

2004 - 2005

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

HOUSE OF REPRESENTATIVES

ENERGY EFFICIENCY OPPORTUNITIES BILL 2005

EXPLANATORY MEMORANDUM

(Circulated by authority of the Minister for Industry, Tourism and Resources,
the Honourable Ian Macfarlane MP)

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ENERGY EFFICIENCY OPPORTUNITIES BILL 2005

OUTLINE

1. The Energy Efficiency Opportunities Bill 2005 (the Bill) establishes the framework for mandatory energy efficiency opportunities assessments and public reporting of outcomes by large energy using businesses, as announced by the Australian Government in the energy white paper in June 2004. The Bill includes the following elements – registration of company details with the Department; submission of a plan to undertake assessments; undertaking an energy efficiency opportunities assessment; reporting publicly on the outcomes of the assessment; and compliance and enforcement arrangements.

FINANCIAL IMPACT STATEMENT

2. The Government has appropriated \$16.88m over five years from 2004-05 to introduce the measure. Ongoing but reduced funding will be required to continue administration of the program in subsequent years.

REGULATION IMPACT STATEMENT

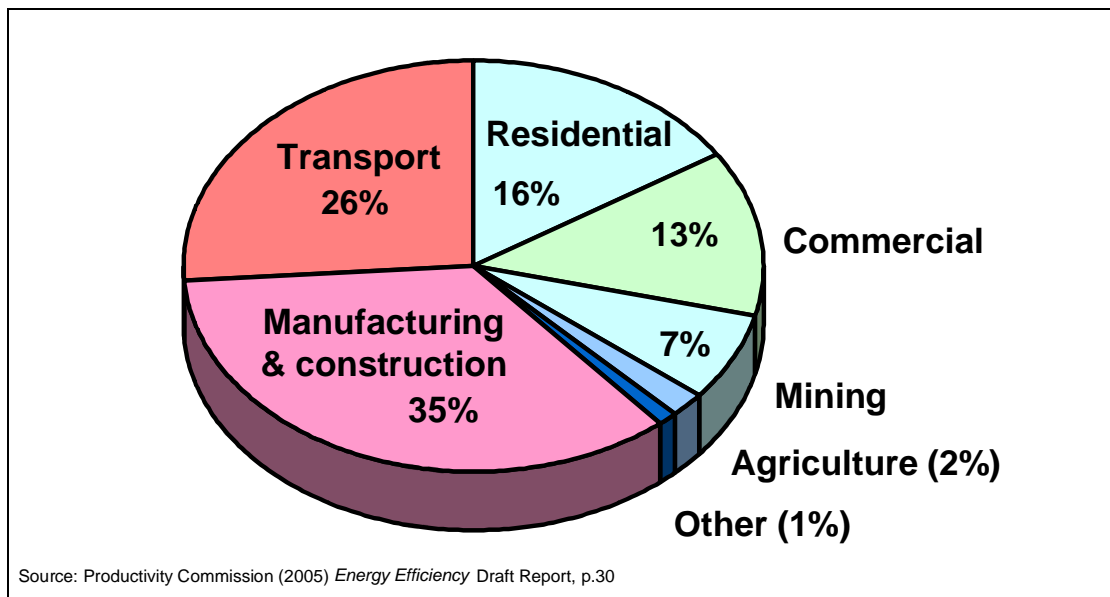
INTRODUCTION

3. Energy is a basic input into almost every aspect of personal and business activity. Total primary energy consumption has grown at an average rate of 2.4% per annum between 1973-74 and 2001-02, and the Australian Bureau of Agricultural and Resource Economics (ABARE) forecasts further growth of around 2.2% per annum between 2001-02 and 2019-20. Moreover, much of Australia's energy is sourced from non-renewable fossil fuels – over 90% in 2001-02 (Productivity Commission 2005, p.23). Greenhouse gas emissions produced during the burning of fossil fuels to create energy are thought to have potentially long term and harmful environmental effects.

4. There are both economic and environmental benefits from improving Australia's energy efficiency – using less energy inputs to produce a given amount of output. While all sectors of the economy – households, governments and businesses – have the potential to be more energy efficient, small improvements in energy efficiency in the business sector are likely to have much greater impacts on total energy use than changes of a similar magnitude in the residential sector.

5. Business use accounts for over 80% of Australia's primary energy consumption, as shown in Figure 1. However, a relatively small number of businesses are responsible for the majority of this energy use. Analysis of Australian Bureau of Statistics' (ABS) data suggests that the 250 largest business energy users account for around 60% of all energy used by business.

Figure 1: Primary energy resources attributable to sectors, 2001-02



6. Recently, the Australian Government has also been working with State and Territory Governments through the Ministerial Council on Energy to create a National Framework for Energy Efficiency (NFEE). NFEE aims to unlock the significant but un-tapped economic potential associated with the increased uptake of energy efficient technologies and processes across the Australian economy. It is being developed cooperatively with the involvement of all government jurisdictions and key stakeholders.

7. The Australian Government released its Energy White Paper, *Securing Australia's Energy Future*, on 15 June 2004. This policy framework aims to deliver the energy investment needed to ensure secure and environmentally sustainable energy supply to 2030. A major challenge to Australia's economic growth and living standards will be to meet a projected 50% increase in energy demand while moving to a low emissions future by 2020. The Energy White Paper recognised that improvements in energy efficiency will be a key step towards meeting this goal.

8. Over the past decades the Australian Government has assisted companies to identify energy efficiency opportunities through a variety of voluntary programs. The recently concluded Energy Efficiency Best Practice (EEBP) program provided Australian Government assistance worth over \$10 million to companies that wished to work towards greater energy efficiency. Industry and Government worked together to identify cost-effective energy efficiency opportunities and overcome barriers to their implementation. Initially focused on benchmarking and information reports, the program evolved to concentrate on practical and hands-on assistance to help organisations in energy efficiency related implementation, innovation and capacity building.

9. Some State Governments have also implemented or are currently formulating initiatives focussing on energy efficiency in business. For example, the Victorian Environmental Protection Agency's Energy Efficiency in Industry Program, requires emission licence holders to identify, and implement energy efficiency improvements meeting a financial payback threshold. The program is expected to generate annual greenhouse gas reductions of 1.15 million tonnes per annum and energy savings of approximately \$25 million per annum from 2006 onwards (Marsiglio 2005).
10. These programs have shown that a significant number of privately cost-effective energy efficiency improvements had been overlooked by the participating firms. As a result, the Government announced in the Energy White Paper that a mandatory energy efficiency opportunity assessment measure (subsequently named the Energy Efficiency Opportunities program) be introduced.
11. Under the measure, the very largest energy users in Australia (those using more than 0.5 petajoules (PJ) a year – the ABS estimates around 250 firms) will have to assess the potential for improving the energy efficiency of their operations, and report publicly on the outcomes. Firms will be free to make decisions on investments identified via their normal business processes. The government will act to ensure the assessments are rigorous and comprehensive, and to disseminate the lessons learned to the wider business community. Public reporting will be designed to provide the markets with useful information while protecting the reasonable commercial interests of firms.
12. The aim of the Energy Efficiency Opportunities program is to stimulate the business sector to take a more rigorous approach to energy management. It aims to ensure company executives place a high priority on addressing energy costs and energy management practices.
13. This Regulation Impact Statement (RIS) sets out the Government's options for implementing the Energy Efficiency Opportunities program, given that the decision to proceed with a mandatory energy efficiency opportunities program has already been taken.
14. Policy approval was contained in Securing Australia's Energy Future when the mandatory EEOA was announced. Subsequent advice from the Australian Government Solicitor confirmed that legislation was required to implement a mandatory scheme. The only feasible options were in relation to the form of the regulatory requirement. As a consequence, the only feasible options are Option 2 (Mandatory Scheme with minimum performance standards) and Option 3 (Mandatory Scheme without minimum performance standards). Even though Option 1 (Voluntary Scheme) will be discussed in the Options section, it is deemed not feasible given the decision already taken.

PROBLEM

The Challenge

15. The Government's energy policy framework aims to deliver the energy investment needed to ensure secure and environmentally sustainable energy supply to 2030. A major challenge to Australia's economic growth and living standards will be to meet a projected 50% increase in energy demand while moving to a low emissions future by 2020. The Energy White Paper identified that improvements in energy efficiency will be a key step towards meeting this goal by moderating energy demand and emissions.

The Energy Efficiency Gap

16. In Australia, both the level of energy efficiency (measured in terms of primary energy supply per dollar of gross domestic product) and the rate of improvement since 1973 are lower than other major industrialised countries. While the relatively lower price of energy in Australia may explain some of the difference, Australia has lower rates of energy efficiency improvements than countries with similar energy prices, such as Canada and the USA.

17. More generally, experience in Australia and overseas has shown that there is often a gap between best practice energy efficiency, and actual practice. While some technically feasible energy efficiency improvements would not be economically viable, there is also evidence that firms often do not take up energy efficiency opportunities that are privately cost effective. This is known as the energy efficiency gap.

18. Determining the exact size of the energy efficiency gap in Australia is very difficult. A comprehensive estimate would require information on current energy use by each business in Australia, as well as each businesses rate of time preference, to determine the appropriate payback threshold to use. Up to date information on available energy efficiency technology would also be required. Obviously, this would be an infeasible task. Instead the best available estimates of the energy efficiency gap are those compiled by extrapolating from sector-specific case studies and audits to determine the average energy efficiency gap in particular sectors of the economy. Some of the drawbacks to this approach, including other modelling issues are discussed under the 'benefits' section for option 2 in the impact analysis component of the RIS.

19. Table 1 shows the average energy efficiency potential (expressed as a percentage reduction in current energy use) across sectors in the Australian economy compiled by the Sustainable Energy Authority of Victoria (SEAV). Energy efficiency potential in the industrial sector ranges from 3.4% to 11.2% of current energy use, with an average of 6.4%. Potential rates of energy saving are even higher in the commercial sector, primarily due to improvements in commercial building design.

Table 1: SEAV estimates of Energy Efficiency Potential by sector

Sector	Average EEP % across sector (range of sub-sectors)
Agriculture	5.0
Industrial	6.4 (3.4 to 11.2)
Commercial	10.4 (7.3 to 14.1)
Residential	13.0

Source: Productivity Commission (2005) p.84

20. Experience with the EEBP and other Government programs suggest that many businesses could save 10 to 30% on their energy costs without reducing productivity. For example, a malting company identified ways to reduce energy consumption by 43%, (predominantly in kilning) and the roll out of these ideas to 6 sites achieved 13% savings against their total budgets. A brewery implemented savings which will reduce refrigeration energy consumption by 35%, or \$500,000 per annum. A paper manufacturer identified over 120 energy saving opportunities to achieve a cumulative 10% saving on energy costs.

21. The Final Review of the EEBP program found that the cumulative net benefit of the program from identified potential energy efficiency actions by business was over \$55 million and over 1.5 million tonnes of greenhouse gas emissions could be prevented.

Is there a role for Government intervention?

22. The existence of an energy efficiency gap may appear counter-intuitive. Generally, firms would be expected to take up cost-saving energy efficiency opportunities without any need for government intervention. Firms which use large amounts of energy would have a particular incentive to increase energy efficiency and reduce their input costs.

23. However, empirical evidence has established that an energy efficiency gap exists. There are a number of possible explanations for the energy efficiency gap. These include:

- Market failures, including imperfect information, split incentives and externalities;
- Organisational failure and behavioural norms; and
- Other reasons, including hidden costs.

24. The orthodox economic position is that Government intervention is only warranted to address the first category, market failures (especially in this case, information failures and environmental externalities). However, organisational failure and behavioural norms that are widespread in the market and produce outcomes that confound orthodox expectations of what the market should be delivering are also arguably market failure.

25. Anecdotal evidence from previous Australian programs supports the Government's view that large energy users do in fact appear to lack information about energy efficiency opportunities within their own organizations, and are thus failing to take advantage of potentially privately cost effective investments.

26. The other, and equally important problem to which this program is directed is the ability of such a measure to help address environmental externalities associated with emissions. The Government explicitly stated in the White Paper that it is committed to a strong, secure and sustainable energy sector. However there is no single solution that will address the Government's desire to encourage substantial investment in the infrastructure needed to support growing energy demands, while at the same time moving the sector towards a low-emissions future.

27. The energy efficiency opportunities program is a crucial element of the Government's multi pronged strategy of growing the economy while reducing energy demand and the economy's greenhouse footprint. It needs to be re-iterated that the program merely seeks to enhance information flows to decision makers at the individual entity level, but does not mandate an adoption of an energy efficiency investment if the firm does not consider it to be privately cost effective. No mandated target reduction in energy use is involved. This approach strikes a sound regulatory balance by helping to address organisational information barriers, which may then lead to lower energy use and reduce environmental externalities when, and only when, it is of benefit to the individual business entity.

28. In developing the approach to energy policy set out in Securing Australia's Energy Future, the Government decided to put greater emphasis on energy efficiency in the business sector in preference to other options such as emissions trading or mandatory renewable energy targets which would have involved higher energy costs for large energy users.

29. In theory, a Government program that simply provided business with information about the potential for cost effective energy efficiency improvements would be one way to address information deficiencies and any associated environmental externalities associated with higher than necessary energy use.

30. Indeed the initial EEBP program focused on information provision. Fact Sheets and other material were made available to industries regarding energy efficiency best practice. However, program reviews found that information provision by itself did not assist companies seeking to improve their energy efficiency. Of more importance in addressing the information issues in relation to efficient energy use would thus appear to be a more active engagement at the specific business entity level in terms of assessing the unique energy circumstances of the individual firm, rather than broader (and more passive) information fact sheets. This is a key change under the Government's enhanced approach with the energy efficiency opportunities program.

31. Reviews identified that another problem of particular relevance for business is the second category of impediments – organisational barriers. Overseas research, summarised in the figure below, suggests that these organisational barriers to the adoption of cost-effective energy efficient technologies and processes are even more likely to occur in larger firms.

Figure 2: Organisational Barriers to Energy Efficiency Improvements

Risk aversion – managers may have an incentive to avoid risky projects and actions in areas like energy efficiency which are perceived as non-core to the organisation’s operations, particularly if they are not rewarded for taking greater risk by the owners of a firm (De Canio 1993)

Short time horizons – Managers might operate with a shorter time horizon than the owners of the firms (Sorrell et al 2000, De Canio 1993)

Lack of cooperation – Managers in different parts of an organisation might not cooperate if their incentives have not been appropriately aligned by the owners (De Canio 1994)

Decentralisation – organisations with decentralised management were shown to be poorly equipped and less likely to pursue large-scale projects spanning the entire organisation. On the other hand, organisations with centralized management were constrained in adopting small-scale localized initiatives which required the active cooperation of their employees (Cebon 1992).

Source: Productivity Commission (2005) p. 67

32. Participants in the Productivity Commission’s inquiry also gave anecdotal evidence of similar barriers being present in the Australian context. This is supported by comments of organisations which have participated in the EEBP program. Prior to joining the program, participants had not considered how energy was used in their business or used a systems approach to analyse energy use. Some companies did not have the information to accurately analyse energy use prior to the installation of better metering, monitoring and reporting processes. Other companies had previously expanded existing technologies and processes rather than considering whether an alternative process may be more energy efficient and cost effective.

33. A submission to the Productivity Commission by energy management consultants Energetics indicates that its evaluations by over the past five years of 47 sites that spend more than \$5m a year on energy has found 44 of them (94%) don’t have established energy management systems. Including these large users, management diagnostics have been completed for 159 sites in past 3 years in Australia: 69% of the sites self-scored at 1 Star – meaning they have no practices for managing energy – even for controlling waste. 18% of sites scored 2 stars, and only 3% 3 stars or above. It is only this latter 3% that have management systems established to control energy. This data suggests that energy management may not be rigorous in Australian companies that are energy intensive and would therefore be expected to maximise energy efficiency.

(<http://www.pc.gov.au/inquiry/energy/subs/subdr104.pdf>)

34. While the Productivity Commission's Report into Energy Efficiency has not been finalised, the draft report expresses reservations about the scope for government interventions to address purely organisational barriers to energy efficiency. However, the Productivity Commission did note the relationship between understanding behavioural and organizational limitations and successfully designing energy efficiency programs directed towards the correction of market failures, such as environmental externalities or information failure.

35. The Government's energy efficiency opportunities program is directed towards much more than just organisational barriers. The program seeks to address information failures and organizational barriers at the individual entity level which will allow businesses to adopt energy efficiency opportunities when it is of benefit to them. To the extent that energy efficiency opportunities are adopted by firms when it is in their best interests to do so, the Government's other key goal of a low emissions energy future will also be realised, with a reduction in the environmental externalities associated with a more efficient use of energy.

OBJECTIVES

36. The dual objectives of the Energy Efficiency Opportunities Program are to overcome the information failures and organisational barriers described above which work against businesses identifying privately cost-effective improvements in energy efficiency, and to the extent that these opportunities are adopted, the Government's goal of a lower emissions future with reduced environmental externalities will be realised. Increased take-up of privately cost effective energy efficiency improvements will benefit both the Australian economy (through increased productivity) and the environment (through reduced greenhouse gas emissions associated with energy use).

37. In considering the implementation options, it is also necessary to be mindful of the Government's broader objectives of minimising the regulatory impact of its decisions. In this regard the Government will favour lower compliance cost options, as long as such options still substantially achieve the Government's objectives.

OPTIONS

38. The decision to require Australia's largest energy users to undertake mandatory energy efficiency opportunity assessments, and report publicly on the outcomes was made as part of the Energy White Paper, released in June 2004. The Government explicitly does not require the implementation of energy efficiency opportunities identified by companies. This RIS is primarily focused on issues of implementation. This RIS compares 3 options:

- Option 1 is the status quo scenario against which the net costs and benefits of other options will be compared.
- Option 2 is the initial proposal for a mandatory scheme, presented to stakeholders for consultations.
- Option 3 is the revised proposal for a mandatory scheme, which incorporates feedback from stakeholder consultations.

The main features of each option are summarised in the table below, with more detail provided in the following sections.

Table 2: Comparison of RIS Options

	Option 1	Option 2	Option 3
Mandatory if meet energy use threshold	✘	✓	✓
Legislation & verification	✘	✓	✓
Assessment procedure	to some degree	✓	✓
Public reporting	✓	✓	✓
Recognition of leading companies	to some degree	✓	✓
Capacity building	to some degree	✓	✓
Minimum point score		✓	✘
Policy, management & people		✓	Less onerous
Data and analysis		✓	Less onerous

Option 1 – Voluntary Scheme

39. If the Government had decided not to proceed with a mandatory energy efficiency opportunities assessment program for large energy users, the alternative would have been a continuation of the status quo where the majority of firms undertake energy audits and investments in energy efficiency improvements only on a voluntary basis.¹

¹ The exception would be some firms with sites located in Victoria. The Victoria Environmental Protection Agency (EPA) requires all firms which hold an emissions licence to undertake an energy audit and implement any energy efficiency opportunity identified with a payback of two years or less.

40. Such companies will thus incur some costs, although these assessments will likely be undertaken as part of the company's standard business planning and investment strategies. As detailed in the impact analysis for Option 1, the Australian Government's Energy Efficiency Best Practice (EEBP) program and its predecessor the Enterprise Energy Audit Program (EEAP) were programs that assisted companies who voluntarily undertook energy efficiency assessments.

The most recent program, the EEBP, involved industry associations and government working together to identify types, extent and patterns of energy use within sectors, and the improvement potential of enterprises within that sector based on best practice. It also involved working on strategies to implement such practices and monitor progress. Under EEAP, an attempt was made to separately account for the costs of undertaking voluntary energy audits.

41. Under the program, aggregate costs incurred by participating organisations and the Australian Government was around \$18 million in 1999 dollar terms. However as noted in the impact analysis section for this option, the Program reviews for the EEAP and EEBP show that companies voluntarily participating in the scheme were able to identify considerable benefits. Indeed the Final Review of the EEBP identified a total of \$74 million in energy savings from implemented projects, with an associated 1.5 million tonne reduction in greenhouse gas emissions.

42. That said, the review did not quantify the proportion of identified energy efficiency opportunities actually taken up by the companies involved. In fact, there was some evidence that after the conclusion of the program, further ongoing action waned. This is not inconsistent with some of the recent research in this area, especially a study of firm behaviour in Norway, which attempted to explain the reasons why firms did not implement energy efficient solutions². Some key reasons related to information difficulties and a lack of engagement or responsibility of personnel for particular outcomes, as well as financial management rigidities within the organisation. Some of these specific issues are directly addressed by the requirements under the Government's proposed Energy Efficiency Opportunities program.

43. Indeed the previous lack of ongoing successful outcomes associated with the previous Government programs may well also be due to the lack of a requirement to continually monitor and report on actions which would be expected to provide greater momentum to investigate and take up opportunities than would a once-off audit and assessment process.

44. The current funding for the Government's existing schemes has since lapsed, although there remains a body of expertise and knowledge in the Department and companies which have participated in the program. General information, case studies and fact sheets are available on the Department of Industry, Tourism and Resources' website (www.industry.gov.au/energybestpractice). Some State Governments have expressed interest in similar state-based schemes.

² Saele H, Nordvik H, Naesje P, Hagen O (2005) "What prevents organisations from implementing energy saving measures?" ECEEE 2005 Summer Study.

Option 2 – Mandatory Scheme with Minimum Performance Standards

45. In its Energy White Paper, the Australian Government announced that companies using more than 0.5 petajoules of energy per year would be required to undertake rigorous and comprehensive assessments of energy efficiency opportunities consistent with an improved Australian Standard (AS/NZS 3598:2000 Energy Audits) every five years, starting in 2006. The assessments would identify energy efficiency opportunities with a payback of four years or less, and firms would be required to report publicly on the outcomes of the assessment.

46. The Government proposed the Energy Efficiency Opportunities program would commence in 2006. An initial proposal was a scheme that would involve meeting a wide range of minimum performance standards for energy management and assessment, covering 5 strategic elements:

- ***Legislation and verification:*** to ensure that Australia's largest energy users adopt an adequate standard of energy management and review.
- ***An assessment procedure:*** to enable companies to undertake and demonstrate a best practice approach to managing and identifying cost effective energy opportunities. The assessment procedure outlines the policy, management and data analysis systems that a company needs to have in place to manage energy use effectively. In the first instance, companies will look at whether they have reached a prescribed minimum standard and, if not, when they intend to reach the standard. The assessment procedure will require minimum action by all companies, but will also allow those companies that are already going beyond the minimum required level to demonstrate their achievements by attaining a higher level of points and public recognition. Companies will be required to identify energy efficiency opportunities within their organisations with a payback of four years or less, or using similar measures which align with corporate decisions requiring capital investment.
- ***Public reporting of opportunities:*** to ensure that CEOs and company boards consider the identified opportunities carefully. To do this, annual public reporting will be designed to enable markets to obtain useful information, while protecting the reasonable commercial interests of business.
- ***Recognition of leading companies and good practice:*** to encourage companies to achieve their best through communications activities, including a national energy efficiency awards program.
- ***Capacity building:*** to support development of energy efficiency skills and knowledge within large energy using businesses and the consulting sector.

47. The Energy Efficiency Opportunities assessment procedure incorporates:
- key elements of Level 3 of the energy audits standard, such as the presence of energy management systems, provision of meaningful data through metering, and involvement of key internal personnel;
 - the translation of energy savings into financial performance improvements;
 - self assessment, with appropriate independent verification, to allow organisations to choose the types of approaches and resources they use;
 - processes that leading companies and the former Energy Efficiency Best Practice program used to identify additional energy efficiency savings, such as mechanisms to engage staff and facilitate creative responses;
 - flexibility to address different starting points, roll-outs across organisations with widely varying structures and cultures and different market pressures, and to reward progressive improvement and early action;
 - more effective integration of energy issues into an organisation's policies, strategies, management and operating systems on an ongoing basis;
 - encouragement of a shift towards a culture of excellence in energy management;
 - improved methods of analysis of energy use, with a particular emphasis on 'systems thinking';
 - improved project evaluation procedures that take account of the full costs and benefits of energy efficiency opportunities for organisations and provide a firm basis for serious investment decisions; and
 - improved awareness of energy efficiency opportunities and performance by the executive and board through public reporting
48. To achieve flexibility while maintaining rigour, the assessment procedure is based on rating scales so that variations in the extent of implementation and level of performance can be recognised. The self assessment scorecard is based on a point scoring system to rate each organisation's business units' or sites' performance on key aspects of energy management that relate to identification of energy efficiency opportunities. The categories for the self-assessment point scoring system are:
- Policy, management and people
 - Data and analysis systems
 - Opportunity identification and evaluation
 - Innovation and excellence (bonus points only)
 - Results (to be reported to Department of Industry, Tourism and Resources – DITR, and a summary publicly reported)

49. These categories recognise that in order to undertake an effective assessment of energy opportunities, certain basic systems will need to be in place. These form the mandatory elements of the assessment, which all firms must meet. The procedure allows for companies to identify the necessary systems and to put them in place over time. It also allows companies to use a range of existing systems, practices and approaches for identifying energy efficiency opportunities, and to have these recognised.

- ***Policy, management and people*** broadly corresponds to sections of the energy audits standard that relate to establishment and maintenance of appropriate policies, action plans and accountability considered essential prerequisites for an energy audit. Additional emphasis is placed on training and the engagement of staff across the organisation, as this is a key lesson from past experience and consultation.
- ***Data analysis, systems and practices*** broadly relates to sections of the standard that address the need for effective ongoing systems to collect and analyse energy data and other relevant information. Integration of these systems into organisational practices and systems is also recognised, as is development and use of energy and material flows and balances to optimise technical performance of plant. Effective communication of relevant information to operational staff and management is also recognised.
- ***Opportunity identification and evaluation*** focuses on a range of mechanisms that may be used to identify energy efficiency opportunities and the application of a comprehensive evaluation system that considers the 'whole of business' case. The options reflect lessons learned from organisations that have successfully improved energy performance. This section also requires listing of opportunities for use in reporting.
- ***Innovation and excellence*** further responds to some of the key lessons from innovative companies and recent experience in programs such as Energy Efficiency Best Practice. It is recognised that it is very difficult to mandate innovation and excellence, so this section is not included in the core requirements; instead, bonus points can be gained in this area. This creates an incentive mechanism to encourage the kinds of activities that the best performing organisations pursue to capture larger energy savings that also contribute to corporate success because of their broader benefits.
- ***Results*** addresses the outcomes of the assessment process and reporting to DITR and the public.

