Australian Government

Department of Resources, Energy and Tourism

# DRIVING ENERGY EFFICIENCY IN THE MINING SECTOR

## THE BUSINESS CASE AND BEYOND

Gaining management support and resources for energy efficiency projects

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# DRIVING ENERGY EFFICIENCY IN THE MINING SECTOR

# THE BUSINESS CASE AND BEYOND

## Gaining management support and resources for energy efficiency projects

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# INTRODUCTION

**This guide describes actions you can take to gain management support and access the resources you need to implement energy efficiency projects.**

Energy efficiency makes sense for mining operations because it can reduce costs. It can also generate a range of other benefits, for example by improving productivity or reducing greenhouse gas emissions.

However, there are many reasons why the full benefits of energy efficiency are often not achieved on mine sites. These include historically low energy prices; a focus on rapid expansion of production driven by market demand; and the small scale and discretionary nature of many energy efficiency projects.

If you have responsibility for driving an energy efficiency program and getting resources to implement energy efficiency projects, the information in this guide can help you improve the success rate of your business case proposals.

An essential element of this process is the preparation of a business case that outlines the quantitative costs and benefits of an energy efficiency project. A brief introduction is included in this guide, but the full detail, including calculation methods and tools, is provided in *The Energy Savings Measurement Guide*.

The focus of this guide is on what you need to do to increase the likelihood of your business case being accepted. Why? Because no matter how good your business case is, it won't be approved unless it is seen as achieving important business priorities. Regardless of the cost or size of a project (and some projects are small or require no funding), successful implementation will always depend on the support of key decision-makers.

The keys to success are being clear about the costs and benefits of your project, and ensuring the project proceeds with ongoing and effective engagement with decision-makers.

*The Energy Savings Measurement Guide*, developed for the Australian Government's Energy Efficiency Opportunities program, provides detailed guidelines on the measurement and evaluation of energy efficiency opportunities. It can be downloaded from **www.energyefficiencyopportunities.gov.au**

## About the guide

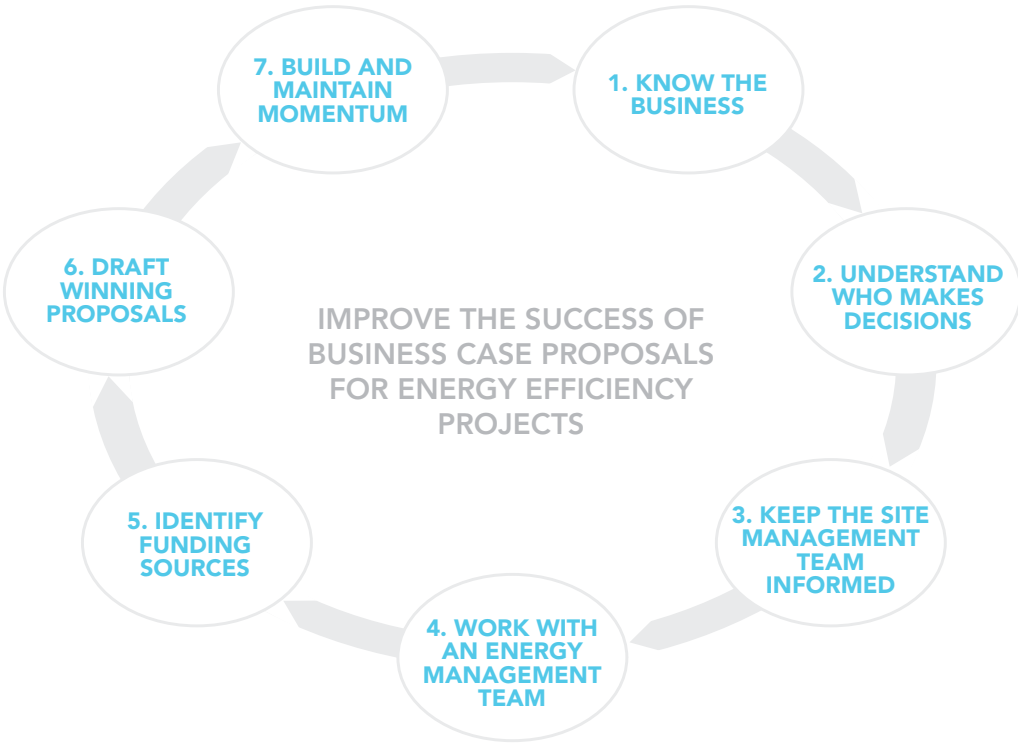
In preparing this guide we asked senior climate change and energy efficiency practitioners across a range of mining companies the following question:

