

**Embedding Energy Management (EEM)**

**Practice Guide - Module 1: Energy and business planning**

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# Purpose of this guide

Welcome to the practice guide on integrating energy management into business planning.

The business environment for foundries and fabricators is constantly changing. However, the escalating cost of energy, carbon costs, new regulatory frameworks and demands for effective management of environmental responsibilities present unique challenges. Managing these issues and understanding their impact on your region, your market and your position in the supply chain is essential to ensuring a sustainable business.

With this guide, your business leaders will be able to make changes to management systems, processes and ultimately, to the culture of your organisation to effectively address the risks and realise the opportunities emerging in your market.

This practice guide is supported by information and tools in the Embedding Energy Management (EEM) workforce development kit. Relevant tools are highlighted in bold throughout the practice guide. The EEM kit is available from the resources section at <http://www.sustainabilityskills.net.au>**.**

# Who will benefit from this guide?

Chief Executive Officers (CEOs), Chief Financial Officers (CFOs), Site Managers, General Managers, Marketing Executives, Procurement and Supply Chain Managers, Site Engineers and Energy Champions who have the desire to learn more about understanding the key energy and carbon-related risks and opportunities for your business.

# Business drivers creating focus on energy management

Traditionally, environmental management in the foundries sector has been regarded from a ‘license-to-operate’ basis under which there were no consequences to carbon pollution, and inputs, such as energy were cheap and abundant. Increasingly however, experience shows that embedding environmental sustainability, or ‘eco-efficiency’ within an organisation’s broader business strategies and practices yields far more than basic environmental compliance. It frequently results in organisational and technical innovations that generate both bottom- and top-line returns. Adapting to a carbon-constrained economy via enhanced eco-efficient practices in foundry processes lowers costs because business reduces the inputs it uses. Challenging the status quo around inputs to manufacturing can bring about additional revenue through innovative thinking that leads to new markets, consolidation of facilities or the introduction of new or improved products or even new business lines.

At a strategic planning level the main reasons why your business should address global trends arising from climate change and resource scarcity, include:

* Positioning your business in the supply chain based on an understanding of energy and resource costs. You may choose alternative suppliers. You should also understand your ability to pass on costs, and the implications for your customers.
* Understanding your business risk, in particular energy and carbon intensity.
* Productivity gains as energy efficiency contributes to profit margins.
* Identifying business opportunities. How well do your competitors manage energy?
* Enhancing your business’ brand and reputation.

# Integrating energy and related trends into business plans

This guide presents five key practices that will help your business better understand the impact of global trends, and how understanding and responding to these trends can be integrated into your business planning processes or systems. In doing so, the emerging risks and opportunities throughout your supply chain and in resource usage can be evaluated in the context of your overall business objectives. These five practices are:

1. Facilitate, amongst the leadership team, a high-level understanding of energy use, carbon emissions and major business inputs as key considerations in developing a strategic response to the global sustainability trends affecting the foundries, fabricators and related industries in Australia.
2. Inform the business planning process of the business drivers for better energy management.
3. Recognise high-level opportunities and risks to be integrated into plans, and that require further investigation.
4. Facilitate the integration of strategic priorities for better energy management into the site’s business plans or a discrete energy plan.
5. Monitor and investigate performance against plans and communicate outcomes.

## Case study - X & Co Casting

**The leadership team via an energy planning forum exposed the need for an energy reduction target. However, variables in production and planned expansion reduce the usefulness of an overall reduction target. X & Co cast engine manifolds for the motor vehicle industry.**

**In brief**

X & Co uses more than 4.3 giga watts (GW) of electricity and 3,300 giga joules (GJ) of gas. The site is planning an expansion of the facility which could deliver up to four times the current production volume. The site does not trigger any energy regulations; however, the need to reduce costs and maintain reputation are strong in the minds of the management team.