50. Within each category (except for innovation and excellence) there are mandatory elements which each firm must meet, as well as additional flexible elements. Firms must meet a sufficient number of flexible elements to reach a minimum point score. However, firms can choose which combination of flexible elements they target, according to their own business requirements. While this approach is flexible and relies on self assessment, the process of independent verification, reporting of actual performance to DITR and the summary reporting to the public will provide opportunities to ensure compliance.

51. To assist firms in undertaking self-assessment a spreadsheet-based tool (using Microsoft Excel), known as '3-Plus', would be available. This scorecard tool would also be made publicly available on the DITR website to make the methodology transparent to investors and the wider community. Scorecards containing individual data from organisations would remain completely confidential.

Option 3 – Mandatory Measure without Minimum Performance Standards

52. Following stakeholder consultation and in-company trials of the 3-Plus self-assessment tool, the initial proposal has been revised. Option 3 describes the revised Energy Efficiency Opportunities proposal, which is a simplified form of the original model. The simplified model still retains the five key strategic elements of the program:

- Legislation and verification
- An assessment procedure
- Public reporting of opportunities
- Recognition of leading companies and good practice: to encourage companies to achieve their best through communications activities, including a national energy efficiency awards program.
- Capacity building

53. However, under option 3 participating companies will not need to perform additional tasks to reach a minimum point score. It will be sufficient for companies to meet the core mandatory elements of an assessment procedure, which focus on basic monitoring, analysis and reporting systems for energy use and possible energy efficiency improvements. The focus has been sharpened to specify the essential elements to support an effective energy efficiency opportunities assessment.

54. Companies who use more than 0.5 petajoules of energy per annum will still need to register with the Department of Industry, Tourism and Resources. These companies will be required to conduct an energy efficiency opportunities assessment within five years, and to report annually on their energy use as well as identification of and implementation of energy efficiency opportunities with a payback of four years or less. This reporting will be to both the Department, through the Australian Greenhouse Office's Greenhouse Challenge Plus web-based interface, and the public via the company website or other published report.

As for Option 2, the Department will have a verification role to ensure compliance with the legislation.

IMPACT ANALYSIS

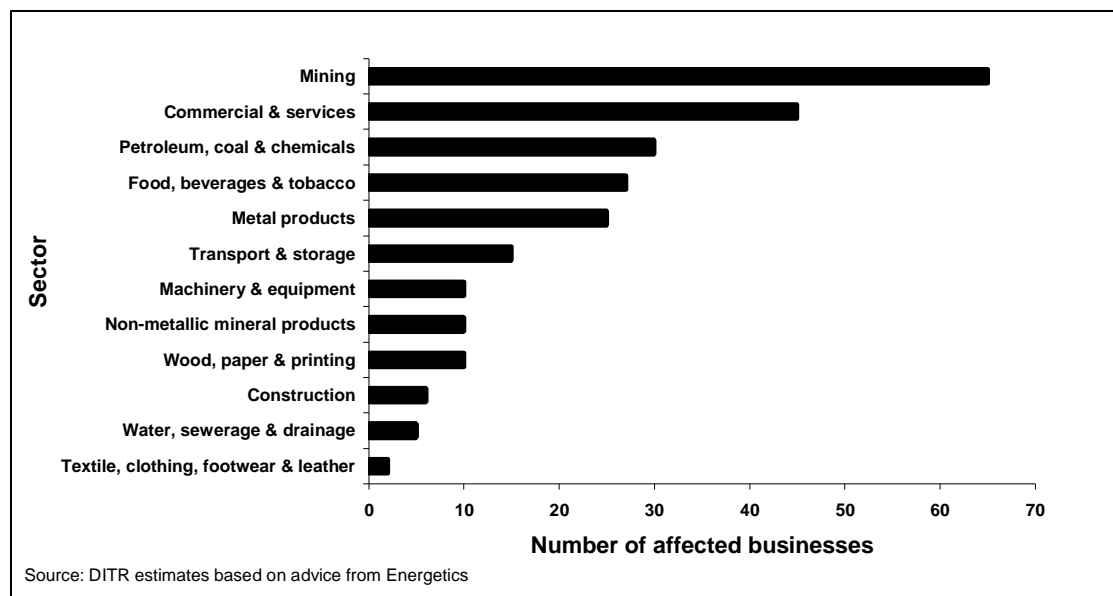
Stakeholders

55. The parties that will be affected under Options 2 and 3 are:

- companies which use large amounts of energy;
- the Federal Government; and
- members of public.

56. The most significant impact will be on the large energy users who are directly subject to the Energy Efficiency Opportunities program. Based on data from the Australian Bureau of Statistics, in 2001/02 around 250 companies were estimated to consume more than 0.5 PJ of energy per annum. The majority of these will be in the industrial sector, including manufacturing and mining companies. However some large commercial sector businesses such as retail and banking chains will also be affected, as shown in Figure 3 below.

Figure 3: Affected companies by industry sector



57. The Australian Government will administer Energy Efficiency Opportunities through the Department of Industry, Tourism and Resources, with assistance from the Department of Environment and Heritage. State and Territory Governments will not be directly affected by the proposal, although several jurisdictions are currently planning or have already implemented somewhat similar energy audit requirements for large industrial energy users. In formulating the Options presented in this RIS, the Australian Government has considered the design of these activities in other jurisdictions, with a view to minimising the burden on affected firms from multiple schemes.

58. While participation in a State or Territory based audit program will not remove the need for compliance with Energy Efficiency Opportunities requirements, areas of possible overlap or duplication will be avoided if possible. Many activities undertaken for other programs will count towards compliance with Energy Efficiency Opportunities where they are substantially similar to Energy Efficiency Opportunities requirements.

59. Members of the public are affected as final consumers of the products produced and sold by the companies affected. However, the ultimate effect of the proposed measure on the price of goods and services is ambiguous. Although the legislation will impose some compliance costs to business, the implementation of cost-effective improvements in energy efficiency is expected to reduce the cost of producing some goods and services in the long term. Members of the public are also beneficiaries of environmental improvements caused by a reduction in the use of fossil fuels and associated greenhouse gas emissions.

Option 1

Costs

60. Under Option 1 companies who choose to voluntarily undertake energy efficiency opportunities assessments will incur some costs, although these assessments will likely be undertaken as part of the company's standard business planning and investment strategies. Similarly, investments in improved energy efficiency are likely to form part of standard business capital upgrades or capacity expansion.

61. That said, under EEBP an attempt was made to separately account for the costs of undertaking voluntary energy audits. Under the program, aggregate costs incurred by participating organisations and the Australian Government was around \$18 million in 1999 dollar terms.

62. While the flow of costs associated with a continuation of the current voluntary assessment model is not known, the assessment of costs for the alternative regulatory options is able to be calibrated as a net additional cost, given that the participants under Energy Efficiency Opportunities are identifiable and their additional requirements and efforts (beyond their current commitments) can also be identified. By adopting this incremental or additional cost approach, the alternative options can be compared against an assumed zero (i.e. no additional) cost baseline for Option 1.

Benefits

63. It seems reasonable to assume that retaining the status quo position of voluntary audit programs would not be likely to generate significantly higher rates of energy efficiency improvement than have been observed historically. However, it is likely that some level of energy efficiency opportunities will be voluntarily identified and taken up by Australian companies without a mandatory assessment scheme. As with costs it is necessary to determine a baseline on top of which additional benefits from Energy Efficiency Opportunities will accrue.

64. Program reviews for the EEAP and EEBP show that companies voluntarily participating in the scheme were able to identify considerable benefits. The Final Review of the EEBP identified a total of \$74 million in energy savings from implemented projects, with an associated 1.5 million tonne reduction in greenhouse gas emissions. Again it is not possible to extrapolate from these results the potential benefits of continuing a voluntary scheme, as the results depend on the opportunities identified and taken up in particular businesses.

65. The Final Review of the EEBP did not quantify the proportion of identified energy efficiency opportunities actually taken up by the companies involved. Evidence from the review suggested that after the conclusion of an intervention program further or ongoing action on energy efficiency wanes as other organisational issues take priority. This is not necessarily a sign of failure; a firm has many competing demands for its internal resources and may find it appropriate to concentrate on issues other than energy efficiency. However, another interpretation could be that a mandatory scheme which ensured companies continued monitoring and reporting on actions taken on an annual basis may provide greater momentum to investigate and take up opportunities than a once-off audit and assessment process.

66. As with the cost estimates, the estimated benefits of the alternative options have been determined relative to a status quo baseline. The modelling conducted by the Allen Consulting Group used a baseline scenario where energy efficiency was expected to continue to grow at historically observed levels with the only actions for reducing the energy efficiency gap coming from voluntary implementation. Benefits reported from further improvements in energy efficiency are additional to these baseline improvements, so the alternative options can be compared against an assumed zero (i.e. no additional) benefit baseline for Option 1.

Summary

67. Retaining a voluntary energy efficiency opportunities assessment program would reduce the up-front compliance costs faced by companies. However it is expected that many companies would elect not to participate at all. A voluntary program would also reduce the productivity and environment benefits compared to that which a mandatory scheme can achieve over time by providing better information to businesses to make cost effective energy interventions. Research has shown that organisational barriers and a lack of information about possible energy efficiency improvements mean that companies do not recognise and undertake privately cost-effective investments. A continued voluntary scheme would not provide the impetus for a significant number of companies to methodically investigate the potential for energy efficiency improvements.

Option 2

Costs

68. The key costs of Option 2 will be the compliance costs incurred by affected firms and administrative costs incurred by the Australian Government. Each of these is addressed in turn below.

Compliance costs

Methodology used to estimate compliance costs

The Department of Industry, Tourism and Resources commissioned Energetics, a specialist energy consultancy, to provide advice on the likely cost of compliance with the Energy Efficiency Opportunities program. Energetics based its cost estimates on its experience as an energy and environmental consultancy. It has direct knowledge of the costs of implementing the energy management processes outlined in options 2 and 3, in a large number of Australian companies. It has used this knowledge to extrapolate these costs to the likely population of companies covered by the program.

The businesses affected by the program were divided into 4 types:

- **Type 1:** Firms with less than 10 sites contributing to total energy use greater than 0.5 PJ, with central management. Likely to be smaller industrial companies.
- **Type 2:** Firms with up to 20 sites, some with energy use greater than 0.5PJ. Local level management with some central coordination and reporting. Likely to be larger industrial companies.
- **Type 3:** Firms with between 20 and over 1,000 sites with central management, each with relatively small levels of energy use. Likely to be commercial, retail, hospitality and transport companies.
- **Type 4:** Firms with between 20 and 50 sites, many of which use more than 0.5PJ per site. Strong local and central management. Likely to be major mining and resources companies and diversified manufacturers.

69. Firms were split into these four types, based on Energetics' experience in conducting energy audits, the number and size of sites, and the company management structure, which all have an impact on the level of costs incurred. In general, compliance costs are expected to be lowest for Type 1 firms. Type 2 and 4 firms are expected to have higher absolute costs due to the greater complexity of their operations and number of high energy use sites (but are likely to have some economies of scale). Type 3 firms may also face higher costs, especially in data collection across a larger number of sites, but the program is intended to allow assessment using representative sites where a large number of similar sites exist in an enterprise.

70. Energetics used two distinct techniques to estimate different components of compliance costs. The Energetics compliance cost analysis is attached at Attachment B, and contains detailed explanations of the methodology, particularly the discussion from page 38 of Attachment B.

71. Firstly, a bottom-up estimation approach for the energy measurement, monitoring and management system requirements that form the basic requirements necessary to undertake an opportunities assessment. Energetics has practical experience of how much such systems typically cost to implement in firms of various types.

72. Secondly, based on its experience that firms undertaking an intensive assessment of energy efficiency opportunities typically spend an amount directly budgeted as a proportion of either energy costs or more broadly operating costs, the costs of undertaking the ‘audit’ type part of the assessment is costed as a proportion of energy or operating costs. Energetics’ experience underlies its estimates of likely costs of this component that represent how firms of varying size usually expend on this type of assessment.

Bottom-up methodology for systems necessary for an assessment

73. Using the 3-Plus Tool (see description below), a minimum compliance response was constructed in which the firm complied with all mandatory elements, and the least-costly combination of flexible elements necessary to obtain the minimum point score.

- As background, the 3-Plus Tool is a software tool that allows companies to enter information about what energy monitoring and management systems and processes they have in place. It allows them to assess the standard of systems that they have, and identify areas that they could improve.
- Under option 2, the 3-plus tool is used as an assessment tool under which companies would be required to achieve certain scores for their systems and processes, in addition to undertaking an assessment of their opportunities.
- Under option 3, the 3 plus tool is used as a business diagnostic tool that firms can use for their own benefit to assess the state of their energy management. A core set of basic standards of energy monitoring and management processes will be required to actually complete an assessment. The tool will help companies plan their assessments.

74. Energetics then used a bottom-up approach for the monitoring and reporting requirements which identified the estimated total cost of compliance for each element of Energy Efficiency Opportunities, based on firm type. An adjustment was then made to account for activities that were already being done by the affected businesses, to determine the incremental or additional cost to firms of complying with Energy Efficiency Opportunities requirements.

Energy or operating cost methodology for undertaking an assessment

75. The requirement to perform an energy efficiency opportunities assessment within five years of the program coming into effect is costed separately to the reporting and monitoring requirements of the program, and is based on a firm’s assumed energy spend. Four scenarios were used:

- 1% of annual energy cost per year for 5 years where energy spend per firm (on average) is less than 5% of operating costs and/or less than \$15 million pa. This implies that firms with this level of spend on energy would typically spend up to 5% of annual energy costs conducting a detailed assessment suitable for making investment decisions;

- 0.06% of total operating costs per year for 5 years where energy spend is greater than \$15 million but less than \$50 million pa. This implies that firms with large energy spend would typically take a “% of operating costs” approach to conducting a detailed assessment, with energy spend typically a significant proportion of total operating costs. Estimates were made of the operating costs for applicable sectors based on estimated proportion of costs that are energy-related, including:
 - 15% of operating costs for Mining;
 - 20% of operating costs for Wood, Paper & Printing; Non-metallic Minerals and Metal Products;
 - Up to 30% of operating costs for Transport and Chemicals;
 - 5% of operating costs for Water, sewerage and drainage;

For these sectors 0.06% of annual operating costs were calculated where energy costs exceed \$15 million per year. Where energy costs are estimated to be less than \$15 million per year, the 1% of energy costs method was applied. This level of cost broadly reflects costs that could be incurred from Energetics experience and based on the modelling conducted. At the margin (i.e. close to \$15 million annual energy spend) estimates of per-entity spend on the Opportunities Assessment can differ markedly between the “1% of energy” and “% of operating cost” methods, however it is expected that entities around this level could employ a method that reflects their current level of knowledge of opportunities and perceived benefits from the measure. Overall costs for this part of the measure are not expected to be materially affected;

- Two-thirds of 0.06% of total operating costs per year for 5 years where energy spend is greater than \$50 million, to reflect further economies of scale compared with the basic “% of operating cost” method for sites with very large energy spend, typically reflecting large-scale items of equipment rather than necessarily more items of equipment;
- Two-thirds of 1% of annual energy cost per year for 5 years for commercial and construction sectors, to reflect an approach that would be based on a detailed assessment at representative sites / applicable technology levels, with results extrapolated to a whole population of sites.

76. For both the reporting and assessment requirements, adjustments were made to the base cost to account for actions already taken by affected firms. This gives the additional or incremental cost associated with complying with Energy Efficiency Opportunities.

Compliance cost estimates

77. The table below shows the expected average incremental cost per annum incurred by firms undertaking the assessment requirements of Energy Efficiency Opportunities. Overall the modelling assumes that 20% of the compliance cost for any one firm is faced in each year. However the cost will vary depending on the type of firm and the sector in which it operates, so that the year to year cost will vary in practice, as different firms undertake their assessments. The methodology for estimating the costs in Table 3 is set out from page 38 in Attachment B.

Table 3: Compliance cost for Energy Efficiency Opportunities, by firm type and industry sub sector

Industry Sector	Av. annual incremental cost per firm				Total cost per annum
	Firm Type				
	1	2	3	4	
Mining	28,700	31,800	n/a	56,100	2,580,000
Food, beverages, tobacco	55,000	97,100	n/a	n/a	2,200,000
Textile, clothing, footwear & leather	85,000	n/a	n/a	n/a	170,000
Wood, paper & printing	-	22,200	n/a	63,900	350,000
Petroleum, coal & chemical	16,300	28,700	n/a	148,600	1,340,000
Non-metallic mineral products	26,000	42,400	n/a	n/a	380,000
Metal products	24,700	23,500	n/a	91,700	730,000
Machinery and equipment	71,400	83,300	n/a	n/a	750,000
Water, sewerage & drainage	n/a	107,500	n/a	138,500	570,000
Construction	n/a	n/a	57,000	n/a	340,000
Transport & storage	n/a	24,300	17,700	35,000	380,000
Commercial & Services	n/a		108,300	n/a	4,870,000
ALL	36,900	46,400	96,100	70,000	14,660,000

78. This direct assessment cost is added to the other reporting and monitoring costs as shown in Table 4 below. The upfront costs of compliance (excluding the cost of opportunity assessment) total \$21.7 million or an average of \$86,700 per firm. Recurrent costs will be \$28.7 million per year, or around \$114,600 per firm. Recurrent costs are higher than the development costs because they include the cost of Energy Efficiency Opportunities and, in some cases, firms are expected to need to spend more on recurrent expenditure than setting up the initial systems and processes.

Table 4: Estimated Compliance Costs – Option 2

Requirement	Average cost per firm		Total cost	
	Development	Recurrent	Development	Recurrent
Confirming 0.5PJ Threshold	9,340	-	2,335,000	-
Policy, management & people	42,898	13,267	10,724,375	3,316,840
Data & analysis	18,500	25,150	4,625,000	6,287,500
Opportunities Assessment	-	58,640	-	14,660,000
Innovation & Excellence	1,250	8,380	312,500	2,095,000
Reporting	14,725	9,191	3,681,250	2,297,715
ALL	86,713	114,628	21,678,125	28,657,055

79. In determining the annual costs of Option 2 the development costs are assumed to be incurred in 2005-06. As noted before, 20% of total assessment-related compliance costs are faced in each year (including in year 1), hence the first year impact is the highest of all single year estimates at \$36.3 million. From 2006-07 onwards, the annual compliance cost is equivalent to the recurrent costs only, or \$28.7 million per annum.

80. For the cost calculations by entity type, the individual requirements in Table 4 above were determined for each of the 250 entities, spread across the industry sectors and firm types according to the splits in Table 5 below. These industry and ‘firm type’ allocations are used to scale up the individual calculations for each element of the compliance requirements under Option 2 and later for Option 3. The detailed breakdown of each cost component is presented in the compliance cost report prepared by Energetics for the Department (see Attachment B)

Table 5: Entities by Number – Industry and ‘Firm Type’ Concordance

Industry Sector	Firm Type				Total by Industry
	1	2	3	4	
Mining	30	10	0	25	65
Food, beverages, tobacco	10	17	0	0	27
Textile, clothing, footwear & leather	2	0	0	0	2
Wood, paper & printing	0	7	0	3	10
Petroleum, coal & chemical	10	15	0	5	30
Non-metallic mineral products	3	7	0	0	10
Metal products	3	20	0	2	25
Machinery and equipment	7	3	0	0	10
Water, sewerage & drainage	0	4	0	1	5
Construction	0	0	6	0	6
Transport & storage	0	7	4	4	15
Commercial & Services	0	0	45	0	45
Total by Firm Type	65	90	55	40	250

Government Administration Costs

81. Estimates of Government administration costs for implementation of Energy Efficiency Opportunities were provided in the Energy White Paper and are provided in the table below. After 2008-09 no net additional recurrent funding is allocated, and it is assumed that any administration costs would be provided through internal departmental budget allocation processes.

Table 6: Estimated Administration Costs, Energy Efficiency Opportunities

Year	2004-05	2005-06	2006-07	2007-08	2008-09	Total	2005-06 to 2008-09
\$ million	2.2	3.7	3.9	3.7	3.3	16.9	14.6

Source: Australian Government (2004) page 181.

Cost Summary

82. Table 7 below summarises the estimated annual costs of Option 2. The total undiscounted cost is just under \$309 million over the 10 years to 2014-15.

83. The costs and benefits of Energy Efficiency Opportunities will occur at different times. In particular, there will be a time lag in obtaining the benefits from improved productivity as it takes some years for all companies to complete their energy efficiency opportunities assessment and make subsequent capital investments in energy efficiency improvements at their discretion. In order to compare costs and benefits which occur at different times, a net present value of costs and benefits is calculated. This accounts for the time value of money, which reflects the fact that a dollar spent today is valued more highly than a dollar spent in the future.

84. Choosing an appropriate discount rate for benefit-cost analysis is a subject of some debate. There is a substantial body of literature which provides conflicting advice on the appropriate mechanism by which economy-wide benefits and costs for a project should be discounted over time. For this analysis, we have used the risk-free discount rate (ie a real discount rate of 3%), which is consistent with the real interest rate on a CPI-linked government bond. No arbitrary additional premium has been added to this discount rate, as each quantifiable cost and benefit line item has been conservatively estimated to account for the risk and uncertainty in the analysis.

85. Applying a real discount rate of 3% generates a net present value for these costs of \$265.5 million. Of this around 95% of the costs are borne (in the first instance at least) by the affected firms. The extent to which these costs are passed on to consumers in the form of higher priced goods and services will depend on the level of competition in the industries concerned and the degree to which benefits from energy effective savings flow through to business operations following various energy efficiency investments. It is not possible to separately quantify the magnitude of these indirect effects on consumers, as this would require a detailed analysis of the level of competition now and in future in the industries affected. Many energy-intensive industries are at early stages in the value chain (for example mining and refining) and so the impact of final consumers would also need to consider how cost-savings are passed on at each step in the value chain. It is worth noting that part of the benefit to consumers is already captured as an element of the benefits accruing from the increase in gross domestic product, discussed in the benefit section below.

Table 7: Estimated Costs, Option 2, 2005-06 to 2014-15
(Note: costs discounted to 2005-06 values)

OPTION 2 - COSTS	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
\$ million											
Compliance costs	36.3	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	294.3
Registration and Reporting	21.7	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	147.7
EEOA	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	146.6
Administrative costs	3.7	3.9	3.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	14.6
Federal Government	3.7	3.9	3.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	14.6
TOTAL Costs (undiscounted)	40.0	32.6	32.4	32.0	28.7	28.7	28.7	28.7	28.7	28.7	308.9
Discounted costs, 2005-06 values	38.9	30.7	29.6	28.4	24.7	24.0	23.3	22.6	22.0	21.3	265.5
NPV economic costs \$m											265.5

Benefits

86. The primary quantifiable benefit of a mandatory scheme will be the energy cost-savings and other productivity improvements flowing from investment in energy efficiency improvements. These need to be expressed in net terms, to account for the capital cost of the investments. Improvements in productivity will allow a greater amount of output to be produced with a given set of inputs, thereby increasing Australia's gross domestic product (GDP).

87. Improvements in energy efficiency which reduce fossil fuel consumption may also have environmental benefits, including reductions in greenhouse gas emissions. Determining the appropriate dollar value to place on these positive environmental impacts is a complex and controversial task, which is not included in the benefit calculations.

Methodology used to estimate benefits

88. Quantifying the benefits of Options 2 and 3 is much more difficult and uncertain than estimating their costs. Firstly, there has never been a full and comprehensive assessment of the size of the energy efficiency gap. Secondly, there is only limited, and anecdotal, information on the extent to which a mandatory audit program would influence firms to take up energy efficient investments.

89. Modelling conducted for the NFEE estimated the potential for energy efficiency improvements in particular sectors of the Australian economy. These estimates were based on opportunities with a payback period of four years or less, identified in previous case-studies and energy audit results. As noted before, the level of comfort that can be placed in the results of the NFEE modelling depends on the representativeness of the underlying case study data used to determine the size of the energy efficiency gap.

90. The economy-wide impacts of increasing energy efficiency were modelled by the Allen Consulting Group, assuming that 50 per cent of potential energy efficiency improvements would be taken up over a 12 year period from 2005 to 2016. The effects were compared to a "business as usual" scenario where energy efficiency continued to increase at historical rates with the current voluntary arrangements still in place.

91. By 2016, 12 years after the initial investments in energy efficiency opportunities began, these increases in energy efficiency would increase GDP by 0.09% or \$975 million. In addition, total direct energy cost savings would be around \$1.4 billion and greenhouse gas emissions would be reduced by 2.8% (9.5 mega tonnes of carbon dioxide equivalent).

92. The NFEE modelling does not examine in detail how the 50% take up of energy efficiency opportunities (above the baseline case) would occur through various policy approaches. In particular, it does not discuss the relative take-up rates that might accrue under a mandatory scheme such as Option 2 or Option 3. This lack of detail also makes it unwise to assume how moving away from a 50% take up rate will affect the level of GDP growth.

93. What is known from small sample data is that when businesses are aware of the energy efficiency opportunities available to them, their take-up rates are quite high. Although the participants in the previous schemes such as EEAP were involving themselves on a voluntary basis (and hence may have been self selecting themselves because they expected to see positive opportunities as a result of any energy efficiency audit), their take-up rates (ie. moving from assessment to energy efficient interventions) were significant at around 80%.

94. That said, while the lower 50% take-up implied in the Allens' analysis is still strong, it is more in line with the take-up rates that one might expect from larger firms (such as those targeted by Energy Efficiency Opportunities). In terms of comparing the expected take-up rate differential that might be generated by the slightly more extensive compliance requirements (in relation to data analysis and organisational involvement) in Option 2 compared to Option 3, there is some argument that benefits might be slightly higher for Option 2.