> *What have you done that has made your business case proposals for energy efficiency programs and projects successful?*

Although there are some differences in their approach, seven key activities were consistently identified (see Figure 1). These activities are explored in this guide including tips and case studies.

You may find this guide useful to either review your current approach to business case proposals or to help you plan a new energy efficiency program.

Figure 1: Steps to success



# 1. KNOW THE BUSINESS

**Every site will have different business priorities. Understand what they are so that you can align your business case for energy efficiency with core business objectives.**

Energy efficiency can deliver significant energy savings and other business benefits. However, if the benefits are not well understood or if energy efficiency is viewed as a distraction, then you may find it hard to get the support that you need.

The priorities on any site are safety (first and foremost) followed by production: ensuring that minerals, oil or gas are extracted, processed and transported as efficiently as possible. This is balanced by a range of other demands including cost reduction and the need to meet environmental and other compliance requirements. Energy efficiency may not be regarded as a priority within this context.

Take the time to understand the needs of your site and the issues that might influence the financial viability and attitudes towards energy efficiency. These might include:

- the energy profile of the site (where is most energy used and where are the most significant opportunities likely to be?)
- the depth of the resource and the equipment used
- the mining or extraction method
- whether the site uses on- or off-grid electricity
- staff turnover and skills
- the availability of capital
- the extent to which the site has operational or financial control over energy
- the safety record and targets
- recent weather-related events (floods and cyclones) that lead to operational down time

To get support for your project it is essential that you understand these variables and link your business case for energy efficiency with core business objectives and current priorities. These may include safety, business improvement, throughput or staff retention.

## TIP

Opportunities to align energy efficiency projects with other drivers:

- Every site is unique so match the needs of the site to the different benefits that energy efficiency can provide
- It may be effective to use compliance requirements to bring a new focus on energy efficiency
- Solve an existing problem through an energy efficiency project, e.g. identify opportunities that will increase production throughput as well as deliver an energy saving
- Use a mine expansion to `design in' energy efficiency
- Look for the most efficient options when procuring new equipment
- Implement projects during maintenance shut-downs
- Build energy efficiency into practices and procedures, e.g. for operation, maintenance or staff remuneration

The case studies throughout this guide highlight how opportunities such as these have been linked to energy efficiency projects to support the presentation of a project business case.

# 2. UNDERSTAND WHO MAKES DECISIONS

**Each energy efficiency project will involve different decision-makers. Get to know who these people are and their areas of responsibility and you can start to build support and target your business case.**

Everyone on a mine site has a role to play in achieving production targets and doing so in a cost-effective, safe and responsible way.

Specialisation of business functions and tasks mean that the priorities of one manager may be different from those of another. To get support and resources, you need to understand who the key decision-makers are and how to get them interested in energy efficiency. Some of the decision-makers and suggestions for getting their support are shown in Table 1.

