations with limited access to a reliable grid supply. The Use of Energy from Renewable and Alternative Sources theme seeks to identify how Defence can expand its renewable energy program and increase the proportion of electricity and fuel sourced from on-site, non-fossil reliant resources, where this provides value for money.

The theme identifies opportunities for Defence to further develop the renewable resources it manages by expanding renewable generation at remote sites and progressing larger scale renewable energy projects at Higher demand facilities. As noted in Chapter 1, the business of energy generation does not align with Defence’s core role; however improving energy security by diversifying supply from renewable and alternative sources can support and enhance Defence capability. Conversely, capital budgets are constrained and funding for renewable projects could be difficult to secure. Accordingly, Defence may progress renewable energy schemes through a private sector partner with specialist skills and experience in the relevant technology. Defence plans to investigate the viability of entering into a long term power purchase agreement (PPA) with a private sector partner, thereby providing them with the financial security needed to back the capital investment required.

The advantages for Defence in developing renewable projects through a partnership are:

- cost savings, particularly at locations with high demand or distribution charges
- energy security at sites subject to power interruptions

The strategic goals for this theme aim to increase the proportion of energy that Defence secures from renewable sources.

The two goals Using Energy from Renewable and Alternative Sources are detailed in Table 3-3.

**Table 3-3: Using Energy from Renewable and Alternative Sources**

<table>
<thead>
<tr>
<th>GOAL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-1</td>
<td>Increase renewable energy generation across the Defence Estate</td>
</tr>
<tr>
<td></td>
<td>Ensure that new SMART Infrastructure Manual require assessment of the costs/benefits of small scale renewables, such as solar photovoltaics and solar hot water systems, for new buildings and refurbishments.</td>
</tr>
<tr>
<td></td>
<td>Ensure that the SMART Infrastructure Manual allow for consideration of features that enable future uptake of renewable energy generating technology, e.g. roof pitches facing north for future solar panel installations.</td>
</tr>
<tr>
<td></td>
<td>Complete a feasibility study to prioritise sites with the greatest renewable energy potential and determine the appropriate procurement model (private sector partnership or Defence investment).</td>
</tr>
<tr>
<td></td>
<td>Establish partnerships with private sector renewable energy technology providers to progress renewable energy projects at identified sites.</td>
</tr>
<tr>
<td></td>
<td>Progress feasible energy projects, identified as viable Defence investment projects, through Defence ESD or other appropriate Defence budgets.</td>
</tr>
<tr>
<td>3-2</td>
<td>Maintain “watching brief” on latest renewable energy technologies</td>
</tr>
<tr>
<td></td>
<td>Maintain a “watching brief” on new alternative energy options and provide information to other Groups and Services on the latest renewable energy technologies.</td>
</tr>
</tbody>
</table>

Driving Energy Saving Behaviour

Successful delivery of any organisational strategy requires congruent systems, procedures, project delivery mechanisms, communication protocols, leadership, training programs and a culture that supports and recognises individual and team initiative, effort and innovation.

Defence has effective energy procurement practices that seek to establish and manage long term contracts to provide security and value for money outcomes. This theme supplements the procurement function and examines the crucial ‘demand side’ of energy consumption.

The Driving Energy Saving Behaviour theme includes actions to build an enabling culture that supports delivery of the Strategy, to educate staff so that they understand the importance of energy conservation, to provide people with the information and skills they need to identify energy saving initiatives and to acknowledge and reward efforts toward improving energy performance.

There are already examples of highly motivated and innovative personnel across defence who champion energy initiatives. For example, there is an established network of highly committed environmental teams (RESOs and Senior Environmental Managers (SEMs)) with the knowledge and expertise to support regional initiatives, supported by a centralised agency in Environment and Engineering Branch. Existing Defence procedures, training networks, orders and directives provide a means by which the importance of energy conservation behaviour can be reinforced with Defence personnel. Defence is also driving improved energy performance and innovation through its Base Services Contractors.

Defence will build on this strong foundation to increase the general awareness amongst personnel of the costs and benefits of energy conservation, reinforcing the message that energy cost savings equal more funds to support capability, while ensuring that measures do not negatively impact upon personnel comfort needed during training and other activities. It will work to strengthen the reward and recognition of energy conservation efforts through existing programs and new schemes. Defence will provide forums and systems to make it easier for regional environmental teams to network and share knowledge.

The goals under this theme will develop Defence personnel’s ability to recognise and correct behaviours or situations that waste energy. The goals will harness the collective knowledge and initiative of the Defence organisation by improving access to networks and knowledge sharing tools. The six goals for Driving Energy Saving Behaviour are detailed in Table 3-4.