Some ad hoc improvements have been implemented over the past two years, including high bay lighting replacement (Mercury Vapour for T5) and temperature set-point optimisation for their continuous casters and extrusion presses. Despite these ad hoc activities a recent energy review identified 20 savings opportunities with approximately $390,000 worth of savings with a one year payback.

It was not expected that these opportunities would be implemented due to resource requirements and a lack of systems. The interface between current business plans, forecasted energy costs, the current capacity to implement and awareness of competition in the industry from off shore processing, were discussed at the energy planning forum.

The planning forum from Module1 of the EEM program was conducted so that the leadership team could put a plan in place to ensure these cost savings were delivered.

**Results**

A series of targets have now been developed to accommodate the dynamic nature of production. At the moment, total production does not correlate with energy use due to the large percentage of air handling and space cooling which are not production dependants – the energy consumption of this equipment tends to skew results depending on the weather.

As a result of this and the fact that the site has in place a relatively good sub-metering system, more area/equipment-specific targets were able to be developed.

These included developing a kWh per kg of billets cast in the casting department, an overall percentage reduction target for out of hours (base-load) consumption and reporting on energy consumption per mainfold (excluding weather-related energy consumption).

The targets will be achieved by rolling out a program of energy savings opportunities with a payback period of one year for all projects.

An annual reduction in carbon pollution which amounts to a little over 10% of their FY 2012 carbon emission tonnage.

Energy performance indicators for energy consumed per manifold will be reported monthly at the management meeting and progress against targets reported to the CEO and the Board to support reputation.

Energy monitoring of energy intensive equipment including casters, extruders and air conditioning will be documented and integrated into the sites ISO 9000 quality system.

Accountabilities for energy reporting will be established to support the target and the underlying business drivers discussed at their planning forum.

## Practice steps

| Practice steps | Description |
| --- | --- |
| 1. **Develop a high-level view of your business’ energy use, carbon emissions and major business inputs****.**
 | Prior to involving senior personnel at a site, it is useful to understand the scale of the resources consumed by your business and the carbon emissions produced. Once the volumes and costs are determined, you can see the extent to which global trends are impacting your business. A high-level understanding can be obtained by:* accessing electricity, fuel, water and wastewater invoices for the past year
* converting energy data into carbon emissions using conversion factors published by government
* accessing other input data, such as packaging, raw materials, chemicals and transport
* obtaining production data for the last year.

This information can be summarised using a simple **Energy baseline tool** with relevant commentary that explains current performance, and used as input to Step 2.  |
| 1. **Understand trends and the benefits to your business of better energy and carbon management. Engage site management to identify high-level plans.**
 | To better inform business planning, it is important that global and regional trends in energy, carbon, resource availability and the economy are understood. Your business should make itself ready for the short, medium and possibly long-term risks and opportunities emerging from these trends. To facilitate this you should:* research the external trends impacting your business, focusing on trends in energy, carbon and water that affect your supply chain as well as your operations
* present these global trends for the foundries industry and your business to the Site Leadership Team (SLT).