95. Unfortunately there is no evidence available to make a definitive claim about the various pathways from audit and identification through to actual energy efficient investment decisions. In the absence of such data, it is not possible to make a fine distinction between the differing identification obligations under Option 2 and Option 3 and their impact on take-up rates beyond those calculated in the Allens' analysis. In theory Option 2 benefits should have a slightly higher take-up rate, but for the purposes of the RIS analysis the quantified benefits are the same for both Options.

96. The Allen's modelling included increases in energy efficiency in sectors, such as the residential and agricultural sectors, not targeted by Energy Efficiency Opportunities, and included investments by both small and large firms.

97. The Allen Consulting Group, at the request of the Department of Industry, Tourism and Resources, explored whether the NFEE modelling could provide greater sectoral detail on the benefits of Energy Efficiency Opportunities. Allen's concluded that, although the scope of Energy Efficiency Opportunities differed from that of the NFEE modelling, some general inferences could be drawn.

98. Australian Bureau of Statistics (ABS) data suggest that around 250 firms used greater than 0.5 PJ in 2001-02. Firms which consumed more than 0.5 PJ of energy were responsible for around 1156 PJ of energy end use. This is equivalent to just over 60 per cent of total energy use of businesses covered in the 2001-02 ABS survey (1884 PJ), and around 35 per cent of total energy end use in the economy in 2001-02 as reported by the Australian Bureau of Agricultural and Resource Economics (2004). Thus around a third of the impacts estimated in the NFEE modelling could arise from the Energy Efficiency Opportunities population, assuming that all identified opportunities with paybacks up to 4 years are implemented, and that the modelling involved uniform opportunities for energy savings; uniform distribution of large energy use firms using greater than 0.5 PJ of energy; and uniform expansionary impacts on GDP.

99. Examining the above assumptions relating to uniform opportunities, distribution and expansionary impacts, it was noted that not all opportunities for energy savings are uniform. The greatest potential for energy efficiency improvement arise in the services sectors, including wholesale and retail trade (11.9 per cent energy efficiency improvement potential for paybacks less than 4 years), finance and business services (11.1 per cent), accommodation, cafes and restaurants (14.1 per cent) and culture, recreation and personal services (9.9 per cent) (Allen Consulting Group 2004a).

100. The lowest opportunities for energy efficiency improvements arise in the trade exposed mining, minerals processing and chemicals industries, where energy efficiency improvement potential ranges from 3.4 per cent for mining, through 4.3 per cent for alumina and aluminium, up to 8.9 per cent for basic chemicals. These industries are likely to have greater requirements for energy use, and to comprise large energy using firms.

101. This leads to the second point — large energy use firms are likely to be concentrated in a small number of energy intensive resource extraction or processing industries. Minimum efficient scale in these industries tends to drive a smaller number of larger firms.

102. Thirdly, expansionary impacts on GDP are not uniform. The greatest first round contributions to positive GDP growth stimulus by industry are from the other manufacturing and trade services sectors, and from the energy intensive trade exposed industries — alumina and aluminium and iron and steel. As noted, it is difficult to determine exactly what factors drive the results for other manufacturing and trade services. However, it is reasonable to infer from the energy intensive trade exposed industry results that these industries have a greater relative contribution to the overall GDP growth resulting from energy efficiency investments.

103. What this suggests is that if anything, large energy use firms are likely to make a greater contribution to the overall GDP growth. When combined with the second point above, the conclusion can be drawn that the Energy Efficiency Opportunities population of firms could be responsible for at least a third of the overall boost to GDP in the MMRF-Green modelling, or around \$300 million in year 12. Significant caution needs to be observed in relation to this conclusion however, as it is based more on inference rather than explicit modelling output.

104. The Allen's modelling assumes that energy efficiency improvements are introduced uniformly over a 12 year period. However, for the purposes of this RIS a 10 year time horizon is adopted and firms will have a five year period to conduct their initial energy efficiency opportunities assessment. This means that some firms will not begin undertaking energy efficiency improvements until year 5 onwards. The time period in which the financial benefits from the energy efficiency improvements will occur is thus truncated, and the total benefit of \$300 million per annum implied by the Allen's analysis (noting the caveats) cannot be fully attributed to the Option.

Estimated Benefits

105. Based on the available evidence, a best estimate is that the net financial benefit of firms taking up energy efficiency opportunities identified through the EEOA measure could rise to around \$205 million in year 10 (2014-15), or a total benefit in net present value terms of \$760 million.

Table 8: Estimated Benefits, Option 2, 2005-06 to 2014-15

OPTION 3 - BENEFITS \$ million	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Benefits, undiscounted	5.1	15.4	30.8	51.4	77.1	102.8	128.5	154.2	179.9	205.6	950.7
Discounted benefits, 2005-06 values	5.0	14.5	28.2	45.7	66.5	86.1	104.5	121.7	137.8	153.0	762.9
NPV economic benefits \$m											762.9

Sensitivity Testing

106. As noted considerable uncertainty surrounds the benefit estimate. The two key assumptions that affect the analysis are the discount rate that is applied and the rate of take-up of energy efficiency opportunities.

107. There is considerable debate over the appropriate discount rate to choose when undertaking impact analysis. The Productivity Commission, in its draft report into Energy Efficiency noted the particular sensitivity of case studies into energy efficiency to the discount rate applied. As noted above, a discount rate of 3% has been applied here, consistent with the real long-term Government bond rate. Choosing another discount rate will alter the magnitude of the expected net benefits and costs of Option 2, but will not significantly alter the ratio of costs to benefits (see Table 9).

Table 9: Sensitivity Analysis Option 2 – Discount Rate

Real Discount Rate	3%	12%	Difference
Benefit (NPV, \$ million)	762.9	418.7	344.2
Cost (NPV, \$ million)	265.5	179.9	85.6
Net Benefit (NPV, \$ million)	497.4	238.8	258.6
Ratio Benefits to Costs	2.9	2.3	0.6

108. While a suite of differing take-up rates could also be theoretically modelled in addition to the sensitivity testing on the discount rates, it would be quite a detailed and time consuming task. However, another method by which additional sensitivity testing can be applied to the benefits estimate is to consider the sensitivity of the component of the NFEE benefits which are assumed to relate to the population captured by the Energy Efficiency Opportunities program. As discussed in some detail in the preceding section, a third of the overall boost to GDP in the MMRF-Green modelling has been assumed to relate to the EEO program population, that is, around \$300 million per annum by year 12. Given the uncertainty in this estimate, we can apply quite extreme bounds to this figure to test whether a \$100 million difference either side of the \$300 million estimate would impact on the net benefit calculation in any major way.

109. Applying these lower and upper bounds with a 3% discount rate gives a NPV for the benefit calculation of between \$494.9 million and \$989.7 million. This generates a net benefit calculation of between \$229.4 million and \$724.2 million. If we instead use the higher discount rate scenario of 12%, the NPV for the benefits fall to between \$271.6 million and \$543.2 million. The net benefit estimates also fall, but still remain strongly positive ranging from \$91.7 million to \$363.3 million.

110. While this sensitivity analysis provides some additional insight into the range of possible outcomes given the caveats associated with these benefits calculations, under the range of scenarios presented, option 2 still represents a positive net benefit outcome from the Energy Efficiency Opportunities program. In addition, the benefit calculations represent the lower bound of possible economy wide outcomes (for any discount rate or take-up rate variation) given that they currently exclude the environmental benefits that would be associated with a reduction in greenhouse gas emissions. Given the difficulty in valuing these benefits, they have not been included in the benefit calculations reported in this RIS.

111. That said, the analysis in the RIS is best considered from the perspective of the relative impact of option 2 or 3 in terms of compliance costs for industry, given that there are still quite strongly held opinions about the accuracy and reliability of the benefit calculations associated with the modelling of the energy efficiency gap in the Australian context. These criticisms are best summarised in the draft Productivity Commission's Report into Energy Efficiency, which noted concerns in relation to the range of assumptions used in a number of recent studies in the area. Not all were directly related to the methodology used in the MMRF-Green modelling presented in this RIS, however many of the general criticisms do apply to varying degrees.

112. In short, the criticisms focused on the underlying assumptions in relation to the:

- Criteria for determining cost effectiveness (giving undue emphasis to short-term returns)
- Business-as-usual improvements in energy use (being understated as the base-case and hence overstating potential benefits of closing any energy efficiency gaps)
- difficulties associated with the extrapolation of audit and best-practice study results to a whole sector and/or the representativeness of the simulated producers and consumers in the scenarios.

113. These criticisms serve to highlight the caution that should be applied to the analysis in the RIS in relation to the benefits calculations.

Summary

114. Table 10 shows the flow of costs and benefits over the next 10 years. Although the net benefit is initially negative in the first few years, the overall net benefit of Option 2 is \$497.4 million in net present value terms.

Table 10: Summary of estimated costs and benefits, Option 2

OPTION 2 - SUMMARY	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
\$ million											
Benefits, undiscounted	5.1	15.4	30.8	51.4	77.1	102.8	128.5	154.2	179.9	205.6	950.7
Costs, undiscounted	40.0	32.6	32.4	32.0	28.7	28.7	28.7	28.7	28.7	28.7	308.9
Net benefit, undiscounted	-34.9	-17.1	-1.5	19.4	48.4	74.1	99.8	125.5	151.2	176.9	641.8
Discounted benefits, 2005-06 values	5.0	14.5	28.2	45.7	66.5	86.1	104.5	121.7	137.8	153.0	762.9
Discounted costs, 2005-06 values	38.9	30.7	29.6	28.4	24.7	24.0	23.3	22.6	22.0	21.3	265.5
Discounted net benefit, 2005-06 values	-33.9	-16.2	-1.4	17.3	41.8	62.1	81.2	99.1	115.9	131.6	497.4
NPV economic benefits \$m											762.9
NPV economic costs \$m											265.5
BENEFIT-COST over 10 years (net benefit), \$m											497.4
BENEFIT-COST RATIO											2.9

Option 3

Costs

115. Again the key costs will be the compliance costs for affected firms, and the administrative cost incurred by the Australian Government.

Compliance Costs

Methodology used to estimate compliance costs

116. Energetics also estimated the likely compliance costs for Option 3. Option 3 does not require firms to obtain a minimum point score, effectively reducing the number and level of compliance obligations. Energetics compared the requirements under the “minimum compliance cost” scenario developed to assess the costs of Option 2, with the reduced requirements set out in Option 3. It then estimated the proportion of the Option 2 costs which would still be incurred under the reduced Option 3 requirements.

Estimated compliance costs

117. Table 11 sets out the estimated additional costs incurred by the affected firms to comply with Option 3. The requirements to confirm threshold energy use, undertake an energy efficiency opportunities assessment and report on the results are common to both Options 2 and 3, so the cost for these elements does not change. However, the compliance costs for the other elements falls substantially. On average, compliance costs for Option 3 are estimated at around three quarters of those incurred under Option 2.

Table 11: Estimated Compliance Costs – Option 3

Requirement	% of Option 2 cost*	Average cost per firm		Total cost (\$M)	
		Develop.	Recurrent	Develop.	Recurrent
Confirming 0.5PJ Threshold	100	9,340	-	2.34	-
Policy, management & people	43	18,692	5,651	4.67	1.41
Data & analysis	53	7,000	14,205	1.75	3.55
Opportunities Assessment	100	-	58,640	-	14.66
Innovation & Excellence	0	-	-	-	-
Reporting	100	14,725	9,191	3.68	2.23
ALL	76	49,757	87,687	14.33	21.92

* Average of annual costs over the initial 5 year period

118. For Option 3, the upfront costs of compliance (excluding the cost of opportunity assessment) total \$12.4 million or an average of \$49,700 per firm. Recurrent costs will be \$21.9 million per year, or around \$87,600 per firm. In determining the annual costs of Option 3 the development costs are assumed to be incurred in 2005-06. As noted before, 20% of assessment related compliance costs will also occur in year one and, when added to the up-front compliance cost estimates, the first year impact is the highest of all single year estimates at \$27.1 million. From 2006-07 onwards, the annual compliance cost is equivalent to the recurrent costs only, or \$21.9 million per annum.

Administration Costs

119. Administration costs are the same for Option 3 as in Option 2, as the reduced compliance obligations for firms will not materially alter the level of administrative, verification and enforcement activity the Australian Government will undertake.

Summary

120. Table 12 below summarises the estimated costs for Option 3. The net present value of the total costs incurred between 2005-06 and 2014-15 is \$205.6 million. Business compliance costs account for 94% of these costs, with the remaining 6% being borne by the Australian Government.

Table 12: Estimated Costs, Option 3, 2005-06 to 2014-15

OPTION 3 - COSTS	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
\$ million											
Compliance costs	27.1	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	224.4
Registration and Reporting	12.4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	77.8
EEOA	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	146.6
Administrative costs	3.7	3.9	3.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	14.6
Federal Government	3.7	3.9	3.7	3.3	0.0	0.0	0.0	0.0	0.0	0.0	14.6
TOTAL Costs (undiscounted)	30.8	25.8	25.6	25.2	21.9	21.9	21.9	21.9	21.9	21.9	239.0
Discounted costs, 2005-06 values	29.9	24.3	23.4	22.4	18.9	18.4	17.8	17.3	16.8	16.3	205.6
NPV economic costs \$m											205.6

Benefits

121. The benefits of Option 3 are assumed to be identical to those calculated under Option 2. That is, the benefit from increased productivity due to energy efficient investments will rise to around \$205 million in 2014-15 or a total benefit in net present value terms of \$760 million. Positive environmental benefits from reduced use of fossil fuels would be additional to this. The realisation of benefits over time is shown in the table below.

Table 13: Estimated Benefits, Option 2, 2005-06 to 2014-15

OPTION 3 - BENEFITS \$ million	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Benefits, undiscounted	5.1	15.4	30.8	51.4	77.1	102.8	128.5	154.2	179.9	205.6	950.7
Discounted benefits, 2005-06 values	5.0	14.5	28.2	45.7	66.5	86.1	104.5	121.7	137.8	153.0	762.9
NPV economic benefits \$m											762.9

Sensitivity Testing

122. The impact analysis for Option 2 noted the considerable uncertainty surrounding the benefit estimate. It also noted the time challenges of modelling a range of take-up rates, and the fact that the benefits are an underestimate due to the exclusion of environmental benefits. These same caveats apply for Option 3.

123. However sensitivity analysis was conducted on the impact of varying real discount rates on the expected net benefit of Option 3. As was the case with Option 2, choosing another discount rate will alter the magnitude of the expected net benefits and costs of Option 3, but will not significantly alter the ratio of costs to benefits (see Table 9).

Table 14: Sensitivity Analysis Option 3 – Discount Rate

Real Discount Rate	3%	12%	Difference
Benefit (NPV, \$ million)	762.9	418.7	344.2
Cost (NPV, \$ million)	205.6	139.6	66.0
Net Benefit (NPV, \$)	557.3	279.1	278.2
Ratio Benefits to Costs	3.7	3.0	0.7

124. In a similar manner to option 2, the benefits calculations for option 3 have also been subjected to sensitivity in relation to the population captured by the Energy Efficiency Opportunities program, by varying the mid-point estimate of \$300 million per annum by year 12 to a lower bound of \$200 million and an upper bound of \$400 million.

125. Applying these lower and upper bounds with a 3% discount rate gives a NPV for the benefit calculation of between \$494.9 million and \$989.7 million. This generates a net benefit calculation of between \$289.3 million and \$784.1 million. If we instead use the higher discount rate scenario of 12%, the NPV for the benefits fall to between \$271.6 million and \$543.2 million. The net benefit estimates also fall, but still remain strongly positive ranging from \$132 million to \$403.6 million.

126. Despite the uncertainty surrounding the exact amount of economic benefit, these figures suggest that the magnitude of benefits generated by Energy Efficiency Opportunities are likely to be of sufficient magnitude that the net benefit of option 3 is significantly positive.

Summary

127. Table 15 shows the net benefit of Option 3 over time. The costs exceed the benefits for the first two years, but then an annual net benefit is produced. Overall Option 3 would deliver a net present benefit of \$557.3 million over the 10 years.

Table 15: Summary of estimated costs and benefits, Option 3

OPTION 3 - SUMMARY	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
\$ million											
Benefits, undiscounted	5.1	15.4	30.8	51.4	77.1	102.8	128.5	154.2	179.9	205.6	950.7
Costs, undiscounted	30.8	25.8	25.6	25.2	21.9	21.9	21.9	21.9	21.9	21.9	239.0
Net benefit, undiscounted	-25.7	-10.4	5.2	26.2	55.2	80.9	106.6	132.2	157.9	183.6	711.7
Discounted benefits, 2005-06 values	5.0	14.5	28.2	45.7	66.5	86.1	104.5	121.7	137.8	153.0	762.9
Discounted costs, 2005-06 values	29.9	24.3	23.4	22.4	18.9	18.4	17.8	17.3	16.8	16.3	205.6
Discounted net benefit, 2005-06 values	-24.9	-9.8	4.8	23.2	47.6	67.7	86.6	104.4	121.0	136.6	557.3
NPV economic benefits \$m											762.9
NPV economic costs \$m											205.6
BENEFIT-COST over 10 years (net benefit), \$m											557.3
BENEFIT-COST RATIO											3.7

CONSULTATION

128. The Department held consultation workshops with almost 180 industry members in Perth, Sydney, Melbourne, Brisbane and Canberra during October and November 2004 to discuss the development of the mandatory Energy Efficiency Opportunities program.

129. The participants represented companies across the manufacturing, mining and resource processing, power generation and distribution, energy services, and transport sectors. Members of the Australian Greenhouse Office (AGO), state government agencies (in particular, those involved in developing the National Framework for Energy Efficiency) and industry associations also participated. A list of organisations who participated in the workshops is at Attachment A.

130. The workshop participants were given an opportunity to identify the benefits and opportunities Energy Efficiency Opportunities may provide for their organisation, as well as raise any challenges and risks they foresaw. Participants also shared their experience of current business practice, including what elements are necessary for a successful assessment procedure. These elements were used by the Government in designing the initial proposal (Option 2).

131. The industry workshops were highly valuable for gaining industry input into the design of Energy Efficiency Opportunities. While company representatives had specific comments or experiences, common themes emerged from the workshops on the challenges, benefits, lessons and recommended design of Energy Efficiency Opportunities.

132. A clear message from industry was that Energy Efficiency Opportunities must be an overarching framework that takes account of differing company practices and structures and has reporting methodologies consistent with other Commonwealth and state programs.

133. Industry members wanted Energy Efficiency Opportunities to be flexible, efficient and credible. They argued new energy efficiency opportunities will be generated by getting the right principles, processes and systems in place and then having the follow-up support to implement projects.

134. The key areas of concern surrounded five main issues:

- **the four-year payback** – whether it was the best method for reporting on opportunities,
- **public reporting** – how to encourage companies to be thorough in identifying opportunities when they must publicly report outcomes,
- **streamlining** – ensuring the methodologies of state and federal programmes are consistent,
- **complexity of company structure and operations** – how to design a framework that accounts for diversity of company structure and practice, and
- **attitudinal hump** – how to shift companies into ‘opportunity’ thinking around energy efficiency and away from a belief that everything cost-effective has been ‘done’ on energy.

135. The participants acknowledged it was a large task to design Energy Efficiency Opportunities, build the necessary capacity and improve energy efficiency across the business economy. The Australian Government’s role was to help to build capability and assist companies ‘to go on the journey’. Knowledge needed to be shared across business and external expertise harnessed.

136. Evaluation of the workshops showed the participants valued being involved so early in the development of the measure and being asked about their concerns and the challenges ahead. They also appreciated the opportunity to talk to their counterparts in other industries and discuss how they approach energy efficiency.

137. The views from these consultations are being drawn upon in the development of program guidelines, including an assessment procedure and reporting framework.

Further consultation

138. The details of the assessment procedure will be included in the regulations and guidelines rather than the EEO Bill. The development of these details is ongoing and firms will be consulted on the compliance costs, as well as being provided with the RIS, and these consultations will inform the finalisation of the model.

139. Limited consultation on the costs of compliance have occurred with trial companies, who are assisting in the development and testing of the details of the program model. Firms were not consulted more widely because the details were under development and not fixed. Once the options were clearly identified (options 2 and 3) in July 2005, there was little time available in the legislative timetable to undertake wide consultation on the current compliance cost estimates in the draft RIS. Current expectations are that the draft RIS will be provided to various representatives for targeted consultation prior to the introduction of the Bill.

CONCLUSION AND RECOMMENDED OPTION

140. The costs and benefits of Option 2 and 3, compared to the status quo option 1 are summarized in the table below.

Table 16: Comparison of Options - Net Benefits

NPV \$ million	Option 1	Option 2	Option 3
Benefit	0.0	762.9	762.9
Cost	0.0	265.5	205.6
Net Benefit (cost)	0.0	497.4	557.3

141. As discussed previously, the financial benefit for both options is around \$760 million in NPV terms. This number is a best estimate based on the available data, although considerable uncertainty remains. Sensitivity testing of the discount rate and the benefits likely to be captured by the target population of the EEO program. Combining the lower bound estimates of the benefits – that is, using the highest discount rate example (ie 12%) and the lowest benefit estimate (ie. assuming the benefits associated with the EEO target population are a 1/3 lower than the base case) still generates a significant net benefit outcomes for both option 2 and 3 at \$91.7 million and \$132 million respectively.

142. While the benefits calculations should be treated with significant caution (noting the criticisms that have been leveled at some of the key assumptions), the more important element of the analysis is the relatively lower compliance cost estimates associated with option 3.

143. The compliance costs of each Option were more readily ascertainable and a detailed analysis of the likely compliance effects have been undertaken. Although most firms subject to Energy Efficiency Opportunities will already undertake some monitoring, reporting and analysis of their energy-use, to differing degrees, there will be additional costs incurred. The compliance costs for Option 3 will be less than Option 2, due to the reduced and simplified regulatory requirements.

144. Given that the dual objectives of the Energy Efficiency Opportunities Program are to overcome the information failures and organisational barriers associated with businesses identifying privately cost-effective improvements in energy efficiency, as well as to assist in reducing emissions and associated environmental externalities to the extent efficiencies are implemented, the lowest cost compliance model should be the preferred option chosen.

145. It is thus recommended that Option 3 be adopted, as it provides the greatest net benefit overall - where compliance costs to business are minimised under a mandatory identification scheme, while the Government's objectives relating to Australia's environment, productivity, sustainability and competitiveness are still met.

IMPLEMENTATION AND REVIEW

146. Energy Efficiency Opportunities will be implemented through enabling legislation. Subordinate instruments will provide detail such as reporting requirements. The Department will also issue guidelines for the assessment process to assist companies to meet their obligations.

147. The Government is requiring a mandatory assessment of energy efficiency opportunities at least once every five years. Given this, a sunset clause for the legislation was considered inappropriate, as it may send an unintended signal that the assessment was simply a one-off requirement which would not be conducive to a longer term organisational commitment to identifying energy efficiency opportunities. The Government is interested in sending a strong signal that it expects that the anticipated benefits of this program be a longer term commitment by business, and that the changed behaviour that this should bring will be an important element in encouraging investment in more efficient energy use, and though that, a lower emission future.

148. Key components of the program are being trialled in the second half of 2005 and beyond by leading companies across a wide range of sectors, including heavy and light manufacturing, mining, commercial and transport. All companies covered by the legislation will be required to register for the program during 2006-07. By end of Year 2008-09, 50 businesses will have undertaken, and publicly reported on, their EEOA assessment. Verification and reporting arrangements will be determined consultatively, however reporting is intended to utilise the Greenhouse Challenge Plus online reporting system, which already has about 120 of the EEO target companies reporting on greenhouse and energy. It is expected that firms will conduct energy efficiency opportunities assessments on a five-year rolling basis from 2007.

149. The reporting requirements of Energy Efficiency Opportunities provide the opportunity to collect data with which to review the program. Key performance indicators (KPIs) have been designed against which the success of the program will be measured. The KPIs include measures of both the effectiveness and the efficiency of the program – and an important issue that the Government will be mindful of is the degree to which organizational change has occurred.

150. Where the information needed to assess performance against a KPI will not be readily available from company returns, targeted surveying will be undertaken. This may include surveys of business awareness of Energy Efficiency Opportunities or satisfaction of the participating companies with the reporting systems used.

151. Effectiveness is a measure of how well the program is achieving the desired program outcomes (its objectives). The effectiveness KPIs tend to be long-term and focused at a high level.

152. As discussed in an earlier section, the overall desired outcome of Energy Efficiency Opportunities is to overcome the information failures and organisational barriers which work against businesses being able to properly identify and undertake what would otherwise be privately cost-effective improvements in energy efficiency. Six effectiveness KPIs are proposed.

1. Increased awareness of the Energy Efficiency Opportunities program
2. Level of participation in the Energy Efficiency Opportunities program
3. Improvement in energy management
4. Improvement in the identification of energy efficiency opportunities
5. Improvement in the uptake of energy efficiency opportunities

153. Savings in energy and money spent and costs as a result of Energy Efficiency Opportunities-induced actions. Efficiency is a measure of the extent to which the program outputs are maximised for a given level of inputs. So, it is necessary to develop outputs for the Energy Efficiency Opportunities program that will feed into the outcomes. The efficiency KPIs tend to be more short-term than those for effectiveness, and more focused on the running of the program.

154. The areas of interest for efficiency KPIs are the achievement of project milestones, key stakeholder satisfaction and effective communication. The efficiency KPIs identified for the program generally fall into these three categories. They are:

1. Stakeholder awareness of the program and what is expected of participants, eg registration, assessment procedure, reporting, verification (communication);
2. Reporting systems are appropriately targeted, easy to use, high quality and where possible streamlined (communication and satisfaction);
3. Key delivery management milestones met as per the CIU implementation plan (milestones);
4. Program delivered on time and to budget (milestones);
5. Participant attitudes to the scheme – number of firms satisfied with the Energy Efficiency Opportunities process and consultation (satisfaction); and
6. Target firms perceive benefits from program participation eg from the trials, capacity building, consultation in developing the measure, materials/tool, etc (satisfaction and communication).

155. Monitoring of the Energy Efficiency Opportunities program’s KPIs will be an ongoing process, as set out in the table below.