Table 1: Decision-makers at site level and how to get their support

| Decision maker* | Their role and interests | How to get their support |
|---|---|---|
| Mine Manager | Most senior executive at the site<br>Overall responsibility for mining and processing operations<br>**Main concerns:** safety, meeting production and expenditure targets for the site | Relate energy efficiency to production, safety, & cost reduction targets<br>Tell them what other sites or companies have done, and the benefits<br>Explain any major risks and how they've been addressed |
| Mine Superintendent<br>Process Superintendent | Executive roles with responsibility for mining/ processing operations<br>**Main concerns:** safety, meeting performance and expenditure targets for mining/ processing operations | Understand their current priorities and energy issues that might impact on operations<br>Explore how energy efficiency projects will enhance the reliability of production, increase output, reduce site operational costs and/or reduce or defer future capital costs<br>Make sure your business case addresses any risks to throughput |
| Finance Manager | Executive role with responsibility for managing site expenditure<br>**Main concerns:** Cost control | Understand their current investment priorities and challenges<br>Ask them for examples of effective business cases<br>Highlight opportunities for R&D tax concessions and government funding |
| Environmental Officer | Responsibility for environmental planning and technical standards<br>**Main concerns:** environmental compliance, demonstrating environmental and energy efficiency outcomes | Understand their current environmental priorities<br>Discuss links between energy efficiency and environmental issues on site (e.g. greenhouse emissions, water, waste)<br>Discuss how better data on energy will help them meet multiple compliance requirements |
| Business Improvement Manager | Responsibility for identifying and implementing business improvement projects across the site<br>**Main concerns:** Improving operational performance | Find out about their current priorities and projects<br>Discuss how the project could generate whole-of-business financial savings and other business benefits |

*These positions will not apply to every company and the position titles are indicative only.

## TIP

Engage with these people as early as possible, keep them informed on progress, and show how you can help them to achieve their own objectives.

Of critical importance is the need to gain genuine management commitment to the program and for this commitment to be effectively and regularly communicated throughout the organisation. If line managers understand that energy efficiency is a priority issue for their General Manager, they are more likely to cooperate and dedicate the necessary time and resources over which they have control. Similarly, site General Managers are more likely to support the program if they know energy efficiency is important to the managers above them.

### Targeting your communication to the audience

Communication needs to be targeted to each individual: their role, interests and understanding of the issue. Overly technical language or jargon may cause confusion and should be avoided. Modify your language and approach to align with their particular interests and the unique needs of the site. The benefit to the financial bottom line will be of interest to all managers, but other important issues will include throughput, safety, compliance and business improvement.

It may be useful to use physical metrics as substitute terminology for energy efficiency because these are more meaningful on a mine site. For example, anything that is good for productivity is good for energy efficiency, so you can talk about the benefits of a project in terms of tonnes moved per shift or dig rates.

## TIP

Take time to speak to key decision-makers one-on-one to understand how your energy efficiency project might help meet their objectives.

## CASE STUDY

### Creating the time to share perspectives with decision-makers – a collaborative approach

Downer EDI Mining has a corporate level energy and greenhouse team. Lionel Pero, Manager Greenhouse and Sustainability explains the importance of taking the time to discuss energy efficiency with key site personnel.

*"My role is to develop and implement programs that will achieve ongoing energy efficiency and greenhouse gas reductions across our mining business. One of our new initiatives involves the implementation of a comprehensive site-level greenhouse and energy management plan. The plan incorporates targets, reporting and the implementation of specific initiatives.*

*In developing the plan I found that it was really important to create opportunities to speak one-on-one with key project-level decision-makers such as the Project Manager, Maintenance Superintendent, Health Safety and Environment Superintendent, Production Superintendent and Senior Engineers. By listening to their perspectives and sharing ours we have been able to develop a workable plan. Where there has been slower uptake we have been able to make some changes and overcome them. Along the way we have come to understand both the challenges and benefits of the project from the perspective of a range of managers. This has allowed us to create strong support from site managers to implement specific projects."*

Lionel Pero, Manager Greenhouse and Sustainability,
Downer EDI Mining Pty Ltd

# 3. KEEP THE SITE MANAGEMENT TEAM INFORMED

**The site management team needs to understand what you are doing and why before they can support your energy efficiency projects.**

You may be daunted by the challenge of getting site management to support energy efficiency, but a short and well-structured presentation focused on business drivers and benefits can create important allies for your work. The aim is to get their support early and keep them informed so that they are not surprised when you seek support for a specific project.