Consider current business plans and identify the implications of these trends for your business.To progress the strategic thinking around these global trends, a range of stakeholders should be consulted and their support obtained, as follows:* Use the **Energy and business planning facilitator runsheet** to run a global trends planning forum with the SLT to better understand how environmental sustainability impacts your business through:
1. a **global trends** presentation
2. a presentation of current performance in resource consumption and business inputs, as well as any current goals or targets
3. a presentation of the current business plans
4. identification of risks and opportunities and the development of goals and targets
* once management buy-in is achieved, a similar presentation and summary of workshop outcomes can be presented in, say, a toolbox session to obtain the support of site personnel
* letters to suppliers will inform supply chain partners of any changes you make, and alert them to the fact that this may impact the way you conduct business with them
 |
| 1. **Recognise high-level opportunities and risks to be integrated into plans (that require further investigation).**
 | As a component of the above planning forum, it may be worth further investigating risks and opportunities identified by:* developing a matrix that identifies, ranks and prioritises risks and opportunities considering the impact on your business and the timeframe in which they are likely to occur
* developing a matrix that helps your leadership team decide on its strategic priorities for inlusion in your energy plan, as part of your business planning process
* routinely reviewing your risk/opportunities as part of business planning
 |
| 1. **Facilitate integration of strategic priorities for sustainability into the site’s business plans.**
 | To ensure the identified goals, targets and priority (risk/opportunity) actions are carried out, the energy plan should be integrated in your business plan.* Arising from the analysis of risks and opportunities, you should develop a set of questions that reflect your strategic response to the global trends. From this, relevant information should be collated, such as your carbon inventory, to answer these questions so that guidelines can be developed to help you progress the initiatives that you want to integrate into your operating and higher level business plans.
* Operational improvement initiatives are likely to be able to be progressed quickly using existing systems. For capital or strategic projects, develop project briefs and/or employ your business case template, ensuring that you apply a whole-of-business approach that looks at all benefits and costs.
* Document all initiatives in an energy plan that should be considered, in whole or in sections, as part of your normal business planning cycle (see the **Energy plan template**).
 |
| 1. **Monitor and investigate performance against plans and communicate outcomes.**
 | To monitor and investigate performance against your energy plan accountabilities and performance measures/metrics need to be identified. Strategies developed should be validated after a reasonable timeframe, perhaps six months, and refined where appropriate. A progress reporting schedule can be set up that uses existing meetings/forums. For example, monthly operations meetings, six-monthly management reviews, daily production meetings, business improvement meetings, or as appropriate. This schedule should be documented in your overall energy plan Communicate outcomes to relevant stakeholders. Stakeholders and the means of communication may vary depending on the action being progressed. For example, resource indicators against target might be included in monthly SLT reporting, whereas annual carbon emissions may be reported publicly or to key stakeholders. Company or site newsletters or informal channels may be best suited to communicating the success of key initiatives to acknowledge effort and encourage staff participation.  |

## Supporting tools and templates related to the practice steps

The EEM tools are available from [www.sustainabilityskills.net.au](http://www.sustainabilityskills.net.au)

| Tool or template | This tool is useful if… |
| --- | --- |
| Energy baseline tool | You are starting out on a process to integrate better management of carbon and energy ~~(and water)~~ into your business planning and you want to understand how these issues currently impact your business. This tool can be used for modules 1 to 4. |
| Global trends presentation | You are engaging with senior management at a site/company level to consider the global trends in energy, carbon and resources impacting your business so that you can prioritise and build them in to your business planning. A key aspect of this session is identification and understanding of global trends that are most relevant to the foundries industry and your business, including global and regional trends, policy and legislation, water management, and brand and reputation issues.A key outcome of this presentation is the support of management for the progression of your priority sustainability issues. |
| Energy and business planning facilitator runsheetGlobal trends presentationSample energy plans | You require a structured, facilitated process to present the global trends impacting your business to prioritise the risks and opportunities for your business arising from these trends, and to start planning for the implementation of these business priorities.Key outcomes of this workshop include:* identifying the overarching global trends for the foundries and fabricator industries
* understanding the trends that are important to your business
* considering how well your business currently responds to these trends
* strategic priorities and next steps to develop your energy plan.
 |
| Energy plan templateSample energy plans | You want to start creating an energy plan for your business in response to the strategic priorities you have identified from the global trends analysis as a starting point, and where appropriate, begin to engage with your suppliers and (retail) customers. |
| Global trends presentation – Toolbox talk | You want to explain to site personnel which key global trends are relevant to the foundries and fabricators industry in general and your business in particular.A key outcome of this talk is the support of site personnel for the overarching EEM strategy and an understanding of their role in the implementation of the plan. |

## Additional websites for reference/general knowledge

The following websites are recommended for background knowledge and further reference.