Table 17: Evaluation Timeline

Evaluation milestone	Timeline
Major baseline survey completed	2006
Ongoing data collection/analysis from company reports	Throughout 2006-2010
Yearly efficiency review and reporting	Throughout 2006-2010
Yearly 'running changes'	Throughout 2006-2010
Undertake special evaluation data collection	2009
Draft evaluation report written	January 2010
Circulation of draft report	February 2010
Final evaluation report written and released	July 2010
Review evaluation	July-December 2010
Implement evaluation findings in ongoing program	2011

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ATTACHMENT A – LIST OF STAKEHOLDER WORKSHOP PARTICIPANTS (OCT-NOV 2004)

Perth

Alberfield, Austral Bricks WA, Australian Greenhouse Office (AGO), Alcoa World Alumina, BP Refinery Kwinana, Bristle Roofing, Chamber of Commerce and Industry of WA, Chamber of Minerals & Energy of WA, Curtin University, Ecos (representing Chevron Texaco Australia), Epic Energy, Hismelt, Millennium Chemicals, Minara Resources, Newmont Australia, SEDO/NFEE (WA), Simcoa Operations, Sons of Gwalia, The Laminex Group, Tiwest Joint Venture, Transalta, Water Corporation, Wesfarmers, Western Mining, Woodside.

Sydney

AGL, AGO, Alcan Grove, Blue Circle Southern Cement, BlueScope Steel, Boral, Centennial Coal, Coca-Cola Amatil, Delta EMD, Dept of Energy, Utilities & Sustainability (DEUS)/ NFEE, Energetics, Energy Conservation Systems, EnergyAdvice, Exergy Australia, H C Extractions, Hydro Aluminium Kurri Kurri, NSW Greenhouse Gas Scheme, Origin Energy, PACIA, Qantas, Shell, Stonefern Management Consulting, Sustainable Business, Sydney Water, Tomago Aluminium Western Sydney Area Health Service, Woolworths Ltd, Xstrata Coal.

Melbourne

ACI Packaging, AGL Corporate, AGL Energy Sales & Marketing, Amcor, Amcor Paper, AGO, Australian Trucking Association, Australian Vinyls, Bega Cheese, BHP Billiton, Caltex, Department of Sustainability & Environment (VIC), Edison Mission, EEP Management, Energy Supply Association of Australia (ESAA), EnergyAdvice, EPA Victoria, ESSO, FMP Group, Harvey, Holden, International Power – Hazelwood Power Station, IS Alliance, Kimberly-Clark, Mitsubishi, National Foods, Norske Skog, Orica, Origin Energy, Productivity Commission, Qenos, Rio Tinto, SCA Hygiene Austral Asia Pacific, Sustainable Energy Authority Victoria/ NFEE, Shell, Siemens, Telstra, Wesfarmers – Kleenheat Gas.

Brisbane

A3P, AGL Corporate, AGO, Alinta, Anglo Coal Australia, Australian Industry Group, BHP Billiton, BHP Billiton Coal, Boral Ltd, BP (Bulwer Island) Refinery, Brisbane City Council, Comalco Aluminium Ltd, Commerce Queensland, Consolidated Rutile Ltd (CRL), CSIRO, Dept of Energy/NFEE, Energex, Energy Users Association, EPA – Qld, Ergon Energy, Gold Coast City Council, Hyne Timber, Incitec Pivot, NCMC, NRG Gladstone Operating Services, OSD Energy Services, Placerdome Asia Pacific, QNI, Queensland Magnesia, Queensland Rail, Queensland Resources Council, Rio Tinto, Santos, Tarong Energy, Xstrata Copper.

Canberra

Australian Energy Performance Contracting, Australian Industry Greenhouse Network, Australian Industry Group, Australian Trucking Association, Balance Energy, BlueScope Steel, Carter Holt Harvey, Cement Industry Federation, Coles

Myer, Context, DeltaEMD, Energy Users Association of Australia, PaperlinX, Patrick Corporation, Pilkington (Australia), Visy Pulp and Paper.

Aluminium sector workshop - Alcan Gove, Alcoa World Alumina Australia, Australian Aluminium Council, Comalco Aluminium Limited, Hydro Aluminium Kurri Kurri, Queensland Alumina, Tomago Aluminium Company, Worsley Alumina.

ATTACHMENT B – ANALYSIS OF COSTS OF COMPLIANCE

SCOPE OF WORK AND APPROACH

Scope of review – Order 2005 3

156. This review has sought to estimate the net costs and net benefits that might be expected to result for firms or reporting entities participating in the Government's Energy Efficiency Opportunities measure (EEO). The assessment has focused on key elements related to the measure:

1. Elements of the 3-Plus tool that would be required to achieve the minimum score required, including:
 - a. Policy, Management and People,
 - b. Data and Analysis,
 - c. Opportunity Identification and Evaluation,
 - d. Innovation and Excellence, and
 - e. Reporting;
2. Potential impact on costs of compliance arising from some firms' core energy consuming processes that may be unlikely to be influenced by EEO activities, at least on an averaged annual cost basis – i.e. “lumpy investments”;
3. The additional costs of EEO relative to measures that firms already undertake, either as part of internal efforts to implement cost-effective energy efficiency solutions or as part of other government-sponsored programs, or both;
4. Comparison of compliance costs (and benefits) compared with other mandated or voluntary programs;
5. Expected benefits arising to firms participating in EEO in terms of energy savings, and other benefits that might arise via improved practices, information, and transaction costs associated with participation in multiple programs;
6. Flexible elements of the 3-plus tool (other than a minimum set required to achieve the minimum score), including an assessment of possible compliance costs against the stated criteria and possible alternate approaches.

Scope of review – Order 2005 3a

157. The possible shift in focus of the assessment of energy measurement, monitoring and management systems, to mandating a simpler set of requirements more directly related to a standard for the performance of an adequate Energy Efficiency Opportunities Assessment, calls for a further estimation of compliance costs.

158. Under this scenario companies would not use the 3 plus tool for compliance, but rather as a reporting tool against which they do not have to reach any particular standard. However, the program would mandate, as part of the standard for the Assessment of Energy Efficiency Opportunities, certain elements described in the 3 plus tool. These elements will be integrated as required components of the Energy Efficiency Opportunities Assessment process.

Physical boundary assumptions

159. The government's White Paper indicated that around 250 firms might be expected to be required to comply with the EEO measure, by consuming in excess of 0.5 PJ of energy per year. In order to assess the possible costs of complying with the measure for these 250 firms, a number of boundary issues must be taken into account. For example:

1. Who are the 250 firms, what is their structure and in what sectors do they operate?
2. What proportion of energy use within each sector (as estimated by, say ABARE) will be captured under the measure, and at what cost is this energy acquired (so that benefits can be reasonably estimated)?
3. What existing data acquisition, reporting and assessment levels are there within organisations such as consolidated purchasing, reporting to Greenhouse Challenge, internal systems-focus on energy management and assessment of opportunities?
4. What is the definition of “energy” under the measure including common sources used for energy value, process feedstock, explosives and chemical processes?
5. At what organisation level(s) is 0.5 PJ to be measured and do organisation structures give rise to the potential for multiple reporting entities coming from within individual firms?

160. These basic boundary issues are potentially material to the costs of compliance, both in terms of the number of firms or reporting entities that may be captured (impacting on overall costs of compliance) and on the cost per firm or entity required to comply. For the purpose of this assessment:

1. It was assumed that 250 entities would be required to comply,
2. ABARE and industry knowledge were used to estimate the number of entities within each sector (generally at 1- and 2-digit ANZSIC levels),
3. These entities were characterised by organisation type to recognise differences in approaches to compliance – including large corporate entities with a large number of high-energy use sites, smaller industrial firms that use 0.5 PJ through a small number of high-energy use sites and / or the aggregation of energy use at several sites, and typically commercial-sector organisations that use 0.5 PJ only through the aggregation of energy use at a large number of sites. We see 4 basic types of organisation structure that may apply:
 - a. Type 1: A small (< 10) number of operations with central management, with a total energy use > 0.5PJ. Likely to be industrial. Typically compliance is managed centrally.
 - b. Type 2: A medium (up to 20) number of operations, with some operations > 0.5PJ or total energy >0.5 PJ and strong local and corporate management. Likely to be industrial. Typically compliance is at a local level with some coordination and reporting of compliance centrally.
 - c. Type 3: A large (20 to 1,000+) number of operations with generally small individual energy use, but total energy use > 0.5PJ, and central management. Likely to be communications, commercial, retail, cafes/restaurants and transport. Typically compliance is managed centrally.
 - d. Type 4: A large (20 to 50+) number of operations with some/many sites > 0.5PJ. Both strong local and central management. More likely to be industrial. Typically compliance is at a local level to ensure sites > 0.5PJ pass assessment, with coordination and quality control managed centrally to ensure consistency of response.
4. Energy forms were taken to include those fuels used for their intrinsic energy value and commonly reported as “energy usage” – i.e. electricity, natural gas, petroleum, diesel, LPG, fuel oil, coal and derived coal (by)products, woodwaste, bagasse,
5. Estimates were made of the proportion of sectoral energy use that would be captured by the 250 entities, and this energy use was costed using estimated energy rates for various sources, including recognition of sectoral price differences,

6. This approach results in one scenario that estimates average energy use and cost per firm or entity within each sector by firm type. It is recognised that this is one scenario, and that the final make-up in terms of the number of entities, their energy use and cost will be different.

161. These boundary assumptions were used for the assessment of potential compliance costs under both Order 2005 3 and Order 2005 3a.

Approach to reporting potential costs

162. Under both potential compliance regimes we have sought initially to “imagine” that organisations do not currently do any of the tasks that are identified in 3-Plus. This is, of course, not the case, and hence total cost estimates that result have no particular relevance. This approach is useful to estimate what the potential costs per-firm are however, as it may be expected that some (albeit few) firms will fall into this category.

163. We estimate that, in relation to the elements required to be completed to achieve minimum compliance for both approaches, the most significant factors that will affect cost estimates are:

- Influence – we expect that many large energy-using firms will have some core processes or equipment that are unlikely to be influenced to a significant degree by the EEO assessments. For example aluminium reduction cells, blast furnace, mine draglines and other similar “lumpy assets” may, to a large extent, be outside the influence of this measure other than at a reporting level and peripheral influencing factors. We expect that this factor will have the highest impact on compliance costs.
- Additionality – for other energy consuming equipment and processes, it will be the case that some firms manage this to some degree, and have some processes in place to identify, assess, scope and implement actions that are cost effective. To the extent that firms already do this (and to the extent that they achieve comprehensive and sustained improvement) the EEO assessment may be an additional task.

164. Noting these factors the following approach to costing under both the initial and the simplified model was adopted:

- Determination if the 0.5 PJ threshold is achieved: an upper limit of cost was estimated and would reflect a firm / reporting entity that has limited knowledge of energy usage (though costs are assumed to be managed from an accounting perspective), together with a low estimate (large users and firms who have a good or reasonable knowledge of usage or ready access to this information) and an average estimate taken to represent the expected overall effort required by firms to assess their need to comply and then register with DITR including an outline of the organisation structure proposed to manage compliance.

- Cost of compliance with 3-Plus elements: this was limited to two scenarios – firstly under the initial Order a scenario was created using 3-Plus that would enable compliance (50% score) to be achieved, and costs estimated taking the organisation structure into account and linked, where appropriate, to energy use / spend by firm or entity within these structures; secondly under the proposed Simplified approach costs were assessed on a similar basis. For both scenarios key elements likely to influence costs are identified. Further for both scenarios, influence and additionality factors are estimated, to reflect possible compliance costs that are over and above costs firms may incur now to meet the stated requirements.
- Costs of Opportunities Assessments: as a base scenario we have constructed a model to estimate what firms could expend on a typical detailed technical assessment, drawing on %-of-energy/opex estimates by others. Influence and additionality factors are taken into account to determine the potential “additional” costs for this aspect. The initial 3-Plus model and the Simplified model then describe additional tasks that should be completed, principally related to engagement of management, broader consultation across multiple stakeholders, and development of appropriate data management and metering strategies. Base and “additional” costs under both scenarios are estimated for these additional tasks.

SUMMARY OF FINDINGS

Overall costs of compliance

165. Under a simplified approach to compliance (Order 2005 3a) we estimate the following costs may be “additional” to costs firms/entities incur related to energy efficiency.

Table 1: Estimated EEO compliance costs – simplified additional approach

Element	Development / Upfront Cost	Recurrent Annual Cost	Average per-firm development cost	Average per-firm recurrent cost	Average 5-Year Per-Firm Cost
Confirming 0.5PJ threshold	\$ 2,335,000	\$ -	\$ 9,340	\$ -	\$ 9,340
Policy, management & people	\$ 4,673,000	\$ 1,412,805	\$ 18,692	\$ 5,651	\$ 41,296
Data & analysis	\$ 1,749,960	\$ 3,551,250	\$ 7,000	\$ 14,205	\$ 63,820
Opportunities assessment		\$ 14,660,000	\$ -	\$ 58,640	\$ 293,200
Innovation & excellence	\$ -	\$ -	\$ -	\$ -	\$ -
Reporting	\$ 3,681,250	\$ 2,297,715	\$ 14,725	\$ 9,191	\$ 51,489
All elements	\$ 12,439,210	\$ 21,921,770	\$ 49,757	\$ 87,687	\$ 459,145

166. The above 5-year average cost per firm / entity is equivalent to 0.66% of average 5-year spend on energy use that could be influenced by the measure, and is equal to a total 5-year cost for the measure of \$115 million. Under the original 3-Plus the estimated additional costs to comply (achieve the minimum 50% score in 3-plus) are:

Table 2: Estimated EEO compliance costs – original additional approach

Element	Development / Upfront Cost	Recurrent Annual Cost	Average per-firm development cost	Average per-firm recurrent cost	Average 5-Year Per-Firm Cost
Confirming 0.5PJ threshold	\$ 2,335,000	\$ -	\$ 9,340	\$ -	\$ 9,340
Policy, management & people	\$ 10,724,375	\$ 3,316,840	\$ 42,898	\$ 13,267	\$ 95,966
Data & analysis	\$ 4,625,000	\$ 6,287,500	\$ 18,500	\$ 25,150	\$ 119,100
Opportunities assessment	\$ -	\$ 14,660,000	\$ -	\$ 58,640	\$ 293,200
Innovation & excellence	\$ 312,500	\$ 2,095,000	\$ 1,250	\$ 8,380	\$ 34,770
Reporting	\$ 3,681,250	\$ 2,297,715	\$ 14,725	\$ 9,191	\$ 51,489
All elements	\$ 21,678,125	\$ 28,657,055	\$ 86,713	\$ 114,628	\$ 603,865

167. These costs are lower than those that exclude additionality; these costs are estimated at \$42.5 million development and \$41.5 million recurrent to achieve a minimum 50% 3-Plus score. Individual components of these cost estimates are summarized below.

Meeting 0.5PJ threshold & registration with DITR

168. We estimate that, on average firms / entities may incur costs of less than \$10,000 to determine they need to comply with EEOA, define the proposed organisation structure / business model for achieving compliance, and register with DITR.

Table 3: Cost to confirm 0.5PJ threshold, EEOA structure and registration

Type	# of Entities	Low Cost	High Cost	Average cost	Total cost - Low	Total cost - High	Total cost - Average
1	65	\$ 2,000	\$ 10,000	\$5,000	\$130,000	\$650,000	\$325,000
2	90	\$ 2,000	\$ 15,000	\$7,000	\$180,000	\$1,350,000	\$630,000
3	55	\$ 5,000	\$ 50,000	\$20,000	\$275,000	\$2,750,000	\$1,100,000
4	40	\$ 4,000	\$ 10,000	\$7,000	\$160,000	\$400,000	\$280,000
All	250	\$ 2,000	\$ 50,000	\$9,340	\$745,000	\$5,150,000	\$2,335,000

- This shows an estimated average cost per firm / entity of \$9,340, and an estimated total cost of \$2.3 million,
- Upper limit costs for any single firm are estimated to be \$50,000 – this would typically be a firm / entity with a large number of, generally, small energy-using sites who does not currently have knowledge of energy usage or consolidated data systems other than cost accounting systems. We expect that firms at this level would be the exception,
- Lower bound costs are estimated to be nominal, at about \$2,000, and would apply to many firms who have knowledge of energy use / know that energy use far exceeds 0.5 PJ, and incur costs primarily to complete registration and how confirm business units / entities will participate,
- This is assumed to be a one-off cost to business.

Policy, management and people

169. Under the proposed simplified set of requirements for this element, upfront and recurrent costs per firm are estimated to be:

Table 4: Estimated “additional” costs for element 1 under simplified model

Area	Description	Development Cost	Recurrent Cost
1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		
1.1 Public Policy:	State corporate level objectives (short and long term)	\$ 1,250,000	\$ 312,500
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei	\$ 3,056,250	\$ 1,008,590
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management	\$ 366,750	\$ 91,715

170. This is equivalent to \$18,700 on average per firm in upfront costs (first year) and \$5,700 per year recurrent costs (e.g. years 2 to 5 under a 5-year program). Total costs are \$4.7 million upfront and \$1.4 million recurrent. This compares with estimated costs under the original 3-Plus model (mandatory and selected flexible elements to achieve minimum 50% score) as shown below:

Table 5: Estimated “additional” costs for element 1 under original model

Area	Description	Development Cost	Recurrent Cost
1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		
1.1 Public Policy:	State corporate level objectives (short and long term)	\$ 1,250,000	\$ 312,500
1.2 Internal Policy and Action Plan	Be structured so that it is consistent with or integrated into other core management strategies such as business improvement, risk management, OH&S, environmental management		
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei		
1.2 Internal Policy and Action Plan	Include a Communication strategy that ensures all staff have access to relevant content of the Policy and Action Plan and ensures that all new and existing staff are aware of the energy policy.	\$ 6,112,500	\$ 2,017,125
1.3 Public policy	Published on firm’s web-site and in Annual Report		
1.3 Public policy	Policy lists individual targets for major sites or major energy consuming activities comprising specified percentage of organisation’s total energy cost	\$ 1,528,125	\$ 382,050
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management		
1.4 Internal Policy	Formal KPIs for relevant staff are included in their Duty Statements		
1.4 Internal Policy	Energy policy requires contractors and suppliers to submit energy policy.		
1.4 Internal Policy	The internal policy was developed with the active consultation and involvement of staff across site functional groups and vertically from “bottom up”.	\$ 1,833,750	\$ 605,165

171. The additional costs of compliance with Element 1 to achieve the minimum compliance score is estimated to be \$43,000 on average per firm / entity to develop, and \$13,250 per year recurrent. Total costs are estimated at \$10.7 million upfront and \$3.3 million recurrent.

Data and analysis

172. Under the proposed simplified set of requirements for this element, upfront and recurrent costs per firm are estimated to be:

Table 6: Estimated “additional” costs for element 2 under simplified model

Area	Description	Development Cost	Recurrent Cost
2.1 Monitoring and Reporting Data	Energy billing data at site and/or business unit level collated		
2.1 Monitoring and Reporting Data	Performance compared with objectives and targets in corporate and site policies on a monthly basis	\$ 999,960	\$ 1,770,000
2.2 Analysis	Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager	\$ 750,000	\$ 555,000
2.3 Monitoring and Reporting Data	Frequently collected and reported energy data (monthly or weekly or more frequently)		
2.3 Monitoring and Reporting Data	Either permanent or temporary sub-metering installed or sub-metering data from representative company processes and data regularly collected and analysed		
2.3 Monitoring and Reporting Data	Where sub-metering is installed, specify how often data (including trends and benchmarking) is reported to management and equipment operators		
2.4 Analysis	Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered	\$ -	\$ 1,226,250

173. This is equivalent to \$7,000 on average per firm in upfront costs (year 1) and \$14,000 per year recurrent costs (e.g. years 2 to 5 in a 5-year program). Total “additional costs” are \$1.75 million upfront and \$3.55 million recurrent.

174. This compares with estimated costs under the original 3-Plus model (mandatory and selected flexible elements completed to achieve minimum 50% score) as shown below:

Table 7: Estimated “additional” costs for element 2 under original model

Area	Description	Development Cost	Recurrent Cost
2.1 Monitoring and Reporting Data	Energy billing data at site and/or business unit level collated, and monthly report submitted to site or business unit manager (for 90% of organisation’s total energy cost). Summary report submitted quarterly to CEO and Board		
2.1 Monitoring and Reporting Data	Performance compared with objectives and targets in corporate and site policies on a monthly basis	\$ 1,500,000	\$ 2,655,000
2.2 Analysis	Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager	\$ 750,000	\$ 555,000
2.4 Analysis	Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such a		
2.4 Analysis	Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered		
2.4 Analysis	Use of energy-based models with plant/equipment designers/specifiers and suppliers to facilitate design or selection of more efficient options, for every significant equipment or plant purchase.		
2.4 Analysis	Analysis of performance at equipment, system and/or plant or site level against ‘best existing practice’ indicators, within the last year	\$ 2,375,000	\$ 3,077,500

175. The additional costs of compliance with Element 2 to achieve the minimum compliance score is estimated to be \$18,500 on average per firm / entity to develop, and \$25,000 per year recurrent. Total costs are estimated at \$4.6 million upfront and \$6.3 million recurrent.

176. We note no costs for sub-metering are included. Within the Opportunities Assessment stage we assume that temporary sub-metering would be installed to inform the assessment, and is costed as part of this work. We further assume that permanent sub-metering is only justified on a cost-effectiveness basis and would be included in the development of total costs / benefits associated with a particular project or suite of projects, rather than as a cost of compliance.

Innovation & excellence

177. Under a proposed simplified set of requirements there would be no requirement to meet any minimum performance level of this element. Hence costs are nil.

178. This compares with estimated costs under the original 3-Plus model (selected flexible elements completed to achieve minimum 50% score) as shown below:

Table 8: Additional cost of compliance with element 4.3

Area	Description	Development Cost	Recurrent Cost
4.3 Internal Policy	Policy includes commitment to improve product or service energy efficiency through design		
4.3 Internal Policy	Policy includes commitment to apply lifecycle costing to new plant and equipment design and selection		
4.3 Internal Policy	Policy includes commitment to apply lifecycle costing to procurement of materials, products and equipment	\$ 312,500	\$ 2,095,000

179. This implies an average additional cost per entity of \$1,250 to develop the above requirements (year 1), and about \$8,500 per year (2 to 5) thereafter in additional costs to comply (estimates rounded to nearest \$250). Total costs are \$0.3 million upfront and \$2.1 million recurrent.

Reporting

180. No simplified reporting requirements are proposed, just those specified in the 3-plus tool provided with Order 2005 3. Additional costs associated with reporting elements are:

Table 9: Additional cost of compliance with element 5

Area	Description	Development Cost	Recurrent Cost
5.1 Reporting to DITR	List of identified opportunities that meet DITR rate of return threshold		
5.1 Reporting to DITR	Information on the organisation's response to each opportunity		
5.1 Reporting to DITR	Annual report on past and projected future trends in energy use and energy efficiency indicators must be submitted (including energy use, PJ and \$, energy/\$profit, rate of energy efficiency improvement)		
5.1 Reporting to DITR	Annual report on cumulative and latest year annual costs and benefits of EEO measures		
5.1 Reporting to DITR	Comparisons against benchmarks for international 'best practice' indicators agreed with DITR		
5.1 Reporting to DITR	Compliance report submitted to DITR	\$ 3,056,250	\$ 2,047,715
5.2 Public Reporting	Public Summary report of the above submitted to DITR, the placed on the organisation's web-site and reported in its Annual Report	\$ 625,000	\$ 250,000

181. This implies an average cost per entity of \$15,000 to develop suitable reporting templates to DITR and web summary publications (year 1). Recurrent costs (years 2 to 5) are estimated at an average of \$9,000 per entity (rounded to the nearest \$500). Total costs are \$3.7 million upfront and \$2.3 million recurrent.

Opportunities assessment

182. The potential cost of assessing opportunities was assessed separate to other mandatory elements of 3-Plus, and drew on previous suggested approaches that linked expenditure on this element to the proportion of total spend that is energy-related, together with the above approach to setting boundaries. Possible “additional” costs are indicated below:

Table 10: Estimated additional annual cost of opportunities assessment

Sector	\$/Firm in Type 1	\$/Firm in Type 2	\$/Firm in Type 3	\$/Firm in Type 4	Annual \$ Type 1	Annual \$ Type 2	Annual \$ Type 3	Annual \$ Type 4	TOTAL ANNUAL \$
Div. B Mining	\$ 0.0287	\$ 0.0318	\$ -	\$ 0.0561	\$ 0.861	\$ 0.318	\$ -	\$ 1.403	\$ 2.58
21 Food, beverages, tobacco	\$ 0.0550	\$ 0.0971	\$ -	\$ -	\$ 0.550	\$ 1.651	\$ -	\$ -	\$ 2.20
22 Textile, clothing, footwear and leather	\$ 0.0850	\$ -	\$ -	\$ -	\$ 0.170	\$ -	\$ -	\$ -	\$ 0.17
23-24 Wood, paper and printing	\$ -	\$ 0.0222	\$ -	\$ 0.0639	\$ -	\$ 0.155	\$ -	\$ 0.192	\$ 0.35
25 Petroleum, coal and chemical	\$ 0.0163	\$ 0.0287	\$ -	\$ 0.1486	\$ 0.163	\$ 0.431	\$ -	\$ 0.743	\$ 1.34
26 Non-metallic mineral products	\$ 0.0260	\$ 0.0424	\$ -	\$ -	\$ 0.078	\$ 0.297	\$ -	\$ -	\$ 0.38
27 Metal products	\$ 0.0247	\$ 0.0235	\$ -	\$ 0.0917	\$ 0.074	\$ 0.470	\$ -	\$ 0.183	\$ 0.73
28 Machinery and equipment	\$ 0.0714	\$ 0.0833	\$ -	\$ -	\$ 0.500	\$ 0.250	\$ -	\$ -	\$ 0.75
37 Water, sewerage and drainage	\$ -	\$ 0.1075	\$ -	\$ 0.1385	\$ -	\$ 0.430	\$ -	\$ 0.139	\$ 0.57
Div. E Construction	\$ -	\$ -	\$ 0.0570	\$ -	\$ -	\$ -	\$ 0.342	\$ -	\$ 0.34
Div. I Transport & storage	\$ -	\$ 0.0243	\$ 0.0177	\$ 0.0350	\$ -	\$ 0.170	\$ 0.071	\$ 0.140	\$ 0.38
Commercial and Services b	\$ -	\$ -	\$ 0.1083	\$ -	\$ -	\$ -	\$ 4.874	\$ -	\$ 4.87
Grand Total	\$ 0.0369	\$ 0.0464	\$ 0.0961	\$ 0.0700	\$ 2.396	\$ 4.172	\$ 5.287	\$ 2.800	\$ 14.66

183. That is, an average of \$14.66 million would be expected to be spent on opportunities assessment per year, additional to what firms may currently spend. This equates to \$58,500 per firm / entity per year, with a range from about \$16,000 to \$150,000 per year on average for firms within sectors. We note that the inherent statistical nature of the analysis will produce outliers, and cost ranges on an average-per-firm within each sector may not be so diverse.