Create opportunities to update and present to the site management team on a regular basis. This may be prior to commencement of an energy efficiency assessment or it may be a progress update. You may also need to present the business case for a specific energy efficiency project.

A communications plan sets out how and when you will communicate with all stakeholders– including the site management team. More detail is available in the Energy Efficiency Opportunities *Assessment Handbook* (pp. 31-42). The *Assessment Handbook* is available at **www.energyefficiencyopportunities.gov.au**

## TIP

Presenting to a site management team

- Do your homework:
  - understand current site priorities
  - know who the key decision-makers are and their interests
- Let them know what you are doing or want to do, and the reasoning behind it
- Present the business drivers and benefits that are going to have most impact
- Comment on the rigour of the assessment and the accuracy of the energy and financial benefit forecasts
- Relate to achievements at other sites or competitors to demonstrate what is possible and to create a positive sense of opportunity
- Let them know what resources are required and why. This might include external expertise or training for staff
- Keep it short and punchy but provide written information to support your case

## CASE STUDY

### Site management team presentation

Bryan Williams, Principal Advisor Climate Change and Energy Efficiency at Newmont, has learnt from experience that the best way to engage management is to focus on business improvement.

*"When we reviewed an energy efficiency assessment that we had completed at one site we identified that one of the greatest limitations had been the lack of site management support. We hadn't communicated what we were doing and why well enough.*

*So, for our next assessment we did our homework, prepared and then delivered a presentation to the site management team to obtain their buy in. We knew they had completed energy efficiency / greenhouse audits in the past and didn't get much out of them. So we made sure that we presented this assessment as clearly different from old style audits – it would be more rigorous, involve key personnel and the relevant decision-makers on site and deliver cost savings and other operational benefits. It was also presented as a business opportunity not just environmental risk management."*

Bryan Williams, Principal Advisor Climate Change and Energy Efficiency, Newmont Asia Pacific

# 4. WORK WITH AN ENERGY MANAGEMENT TEAM

**Members of an energy management team can share the task of getting management support and appropriate resources.**

Many mine sites have established an energy management team to support the process of improvement. This can be a very effective way of involving key decision-makers in the assessment process and building their support for identified projects. An energy management team:

- shares the workload
- encourages greater ownership of the assessment process by influential personnel
- involves management who may not be able to be involved in the detailed aspects of every project
- provides a forum for review as an energy management program progresses
- helps develop strategies that can be integrated into short and longer term business plans

## TIP

**Establishing an effective energy management team**

- Endorsement from the site management team is essential
- If the Chair is one of the management team this encourages them to update the management team regularly
- Make sure all functional areas of the site are represented, for example:
  - Finance Manager
  - Mine Superintendent
  - Process Superintendent
  - Maintenance Superintendent
  - Business Improvement Manager
  - Technical staff
- Document the roles and responsibilities of each member of the energy management team to improve accountability
- You may have an existing team or be able to modify the terms of engagement of another group

# 5. IDENTIFY FUNDING SOURCES

**Do not limit yourself to traditional funding sources. Know what is available and be creative.**

Not every project requires funding - especially where operational changes are available at low or no cost. For these projects the direct engagement of individuals in your organisation is essential.

When it comes to accessing funding, there may be a range of options depending upon your circumstances (see below). Don't limit yourself to traditional sources. Others are often available; for example, special funds for business development.

It is important to be fully informed of funding options and the timing associated with them, because this can make the difference between a project being implemented or just sitting on the shelf. Align your efforts with the budget cycle, otherwise momentum can be lost.

## Justifying capital expenditure

Quantified costs and benefits are essential to obtain approval for capital expenditure. Since significant funding may be required it helps to get senior managers involved early in the process.

