



FUNCTIONAL SKILLS FOR AN ENERGY EFFICIENCY ASSESSMENT

Conducting an effective energy efficiency assessment requires the right mix of people and skills. Recent research has highlighted the importance of multi-disciplinary teams, strongly supported by senior management, to maximise the outcomes from energy efficiency assessments.

In 2009–10, the National Framework for Energy Efficiency (NFEF), a joint initiative of Australian, State and Territory Governments, commissioned a research report investigating energy efficiency assessment skills to inform activities that would address the capacity and capability of industry in this area.

As part of the research, a skills analysis was conducted of the roles and skills required to undertake, report on and implement the findings of rigorous energy efficiency assessments now and into the future. The research was primarily based around the assessment requirements of the Energy Efficiency Opportunities (EEO) program, a NFEF and Australian Government initiative.

The findings also have relevance for companies participating in State government energy assessment programs and other companies wishing to improve their energy efficiency performance.

The research involved consultation with over 100 companies from a range of industry sectors registered in the EEO program, as well as energy service providers, industry associations, education providers and government departments.

KEY RESEARCH FINDINGS

The research identified a suite of functional skills covering the practical skills that allow companies to conduct rigorous effective energy efficiency assessments.

The functional skills were arrived at by mapping the skills needed to undertake the seven stages of an energy efficiency assessment as outlined in EEO's Assessment Handbook (see Table 1). The functional skills required for effective energy efficiency assessments can be categorised under the following six key areas:

- Project planning and management
- Communication planning and implementation
- Understanding energy use
- Identifying potential opportunities
- Decision making
- Monitoring and investigation.

Relevant experience will help ensure competence in the required skills, but the skills also need to be complemented by industry specific knowledge of the assessment process and knowledge of legal and compliance requirements. The level of competence and knowledge required may be relative to the size or type of company undertaking the assessment.



Table 1. Functional skills for energy efficiency assessment and their relationship with stages of an effective energy efficiency assessment

Functional skills	Energy efficiency assessment stages						
	1. Project plan	2. Communication plan	3. Understanding energy use	4. Identifying potential opportunities	5. Detailed investigation	6. Business decisions and implementation	7. Tracking and communication
Project planning and management Ability to direct and guide a group in completing tasks and attaining goals of energy efficiency assessment							
Communication planning and implementation Ability to exchange, engage, convey, and express knowledge and ideas in an energy efficiency assessment context							
Understanding energy use Ability to collect and analyse energy and financial data for the purpose of identifying energy use and savings							
Identifying potential opportunities Ability to think strategically and creatively							
Decision making Ability to develop and assess business cases for the implementation of energy efficiency opportunities							
Monitoring and investigation Ability to assess, install and use appropriate monitoring equipment and develop analysis systems							

* Some functional skills can also be applicable to other stages of an energy efficiency assessment that are not highlighted.



THE IMPORTANCE OF TEAMS

The functional skills required to undertake a rigorous and comprehensive energy efficiency assessment are unlikely to be found in one person; rather, energy efficiency assessments are most effectively undertaken by a team.

The research showed that some companies formed teams comprised of company employees. Other companies recognised that they may not always have the required expertise, and therefore engaged energy service providers at different stages of the process. The professional roles of team members varied, e.g. engineers, business improvement managers, operational management, occupational health and safety managers or sustainable development managers but overall, they could be grouped into four categories:

- people who can effectively manage the assessment process within the company
- people with a technical understanding of the operational process
- people with the ability to gather and analyse appropriate data on energy used
- people who can drive the development of business cases and engage others in the business with relevant expertise and decision making responsibilities.

Where companies engaged external resources, they sought providers with energy expertise and knowledge that would bring alternative perspectives to the assessment process. Importantly, they required providers with an understanding of the production processes and business they were operating in. When energy service providers were involved, they were usually university qualified specialists, e.g. engineering or technical professionals.

FACTORS DETERMINING A SUCCESSFUL ENERGY EFFICIENCY ASSESSMENT

'Availability of people with appropriate skills' and 'Senior management buy-in and support' were ranked by industry as the most important factors determining the success of an energy efficiency assessment.

The research indicated that effective assessments required the involvement of people from across the organisation, with diverse backgrounds and skill sets, including corporate management, procurement, site management, operations, engineering, maintenance, sustainability, health and safety, compliance, legal and communications.

Senior management buy-in was considered vital to ensure energy efficiency assessments received sufficiently high priority and the required resources. The functional skills required to achieve this buy-in include:

- Facilitation and negotiation skills required to acquire necessary human, financial and physical resources and support (Functional skill 4)
- Ability to determine the roles of internal and external project stakeholders in the assessment, and develop and implement an effective communications and engagement plan to get their buy-in (Functional skill 7)
- Ability to develop and present a business case for energy efficiency projects that is meaningful to all relevant levels and areas of management, including senior management (Functional skill 31)
- Ability to manage integration of energy efficiency projects and goals into cross-business operational plans, procedures and key performance indicators, and develop systems that lead to ongoing energy efficiency assessment and implementation (Functional skill 33).

The ability to develop and present a business case for energy efficiency projects to senior management was among the skills gaps identified in the research. Other skills gaps related to:

- energy data collection and analysis
- development of energy mass balances
- selection and use of metering and monitoring equipment
- ability to integrate energy efficiency findings into cross business operational plans and practices.

These skills gaps may have prevented companies from realising the full potential of their energy efficiency assessments.

FUNCTIONAL SKILLS FOR AN ENERGY EFFICIENCY ASSESSMENT

Access to and availability of the following skills will help ensure a company is well placed to form an effective energy efficiency assessment team.