184. We note also that annualised averages are unlikely to reflect the nature of expenditure for some firms. In many cases it could be expected that much higher costs would be incurred in Year 1, with lower costs in subsequent years to assess progress of individual opportunities and identify / evaluate new opportunities. However the total cost of \$14.66 million per year implies an overall cost of Opportunities Assessment over 5 years of \$73.25 million. The mix of firms / entities conducting assessments in any one year would influence the actual amount spent, but would on these estimates average \$14.66 million per year. This is equivalent to about 0.42% of the estimated annual cost of energy use that is expected to be influenced by the measure.

BENEFITS OF EEOA

185. Re-stating the estimated possible costs of compliance with EEOA:

Overall costs of compliance

186. Under a simplified approach to compliance (Order 2005 3a) we estimate the following costs may be “additional” to costs firms/entities incur related to energy efficiency.

Table 1: Estimated EEO compliance costs – simplified additional approach

Element	Development / Upfront Cost	Recurrent Annual Cost	Average per-firm development cost	Average per-firm recurrent cost	Average 5-Year Per-Firm Cost
Confirming 0.5PJ threshold	\$ 2,335,000	\$ -	\$ 9,340	\$ -	\$ 9,340
Policy, management & people	\$ 4,673,000	\$ 1,412,805	\$ 18,692	\$ 5,651	\$ 41,296
Data & analysis	\$ 1,749,960	\$ 3,551,250	\$ 7,000	\$ 14,205	\$ 63,820
Opportunities assessment		\$ 14,660,000	\$ -	\$ 58,640	\$ 293,200
Innovation & excellence	\$ -	\$ -	\$ -	\$ -	\$ -
Reporting	\$ 3,681,250	\$ 2,297,715	\$ 14,725	\$ 9,191	\$ 51,489
All elements	\$ 12,439,210	\$ 21,921,770	\$ 49,757	\$ 87,687	\$ 459,145

187. Under the original 3-Plus the estimated additional costs to comply (achieve the minimum 50% score in 3-plus) are:

Table 2: Estimated EEO compliance costs – original additional approach

Element	Development / Upfront Cost	Recurrent Annual Cost	Average per-firm development cost	Average per-firm recurrent cost	Average 5-Year Per-Firm Cost
Confirming 0.5PJ threshold	\$ 2,335,000	\$ -	\$ 9,340	\$ -	\$ 9,340
Policy, management & people	\$ 10,724,375	\$ 3,316,840	\$ 42,898	\$ 13,267	\$ 95,966
Data & analysis	\$ 4,625,000	\$ 6,287,500	\$ 18,500	\$ 25,150	\$ 119,100
Opportunities assessment	\$ -	\$ 14,660,000	\$ -	\$ 58,640	\$ 293,200
Innovation & excellence	\$ 312,500	\$ 2,095,000	\$ 1,250	\$ 8,380	\$ 34,770
Reporting	\$ 3,681,250	\$ 2,297,715	\$ 14,725	\$ 9,191	\$ 51,489
All elements	\$ 21,678,125	\$ 28,657,055	\$ 86,713	\$ 114,628	\$ 603,865

188. These costs are lower than those that exclude additionality; these costs are estimated at \$42.5 million development and \$41.5 million recurrent to achieve a minimum 50% 3-Plus score. Metering and innovation costs are generally additional to these costs, and are assumed to be justified on a cost-benefit basis for individual projects or approaches by individual firms / entities.

189. The NFEE development process, to which Energetics contributed input in relation to potential savings in the industrial sectors, estimated that savings of 101 PJ out of an estimated 1,474 PJ (mining and manufacturing plus commercial – 6.85% above BAU) could potentially be achieved if just 50% of measures at nominal 4-year payback or less were found to be viable.

190. The process adopted here estimates that 54% of industrial and commercial energy use will be subject to the EEOA measure. If we assume that savings above are equally distributed between those included in, and those not included in EEOA this gives an estimate of expected savings by EEOA liable parties of 54 PJ.

191. The process adopted here has sought to isolate those areas where industry currently has no additional support need – this yields an estimated 353 PJ in 2000/01 of energy that is estimated not to be presently managed effectively for energy efficiency. If 54 PJ is wholly achievable from this energy (i.e. 100% of all remaining energy is assumed to be fully managed to yield all cost-effective opportunities) this equates to 15.4% savings against 2000/01 usage (less against growth in this energy to 2015 – eg if growth is 2% pa, 353 PJ becomes 465 PJ under BAU, and 54PJ savings against 2015 = 11.6%).

192. We do not have access to modeling behind the economic benefits of the NFEE. However the value of 54 PJ in annual savings, distributed proportionate to current usage, across all energy forms used in this model, could be more than \$700 million per year in 2015 if energy prices escalate at just 2% per year. This compares with \$12.4 million in EEOA set-up costs and \$21.9 million recurrent (assuming all \$700 million in 2015 savings are the result of EEOA and not other NFEE policies – e.g. MEPS extended to commercial / industrial sectors), excluding implementation costs which would be in excess of \$1.4 billion to achieve an average 2.3 year payback (from NFEE).

COST OF COMPLIANCE: “COMMON ENERGY” DEFINITION

Costs of identifying energy use to determine whether they are subject to the 0.5PJ threshold

Type 1: A small (< 10) number of operations with central management, with a total energy use > 0.5PJ. Likely to be industrial. Typically compliance is managed centrally.

We expect that, whether energy is reported / centrally procured or not, the cost of determining if an organisation in this category meets or exceeds the 0.5 PJ threshold (and registering with DITR) will be low under a “common” definition of “energy”.

We expect that, in general, Type 1 companies are those that reach the 0.5PJ criterion through the aggregation of the energy use at one or more sites. This represents companies with a single management structure that is likely to implement the program and undertake the assessment.

We expect that companies captured under this definition may include:

- Small to medium scale mining and oil & gas companies,
- Some food & beverage companies in many F&B sub-sectors, such as sugar, beer & malt, carbonated soft drinks, cereals, dairy processing, meat processing, seafood processing, confectionary, fruit & vegetable,
- Some chemicals manufacturers
- Machinery and equipment manufacturers
- Some independent metals manufacturing companies (e.g. steel, recycled steel, copper and zinc smelting, alumina refining, aluminium smelting),
- Some non-metallic minerals companies

193. In our opinion, the cost per company to determine if they exceed 0.5 PJ and register with DITR will be in the range \$2-10,000, with higher costs incurred where data is not managed effectively and external resources are engaged to assist in determining total usage and assisting to define business structure for the purpose of the measure. In general we would expect that costs would be at the lower end of this cost range, with many companies already having at least basic energy use knowledge via reporting or central procurement. Total number of companies may be in the order of 65.

Type 2: A medium (up to 20) number of operations, with some operations > 0.5PJ or total energy >0.5 PJ and strong local and corporate management. Likely to be industrial. Typically compliance is at a local level with some coordination and reporting compliance centrally.

194. We expect that where energy is reported / centrally procured, the cost of determining if an organisation in this category meets or exceeds the 0.5 PJ threshold will be low under a “common” definition of “energy”. Where this is not the case costs are likely to be low to moderate.

195. Some organisations in this category will be among the largest energy users in Australia (far in excess of 0.5 PJ), and will already be aware that they are required to comply with the measure. Notwithstanding autonomy of operation at a site level, deregulation of energy markets will in most cases have led to centralized procurement of major energy forms, which will make assessment of energy use relatively easy.

We expect that companies captured under this definition may include:

- Large scale mining and oil & gas companies,
- Some food & beverage companies in F&B sub-sectors, such as baking, major dairy processing, major meat processing,
- Wood, paper and printing companies,
- Some non-metallic minerals companies,
- Some chemicals manufacturers, particularly with down-stream operations, large plastics manufacturing,
- Metals manufacturing companies,
- Possibly some transport & storage companies, and gas production / distribution,

196. In our opinion, the cost per company to determine whether they exceed 0.5 PJ and then register with DITR will be in the range \$2-15,000, with higher-end costs incurred where data is not currently managed effectively and external resources are engaged to assist in determining total usage and assisting to define business structure for the purpose of the measure. In general we would expect that costs would be at the lower end of this cost range, with many companies already having at least basic energy use knowledge via reporting or central procurement. Even where a more detailed assessment is required (e.g. for borderline 0.5 PJ companies), the small number of sites would mean relatively low costs of acquiring relevant account data and requesting usage information from suppliers. We expect that total number of companies will be higher than for Type 1, estimate 90.

Type 3: A large (20 to 1,000+) number of operations with generally small individual energy use, but total energy use > 0.5PJ, and central management. Likely to be communications, commercial, retail, cafes/restaurants and transport. Typically compliance is managed centrally.

197. We expect that moderate to high costs may be incurred by some companies within this category compared with others, owing to both the large number of sites for which data may need to be acquired (where not retained from procurement activities), in particular where energy use is borderline 0.5 PJ, and the possible number of business operations. Some companies here are very large, and will have knowledge that they far exceed 0.5 PJ – for these costs to confirm energy use exceeds this level will be low, but developing proposed structural approach might be more costly.

We expect that companies captured under this definition may include:

- Communications,
- Supermarket companies,
- Large commercial property trusts / owners,
- Banks and other financial institutions,
- Fast-food chains (medium to large number under central ownership would be required),
- Some retail-centre owners,
- Hotel chains / hospitality,
- Construction companies,
- Transport companies

198. We estimate that the highest costs and widest range of costs to determine if energy use > 0.5 PJ will be incurred here. Costs are estimated to range from \$5-50,000, with higher costs incurred by a (probably) small number of companies without centralized energy data. For very large companies such as major banks and supermarket chains, it is likely that energy use or cost is reasonably well known, however modest costs may be incurred to develop proposed structures for the measure, taking (generally) higher numbers of business units that may be included. Average costs may be in the order of \$20,000. We expect that total number of reporting entities will be in the order of 55.

Type 4: A large (20 to 50+) number of operations with some/many sites > 0.5PJ. Both strong local and central management. More likely to be industrial. Typically compliance is at a local level to ensure sites > 0.5PJ pass assessment, with coordination and quality control managed centrally to ensure consistency of response.

199. We would expect that this category will include major mining / resources and mineral processing companies, some pulp & paper companies and some diversified manufacturing companies. In general we would expect most, or all of these companies to use far in excess of 0.5 PJ, and costs to determine requirements to comply are likely to be low. Estimated costs are \$4-10,000 to determine compliance and registration. The number of companies is likely to be low, with a number of business units individually complying with the measure. Estimated number of reporting entities is 40.

Summary

Table 11: Summary of 0.5PJ threshold, compliance structure & registration costs

Type	# of Entities	Low Cost	High Cost	Average cost	Total cost - Low	Total cost - High	Total cost - Average
1	65	\$ 2,000	\$ 10,000	\$5,000	\$130,000	\$650,000	\$325,000
2	90	\$ 2,000	\$ 15,000	\$7,000	\$180,000	\$1,350,000	\$630,000
3	55	\$ 5,000	\$ 50,000	\$20,000	\$275,000	\$2,750,000	\$1,100,000
4	40	\$ 4,000	\$ 10,000	\$7,000	\$160,000	\$400,000	\$280,000
All	250	\$ 2,000	\$ 50,000	\$9,340	\$745,000	\$5,150,000	\$2,335,000

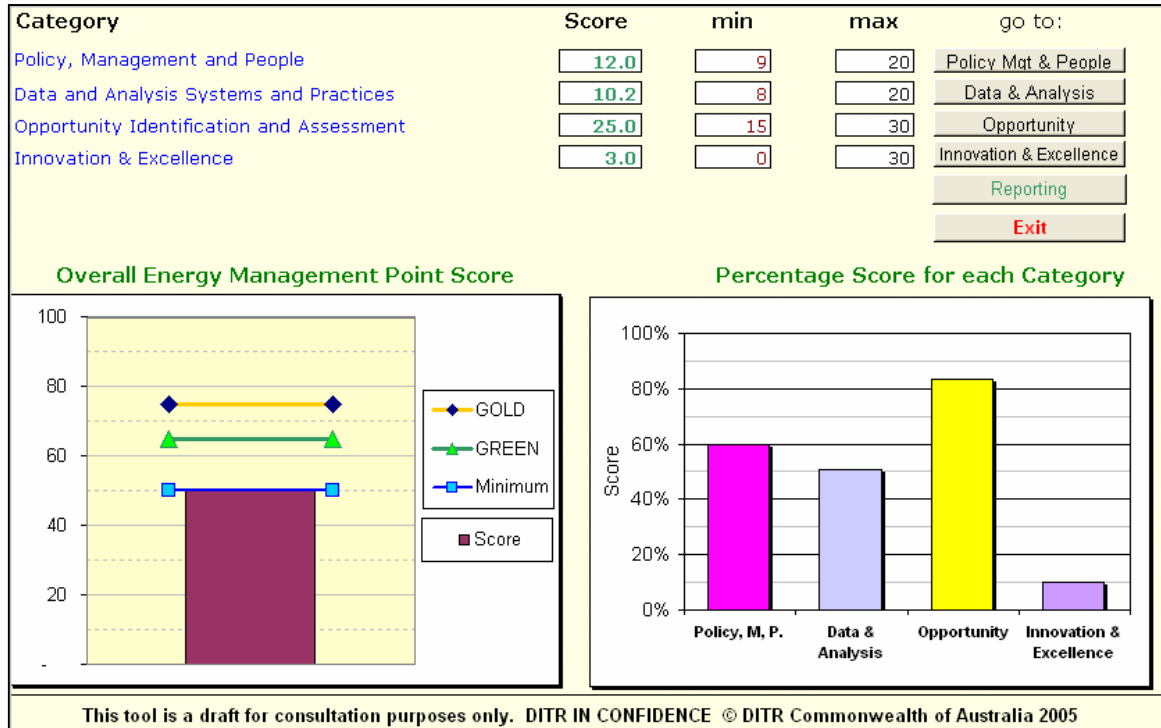
200. Within each of the end-user types assessed here, we note that costs a company may incur to simply inform themselves of the nature, intent and scope of the measure have not been included. We expect that a number of companies have already incurred expense, internally and potentially externally, to conduct this task, and may continue to do so.

201. Note: we have excluded from this assessment energy producers and distributors, and government operations. Clarification on the inclusion of these is required, taking into account ownership & equity issues (eg public/government owned generation and distribution assets), and energy use definitions (particularly at distribution level – eg petroleum).

Costs of Minimum Performance Against 3-Plus Standard – Order 2005 3

202. In assessing the costs to comply with the requirements of 3-Plus (initial structure) we have looked at a possible “minimum-cost” model that would enable the minimum score of 50 points to be achieved. This resulted in the following overall score.

Figure 1: Outcome from 3-Plus scenario for minimum score to comply



203. The following summary describes the estimated costs associated with completion of mandatory and flexible elements that could be associated with achieving this score. In each element we estimate base costs assuming no current measures are in place, followed by an assessment of likely costs taking current action into account.

Policy, management and people

MANDATORY REQUIREMENTS					
1.1 Public Policy:		Complies?			
Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		Yes ▾			
State corporate level objectives (short and long term)		Yes ▾			
1.2 Internal Policy and Action Plan					
<u>The Internal Energy Policy</u>					
Be structured so that it is consistent with or integrated into other core management strategies such as business improvement, risk management, OH&S, environmental management		Yes ▾			
Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for their delivery.		Yes ▾			
These must then be authorised/confirmed each year by the CEO and Board (Australia) after formal review by the senior management team					
Include a Communication strategy that ensures all staff have access to relevant content of the Policy and Action Plan and ensures that all new and existing staff are aware of the energy policy.		Yes ▾			
FLEXIBLE ACTIONS: Policy, Management and People					
1.3 Public policy		(Insert data in white boxes)		Max Points	Your Points
Published on firm's web-site and in Annual Report		Yes ▾	1	1	
Policy lists individual targets for major sites or major energy consuming activities comprising specified percentage of organisation's total energy cost	Percentage of energy costs with individual objectives =	100	2	2	
1.4 Internal Policy					
State titles and names of senior staff at each site and/or business unit formally responsible for energy management	Percentage of energy for which responsible staff named in policy=	100	1	1	
Energy improvement KPIs used in salary calculation of senior staff named above. Max score for 10% of salary influenced by energy efficiency.	Enter energy efficiency component of salary.	0	2	0	
Formal KPIs for relevant staff are included in their Duty Statements	<input checked="" type="checkbox"/> KPIs included in duty statement:		1	1	
Site / Business Unit level energy management Action Plan update frequency	Annually = 0 points ▾		1.5	0	
Energy policy requires contractors and suppliers to submit energy policy.	Yes ▾		1	1	
Policy commits to implementation of energy efficiency opportunities with IRR < 50% p.a. (or equivalent as calculated using evaluation methodology specified in Internal Policy)	50% IRR = 0 points ▾		2.5	0	
The internal policy was developed with the active consultation and involvement of staff across site functional groups and vertically from "bottom up".	Yes ▾		1	1	
A staff energy efficiency training strategy that provides energy training up to a maximum for 5 person-training days per million dollars of energy costs.	Enter energy efficiency training days / \$M energy	0	2	0	

Base cost – no current policy or plans

204. 1.1 & 1.2: Mandatory Elements: development of a public policy is assumed to cost in the order of \$10,000 per entity to develop and a further \$2,500 per year to update. It is assumed that this is developed at the corporate level for each entity, and does not vary by organisational complexity. The main cost element here is to “State corporate level objectives (short and long term)” since this could be expected to require some level of assessment of committed action plans at site/business unit level, and future business plans at these levels (upfront and annually to re-confirm objectives). The cost to develop a corporate policy itself would be nominal.

205. Costs will vary by organisational complexity for the development of element 1.2 Internal Policy and Action Plan. For Type 1 organisations we estimate a development cost of \$30,000, with about twice this cost (\$60,000) for both Type 2 and Type 4 entities owing to their greater number of sites and/or energy spend. Type 3 organisations are expected to be characterised by few, if any, sites spending more than \$5 million on energy per year, and the action plans are expected to be at the level of corporate plus technologies / techniques that can be rolled out across business units and jurisdictions. Establishment costs are estimated at \$45,000.

206. A significant component of these costs is expected to relate to the first sub-element, requiring that the policy and action plan “Be structured so that it is consistent with or integrated into other core management strategies such as business improvement, OH&S, environmental management”. This could entail analysis of the requirements and structure of these systems at site / business unit level to ensure conformance. The requirement for a “Communications strategy...” could also be a sizeable upfront cost, for example if the development of a video is considered to be an effective method of conveying the policy and action plan to teams of employees / managers within sites and business units.

207. For all types of organisation we assume that about one third of development costs will be spent annually on updating action plans consistent with the stated requirements. This gives total development and recurrent costs as shown below.

Table 12: Base cost of compliance with element 1.1 & 1.2 – no current action

Area	Description	Development Cost	Recurrent Cost
1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		
1.1 Public Policy:	State corporate level objectives (short and long term)	\$ 2,500,000	\$ 625,000
1.2 Internal Policy and Action Plan	Be structured so that it is consistent with or integrated into other core management strategies such as business improvement, risk management, OH&S, environmental management		
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei		
1.2 Internal Policy and Action Plan	Include a Communication strategy that ensures all staff have access to relevant content of the Policy and Action Plan and ensures that all new and existing staff are aware of the energy policy.	\$ 12,225,000	\$ 4,034,250

208. This implies an average cost per entity of \$59,000 to develop policies and action plans consistent with requirements, and about \$18,500 per year thereafter to update these (estimates rounded to nearest \$500).

209. 1.3 & 1.4: Flexible Elements: If all sub-elements of 1.3 and 1.4 were to be implemented, we expect that upfront costs of \$25-50,000 per firm could be incurred, together with recurrent costs of \$40-200,000+.

210. A significant part of upfront costs would be associated with the development of incentives for staff with energy targets included in salary packages, and development of processes / systems to support frequent (e.g. monthly / quarterly) action plan updating and training needs.

211. High recurrent costs would result largely from the stipulated training requirements (e.g. 5 days per year per million spent on energy would result in very high costs for large energy users). These costs do not include “opportunity” costs that may be incurred, nor do they include incentives that may apply where energy targets / KPIs are included in salaries.

212. Selecting a smaller set of sub-elements to meet the minimum required standard could substantially lower costs. For this scenario it was assumed the following sub-elements would be completed:

Table 13: Selected flexible sub-elements of 1.3 & 1.4 to enable 3-Plus compliance

1.3 Public policy
Published on firm's web-site and in Annual Report
Policy lists individual targets for major sites or major energy consuming activities comprising specified percentage of organisation's total energy cost
1.4 Internal Policy
State titles and names of senior staff at each site and/or business unit formally responsible for energy management
Formal KPIs for relevant staff are included in their Duty Statements
Energy policy requires contractors and suppliers to submit energy policy.
The internal policy was developed with the active consultation and involvement of staff across site functional groups and vertically from "bottom up".

213. Where no action is currently undertaken in respect of these sub-elements we expect that set up costs of \$5,000 to \$10,000 for each of 1.3 and 1.4 could be incurred. We estimate that most of these costs would be internal and may include, for example, formation of a committee at business unit / site levels to contribute to policy development and reach consensus on target setting, adjustment of internal systems to include energy KPIs in staff duty statements and inform contractors of policy requirements, and nomination / selection of senior staff with responsibility for energy management – including scope and definition of duties related to this role. Recurrent costs would be modest for 1.3 and 1.4 (25% and 33% of upfront costs respectively), and could consist primarily of an audit of relevant materials related to these sub-elements to confirm currency and amend / update as appropriate.

This gives upfront and recurrent cost estimates as shown below:

Table 14: Base cost of compliance with element 1.3 & 1.4 – no current action

Area	Description	Development Cost	Recurrent Cost
1.3 Public policy	Published on firm's web-site and in Annual Report		
1.3 Public policy	Policy lists individual targets for major sites or major energy consuming activities comprising specified percentage of organisation's total energy cost	\$ 2,037,500	\$ 509,375
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management		
1.4 Internal Policy	Formal KPIs for relevant staff are included in their Duty Statements		
1.4 Internal Policy	Energy policy requires contractors and suppliers to submit energy policy.		
1.4 Internal Policy	The internal policy was developed with the active consultation and involvement of staff across site functional groups and vertically from "bottom up".	\$ 2,037,500	\$ 672,375

214. This implies an average cost per entity of \$16,500 to develop the minimum set of flexible elements consistent with requirements, and about \$4,750 per year thereafter to update these (estimates rounded to nearest \$250).

Additionality

1.1 & 1.2: Mandatory Elements:

215. The above cost estimates reflect a scenario where firms / entities do not currently have a basic policy or action plan developed. While policies and action plans may not be developed to the level indicated above, it is likely that the vast majority of firms subject to the measure have commitments to reduce energy embedded within overall company environmental policies, and many will have current action plans resulting from participation in say Greenhouse Challenge Plus. In addition for businesses that manage a substantial part of their energy use as part of normal business it is likely that existing processes for developing, approving and communicating action plans at a business level could be employed to meet these requirements.

216. Notwithstanding these factors, the stated requirements are likely to call for a higher level of effort than may be undertaken at present, including development of short and long term corporate objectives with annual sign off, integration with OH&S and environmental management systems, and communications strategies.

217. In general we estimate that up to 50% of the requirements may be met within existing systems, thus lowering setup costs. At a recurrent level costs are expected to be additional to the extent that policies may not, in general, be updated annually, and to the extent that action plans reflect commitments to implement cost-effective projects that are additional to those that get picked up as part of normal business practices. A 50% reduction in base (no action) costs is estimated here also.

Taking additionality into account the following cost estimates result:

Table 15: Additional cost of compliance with element 1.1 & 1.2

Area	Description	Development Cost	Recurrent Cost
1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		
1.1 Public Policy:	State corporate level objectives (short and long term)	\$ 1,250,000	\$ 312,500
1.2 Internal Policy and Action Plan	Be structured so that it is consistent with or integrated into other core management strategies such as business improvement, risk management, OH&S, environmental management		
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei		
1.2 Internal Policy and Action Plan	Include a Communication strategy that ensures all staff have access to relevant content of the Policy and Action Plan and ensures that all new and existing staff are aware of the energy policy.	\$ 6,112,500	\$ 2,017,125

218. This implies an average cost per entity of \$29,500 to develop policies and action plans consistent with requirements, and about \$9,250 per year thereafter to update these (estimates rounded to nearest \$250).

1.3 & 1.4: Flexible Elements

219. We would expect that firms / entities with existing policies have these on their website and in Annual reports, however most are unlikely to have these at the level of sites / business units. We estimate that 25% of the required tasks for element 1.3 are already carried out (upfront and recurrent).

220. We expect however that the majority of element 1.4 will be additional to current levels of development. Most organisations with energy managers are likely to have just one or a small number of people with this responsibility, and target setting may be generally done at corporate level. In addition we expect that it will be the exception rather than the rule for contractors to be required to submit their energy policies. Hence 90% of base costs are assumed to be additional (upfront and recurrent).

This results in the following estimate of “additional” costs for elements 1.3 and 1.4.