New Hope Corporation is an Australian coal mining company with three open cut operations in Queensland. Mahdi Mason, Senior Environmental Officer, explains their approach to getting support from senior site management.

> *"In planning our energy efficiency assessments we recognised the importance of involving senior site managers but knew that we had to do that in a way that didn't draw too much on their time. First we conducted workshops that were aligned with our Lean Business Improvement Program in which we identified both energy efficiency and business improvement projects. Following those workshops we brought together the site General Manager with the Mining, Technical Services, Coal Preparation and Maintenance Superintendents.*
>
> *By having the key decision-makers together in one room for three hours we were able to quickly review and prioritise the projects that had been identified and identify new ones. Following the workshop formal capital expenditure proposals were developed for the prioritised projects. By involving senior site management early in the decision-making process, rather than waiting until after the business case is developed, there was greater awareness, buy-in and support from senior site management.*
>
> *One example of a successful project is an increase of the tray size and payload on the 785 dump truck fleet at New Acland Mine. This has led to an energy saving of approximately 3.685 TJ and $4.9 million per annum."*
>
> Mahdi Mason, Senior Environmental Officer, New Hope Corporation Ltd

### Operational funds for low and no cost projects

Projects that involve small amounts of money can generally be funded through existing operational budgets.

Operators of the Jaw Crusher at Newmont's Jundee Operations have increased process throughput by 10% by modifying their operational practices and optimising the jaw gap. This project did not require capital to implement but required the support of the operators:

> *"There were strong assumptions about the best way to do things and why. It was only by engaging the key operators early in the assessment process and providing energy and production data that demonstrated the impact of changed operating practices that got their support. The operators ran with it – trialing several modifications until they found the optimal settings."*
>
> Bryan Williams, Principal Advisor Climate Change and Energy Efficiency, Newmont Asia Pacific

## CASE STUDY

### A Corporate funding perspective

> *"At Downer EDI Mining we often provide seed funding for a project, either in-kind in terms of our time, or a financial investment. Our contribution would be in conjunction with a commitment from another party, either internal (e.g. the site) or the client. As the project is rolled out the initiative then becomes 'business as usual' and mining projects provide funding. As a business, risk is a key consideration, and therefore robust risk analysis is undertaken during project feasibility. The timeframe for risk tolerance is also considered. Some projects may have a shorter time horizon than others, and as an organisation, corporate typically has a longer sustainability time horizon and therefore can invest in projects which have longer term risk and reward. The investment will often have broader company outcomes that may not be that tangible at a site level."*
>
> Ross Browning, Group General Manager Sustainable Development, Downer EDI Mining Pty Ltd

## Business improvement

Many businesses have funding available for business improvement, and energy efficiency fits quite comfortably within that. This funding can be used to support trials, particularly if the project has benefits that go beyond the business case for a particular site.

> *"We expected to find significant savings through improvements to our mining equipment operator training program but we had not yet quantified the costs and benefits. We were able to justify corporate funding for a trial because the savings across all the sites were likely to be significant. Now that we have demonstrated savings of around 5% of diesel use, subsequent sites will invest in their own training."*
>
> Lionel Pero, Manager Greenhouse and Sustainability, Downer EDI Mining Pty Ltd

## Dedicated energy efficiency fund

One of the most tangible demonstrations of management support for energy efficiency is the availability of resources for project implementation.

Centennial Coal began energy efficiency assessments in response to state and federal government legislation. The management team wanted to ensure that their commitment to energy efficiency went beyond identifying projects to practically implementing them on the ground. However, the completion of the assessments did not align with standard budget processes and this would have delayed the availability of funds to implement projects.