Project planning and management

Ability to direct and guide a group in completing tasks and attaining goals of energy efficiency assessment, including:

1. Understanding of key energy efficiency program requirements and ability to identify required human, financial and physical resources.
2. Ability to develop an energy efficiency assessment plan (including timelines, budgets etc.) and manage the project within the organisation.
3. Ability to project manage energy efficiency opportunity implementation, including design, procurement, construction, installation and maintenance.
4. Facilitation and negotiation skills required to acquire necessary human, financial and physical resources and support.
5. Culture and behavioural change management skills to drive ongoing energy efficiency, particularly around employee engagement and communication, project planning and business decisions.
6. Ability to develop or participate in multi-disciplinary teams with complementary skills and perspectives.

Communication planning and implementation

Ability to exchange, engage, convey, and express knowledge and ideas in an energy efficiency assessment context, including:

7. Ability to determine the roles of internal and external project stakeholders in the assessment, and develop and implement an effective communications and engagement plan to get their buy-in.
8. Ability to report, document and present key energy and financial data and findings from energy data analysis in a meaningful manner, and report and document the energy efficiency assessment process.
9. Ability to facilitate and manage the energy efficiency opportunities identification process.
10. Ability to develop and manage ongoing communication of energy use data and the multiple benefits of energy efficiency opportunities to stakeholders.
11. Collaborative and cultural change skills to facilitate long-term organisational behavioural change throughout the energy efficiency assessment.

Understanding energy use

Ability to collect and analyse energy and financial data for the purpose of identifying energy use and savings, including:

12. Energy and other data collection skills required to determine, collect and manage the most appropriate energy and process related data, including setting appropriate boundaries for analysis.
13. Ability to develop and implement effective data management, tracking and reporting systems.
14. Energy data analysis skills to apply a range of methods to explore relationship between energy use and a range of variables that may influence it.
15. Technical understanding of process or sector, including understanding of laws of thermodynamics, heat transfer, energy modelling and their applicability to processes and technologies in different sectors.
16. Ability to calculate energy savings using simple payback methods, and/or other relevant financial analysis for identified opportunities.
17. Ability to undertake non conventional financial and whole of business cost benefit analysis including evaluation of environmental and social benefits.

Understanding energy use *continued*

18. Ability to undertake theoretically or statistically valid representative assessments of similar energy using sites, operations or processes.
19. Ability to develop energy mass balance diagrams and models, both averaged and dynamic.
20. Statistical analysis skills for energy and production data, including regression analysis.
21. Ability to develop meaningful energy intensity indicators and benchmark energy and production data against historical performance, best practice and theoretical limits.
22. Understanding of energy markets, energy pricing and tariffs.
23. Ability to use building energy rating, simulation, and simulation methodologies to determine energy use, energy efficiency measures and energy ratings for commercial/office buildings.

Identifying potential opportunities

Ability to think strategically and creatively, including:

24. Ability to undertake whole of system and services thinking.
25. Ability to identify innovative 'out-of-the-box' solutions including contractual, behavioural and cultural solutions.
26. Understanding and analysis of process, site or sector, including dynamic factors and transient behaviour of systems.
27. Understanding and analysis of design, procurement, commissioning, operational and maintenance practices.
28. Ability to undertake and apply specific techniques such as Pinch analysis, development of models and other engineering focussed process optimisation techniques.
29. Ability to identify factors influencing energy use or waste, including procedural, contractual, legal, organisational structure, job descriptions, key performance indicators and behaviour.
30. Awareness and understanding of new and existing technologies, their feasibility and cost-effectiveness, as well as other research and development occurring within the sector and overseas.

Decision making

Ability to develop and assess business cases for the implementation of energy efficiency opportunities, including:

31. Ability to develop and present a business case for energy efficiency projects that is meaningful to all relevant levels and areas of management, including senior management.
32. Understanding of financial decision making processes, key performance indicators and hurdle rates required by the business.
33. Ability to manage integration of energy efficiency projects and goals into cross-business operational plans, procedures and key performance indicators, and develop systems that lead to ongoing energy efficiency assessment and implementation.

Monitoring and investigation

Ability to assess, install and use appropriate monitoring equipment and develop analysis systems, including:

34. Skills required to assess, install and use appropriate measurement and monitoring equipment (temporary or permanent) and application of appropriate techniques for analysis, feedback provision and system/process management based on improved access to information.

CONCLUSION

Companies participating in mandatory energy efficiency programs are continuing to learn about the skills required to undertake effective energy efficiency assessments. To maximise the benefits of assessments companies should take a team approach.

Ideally, project teams should consist of people sourced from across the company and use specialist external resources as required. Teams should include:

- project managers who can oversee assessments
- technical staff who understand how energy is used within production processes
- data analysts who can model trends and relationships
- people who can drive a business case to secure management support, project implementation and organisational change.

Where external resources are used, companies seek providers with business and process specific knowledge that can provide alternative perspectives.

Senior management support is vital to ensure appropriate resources are made available for the assessment and implementation of identified opportunities. Gaining senior management support is a skill in itself, requiring team members with appropriate project management, strategic and communication skills.

FOR MORE INFORMATION

Findings from this report will be made available to industry, energy service providers, professional associations, industry associations, training providers and other interested stakeholders. They will also be used by Government to develop capacity building strategies and resources to support skills development in this area.

For more information, please contact the Department of Resources, Energy and Tourism by sending an email to eex@ret.gov.au

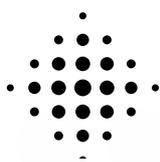
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