**Table 3-4: Driving Energy Saving Behaviour**

<table>
<thead>
<tr>
<th>GOAL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1</td>
<td>Utilise Chain of Command to provide clear direction on imperative for energy conservation</td>
</tr>
<tr>
<td></td>
<td>Utilise relevant documentation (e.g. Commander’s intent documents, base standing orders and environmental policy) to communicate drivers and requirement for efficient energy use.</td>
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<td>4-2</td>
<td>Establish a program to increase awareness of energy consumption drivers and to communicate case studies across Defence</td>
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<td>Develop a comprehensive communications program, utilising existing publications and forums, to promote energy conservation, provide information on best practice and communicate the benefits of saving energy. In addition to these traditional channels of communication, new innovative approaches will be considered such as running energy efficiency promotions at base theatres.</td>
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<td></td>
<td>Train Defence staff, contractors and consultants in energy conservation. Consider innovative, multi-faceted approaches along with existing training forums to build skills and general energy awareness.</td>
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<td></td>
<td>Introduce a pilot site to work with users and optimise energy performance while meeting comfort and capability requirements. The findings from this program will be used to optimise the ESD, communications and training programs.</td>
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<td>4-3</td>
<td>Enhance knowledge sharing across Defence</td>
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<td>Enhance knowledge sharing across regions, Groups and Services by establishing regular conference calls for regional environmental officers (RESOs)/SEMs and contractors, maintaining an intranet site and running an annual conference attended by the regional sustainability staff. Continue to look for innovative and efficient approaches to knowledge sharing.</td>
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<td>Work collaboratively with industry partners, through forums such as the annual Defence Industry Environment and Safety Forum (DIESF), to share knowledge and case studies of successful energy initiatives.</td>
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<td>4-4</td>
<td>Develop and implement a compliance framework</td>
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<td>Monitor and enforce requirements of Base Services contracts to contribute to improved energy performance and resource efficiency. Document the effectiveness of these requirements over time.</td>
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<td>Establish and Implement a framework to ensure that SMART Infrastructure Manual are being followed.</td>
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<tr>
<td>4-5</td>
<td>Recognise and reward energy conservation</td>
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<td>Recognise individuals, facilities and teams in awards, communications or promotional materials.</td>
</tr>
<tr>
<td>4-6</td>
<td>Capture ideas for energy initiatives</td>
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<td>Establish a system that will allow Defence personnel, contractors and industry partners to submit ideas for energy conservation.</td>
</tr>
</tbody>
</table>
Delivering the Strategy

A Defence Estate Energy Strategy Implementation Plan will be developed to guide the implementation of the Strategy. The Implementation Plan will define the tasks to be completed under each strategic goal, anticipated funding and resource requirements, responsibilities and timeframes.

At a high level, the responsibilities for implementation and governance of the Strategy are as follows:

- Assistant Secretary Environment & Engineering (ASEE): has ultimate responsibility for oversight and implementation of the Strategy.
- Head Defence Support Operations (HDSO): is responsible for regional implementation activities.
- Head Infrastructure and Director General Capital Facilities and Infrastructure: have responsibility for new infrastructure initiatives.
- Environment and Engineering Branch: is responsible for monitoring, reporting and facilitating the implementation of the Strategy as a whole.

The Implementation Plan will define metrics to measure progress in implementing the strategy and to track energy consumption performance across Defence. Estimates of cost, benefits and resource requirements will be provided to enable implementation activities to be prioritised.

Access to sufficient funding and resources will be essential to enable successful implementation of the Strategy. Funding or resource constraints may limit the number of goals that can be progressed. For this reason, funding sources and specific resourcing needs will be estimated in the Implementation Plan for each goal identified allowing total funding and resourcing requirements to be fully understood.

Progress in implementation of the Implementation Plan will be monitored and reported annually, including the status of initiatives and costs and resource savings achieved, in accordance with Defence quality management system protocols.

It is anticipated that the implementation of this Strategy will be governed and monitored in conjunction with the Defence Water Strategy as there are some goals and implementation activities that are common to both strategies.
Glossary

ASEE – Assistant Secretary Environment & Engineering
ADF – Australian Defence Force
BCA - Building Code of Australia
BEPM - Building Energy Performance Manual
CDA – Continuous Descent Approaches
CFI – Capital Facilities and Infrastructure
CDF – Chief of Defence
DESP – Defence Environmental Strategic Plan 2010-2014
DIESF – Defence Industry Environment and Safety Forum
DMO – Defence Material Organisation
DOBs – Deployed Operating Bases
DPPM – Defence Procurement Policy Manual
DRETS – Defence Support and Reform Group
DSRG - Defence Science and Technology Organisation
EEGO – Australian Government Energy Efficiency in Government Operations (EEGO) Policy
EE – Environment and Engineering
EMS – Environmental Management Plans
EMS – Environmental Management System
EPC – Energy Performance Contract
ESD – Ecologically Sustainable Development
FOBs – Forward Operating Bases
HDSO – Head Defence Support Operations
HI – Head of Infrastructure Division
HVAC - heating, ventilation, and air conditioning
LIA – Live in Accommodation
LPG – Liquefied Petroleum Gas
NPOC – Net Personnel Operating Cost
OSCAR – Online System for Comprehensive Activity Reporting
PPA – Power Purchase Agreement
POE – Post Occupancy Evaluation
QLF – Quadrilateral Logistic Forum
RESO – Range Environmental and Sustainable Officer
SES – Senior Executive Services fleet
SEM – Senior Environmental Manager
SENT – NATO Smart Energy Team
SMARTI - Sustainable Measurable Adaptable Renewable Transferable Infrastructure Manual
SPP – Strategic Reform Program

References

Department of Climate Change and Energy Efficiency, 2012. Energy Use in the Australian Government’s Operations, Canberra: DCCEE.