| Website link | This website is useful because… |
| --- | --- |
| **Manufacturing Skills Australia (MSA)**<http://www.mskills.com.au/>  | It contains links to key MSA material relating to global trends as well as vocational Training Packages that support your strategic response and the overall EEM package. |
| **Australian Foundries Institute (AFI)** [http://afiaustralia.org](http://afiaustralia.org/?page_id=726) | The Foundry Industry Energy Efficiency (FIEE) Toolkit aims to provide decision-makers of SME foundry businesses with the guidance, tools and links to support to both assess their potential for energy efficiency improvements, and gather enough evidence to make an informed decision around investing in these improvements, or undertake further business case assessment. |
| **European Integrated Pollution Prevention and Control Bureau (EIPPCB) Best Available Techniques Reference (BREF) document for Smitheries and Foundries, May 2005**<http://eippcb.jrc.es/reference/BREF/sf_bref_0505.pdf> | It contains a comprehensive review of best available techniques, including technologies and operating practices through the lifecycle of technology through to decommissioning, for the foundries and smitheries industries, covering all ferrous and non-ferrous processes commonly used in industry. It also covers emerging technologies and contains a range of useful energy-related benchmarking information.  |
| **German Foundry Association**<http://www.nftn.co.za/wp-content/uploads/2011/04/Vortrag-Wolf_Global-trends.pdf> | This presentation provides an overview of technology and business trends in the foundry industry from an international perspective. |
| **The Corporate Ecosystem Services Review (ESR)**[www.wri.org/](http://www.wri.org/) | A structured methodology that assists in the development of strategies to manage business risks and opportunities arising from a company’s dependence and impact on ecosystems. ESR outputs support decision-making processes involving:* corporate business unit or market strategy development
* planning processes for corporate infrastructure projects, such as mines, wells, pipelines, plantations and facilities
* identification of new markets, products or services, and identification of new revenue streams from corporate landholdings
* investments in projects or companies /policy-maker engagement strategies
* environmental impact assessments / environmental reporting.
 |
| **United Nations Environment Programme (UNEP) – Global Environment Outlook (GEO) 2007**<http://www.unep.org/geo/geo4/media/> | Provides the UNEP’s latest summary of global environmental trends. GEO is designed to assist in decision making, focusing on assessment priorities and analysing policy challenges and opportunities. It is also a capacity building tool, bringing together diverse stakeholder groups from all regions. |
| **World Resources Institute (WRI) – Earth Trends**<http://earthtrends.wri.org/> | A comprehensive online database, maintained by the WRI, focusing on the environmental, social and economic trends that shape our world. For example, it allows for a search for water use intensity of agricultural inputs in Australia. Country profiles with maps and graphs can also be viewed. |
| **Harvard Business Review – Sustainability**<http://hbr.org/> | Provides insights into how companies globally view sustainability as an issue, and details case studies that demonstrate important learnings and strategies for the integration of sustainability within everyday business practice. Sustainability as a topic currently results in over 330 articles, of which 224 are case studies alone. <http://hbr.org/search/sustainability/>  |
| **MIT Sloan Management Review -Sustainability**<http://sloanreview.mit.edu/sustainability/> | A business journal that evaluates and reports on new research to help readers identify and understand significant trends in management, one of which is the business of sustainability. |
| **World Business Council for Sustainable Development**<http://www.wbcsd.org> | A CEO-led, global association of some 200 companies dealing exclusively with business and sustainable development.The Council provides a platform for companies to explore sustainable development, share knowledge, experiences and best practices, and to advocate business positions on these issues in a variety of forums, working with governments, non-governmental and intergovernmental organisations. |
| **Global Reporting Initiative**<http://www.globalreporting.org/Home> | The world’s most widely used sustainability reporting framework. This framework sets out the principles and indicators that organisations can use to measure and report their economic, environmental and social performance. |