A dedicated energy efficiency fund was established to overcome this problem. The fund allows energy efficiency projects to be assessed against other energy efficiency projects rather than other capital expenditure. The aim is to ensure that these important projects get maximum consideration in the distribution of corporate funds. To date, over $630,000 of funding has been allocated for projects including waste heat utilisation in bathhouses and power factor correction. [1]

> *"Since we involved our employees so closely in the energy efficiency assessment it was critical to maintain momentum. Ensuring that there is funding available to implement projects is the strongest demonstration that the company values the knowledge and experience of our staff and is committed to improving energy efficiency and reducing greenhouse gas emissions."*
>
> Mary-Anne Crawford, Group Environment Manager,
> Centennial Coal Company Ltd

## External funding

There are a range of external government sources that can be used to fund research and development such as Australian Research Council (ARC) Linkage Projects grants.

A number of other government grants are often available and might be worth exploring for the investigation of large projects.

# 6. DRAFT WINNING PROPOSALS

**Your proposal should outline the costs and benefits of the project clearly and succinctly. Ensure that it contains sufficient detail to satisfy management needs.[2]**

If your project requires funding or management approval you will need to prepare a written business case. Most companies have a formal approvals process with a template that needs to be completed by the project manager. Prepare a draft and have it reviewed by staff members who can provide a fresh perspective. This will ensure that your case is as strong as it can be.

**TIP**

Involve the right people in your proposal

When you develop your business case, involve a finance manager and/or other managers who understand your project and have been successful in obtaining financial support for projects.

## Why is the project important?

Start by stating very briefly, why the project is important to the company. Summarise the main benefits.

## Quantify the whole-of-business costs and benefits

Quantify the capital costs of the project and all of the benefits that will have an impact on the financial bottom line. Whole-of-business benefits may include:

- direct fuel and electricity savings
- savings from avoided or deferred capital investment
- additional output
- productivity improvements
- reduced maintenance requirements
- reduced waste or water usage

More information on the evaluation of financial costs and benefits is provided in the *Energy Savings Measurement Guide*, available at **www.energyefficiencyopportunities.gov.au**

Estimates of costs and savings need to be prepared to a level of accuracy and detail that allows investment decisions to be made and is commensurate with the scale of the project.

These are used to calculate the payback period for the opportunity, incorporating whole-of-business costs and benefits. Make sure that you have confidence in the numbers that you present — a robust financial case is essential for credibility.

There may be other *indirect* benefits that are difficult to quantify but may help you to get support and resource the project. Based on your earlier meetings with key decision-makers on the site, you should highlight any of the less tangible but important benefits, such as:

- improved worker morale and retention
- improved reputation or public image
- a reduction in occupational health and safety incidents
- reduced reliance on external fuel supplies

Make sure that you identify all of the assumptions used in the calculations.

### Align your project with core business objectives

Demonstrate how your project will support the achievement of core business goals such as energy security. For example, if your project will reduce the site's reliance on external energy sources or reduce energy costs, provide site-specific data on trends in the price of electricity or fuel to provide further support for your argument.

### State key project risks and how you will manage them

Include a description of the possible risks to the project and how you will manage them. For example, technical, cost and operational risk will be of concern where new technology or practices are involved. If available, provide case examples that describe how a similar project has been implemented at other mine sites. It may be important to conduct trials as a first step to build understanding of the technology or process before seeking funding for a complete project.

### List those who helped you develop the proposal

Mention the name and title of anyone who has had input to the proposal. For example, it might have been developed with the assistance of the Mine or Finance Manager. This will show that the project has internal support and will provide the senior manager with more confidence in the proposal.

## TIP

**What to include in a business case**

- why the project is important
- a description of the project
- amount of energy saved (GJ/$)
- fuel type being saved
- $CO_2$ emissions avoided
- wider project costs and benefits
- potential for the project to achieve an important strategic goal
- cost to implement the opportunity
- analysis of project risks
- how results will be monitored
- key performance indicators that will demonstrate project success
- people who helped you prepare the proposal

# 7. BUILD AND MAINTAIN MOMENTUM

**Develop and defend your reputation: nothing is more important than evidence of success. Develop systems and procedures along the way to achieve continuous improvement.**

It is easier to get management support and resources for an energy efficiency project if you already have a reputation for success.[3] A sensible approach is therefore to start with an initiative that is easy to get approval for (e.g. because it costs nothing and is easy to implement), then record and publicise the results to internal and external stakeholders. After that you can start to identify more ambitious projects that will require expenditure approval or endorsement from a higher level of management.