Table 16: Additional cost of compliance with element 1.3 & 1.4

Area	Description	Development Cost	Recurrent Cost
1.3 Public policy	Published on firm's web-site and in Annual Report		
1.3 Public policy	Policy lists individual targets for major sites or major energy consuming activities comprising specified percentage of organisation's total energy cost	\$ 1,528,125	\$ 382,050
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management		
1.4 Internal Policy	Formal KPIs for relevant staff are included in their Duty Statements		
1.4 Internal Policy	Energy policy requires contractors and suppliers to submit energy policy.		
1.4 Internal Policy	The internal policy was developed with the active consultation and involvement of staff across site functional groups and vertically from "bottom up".	\$ 1,833,750	\$ 605,165

221. This implies an average cost per entity of \$13,500 to satisfy the above requirements, and about \$4,000 per year thereafter to update these (estimates rounded to nearest \$250).

Summary – Policy, Management & People

222. The additional costs of compliance with Element 1 to achieve the minimum compliance score is estimated to be \$43,000 on average per firm / entity to develop, and \$13,250 per year recurrent. Total costs are estimated at \$10.7 million upfront and \$3.3 million recurrent. This is shown below.

Table 17: Summary of Additional Costs – Policy, Management & People

Area	Description	Development Cost	Recurrent Cost
1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		
1.1 Public Policy:	State corporate level objectives (short and long term)	\$ 1,250,000	\$ 312,500
1.2 Internal Policy and Action Plan	Be structured so that it is consistent with or integrated into other core management strategies such as business improvement, risk management, OH&S, environmental management		
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei		
1.2 Internal Policy and Action Plan	Include a Communication strategy that ensures all staff have access to relevant content of the Policy and Action Plan and ensures that all new and existing staff are aware of the energy policy.	\$ 6,112,500	\$ 2,017,125
1.3 Public policy	Published on firm's web-site and in Annual Report		
1.3 Public policy	Policy lists individual targets for major sites or major energy consuming activities comprising specified percentage of organisation's total energy cost	\$ 1,528,125	\$ 382,050
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management		
1.4 Internal Policy	Formal KPIs for relevant staff are included in their Duty Statements		
1.4 Internal Policy	Energy policy requires contractors and suppliers to submit energy policy.		
1.4 Internal Policy	The internal policy was developed with the active consultation and involvement of staff across site functional groups and vertically from "bottom up".	\$ 1,833,750	\$ 605,165

Data and analysis

MANDATORY REQUIREMENTS					
2.1 Monitoring and Reporting Data		Complies			
Energy billing data at site and/or business unit level collated, and monthly report submitted to site or business unit manager (for 90% of organisation's total energy cost). Summary report submitted quarterly to CEO and Board		<input type="button" value="Yes"/>			
Performance compared with objectives and targets in corporate and site policies on a monthly basis		<input type="button" value="Yes"/>			
2.2 Analysis					
Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager		<input type="button" value="Yes"/>			
FLEXIBLE ACTIONS: Data and Analysis					
2.3 Monitoring and Reporting Data		(Insert data in white boxes)		Max Points	Your Points
Frequency of analysis and reporting energy data (automatically adjusted for percentage of total energy costs covered)	less frequent than weekly = 0 points		2	0	
Sub-metering installed and data regularly collected and analysed monthly, for all loads with annual energy cost more than	above \$1,000,000 of energy / year =		4	0	
Where sub-metering is installed, specify how often data (including trends and benchmarking) is reported to management and equipment operators	no reporting = 0 points		2	0	
This sub-metering drives automated feedback systems or alarms, when energy use is unusually high	<input type="checkbox"/> sub metering alarms		1	0	
2.4 Analysis					
Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such as regression analysis may be appropriate) – points linked to level of detail of model and for portion of total energy cost of firm covered	% energy costs =	80	2	3.2	
	resolution of 1% of energy and material flows = 4 point				
Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered	% energy costs =	80	1.5	0.8	
	monthly = 1 point				
Use of energy-based models with plant/equipment designers/specifiers and suppliers to facilitate design or selection of more efficient options, for every significant equipment or plant purchase.	<input checked="" type="checkbox"/>	% energy costs =	80	1.5	1.2
Analysis of performance at equipment, system and/or plant or site level against 'best existing practice' indicators, within the last year	<input checked="" type="checkbox"/>	% energy costs =	100	1	1
Analysis of performance at equipment, system and/or plant or site level against 'principle-based' best possible energy efficiency indicators	<input type="checkbox"/>	% energy costs =	0.65	1	0

Base cost – no current data and analysis procedures

2.1 & 2.2 Mandatory Elements

223. The potential level of cost for this element may vary widely by organisation. For example, at a very basic “compliance” level, a number of approaches could be adopted, such as:

- Simple spreadsheet models that collate and conduct basic analysis on trends and performance compared with targets would be a very low-cost solution for many organisations, particularly where less than 10 sites are involved;
- More complex spreadsheet models for organisations with more than 10 sites and/or multiple energy inputs;
- Existing financial systems (e.g. SAP) could be modified to take energy use data as well as financial information, and be used to provide outputs for trends analysis;

- Customised databases may be required for organisations with a large number of sites, together with access to databases of activity levels, whether generally static or dynamic;
- Arrangements with retailers and other energy suppliers to receive information on a regular basis and, as a minimum, to centralise invoicing to a single point

224. With all of these approaches factors would be considered over and above basic reporting, particularly consolidation of data for energy procurement purposes, and the requirement for data to be “normalised”.

225. We estimate that a minimum development spend in the order of \$15,000 would be incurred at the level of a Type 1 organisation, who could be expected to develop relatively simple spreadsheets and analysis tools, centralise receipt of energy invoices and establish a process to acquire production or activity data at regular intervals, and develop an appropriate board-level quarterly report. Costs of about twice this level might be expected for Type 2 & 4 organisations, who will have a higher number of sites, and potentially more energy inputs and analysis requirements. Type 3 organisations could be expected to incur the greatest level of development cost, since a database solution is likely to be a minimum requirement. Development costs of \$75,000 are estimated to acquire data and build a database solution with analysis functions, and to establish processes via which energy use and activity levels for a large number of sites can be acquired and normalised on a regular basis.

226. Recurrent costs for data acquisition, analysis and reporting will also vary significantly. For Type 1 organisations costs could be relatively low – for example 2.5 person days per quarter to perform all compliance tasks at \$100/hour (e.g. mix of analysis and senior resources) would give an annual cost of \$8,000. Higher costs – estimated 150% - could be expected for Type 2 and 4 organisations (\$12,000 per year), while Type 3 organisations would incur higher costs, estimated at \$40,000 per year.

227. We stress that the above cost estimates are, in our opinion, basic costs that an organisation could incur to simply comply with the requirement to collate data on a quarterly basis and perform a suitable level of analysis and reporting at board level. In our experience many organisations will expend significantly more than this on data collation and analysis. However the purpose of this for many organisations is to enable, for example, centralised billing, bill validation and payment, input to procurement strategies, reduced cost of transactions. That is, there may be significant cost savings and net benefits to organisations by improving invoice-level collation and analysis systems, that outweigh the additional costs incurred to go beyond basic compliance levels outlined above.

228. Total development and recurrent cost estimates for these elements is shown below:

Table 18: Base cost of compliance with element 2.1 & 2.2 – no current action

Area	Description	Development Cost	Recurrent Cost
2.1 Monitoring and Reporting Data	Energy billing data at site and/or business unit level collated, and monthly report submitted to site or business unit manager (for 90% of organisation's total energy cost). Summary report submitted quarterly to CEO and Board		
2.1 Monitoring and Reporting Data	Performance compared with objectives and targets in corporate and site policies on a monthly basis	\$ 6,000,000	\$ 3,540,000
2.2 Analysis	Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager	\$ 3,000,000	\$ 740,000

229. This implies an average cost per entity of \$36,000 to develop minimum data collation, analysis and reporting procedures, with highest costs concentrated at multi-site organisations, and about \$17,000 per year thereafter to maintain basic systems.

2.3 & 2.4 Flexible Elements

230. If all firms / entities were to install a substantial level of sub-metering and feedback / reporting systems (e.g. at \$250,000 resolution), allied to modelling of energy / material flows and regular acquisition of best practice / possible information for comparison, the costs would be substantial. Initial estimates, based on:

- Type 1: 1% of energy cost to develop, 0.2% of energy cost recurrent;
- Type 2: 1.5% of energy cost to develop, 0.3% of energy cost recurrent;
- Type 3: 0.5% of energy cost to develop, 0.1% of energy cost recurrent;
- Type 4: 1% of energy cost to develop, 0.2% of energy cost recurrent

suggest development costs in the order of \$97 million and recurrent costs of \$19 million (\$388,000 development and \$78,000 pa recurrent per firm / entity). Clearly, for this level a sound business case would need to be developed to justify the expense.

231. Under a minimum-compliance approach to 3-Plus, it may be possible to ignore the requirements of sub-element 2.3 and focus on 2.4 only (though noting that the analysis at 2.4 could benefit in some cases from sub-metered data). The following requirements would need to be met.

Table 19: Selected flexible sub-elements of 2.3 & 2.4 to enable 3-Plus compliance

2.4 Analysis
Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such as regression analysis may be appropriate) – points linked to level of detail of model and for portion of total energy cost of firm covered
Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered
Use of energy-based models with plant/equipment designers/specifiers and suppliers to facilitate design or selection of more efficient options, for every significant equipment or plant purchase.
Analysis of performance at equipment, system and/or plant or site level against 'best existing practice' indicators, within the last year

232. The requirements for these sub-elements are linked to (an extension of) the mandatory requirements, where billing data and KPIs are collated and compared on a regular basis. To some extent the upfront costs here should be met during the opportunities assessment stage, since the development of models (e.g. regression) and analysis of performance against existing best practice should be essential to an assessment of firm-wide opportunities for improvement. These costs are included in the opportunities assessment section, and it is assumed that the acquisition of analysis models or data, and metering of equipment is committed to on a cost-justified / benefits basis.

233. Hence upfront costs here will relate principally to the development of requirements with designers / suppliers related to selection of efficient equipment. Recurrent costs will be incurred in the use of models developed to provide ongoing feedback to plant operators beyond billing-level KPIs, use of design tools and ongoing comparison of performance with best practice.

234. At this minimum level, costs are estimated at:

Table 20: Components of compliance costs for element 2.3 & 2.4

Sub-element	Development Cost	Recurrent Cost
Model development	Assumed part of Opps Assessment cost	Additional to billing level KPI feedback: Type 1 \$2,500 pa to update performance / KPIs and distribute; \$5,000 pa Type 2 & 4; \$10,000 pa for Type 3
Use model to provide feedback	Type of model developed on a cost-justified basis, internalised within project cost	
Use energy models with designers	Uniform \$5,000 to document requirements within internal systems and communicate to designers / suppliers	Variable depending on level of new plant installation, assumed additional \$2,500 pa for Type 1; \$5,000 for types 2, 4 to ensure conformance to reqmts; \$10,000 pa for Type 3 to reflect significantly higher number of sites / projects
Compare with best practice	Uniform \$10,000 per firm to acquire relevant data (quantitative / qualitative)	Uniform \$5,000 per firm pa to compare, update best practice data

This leads to the following estimate of compliance costs:

Table 21: Base cost of compliance with element 2.3 & 2.4 – no current action

Area	Description	Development Cost	Recurrent Cost
2.4 Analysis	Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such a		
2.4 Analysis	Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered		
2.4 Analysis	Use of energy-based models with plant/equipment designers/specifiers and suppliers to facilitate design or selection of more efficient options, for every significant equipment or plant purchase.		
2.4 Analysis	Analysis of performance at equipment, system and/or plant or site level against 'best existing practice' indicators, within the last year		
		\$ 3,750,000	\$ 3,975,000

235. This implies an average cost per entity of \$15,000 to develop minimum requirements regarding selection / design for energy efficiency and acquisition of best practice information, with costs for tools / models assumed to be justified on a cost-benefit basis. Recurrent costs for ongoing feedback on performance, ensuring conformance with design requirements and updating best practice data for comparison are estimated at \$16,000 per year (rounded to nearest \$500).

Additionality

2.1 & 2.2: Mandatory Elements

236. The above cost estimates reflect a scenario where firms / entities do not currently have systems in place to collate billing information that enables regular performance reporting. While reporting frequency and KPI development may not be at the level called for, we believe it is almost certain that many large energy users have systems in place for acquisition of centralised billing data on a regular basis. As discussed above this is often justified for non-energy efficiency reasons such as procurement, bill processing and checking, etc.

237. For both of these elements we estimate that 75% of the requirements are already in place in terms of having bill collation systems that can facilitate monthly reporting, trends analysis and comparison of performance. However we believe it is less the case that monthly reporting at the level required is widely implemented, and assume that 75% of the estimated costs on a recurrent basis are additional to current processes. This gives the following estimate of additional costs for these elements:

Table 22: Additional cost of compliance with element 2.1 & 2.2

Area	Description	Development Cost	Recurrent Cost
2.1 Monitoring and Reporting Data	Energy billing data at site and/or business unit level collated, and monthly report submitted to site or business unit manager (for 90% of organisation's total energy cost). Summary report submitted quarterly to CEO and Board		
2.1 Monitoring and Reporting Data	Performance compared with objectives and targets in corporate and site policies on a monthly basis	\$ 1,500,000	\$ 2,655,000
2.2 Analysis	Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager	\$ 750,000	\$ 555,000

238. This implies an average cost per entity of \$9,000 to augment current bill collation systems to facilitate reporting requirements – i.e. at business unit / board level including performance against target and trends; and about \$13,000 per year per firm to maintain reporting systems (estimates rounded to nearest \$250).

239. 2.3 & 2.4: Flexible Elements: we would expect many of the sub-elements here to be additional to current processes. Best practice information, which we expect will be known by some large users (and possibly building owners via ABGR performance for example) will be either unknown or not particularly relevant (in a quantitative sense at least) to many firms. We expect the use of energy-based models is the exception rather than the rule, as is the provision of monthly feedback on performance at a plant level. We note however that for some firms, performance data is collated at a corporate or business unit level, and would be disseminated to plant level where trends / KPIs show anomalies compared with typical or expected performance – i.e. if there is no apparent problem there may not be a need at plant level to see the information. Where a problem is picked up at a high level, more detailed assessment of energy flows may be carried out at a plant level, using monitoring systems or models that have been implemented on a cost-benefit basis.

240. We estimate that, for best practice additional costs are 50% of those indicated, while for remaining sub-elements additional costs are estimated to be 90% of base costs. This results in the following estimate of “additional” costs for elements 2.3 and 2.4.

Table 23: Additional cost of compliance with element 2.3 & 2.4

Area	Description	Development Cost	Recurrent Cost
2.4 Analysis	Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such a		
2.4 Analysis	Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered		
2.4 Analysis	Use of energy-based models with plant/equipment designers/specifiers and suppliers to facilitate design or selection of more efficient options, for every significant equipment or plant purchase.		
2.4 Analysis	Analysis of performance at equipment, system and/or plant or site level against 'best existing practice' indicators, within the last year		
		\$ 2,375,000	\$ 3,077,500

241. This implies an average cost per entity of \$9,500 to satisfy the above requirements, and about \$12,500 per year thereafter to update these (estimates rounded up to nearest \$250).

Summary – Data and Analysis

242. The additional costs of compliance with Element 2 to achieve the minimum compliance score is estimated to be \$18,500 on average per firm / entity to develop, and \$25,000 per year recurrent. Total costs are estimated at \$4.6 million upfront and \$6.3 million recurrent. This is shown below.

Table 24: Summary of Additional Costs – Policy, Management & People

Area	Description	Development Cost	Recurrent Cost
2.1 Monitoring and Reporting Data	Energy billing data at site and/or business unit level collated, and monthly report submitted to site or business unit manager (for 90% of organisation's total energy cost). Summary report submitted quarterly to CEO and Board	\$ 1,500,000	\$ 2,655,000
2.1 Monitoring and Reporting Data	Performance compared with objectives and targets in corporate and site policies on a monthly basis		
2.2 Analysis	Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager	\$ 750,000	\$ 555,000
2.4 Analysis	Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such a		
2.4 Analysis	Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered		
2.4 Analysis	Use of energy-based models with plant/equipment designers/specifiers and suppliers to facilitate design or selection of more efficient options, for every significant equipment or plant purchase.		
2.4 Analysis	Analysis of performance at equipment, system and/or plant or site level against 'best existing practice' indicators, within the last year		
		\$ 2,375,000	\$ 3,077,500

243. Re-iterating a key point related to this element, we believe that the level and type of sub-metering systems and energy models is likely to be determined on a cost effectiveness basis rather than being seen as a compliance requirement. Development of an energy-based model should be done at the Opportunities Assessment level and used to determine suitable ongoing analysis models.

Opportunity assessment

MANDATORY REQUIREMENTS				
3.1 Opportunity Identification		Complies		
Data from energy billing and indicators calculated (see Data & Analysis section) used for opportunity identification, at least annually.		Yes <input type="checkbox"/>		
3.2 Evaluation of Opportunities				
Clear evaluation methodologies and criteria must be applied to opportunities identified. They must:				
* Evaluate whole of business costs and benefits:		Yes <input type="checkbox"/>		
* Apply a level of detail appropriate to the size of the investment:				
* Achieve a level of accuracy acceptable to financiers (internal or external):				
* Ensure relevant staff are trained to use the evaluation methodologies				
Relevant staff must be trained and competent in application of the evaluation methodologies described above		Yes <input type="checkbox"/>		
Potential energy efficiency improvements assessed in accordance with methodology above.		Yes <input type="checkbox"/>		
3.3 Prioritisation				
A list of energy efficiency opportunities that meet the DITR rate of return reporting threshold within the accuracy level specified above must be compiled and updated at least annually		Yes <input type="checkbox"/>		
be recorded, updated and reported at least annually to site / business unit manager and CEO & Board		Yes <input type="checkbox"/>		
FLEXIBLE ACTIONS: Opportunity Identification and Evaluation				
3.4 Opportunity Identification			Max Points	Your Points
Use of sub-metering data on an ongoing basis as input to opportunity identification. Savings opportunities meeting investment criteria to be included in energy action plan. Analysis and findings to be documented and reported to site/ business unit manager.		Sub metering score from Data & Analysis page	0.00	3 0.00
Use of system and process models on ongoing basis for opportunity identification		Modelling score from D & A page	3.2	1.5 2.4
		Percent of total energy cost covered		
Cross-functional teams with specialist support have identified energy opportunities using available data. Formal meetings and process must be documented. Refer to user guide for requirements.		within the last 1 year = 5 points <input type="checkbox"/>	90	3 4.5
Shopfloor / operator teams with specialist support have identified energy opportunities using available data. Formal meetings and process must be documented. Refer to user guide for reqts.		within the last 1 year = 4 points <input type="checkbox"/>	90	3 3.6
Investigate whole (e.g. production) process, with aim of saving energy through better system integration, innovation and efficiency improvement. See Note 1 for requirements. see Note 1		within the last 1 year = 3 points <input type="checkbox"/>	90	3 0.675
Investigate key energy using system /process eg refrigeration, used within organisation. This includes tackling an energy supply or energy infrastructure problem, or a non-energy problem (e.g. product yield, throughput, quality, maintenance, safety) with energy use implications and potential energy savings. See Note 1 for requirements. see Note 1		Single person external expert/generalist... Weighting = 25% <input type="checkbox"/>	90	2 0.675
Investigate key technology (from this or another industry) with potential to transform energy usage in this organisation. See Note 1 for requirements. see Note 1		Single person external expert/generalist... Weighting = 25% <input type="checkbox"/>	90	2 0.675
3.5 Evaluation				
Transparent process for tracking of progress in evaluating each opportunity and providing regular feedback to proponents and stakeholders within the organisation		<input checked="" type="checkbox"/> transparent process exists	100	1.5 1.5
3.6 Prioritisation				
List of measures within 10 percentage points of IRR investment threshold compiled for further evaluation to identify scope for cost reduction or capture of increased benefits – and items re-evaluated using wider criteria.		<input checked="" type="checkbox"/> list compiled and re-evaluated		1 1

244. The conduct of audits or assessments of energy efficiency opportunities at individual sites, and/or the formulation of strategies within firms to address energy efficiency opportunities has characterised the way in which energy efficiency has traditionally been advanced.

245. The steps undertaken above (and augmented with documentation on the process that should be followed) are, to some extent, a departure from the traditional approach. From the above steps, the following may be considered to be additional to traditional auditing approaches:

- 3.2 – in general these requirements exceed the requirements for a level 3 audit;
- 3.4 – in general shop-floor / cross-functional teams have a role in energy audits, however in general external specialists are left to their own devices to come up with recommendations on cost-effective actions
- 3.5 – in general processes for tracking opportunities and providing feedback would not be included in a typical level 3 audit.

246. At a more specific level, the proposed process for the opportunities assessment stage includes several tasks / elements that would typically be additional to a traditional audit approach. These are shown below.

Basic costing approach

247. Rather than seek to cost each individual item identified as part of the Opportunities Assessment process, we have sought to utilise typical audit costs, augmented by the additional works as identified below.

248. A position put forward by previous work, provided for this project by DITR, suggests that, where energy use represents 6% of annual operating expenses or less, a 1% of energy cost outlay per year to meet the requirements of the opportunities assessment component of the measure may be an appropriate level of expense, while companies that spend more than 6% of operating expenditure on energy could reduce compliance costs by adopting a percent of total operating expense approach.

249. In general we concur with this broad approach, with some exceptions. The level of expense for smaller energy users (1% per year on average for 5 years or 5% once-off for firms spending less than 6% of operating costs on energy and/or spending less than \$15 million per year on energy in total) is greater than would be incurred in a traditional approach (2-3% of energy costs), and the higher costs appear reasonable given the additional tasks. For large users (>6% of operating costs for energy and/or over \$15 million in total on energy), a similar approach is adopted but linked to operating costs rather than energy costs. While previous work suggested costs of 5% of the annual energy cost proportion of total operating costs would be spent over 5 years, our modelling and experience suggests that in general, costs of about 0.3% of annual operating costs over 5 years (0.06% per year) could be expected to be spent, rather than a percent that varies with increasing proportion of energy to total operating costs.

This arises in part from the fact that, for many large energy users, increased energy use is often related to a small number of larger-scale equipment items rather than a greater number of items of equipment requiring a detailed assessment. In general then, the opportunities assessment costs for large users were assumed to be 0.06% of annual operating costs per year. Exceptions to the suggested approach will arise in 2 principal areas:

- For firms with a large number of sites using comparable technology, assessment costs should be discounted to reflect the ability to extrapolate based on limited assessment;
- For the largest energy using firms, assessment costs should be discounted further than that suggested under the “operating cost” method (e.g. where energy spend is over \$50 million per year).

Table 25: Opportunities Assessment Tasks Additional to Traditional Approach & to measures addressed in other elements of 3-plus

1. Background Information "Understanding Your Company"
1.1. Company, Policy, Plans
Existing energy management / environmental management / quality / business improvement systems. Include informal discussion regarding how issues such as water, corporate responsibility, waste management are actually managed, and resources allocated to their management.
Extent and effectiveness of communication across functional groups on a day-to-day basis – what systems are in place, what are the attitudes of groups to each other, do they interact socially or via formal processes
Corporate drivers, goals, people and procedures for approving changes and investments (small and large, with and without implications for core processes and systems).
Investment criteria:
Risk
Staff resources / contractor skills / workloads and flexibility.
Problems (which energy efficiency improvements can help to address):
production bottlenecks,
anomalies identified by staff (eg difficulty in controlling a process, variation in performance with climatic conditions, surprisingly high energy use in an area, etc),
noise or heat inside and outside buildings,
maintenance problems (may help justify replacement of equipment)
1.3. Energy and Production Data
data on conditions affecting energy use (e.g. feedstock quality, ambient conditions, mine depth)
2. Analysis
2.2. Rough Audit/analysis of data
Compare energy performance of process / process steps, with first principles. This may require independent research to determine fundamental energy requirements of chemical processes, or thermodynamic processes.
4. Investigation and Reporting
4.1. Prioritisation
Select most appropriate processes to intensively explore and develop the selected priority opportunities and methods of capturing / implementing opportunity, e.g. :
processes as developed under EEBP program,
Cross-functional teams with specialist support .
Shopfloor / operator teams with specialist support
Formal internal processes for identification and development of 'blue sky' ideas, such as workshop processes, brainstorming sessions, etc
Identify resources required (further data, specialists, time, money).
4.2. Implement Investigation Processes.
Evaluation of the opportunities should include a whole of business assessment of the likely costs and benefits and other factors, e.g. including:
production benefits, throughput, de-bottlenecking, product yield, quality, consistency, etc.
business interruption,
other changes to ongoing costs (e.g. maintenance, labour).
standard financial evaluation method used in the organisation (e.g. NPV) including reasonable discount rates for future benefits, considering persistence, certainty, and lifetime.
risks of implementing and risk not implementing,
resources required to implement (e.g. staff and contractors)
acceptability to various stakeholders.
4.4. Preparation and Presentation
Preparation of business case normally used in this organisation (e.g. capital expenditure requests, board papers) for all efficiency opportunities which meet the investment criteria.
Submission of the business cases through normal business channels.
5 Evaluation
For the ee opps identified and implemented by the company, evaluate the costs and benefits of these annually??

Factors influencing the analysis of per-firm and total costs

250. Estimating per-firm and total compliance costs using this approach is a highly subjective process. Beyond the influencing factors noted above, this estimation requires that several assumptions be made that may have a material bearing on the total costs incurred. These include:

- What companies / business units are required to comply?
- What sectors of industry and commerce are represented, and to what extent?
- What proportion of sectoral energy use, by source, is likely to be covered by the measure; and/or what proportion of sector total energy is likely to be covered?
- What do individual firms, and firms within sectors pay for their various energy input sources?
- What does energy use represent as a percent of operating costs for firms / sectors where this is greater than 6%?
- Which firms / sectors have energy costs as a percent of operating costs greater than 6%?

251. These are important questions that, either individually or collectively, may materially impact on the estimated cost of compliance.