For larger opportunities it may be useful to undertake a pilot at one site before rolling it out to all sites.

## Communicating results

After you have completed a project, ensure that you `package it up' into a brief report for distribution to stakeholders. If available, you might be able to involve communications or public affairs personnel to help. Include important statistics, such as energy and cost savings and other business benefits, and give credit to those who helped you to implement the project. Promote the story to managers and workers on the site, and to external stakeholders through company reports.

## TIP

Establishing influence and reputation[4]

- evaluate projects diligently and never promote something of which you are unsure
- never make exaggerated claims
- leave room to deliver more than you promise
- when you get approval for something implement it straight away
- make sure people know what you have achieved and keep it all on record
- become an authority by staying up to date on energy prices, trends and regulations

## Building energy efficiency into `business as usual'

It is also important to develop systems and procedures along the way to support a continuous improvement approach to energy efficiency. Examples include:

- establishing an energy efficiency policy or upgrading an environment or greenhouse policy to ensure inclusion of explicit references to energy efficiency
- developing a site-based energy efficiency target
- incorporating energy efficiency into procurement criteria
- building energy efficiency into the performance indicators of managers and staff
- improving energy metering and monitoring systems

Improving information systems to measure and track energy consumption will help you to quantify the savings associated with individual projects and to identify and get support for further initiatives. New and sophisticated approaches to energy measurement and performance feedback , which are being developed for both electricity and diesel, can assist in this task.

Justifying the business case and obtaining resources for measurement or data collection projects can be difficult compared to projects that deliver more direct and quantifiable benefits. In developing the business case for these projects it is more important than ever to:

- link to existing business drivers – for example, meeting compliance requirements
- build on the success that has already been achieved through energy efficiency projects
- promote the benefits of energy metering in the context of rising energy prices

# CONCLUSIONS

Interviews with senior climate change and energy efficiency practitioners in the mining industry reinforced the message that the development of a business case is a continual process rather than a one-off event. Their perspectives and experience have been incorporated into the approach that has been presented in this guide.

This approach involves seven steps:

1. Understand your business, its priorities, risks and opportunities, and make sure your energy efficiency projects are aligned to these
2. Understand who makes decisions within your organisation and how best to gain their support
3. Keep site management informed about your energy efficiency program so they are well prepared when you seek support for a specific project
4. Work with an energy management team that involves key decision-makers
5. Be creative in identifying potential funding sources
6. Draft winning proposals that quantify the whole-of-business costs and benefits and link the project to existing business objectives
7. Build and maintain momentum by achieving and promoting successful outcomes and by building energy efficiency into 'business as usual'

By implementing these steps and learning along the way, you can improve your success in building support for and obtain resources to implement energy efficiency projects.

## Further resources

- Energy Efficiency Opportunities, *Assessment Handbook* and *Energy Savings Measurement Guide*: **www.energyefficiencyopportunities.gov.au**
- The Carbon Trust, *Making the business case for a carbon reduction project*: **www.carbontrust.co.uk**

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1 Centennial Coal Company Limited, *Annual Report 2009*, p. 43

2 The Carbon Trust, *Making the business case for a carbon reduction project*, www.carbontrust.co.uk, p. 10.

3 The advice in this section is from The Carbon Trust, *Making the business case for a carbon reduction project*, www.carbontrust.co.uk, p. 4.

4 The Carbon Trust, *Making the business case for a carbon reduction project*, www.carbontrust.co.uk, p. 4.

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