Adopted approach

252. For this project we have taken the following approach:

Step 1: We took key manufacturing, mining, transport and commercial sector data from ABARE, with energy use by source for 2000/01. Within this data, “Derived Energy” was omitted; for example petroleum products produced in the refining process, production of brown coal briquettes from brown coal in the mining sector.

Step 2: Within the Road Transport sectors we assumed, as a preliminary step, that 65% of ADO, 5% of LPG and 2% of petrol consumption was attributable to commercial transport activities.

These steps produced the following output in terms of fuel use by source and sector.

Table 26: Summary of total energy use from ABARE

Sector	ADD	Petrol	Aviation Fuel	Black Coal	Brown Coal Briquettes	Coke	Electricity	Fuel Oil & Other Petrol	LPG	Natural gas	Bagasse, Woodwaste	Grand Total
Div. B Mining	75 PJ			7 PJ			57 PJ	2 PJ	0 PJ	126 PJ		267 PJ
21 Food, beverages, tobacco	1 PJ			7 PJ	0 PJ		23 PJ	1 PJ	1 PJ	28 PJ	84 PJ	145 PJ
22 Textile, clothing, footwear and leather				1 PJ	1 PJ		3 PJ	0 PJ	0 PJ	7 PJ		12 PJ
23-24 Wood, paper and printing	1 PJ			8 PJ			18 PJ	1 PJ	0 PJ	19 PJ	17 PJ	64 PJ
25 Petroleum, coal and chemical				5 PJ		1 PJ	22 PJ	46 PJ	16 PJ	108 PJ		198 PJ
26 Non-metallic mineral products	1 PJ			24 PJ			14 PJ	2 PJ	2 PJ	52 PJ	1 PJ	96 PJ
27 Metal products	4 PJ			187 PJ		6 PJ	179 PJ	46 PJ	1 PJ	156 PJ	2 PJ	581 PJ
28 Machinery and equipment							9 PJ	0 PJ	1 PJ	5 PJ		15 PJ
37 Water, sewerage and drainage	1 PJ						8 PJ			1 PJ		10 PJ
Div. E Construction	24 PJ							0 PJ		2 PJ		26 PJ
Div. I Transport & storage	220 PJ	13 PJ	174 PJ	4 PJ			8 PJ	33 PJ	3 PJ	15 PJ		470 PJ
Commercial and Services b	16 PJ			0 PJ	3 PJ		167 PJ	0 PJ	3 PJ	43 PJ		232 PJ
Grand Total	343 PJ	13 PJ	174 PJ	243 PJ	4 PJ	7 PJ	508 PJ	131 PJ	27 PJ	562 PJ	104 PJ	2,116 PJ

Step 3: A proportion of energy use in each sector was assumed to be covered by the measure. In the absence of detailed information, we assumed in general that sectors would have 25%, 50%, 75% or 90% of total sector energy included in the measure. We assumed that no sector would have 100% of energy included. An exception is transport where we have taken just 10% of energy (stationary) to be included – further clarification on the inclusion or exclusion of mobile fuel for air, sea, road and rail transport would help to refine this figure.

The following sectors were taken to have 25% of energy use included in the measure:

- 22 Textile, clothing, footwear and leather, Div E: Construction and Commercial and services

The following sectors were taken to have 50% of energy use included in the measure:

- Div B: Mining, 21 Food, beverages, tobacco, 28 Machinery and equipment and 37 Water sewerage & drainage

The following sectors were taken to have 75% of energy use included in the measure:

- 25 Petroleum, coal and chemicals

The following sectors were taken to have 90% of energy use included in the measure:

- 23-24 Wood, paper and printing, 26 Non-metallic minerals and 27 Metals

As noted these assumptions are indicative only and while they could be expected to reasonably estimate the capture in some sectors, this may not be the case in others – for example transport as discussed above.

Step 4: An approximation was made of the number of firms that could potentially be captured within each sector. Again the number per sector is unknown, and estimates are made both to reflect “best guess” based on industry knowledge, and to “fit” the overall assumption that about 250 firms would be captured under a “common” energy use definition. Estimating the number of firms thus enables the per-firm energy use to be calculated, as shown below.

Table 27: Estimated energy use per EEOA reporting entity

Sector	Grand Total	Est % EEO	Est EEO PJ	No. of Entities	PJ per Entity
Div. B Mining	267 PJ	50%	134 PJ	65	2.1 PJ
21 Food, beverages, tobacco	145 PJ	50%	73 PJ	27	2.7 PJ
22 Textile, clothing, footwear and leather	12 PJ	25%	3 PJ	2	1.5 PJ
23-24 Wood, paper and printing	64 PJ	90%	58 PJ	10	5.8 PJ
25 Petroleum, coal and chemical	198 PJ	75%	149 PJ	30	5.0 PJ
26 Non-metallic mineral products	96 PJ	90%	86 PJ	10	8.6 PJ
27 Metal products	581 PJ	90%	523 PJ	25	20.9 PJ
28 Machinery and equipment	15 PJ	50%	8 PJ	10	0.8 PJ
37 Water, sewerage and drainage	10 PJ	50%	5 PJ	5	1.0 PJ
Div. E Construction	26 PJ	25%	7 PJ	6	1.2 PJ
Div. I Transport & storage	470 PJ	10%	47 PJ	15	3.1 PJ
Commercial and Services b	232 PJ	25%	58 PJ	45	1.3 PJ
Grand Total	2,116 PJ	54%	1,151 PJ	250	4.6 PJ

That is, some 54% of total estimated energy use by these sectors (includes transport sector fuel) is estimated to be captured by the measure, with an average of 4.6 PJ per business entity that may be required to comply and a range of average energy use per firm within a sector of 0.8 PJ to 20.9 PJ.

Step 5: An estimate of sector energy spend was made, using upper estimates by DITR in the “*Energy Efficiency Opportunities_package_27April05.pdf*” file provided for this project (we note the assertion that the figures provided are indicative only and will vary, sometimes significantly, on a per-firm basis). In addition to sources here, coal was costed at \$2/GJ, coke at \$3/GJ, brown coal briquettes at \$4/GJ, aviation fuel at \$15/GJ and other fuels at \$22/GJ (same as diesel). Total costs were then calculated using estimated source input quantities by ABARE. The resultant “base” costs were then adjusted for certain fuels in certain sectors such as metals, mining, gas distribution, chemicals and commercial to reflect lower or higher per-unit charges for major energy inputs to these sectors. This gives sectoral cost estimates as below:

Table 28: Estimated energy spend by sector

Sector	Est EEO PJ	No. of Entities	PJ per Entity	Sector Spend
Div. B Mining	134 PJ	65	2.1 PJ	\$ 1,057
21 Food, beverages, tobacco	73 PJ	27	2.7 PJ	\$ 317
22 Textile, clothing, footwear and leather	3 PJ	2	1.5 PJ	\$ 24
23-24 Wood, paper and printing	58 PJ	10	5.8 PJ	\$ 356
25 Petroleum, coal and chemical	149 PJ	30	5.0 PJ	\$ 1,532
26 Non-metallic mineral products	86 PJ	10	8.6 PJ	\$ 464
27 Metal products	523 PJ	25	20.9 PJ	\$ 2,912
28 Machinery and equipment	8 PJ	10	0.8 PJ	\$ 105
37 Water, sewerage and drainage	5 PJ	5	1.0 PJ	\$ 57
Div. E Construction	7 PJ	6	1.2 PJ	\$ 135
Div. I Transport & storage	47 PJ	15	3.1 PJ	\$ 687
Commercial and Services b	58 PJ	45	1.3 PJ	\$ 1,074
Grand Total	1,151 PJ	250	4.6 PJ	\$ 8,720

Step 6: An estimate was made of the number of firms of each Type in each sector, and of the proportion of total “EEOA-sectoral” energy included in the measure.

Table 29: Estimated number of firms / entities by Type & energy use

Sector	# Entities Type 1	# Entities Type 2	# Entities Type 3	# Entities Type 4	PJ/Entity Type 1	PJ/Entity Type 2	PJ/Entity Type 3	PJ/Entity Type 4
Div. B Mining	30	10	0	25	0.7 PJ	2.0 PJ		3.8 PJ
21 Food, beverages, tobacco	10	17	0	0	1.8 PJ	3.2 PJ		
22 Textile, clothing, footwear and leather	2	0	0	0	1.5 PJ			
23-24 Wood, paper and printing	0	7	0	3		2.9 PJ		12.6 PJ
25 Petroleum, coal and chemical	10	15	0	5	1.5 PJ	2.5 PJ		19.4 PJ
26 Non-metallic mineral products	3	7	0	0	4.3 PJ	10.4 PJ		
27 Metal products	3	20	0	2	17.4 PJ	17.0 PJ		65.4 PJ
28 Machinery and equipment	7	3	0	0	0.8 PJ	0.9 PJ		
37 Water, sewerage and drainage	0	4	0	1		1.0 PJ		1.3 PJ
Div. E Construction	0	0	6	0			1.2 PJ	
Div. I Transport & storage	0	7	4	4		0.7 PJ	3.5 PJ	7.1 PJ
Commercial and Services b	0	0	45	0			1.3 PJ	
Grand Total	65	90	55	40	2.0 PJ	6.2 PJ	1.4 PJ	9.7 PJ

The estimated energy use per entity can be converted to estimated energy spend per entity by pro-rating total sector spend (from Table 28) in the same proportions to energy use from Table 29. This gives:

Table 30: Estimated energy spend (\$million) by Type & per entity in each Type

Sector	\$ Type 1	\$ Type 2	\$ Type 3	\$ Type 4	\$/Type 1	\$/Type 2	\$/Type 3	\$/Type 4
Div. B Mining	\$ 159	\$ 159	\$ -	\$ 740	\$ 5.30	\$ 15.90	\$ -	\$ 29.60
21 Food, beverages, tobacco	\$ 79	\$ 238	\$ -	\$ -	\$ 7.90	\$ 14.00	\$ -	\$ -
22 Textile, clothing, footwear and leather	\$ 24	\$ -	\$ -	\$ -	\$ 12.00	\$ -	\$ -	\$ -
23-24 Wood, paper and printing	\$ -	\$ 125	\$ -	\$ 231	\$ -	\$ 17.86	\$ -	\$ 77.00
25 Petroleum, coal and chemical	\$ 153	\$ 384	\$ -	\$ 996	\$ 15.30	\$ 25.60	\$ -	\$ 199.20
26 Non-metallic mineral products	\$ 70	\$ 394	\$ -	\$ -	\$ 23.33	\$ 56.29	\$ -	\$ -
27 Metal products	\$ 291	\$ 1,893	\$ -	\$ 728	\$ 97.00	\$ 94.65	\$ -	\$ 364.00
28 Machinery and equipment	\$ 71	\$ 34	\$ -	\$ -	\$ 10.14	\$ 11.33	\$ -	\$ -
37 Water, sewerage and drainage	\$ -	\$ 43	\$ -	\$ 15	\$ -	\$ 10.75	\$ -	\$ 15.00
Div. E Construction	\$ -	\$ -	\$ 135	\$ -	\$ -	\$ -	\$ 22.50	\$ -
Div. I Transport & storage	\$ -	\$ 69	\$ 206	\$ 412	\$ -	\$ 9.86	\$ 51.50	\$ 103.00
Commercial and Services b	\$ -	\$ -	\$ 1,074	\$ -	\$ -	\$ -	\$ 23.87	\$ -
Grand Total	\$ 847	\$ 3,339	\$ 1,415	\$ 3,122	\$ 13.03	\$ 37.10	\$ 25.73	\$ 78.05

Step 7: An estimate was then made of what firms within sectors would spend on this element, drawing on the basic costing approach outlined above on page 29 & page 30. Four scenarios were used;

- 1% of annual energy cost per year for 5 years where energy spend per firm (on average) is less than 5% of operating costs and/or <\$15 million pa. This implies that firms with this level of spend on energy would typically spend up to 5% of annual energy costs conducting a detailed assessment suitable for making investment decisions;
- 0.06% of total operating costs per year for 5 years where energy spend is greater than \$15 million but less than \$50 million pa. This implies that firms with large energy spend would typically take a “% of operating costs” approach to conducting a detailed assessment, with energy spend typically a significant proportion of total operating costs. Estimates were made of the operating costs for applicable sectors based on estimated proportion of costs that are energy-related, including;
 - 15% of operating costs for Mining;
 - 20% of operating costs for Wood, Paper & Printing; Non-metallic Minerals and Metal Products;
 - Up to 30% of operating costs for Transport and Chemicals;
 - 5% of operating costs for Water, sewerage and drainage;

- For these sectors 0.06% of annual operating costs were calculated where energy costs exceed \$15 million per year. Where energy costs are estimated to be less than \$15 million per year, the 1% of energy costs method was applied. As discussed on p29 this level of cost broadly reflects costs that could be incurred from our experience and based on the modelling conducted. At the margin (i.e. close to \$15 million annual energy spend) estimates of per-entity spend on the Opportunities Assessment can differ markedly between the “1% of energy” and “% of operating cost” methods, however we would expect that entities around this level could employ a method that reflects their current level of knowledge of opportunities and perceived benefits from the measure. We would not expect that overall costs for this part of the measure would be materially affected;
- Two-thirds of 0.06% of total operating costs per year for 5 years where energy spend is greater than \$50 million, to reflect further economies of scale compared with the basic “% of operating cost” method for sites with very large energy spend, typically reflecting large-scale items of equipment rather than necessarily more items of equipment;
- Two-thirds of 1% of annual energy cost per year for 5 years for commercial and construction sectors, to reflect an approach that would be based on a detailed assessment at representative sites / applicable technology levels, with results extrapolated to a whole population of sites

This gives the following estimate of compliance costs (all figures in \$millions):

Table 31: Estimated base cost of opportunities assessment

Sector	\$/Firm in Type 1	\$/Firm in Type 2	\$/Firm in Type 3	\$/Firm in Type 4	Annual \$ Type 1	Annual \$ Type 2	Annual \$ Type 3	Annual \$ Type 4	TOTAL ANNUAL \$
Div. B Mining	\$ 0.0530	\$ 0.0636	\$ -	\$ 0.1184	\$ 1.590	\$ 0.636	\$ -	\$ 2.960	\$ 5.186
21 Food, beverages, tobacco	\$ 0.0790	\$ 0.1400	\$ -	\$ -	\$ 0.790	\$ 2.380	\$ -	\$ -	\$ 3.170
22 Textile, clothing, footwear and leather	\$ 0.1200	\$ -	\$ -	\$ -	\$ 0.240	\$ -	\$ -	\$ -	\$ 0.240
23-24 Wood, paper and printing	\$ -	\$ 0.0536	\$ -	\$ 0.1548	\$ -	\$ 0.375	\$ -	\$ 0.464	\$ 0.839
25 Petroleum, coal and chemical	\$ 0.0306	\$ 0.0512	\$ -	\$ 0.2669	\$ 0.306	\$ 0.768	\$ -	\$ 1.335	\$ 2.409
26 Non-metallic mineral products	\$ 0.0700	\$ 0.1131	\$ -	\$ -	\$ 0.210	\$ 0.792	\$ -	\$ -	\$ 1.002
27 Metal products	\$ 0.1950	\$ 0.1902	\$ -	\$ 0.7316	\$ 0.585	\$ 3.804	\$ -	\$ 1.463	\$ 5.852
28 Machinery and equipment	\$ 0.1014	\$ 0.1133	\$ -	\$ -	\$ 0.710	\$ 0.340	\$ -	\$ -	\$ 1.050
37 Water, sewerage and drainage	\$ -	\$ 0.1075	\$ -	\$ 0.1800	\$ -	\$ 0.430	\$ -	\$ 0.180	\$ 0.610
Div. E Construction	\$ -	\$ -	\$ 0.1508	\$ -	\$ -	\$ -	\$ 0.905	\$ -	\$ 0.905
Div. I Transport & storage	\$ -	\$ 0.0986	\$ 0.0690	\$ 0.1380	\$ -	\$ 0.690	\$ 0.276	\$ 0.552	\$ 1.518
Commercial and Services b	\$ -	\$ -	\$ 0.1599	\$ -	\$ -	\$ -	\$ 7.196	\$ -	\$ 7.196
Grand Total					\$ 4.431	\$ 10.215	\$ 8.377	\$ 6.954	\$ 29.977

That is, some \$30 million would be expected to be spent on opportunities assessment per year. This equates to \$120,000 per firm / entity per year.

Step 8: the above costs represent possible costs if all energy use by liable firms was assessed, and if no current attention was paid to energy efficiency opportunities. This is not the case, so the impact of two primary factors was assessed:

- **Influence:** many firms, particularly energy intensive / high \$ as a percent of operating cost sectors like aluminium, pulp & paper and many transport modes may have little ability to influence processes or technologies that use the vast majority of their energy use. They may therefore either not perceive economic value in developing opportunities that will not eventuate in the near term, or may seek only to invest in these assessments at periodic intervals when potential replacement or upgrade strategies merit serious consideration.
- **Additionality:** many firms are already participating in energy management to some degree, and assessment of opportunities under EEO may be an extension of what they already do to some degree. For example, the Aluminium industry welcomed the EEO measure as an extension of work that they already do on energy management, owing to the significant impact energy has on overall operating costs and profitability. We are aware of significant activities to manage energy use by a number of large energy users, and programs such as Energy Efficiency Best Practice, Greenhouse Challenge Plus and DEUS' Energy Smart Business Program have (had) good participation by many large users.

Both of these factors will serve to diminish the total additional amount spent, in some cases significantly. An estimate of the impact of “influence” and “additionality” on base energy usage is shown below, indicating the % of energy by fuel source that may be impacted:

Table 32: % of base energy that may be impacted by Opportunities Assessment

% of Energy Use Influenced by EEO	ADO	Petrol	Aviation Fuel	Black Coal	Brown Coal Briquettes	Coke	Electricity	Fuel Oil & Other Petrol	LPG	Natural gas	Bagasse, Woodwaste
Div. B Mining	75%			75%			75%	75%		50%	
21 Food, beverages, tobacco				90%			90%	90%	90%	90%	0%
22 Textile, clothing, footwear and leather				90%	90%		90%			90%	
23-24 Wood, paper and printing				75%			75%	75%		75%	0%
25 Petroleum, coal and chemical				75%			75%	75%	75%	75%	
26 Non-metallic mineral products				75%			75%	75%	75%	75%	0%
27 Metal products	25%			25%			25%	25%	25%	25%	0%
28 Machinery and equipment							90%		90%	90%	
37 Water, sewerage and drainage	90%						90%			90%	
Div. E Construction	50%									50%	
Div. I Transport & storage	50%	50%	0%	75%			75%	50%	50%	75%	
Commercial and Services b	90%				90%		90%		90%	90%	
% of EEO-Influenced Energy that is Additional	ADO	Petrol	Aviation Fuel	Black Coal	Brown Coal Briquettes	Coke	Electricity	Fuel Oil & Other Petrol	LPG	Natural gas	Bagasse, Woodwaste
Div. B Mining	75%			75%			75%	75%		75%	
21 Food, beverages, tobacco				75%			75%	75%	75%	75%	0%
22 Textile, clothing, footwear and leather				75%	75%		75%			75%	
23-24 Wood, paper and printing				75%			75%	75%		75%	0%
25 Petroleum, coal and chemical				75%			75%	75%	75%	75%	
26 Non-metallic mineral products				50%			50%	50%	50%	50%	0%
27 Metal products	50%			50%			50%	50%	50%	50%	0%
28 Machinery and equipment							75%		75%	75%	
37 Water, sewerage and drainage	75%						75%			75%	
Div. E Construction	75%									75%	
Div. I Transport & storage	75%	75%	0%	75%			75%	75%	75%	75%	
Commercial and Services b	75%				75%		75%		75%	75%	

This results in an estimated 30% of energy use (353 PJ) that will be impacted by the assessment of opportunities, over and above what firms currently address as part of normal business. Translating this into estimated cost for opportunities assessment, using the same approach to costs of assessment as described above, we estimate the following:

Table 33: Estimated additional cost of opportunities assessment

Sector	\$/Firm in Type 1	\$/Firm in Type 2	\$/Firm in Type 3	\$/Firm in Type 4	Annual \$ Type 1	Annual \$ Type 2	Annual \$ Type 3	Annual \$ Type 4	TOTAL ANNUAL \$
Div. B Mining	\$ 0.0287	\$ 0.0318	\$ -	\$ 0.0561	\$ 0.861	\$ 0.318	\$ -	\$ 1.403	\$ 2.58
21 Food, beverages, tobacco	\$ 0.0550	\$ 0.0971	\$ -	\$ -	\$ 0.550	\$ 1.651	\$ -	\$ -	\$ 2.20
22 Textile, clothing, footwear and leather	\$ 0.0850	\$ -	\$ -	\$ -	\$ 0.170	\$ -	\$ -	\$ -	\$ 0.17
23-24 Wood, paper and printing	\$ -	\$ 0.0222	\$ -	\$ 0.0639	\$ -	\$ 0.155	\$ -	\$ 0.192	\$ 0.35
25 Petroleum, coal and chemical	\$ 0.0163	\$ 0.0287	\$ -	\$ 0.1486	\$ 0.163	\$ 0.431	\$ -	\$ 0.743	\$ 1.34
26 Non-metallic mineral products	\$ 0.0260	\$ 0.0424	\$ -	\$ -	\$ 0.078	\$ 0.297	\$ -	\$ -	\$ 0.38
27 Metal products	\$ 0.0247	\$ 0.0235	\$ -	\$ 0.0917	\$ 0.074	\$ 0.470	\$ -	\$ 0.183	\$ 0.73
28 Machinery and equipment	\$ 0.0714	\$ 0.0833	\$ -	\$ -	\$ 0.500	\$ 0.250	\$ -	\$ -	\$ 0.75
37 Water, sewerage and drainage	\$ -	\$ 0.1075	\$ -	\$ 0.1385	\$ -	\$ 0.430	\$ -	\$ 0.139	\$ 0.57
Div. E Construction	\$ -	\$ -	\$ 0.0570	\$ -	\$ -	\$ -	\$ 0.342	\$ -	\$ 0.34
Div. I Transport & storage	\$ -	\$ 0.0243	\$ 0.0177	\$ 0.0350	\$ -	\$ 0.170	\$ 0.071	\$ 0.140	\$ 0.38
Commercial and Services b	\$ -	\$ -	\$ 0.1083	\$ -	\$ -	\$ -	\$ 4.874	\$ -	\$ 4.87
Grand Total	\$ 0.0369	\$ 0.0464	\$ 0.0961	\$ 0.0700	\$ 2.396	\$ 4.172	\$ 5.287	\$ 2.800	\$ 14.66

That is, some \$14.66 million would be expected to be spent on opportunities assessment per year. This equates to \$58,500 per firm / entity per year, with a range from \$16,000 to \$150,000 per year on average for firms within sectors. We note that the inherent statistical nature of the analysis will produce outliers, and cost ranges on an average-per-firm within each sector may not be so diverse. We note also that annualised averages are unlikely to reflect the nature of expenditure for some firms. In many cases it could be expected that much higher costs would be incurred in Year 1, with lower costs in subsequent years to assess progress of individual opportunities and identify / evaluate new opportunities.

What is needed to refine estimates?

253. To a significant degree the above estimates, and the process adopted to arrive at these figures, are a “best-guess” based on data that is available and knowledge in some areas of key firms that are likely to be required to comply with the measure, including both the size of their energy use / spend and, perhaps more importantly, firms’ existing processes and practices with regard to assessing opportunities to improve energy efficiency. As such this should be seen as a “first cut” at determining reasonable and defensible estimates of costs.

Improvements can be made to this estimation process, in particular:

- Further knowledge of what firms are likely to have to comply with the measure, including taking into consideration firms' structures and any impacts this has on who will be required to comply;
- Further refinement of energy unit costs for firms within sectors, and sensitivity analysis around these estimates as this relates to scale of energy use;
- Refinement of the % of total energy or operating costs that could be spent on this aspect of the measure, including basic sensitivity analysis within sectors and more detailed assessment of "additionality" and "influence" factors on total expenditure for this aspect and possible timing-of-investment factors.

FLEXIBLE ACTIONS: Innovation and Excellence					
		(Please insert data in white boxes)		Max Points	Your Points
4.1 Innovation					
Investment in past year on energy-related RDD&C, pilot plants and prototype technologies, as percentage of annual energy cost	less than 1% of annual energy costs =		3.5	0	
Formal internal processes for identification and development of 'blue sky' ideas, such as workshop processes, brainstorming sessions, etc with demonstration of follow-up action carried out in past 3 years	Investigation investment in last 3 years, as a % of energy costs = (max points for 3%)	0	1.5	0	
Investigate product lifecycle/supply chain / regional energy / product user energy. Data has been collected and analysed with the aim of identifying and evaluating energy saving opportunities inside and outside the organisation. See Note 1 for requirements	none held = 0 points		5	0	
	see Note 1	Single person external expert/generalist.. Weighting = 25%			
Demonstrated ongoing program of monitoring global and local developments in relevant fields of RDD&C and evaluation of technologies/systems used in other industries, for potential energy saving opportunities in the organisation	Enter person-days invested in last year per \$M of annual energy costs. (Max points for 5 days/\$M)	0	3	0	
Priority issue(s) for the organisation (e.g. future investments, business development, productivity improvement, etc) were considered from an energy perspective, and opportunities for synergistic energy and non-energy benefits may be identified.	Investment in investigation as percentage of annual energy cost = (max points at 5%)	0	2	0	
Participation in past year in joint industry innovation projects such as development of roadmaps, scoping studies, etc	Investment as % of annual expenditure on energy = (max points at 5%)	0	2	0	
4.2 Leadership					
Facilitation of innovation (and consequent energy efficiency improvements) outside the organisation – upstream, downstream, community, region and business networks	Expenditure and value of in-kind contributions last year as % of threshold (to be set)	0	3	0	
Contribution to development of expertise in energy efficiency through education and training of people from outside the organisation (training courses, prizes or other incentives, cadetships, etc)	Expenditure and value of in-kind contributions last year as % of threshold (to be set)	0	1	0	
At DITR discretion, public reporting of information beyond that required	(criteria TBA)	0	2	0	
Publication this year of case studies, conference papers and other forms of information to motivate and inform others: Must be publicly available, e.g. Internet.	Insert number of case studies etc. (0.25 points each)	0	2	0	
4.3 Internal Policy					
Policy includes commitment to improve product or service energy efficiency through design	Yes		1	1	
Policy includes commitment to apply lifecycle costing to new plant and equipment design and selection	Yes		1	1	
Policy includes commitment to apply lifecycle costing to procurement of materials, products and equipment	Yes		1	1	
Policy establishes specific funding mechanism(s) for energy efficiency (eg in-house carbon levy, energy efficiency fund, re-investment of specified % of savings, etc)	No		2	0	

Innovation and excellence

Base cost – no current innovation and excellence commitments

254. Under an approach where firms sought to achieve a medium-level compliance with the requirements of this element, we estimate costs in excess of \$300 million per year would result. This would arise from, say, RD&D expenditure equal to 3% of energy spend (\$240 million pa), and facilitation of upstream and downstream innovation and education (\$80 million pa based on 1% of energy cost). Clearly costs of this magnitude would need to be cost-justified. In many cases it is unlikely that expenditure on RD&D is, or should be, related to energy costs – many companies will be aware of best practice technology (e.g. via US DOE Industries of the Future), and could feasibly comply with the requirements of this sub-element without significant expenditure at all.

255. We have focused here on measures that could be implemented to enable a minimum 50% compliance score to be achieved. As shown above this is limited to internal policy commitments only, related to commitments to improve product / service energy efficiency through design and to apply LCA costing to procurement and design processes.

256. 4.3 Internal Policy: the thresholds for a number of the aspects of these elements have not yet been set. For the three aspects of internal policy selected, development costs will be nominal, and could include modifications to relevant company documentation related to design / procurement, and communication to internal staff and suppliers. A cost of \$5,000 per entity is assumed.

Recurrent costs would depend on the degree to which new equipment / processes / services are procured or designed. One possible scenario is:

- Energy use increases under a BAU scenario are 1.5% per year, related to installation of new equipment / refurbishment;
- 40% of this energy use could be mitigated via LCA approach to design and purchasing with, say, a 3-year payback;
- 5% of project costs are spent on LCA / design / procurement activities.

257. Under this scenario Type 1 entities would spend about \$12,000 per year on this approach, Type 2 would spend \$33,000, Type 3 would spend about \$23,000 and Type 4 entities would spend \$70,000 per year. These single-scenario costings are used in the model. This gives the following:

Table 34: Base cost of compliance with element 4.3 – no current action

Area	Description	Development Cost	Recurrent Cost
4.3 Internal Policy	Policy includes commitment to improve product or service energy efficiency through design		
4.3 Internal Policy	Policy includes commitment to apply lifecycle costing to new plant and equipment design and selection		
4.3 Internal Policy	Policy includes commitment to apply lifecycle costing to procurement of materials, products and equipment	\$ 1,250,000	\$ 7,815,000

258. This implies an average cost per entity of \$9,500 to satisfy the above requirements, and about \$31,000 per year thereafter to update these (estimates rounded to nearest \$500).

Additionality

259. For many end users, particularly large users, investments in new equipment and technologies that materially change energy consumption patterns will be “lumpy” and averaging of costs even over a 5-year timeframe is unlikely to be representative of the timing of investment. Notwithstanding this, we expect that in most cases the importance of energy costs for these large users is such that, at the time of replacement, high levels of energy efficiency are generally specified to ensure competitiveness is maintained over the long term, and that this commitment is reflected in internal processes.

260. In addition, the commercial sector appears to be increasingly driven to improve the energy performance of new buildings and refurbishments; hence to the extent the above policy initiatives are taken to apply to new equipment / systems / buildings and major refurbishments / expansions only it might be expected that little additional costs for LCA approaches would be directly associated with EEOA, but would be in response to other policies / initiatives.

261. A further example of where life cycle approaches may already be in train is in supermarkets, where the uniformity of designs lends itself to the development of integrated energy efficiency solutions at one or a small number of stores, with cost-effective solutions then simply rolled out to new / refurbishment stores.

262. For the purpose of this assessment we assume that sectors with low energy spend as a % of costs will spend 50% of the base value recurrent, excepting commercial where 25% is taken to be additional. For all sectors with high energy costs as a % of operating costs, additional costs associated with this approach are estimated at 25% of base costs. Policy establishment costs are estimated at 25% of base costs. This gives estimated costs of:

Table 35: Additional cost of compliance with element 4.3

Area	Description	Development Cost	Recurrent Cost
4.3 Internal Policy	Policy includes commitment to improve product or service energy efficiency through design		
4.3 Internal Policy	Policy includes commitment to apply lifecycle costing to new plant and equipment design and selection		
4.3 Internal Policy	Policy includes commitment to apply lifecycle costing to procurement of materials, products and equipment	\$ 312,500	\$ 2,095,000

263. This implies an average additional cost per entity of \$1,250 to develop the above requirements, and about \$8,500 per year thereafter in additional costs to comply (estimates rounded to nearest \$250).

Summary – Innovation & Excellence

264. As the above sub-element 4.3 is the only aspect of element 4 assessed here, the above table and per-firm costs constitute an estimate of minimum costs that could be incurred to meet the minimum level of compliance under 3-Plus.

Reporting

MANDATORY REQUIREMENTS (PRELIMINARY DESCRIPTION OF REPORTING REQUIREMENTS).	
5.1 Reporting to DITR	
<u>The following must be submitted to DITR each year by (date):</u>	
List of identified opportunities that meet DITR rate of return threshold	<input checked="" type="checkbox"/>
Information on the organisation's response to each opportunity	<input checked="" type="checkbox"/>
Annual report on past and projected future trends in energy use and energy efficiency indicators must be submitted (including energy use, PJ and \$, energy/\$profit, rate of energy efficiency improvement)	<input checked="" type="checkbox"/>
Annual report on cumulative and latest year annual costs and benefits of EEO measures	<input checked="" type="checkbox"/>
Comparisons against benchmarks for international 'best practice' indicators agreed with DITR	<input checked="" type="checkbox"/>
Compliance report submitted to DITR	<input checked="" type="checkbox"/>
5.2 Public Reporting	
Public Summary report of the above submitted to DITR, the placed on the organisation's web-site and reported in its Annual Report	<input checked="" type="checkbox"/>

Base cost – no current reporting

265. Under a base cost scenario we assume that firms / entities develop their own template for reporting (i.e. no default template supplied by DITR), and that this is developed from scratch to incorporate results from the development of action plans and summary progress and forecast information drawn from company energy, financial and other relevant systems. We have assumed a fixed cost per entity for reporting, made up of:

- Type 1: \$15,000 average cost per entity for establishment of the first report, with two-thirds of this cost incurred annually to produce updates to DITR.
- Type 2: \$30,000 average cost per entity for establishment of the first report, with two-thirds of this cost incurred annually to produce updates to DITR.
- Type 3: \$22,500 average cost per entity for establishment of the first report, with two-thirds of this cost incurred annually to produce updates to DITR.
- Type 4: \$30,000 average cost per entity for establishment of the first report, with two-thirds of this cost incurred annually to produce updates to DITR.
- For all types we assumed \$5,000 in the first year and \$2,000 in subsequent years is spent on development of a summary report for web publication.

This gives the following estimate of costs:

Table 36: Base cost of compliance with element 5 – no current action

Area	Description	Development Cost	Recurrent Cost
5.1 Reporting to DITR	List of identified opportunities that meet DITR rate of return threshold		
5.1 Reporting to DITR	Information on the organisation's response to each opportunity		
5.1 Reporting to DITR	Annual report on past and projected future trends in energy use and energy efficiency indicators must be submitted (including energy use, PJ and \$, energy/\$profit, rate of energy efficiency improvement)		
5.1 Reporting to DITR	Annual report on cumulative and latest year annual costs and benefits of EEO measures		
5.1 Reporting to DITR	Comparisons against benchmarks for international 'best practice' indicators agreed with DITR		
5.1 Reporting to DITR	Compliance report submitted to DITR	\$ 6,112,500	\$ 4,095,375
5.2 Public Reporting	Public Summary report of the above submitted to DITR, the placed on the organisation's web-site and reported in its Annual Report	\$ 1,250,000	\$ 500,000

266. This implies an average cost per entity of \$29,500 to develop suitable reporting templates to DITR and web summary publications. Recurrent costs are estimated at an average of \$18,500 per entity (rounded to the nearest \$500).

Additionality

267. In reality, many firms will already report their energy efficiency progress to varying levels under a number of programs, in particular Greenhouse Challenge Plus. Increasingly firms are reporting energy performance in Annual Reports and in CSR forums. It could be argued that even in the absence of EEOA this trend would continue.

268. We expect that the requirements stated here can be substantially met by a large number of firms in EEOA, and additional costs for the level of reporting required are likely to be no more than 50% of the costs estimated above. This gives the following estimate of costs:

Table 37: Additional cost of compliance with element 5

Area	Description	Development Cost	Recurrent Cost
5.1 Reporting to DITR	List of identified opportunities that meet DITR rate of return threshold		
5.1 Reporting to DITR	Information on the organisation's response to each opportunity		
5.1 Reporting to DITR	Annual report on past and projected future trends in energy use and energy efficiency indicators must be submitted (including energy use, PJ and \$, energy/\$profit, rate of energy efficiency improvement)		
5.1 Reporting to DITR	Annual report on cumulative and latest year annual costs and benefits of EEO measures		
5.1 Reporting to DITR	Comparisons against benchmarks for international 'best practice' indicators agreed with DITR		
5.1 Reporting to DITR	Compliance report submitted to DITR	\$ 3,056,250	\$ 2,047,715
5.2 Public Reporting	Public Summary report of the above submitted to DITR, the placed on the organisation's web-site and reported in its Annual Report	\$ 625,000	\$ 250,000

269. This implies an average cost per entity of \$15,000 to develop suitable reporting templates to DITR and web summary publications. Recurrent costs are estimated at an average of \$9,000 per entity (rounded to the nearest \$500).

Costs of Minimum Performance Against 3-Plus Standard – Order 2005.3a

270. In assessing the costs to comply with the requirements of 3-Plus (simplified structure) we have looked at “additional” cost estimates for the full “minimum-compliance” model as described above, and adjusted costs downwards to reflect the simplified criteria.

Policy, management and people

271. Based on the revised criteria, compliance could be achieved via completion of the following sub-elements.

Table 38: Simplified element 1 requirements to achieve compliance

1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management
1.1 Public Policy:	State corporate level objectives (short and long term)
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management

272. Requirements for 1.1 remain as per the initial model and hence are unchanged in costs under this simplified approach. The requirements for 1.2 are substantially different, with requirements to integrate action plans with OH&S / enviro systems, and communications strategies removed. We expect that additional costs for this sub-element are 50% of those in the initial model. For 1.4, the nomination of key staff responsible for energy management at site / business unit level should be nominal, and costs of 20% compared with the initial model are estimated – i.e. the more sizeable costs related to requiring contractors to submit energy policies, development of KPIs in staff duty statements and “bottom-up” contribution to policy development are removed.

Table 39: Estimated “additional” costs for element 1 under simplified model

Area	Description	Development Cost	Recurrent Cost
1.1 Public Policy:	Be authorised/confirmed each year by CEO and Board (Australia) after formal review by senior management team, and include site/business unit commitment to effective energy management		
1.1 Public Policy:	State corporate level objectives (short and long term)	\$ 1,250,000	\$ 312,500
1.2 Internal Policy and Action Plan	Have an Action Plan at Corporate level and for each site and/or business unit using > \$5M energy /year, which includes specific objectives, targets ; and maps out how the objectives and targets will be achieved; and allocates sufficient resources for thei	\$ 3,056,250	\$ 1,008,590
1.4 Internal Policy	State titles and names of senior staff at each site and/or business unit formally responsible for energy management	\$ 366,750	\$ 91,715

273. This is equivalent to \$18,700 on average per firm in upfront costs and \$5,700 per year recurrent costs. Total “additional” costs are \$4.7 million upfront and \$1.4 million recurrent.

Data and analysis

274. Based on the revised criteria, compliance could be achieved via completion of the following sub-elements.

Table 40: Simplified element 2 requirements to achieve compliance

2.1 Monitoring and Reporting Data (Must have all)
Energy billing data at site and/or business unit level collated,
Performance compared with objectives and targets in corporate and site policies
2.2 Data Analysis (Must have)
Trends in energy use indicators calculated using billing data and production data on at least a monthly basis and included in report to site or business unit energy manager
2.4 Analysis (One or more of these)
Development and validation of model(s) which relate energy and material or (other relevant) flows through processes or sites using equipment characteristics to predict energy use for actual operation (note for multiple sites or vehicles, etc, tools such as regression analysis may be appropriate) – points linked to level of detail of model and for portion of total energy cost of firm covered
2.3 Monitoring and Reporting Data (Must have)
Frequently collected and reported energy data (monthly or weekly or more frequently)
2.3 Sub-metering (Must have all)
Either permanent or temporary sub-metering installed or sub-metering data from representative company processes and data regularly collected and analysed
Where sub-metering is installed, specify how often data (including trends and benchmarking) is reported to management and equipment operators

- Sub-element 2.1 is similar to that described in the initial model, the exception being monthly reporting of collated data at a business unit level and quarterly reporting at a board level. Compliance costs are estimated at two-thirds of estimated “additional” costs from the initial model.
- Sub-element 2.2 is the same as per the initial model, hence “additional” costs are assumed to be the same.
- As discussed above, we believe that the stated requirements for 2.4 as above are best met in the Opportunities Assessment stage, as this should be an essential component of this work. It would be the use of models to interpret anomalies in billing level KPIs and trends that would represent “additional” costs at a fairly basic level.
- The requirements in respect of 2.3 do, we believe, require clarification, as there is a significant difference between temporary sub-metering (which would be installed where appropriate at the Opportunities Assessment stage to facilitate model development and prioritisation) and permanent sub-metering, which is a much higher level of commitment and cost, and materially impacts on the frequency with which sub-system performance data / trends would be available to management and operators. As discussed above we believe that the case for sub-metering generally needs to be made on a cost-benefit basis.

- For example: A supermarket company considering new lighting technology installs temporary sub-metering on a few trial stores to prove the savings level and hence economic viability of the new technology. The trial is successful, and supports the level of savings that justifies the investment at the trial stores. A company-wide energy model that recognises differences in trading hours, lighting technologies and energy cost rates is then used to determine stores where the project is economically justified at refurbishment. In this case the use of temporary sub-metering at trial stores, at very low cost relative to the consumption by lighting systems across the supermarket network, is adequate to justify the roll-out of the initiative. The installation of permanent sub-metering on all stores lighting systems would deliver little or no additional benefit for very high cost.

Taking this example, it will be the case in many instances that high levels of sub-metering and high frequency of data collection at sub-metered level are not of themselves pre-requisites to achieving good practice. Rather, **the practice of employing M&V that is appropriate to particular needs should be encouraged; the costs and benefits of this will vary widely from firm to firm, and in each firm should be incorporated as part of the business case(s) that seek to justify investment in energy efficiency.**

For the purpose of this analysis, we have assumed that sub-element 2.3 can only be justified (for permanent sub-metering) as part of the cost of energy efficiency initiatives, or (for temporary sub-metering) as part of the cost of conducting the opportunities assessment stage. Hence “additional” costs are nil. The cost of the other elements under the simplified model are estimated to be:

Table 41: Estimated “additional” costs for element 2 under simplified model

Area	Description	Development Cost	Recurrent Cost
2.1 Monitoring and Reporting Data	Energy billing data at site and/or business unit level collated		
2.1 Monitoring and Reporting Data	Performance compared with objectives and targets in corporate and site policies on a monthly basis	\$ 999,960	\$ 1,770,000
2.2 Analysis	Trends in indicators (see below) calculated using utility billing data and production data on at least a monthly basis and included in report to site or business unit energy manager	\$ 750,000	\$ 555,000
2.3 Monitoring and Reporting Data	Frequently collected and reported energy data (monthly or weekly or more frequently)		
2.3 Monitoring and Reporting Data	Either permanent or temporary sub-metering installed or sub-metering data from representative company processes and data regularly collected and analysed		
2.3 Monitoring and Reporting Data	Where sub-metering is installed, specify how often data (including trends and benchmarking) is reported to management and equipment operators		
2.4 Analysis	Use of energy-based models to provide ongoing feedback to plant and equipment operators to optimise performance, points linked to level of detail of model and for proportion of total energy cost of firm covered	\$ -	\$ 1,226,250

275. This is equivalent to \$7,000 on average per firm in upfront costs and \$14,000 per year recurrent costs. Total “additional costs” are \$1.75 million upfront and \$3.55 million recurrent.

Opportunities assessment, innovation & excellence, and reporting

276. Simplified requirements for innovation and excellence eliminate the need to comply with this element, hence costs are nil.

277. No simplified requirements are provided for opportunities assessment and reporting, hence costs are as estimated above for Order 2005 3.

ALTERNATIVE ENERGY DEFINITIONS

Alternative energy forms

278. There are a number of forms of energy that are not conventionally included in energy use reporting. In general they are:

- standard fuels used as a feedstock or input material for the production of a non energy product;
- non-standard forms of energy used as a feedstock; or
- Non-standard forms of energy such as explosives.

279. An extension of the feedstock type is the transformation of energy through petrochemical refining or electricity generation. In both cases energy is the output product, which is on sold to other end uses. It is assumed in these cases it is the net or on-site use of energy that would be applicable under the program.

Standard fuels as feedstock

280. Where an energy form such as natural gas or ethane is used as a feedstock to produce a non-energy related product there is a minimum requirement of the feed material to produce the end product. This can be determined from a stoichiometric evaluation. Additional feedstock material may be lost through inefficiencies in the transformation or production process. Some processes may utilise some or all of the feedstock material to provide heat to the process through chemical reactions or direct combustion of the feed.

281. The quantity of feedstock used beyond that physically required to produce the quantity of final product could be accounted as energy use within the bounds of the program. This could encourage the effective use of the feedstock. This would be relatively easy to include in the program and should not have any significant additional costs for compliance beyond possibly capturing some additional companies or, as is more likely, increase the baseline energy use for companies that would already be captured by the measure. The ability to influence energy efficiency (i.e. feedstock efficiency) may be limited though, assuming that feedstock yield is critical to overall productivity and is a primary focus already.

Non-standard forms of energy as feedstock

282. Some non-standard forms of energy are used as feedstock such as sulphur in the production of sulphuric acid. Sulphur is not usually included in energy use reporting, but in this case may provide more heat than is required for the process and offer opportunities for alternative uses for the waste heat. The difficulty here is to quantify the available waste heat, which may be dependent on technology or even the opportunity to use the waste heat.

283. An alternative case would be the inclusion of sulphur in pyretic ores. During the smelting stage the sulphur is removed through oxidation to produce SO₂. The oxidation of the sulphur provides heat to the smelting of the ore and benefits the process through the reduction in the fuel used for direct heating. While there may be opportunities for waste heat capture in some cases, modern smelting design is directed towards reducing the quantity of direct heating by utilising the sulphur oxidation process.

284. The difficulties in evaluating the available waste heat makes these energy forms difficult to include in the program. For the smelting process, some sites are large and likely to be included in the program anyway, however some may not already be included. Improvements in waste heat recovery will be available to some sites and would result in reductions in direct heating. However in some cases there will be no sink for waste heat, and inclusion in the program owing to the quantity of “free” energy usage by the site / firm could lead to an expensive cost of compliance with little possible benefit.

285. On the whole, it is likely that a case-by-case assessment of relevant factors such as those above would need to be carried out to ensure that benefits are potentially available to individual sites or firms.

Non-standard energy forms

286. Some forms of direct energy use are not usually included in energy use reporting. This includes explosives and solar heating.

287. Explosives used for mining or other demolition work. For mining companies explosives may represent an additional one per cent of the energy use normally reported. Though explosives are not normally equated to other forms of energy use at a site, there is significant quantity of energy used in their manufacture through the use of natural gas as a feedstock in the production of ammonia nitrate. The energy content of explosives is around 3.2 GJ per tonne.

288. Including explosives within the program would not be expected to increase the number of participants. It should be recognised within the program that explosives do represent a source of energy, and changes to the use of explosives could be evaluated in terms of the overall impact on energy use at a site. Compliance costs would not be affected significantly though modest additional reporting may be required. Many mining companies already track the emissions from explosives for NPI or GHC+ reporting.

289. Solar heating is often used for product drying including salt. The actual energy use can be very high and if included in the program for registration purposes would create a distortion. Solar heating is an alternative to direct heating from fuel use or mechanical processes, and as such represents an opportunity to reduce traditional energy use.

ENERGY EFFICIENCY OPPORTUNITIES BILL 2005

NOTES ON CLAUSES

PART 1 - PRELIMINARY

Clause 1 Short Title

290. The short title of the Act will be *Energy Efficiency Opportunities Act 2005*.

Clause 2 Commencement

291. The Act will commence on the day it receives Royal Assent.

Clause 3 Object

292. This clause outlines the object of the Act.

Clause 4 Definitions

293. This clause defines terms used throughout the Bill.

Clause 5 Schedule 1 (consequences of contravening civil penalty provisions)

294. This clause gives Schedule 1 effect.

PART 2 – DEFINITIONS RELATING TO GROUPS

Clause 6 Holding company

295. This clause provides the definition for a *holding company*. The holding company is a company that holds a controlling interest in another company, or companies, that are its subsidiaries.

Clause 7 Controlling corporation

296. Subclause (1) provides the definition for a *controlling corporation* under the scheme. The definition includes all constitutional corporations, that is foreign corporations and trading and financial corporations formed within the limits of the Commonwealth. Controlling corporations will either have subsidiaries or be a single corporation, but in either case will not have a holding company incorporated in Australia.

297. Subclause (2) provides a power for the regulations to exclude certain classes of controlling corporations from the requirements of the Act if their activities are mainly in the electricity generation, electricity and gas transmission or electricity and gas distribution sectors.

Clause 8 Group and members of a group

298. Subclause (1) defines a controlling corporation's group as the controlling corporations and its subsidiaries (if any). It is intended that the members of the group will include corporations that control trusts.

299. Subclause (2) defines the *members* of a group.

300. Subclause (3) deals with situations in which more than one holding company holds a controlling interest in a subsidiary and vests control in the subsidiary according to the rules outlined in the *Corporations Act 2001*. In such a case, if the other holding company is not a member of the group, the subsidiary will not be covered by this section.

301. Subclause (4) provides a power for the regulations to exclude certain classes of subsidiary corporations from the requirements of the Act if their activities are mainly in the electricity generation, electricity and gas transmission or electricity and gas distribution sectors.

PART 3 – CORPORATIONS REQUIRED TO REGISTER

Clause 9 Obligation to apply to register

302. Subclauses (1) to (3) provide the circumstances when a controlling corporation must apply to be registered under the Act including the definition of the *trigger year*. Companies will be required to register when the energy use of their group exceeds a threshold of 0.5 petajoules in the previous financial year. This previous year is referred to as the *trigger year*. A penalty applies to a breach of this requirement.

303. Subclause (2) provides that a controlling corporation that could not have reasonably ascertained that its group met the energy use threshold is not obliged to register. However, it must be noted that subclause (3) puts the burden of proving this on the corporation. This is because the corporation will have exclusive knowledge of whether it was able to ascertain its group's energy use.

304. Subclauses (4) and (5) provide that the application to register must be: made by 31 March in the financial year following the trigger year; be in the specified form; and include any information outlined in the regulations. To avoid doubt, controlling corporations will have nine months following the end of the trigger year to apply to register.

305. Subclause (6) limits the application of Clause 8 to trigger years ending on or after 30 June 2006. This means that as well as those that use over 0.5 petajoules in 2005/2006, other controlling corporations that use over that amount in later years would also become obliged to apply to register.

Clause 10 Energy use threshold

306. Subclause (1) provides that a controlling corporation's group meets the *energy use threshold* if the energy use of the entities mentioned in subclause (2) is more than 0.5 petajoules.

307. Subclause (2) provides that these 'entities' include the members of the group. The subclause also provides that 'entities' can include joint ventures and partnerships. If a member of the group is a participant in a joint venture or a partner in a partnership, and the joint venturers or partners (as the case may be) have either nominated that member to be a reporting entity, or have failed to nominate a reporting entity, the energy use of the partnership or joint venture counts towards whether the controlling corporation's group meets the energy use threshold. It is expected that joint ventures and partnerships affected by this provision will nominate a reporting entity in order to minimise compliance costs for the joint venturers or partners respectively.

308. Subclause (3) allows for regulations to define *energy used*. It is intended that the definition of energy used will refer to the combustion of fuel and the use of electricity by entities in Australia.

309. Subclause (4) and (5) further specify that in defining energy used, regulations may refer to kinds and uses of energy, specify how energy use of a trust is to be established, define how energy use in franchise activities is determined, and how changes to corporate structures will be dealt with.

310. Subclause (6) outlines that the regulations may establish rules for making and revoking nominations of reporting entities for joint ventures and partnerships. It is intended that this will include the requirement that the nominated party accept the nomination.

Clause 11 Exemption from registration on application by corporation

311. This clause provides for exemptions from applying for registration where the Secretary is satisfied that even though the controlling corporation's group exceeded the threshold energy use in the trigger year it isn't likely to do so in the following year.

312. Subclause (1) provides that controlling corporations will not be required to register if covered by an exemption in this clause.

313. Subclauses (2) and (3) set out the circumstances when a controlling corporation can apply for an exemption from the requirement to be registered. The application must be made on or before 31 December in the financial year following the trigger year. This gives corporations six months from the end of the trigger year to apply.

314. Subclause (4) requires that the application for exemption must be in a form, and include the content, specified in the regulations.

315. Subclause (5) sets out the circumstances when the Secretary must approve the application for exemption.

316. Subclause (6) provides that the Secretary will be deemed to have approved the application for exemption if he or she has not advised a decision not to grant the exemption within 60 days of receiving the application for exemption.

PART 4 – REGISTRATION

Clause 12 The Register

317. Subclauses (1) and (2) require that the Secretary must keep a register called the *Register of Corporations for the Energy Efficiency Opportunities Scheme*.

318. Subclause (3) allows for the Secretary to cause the contents of the Register to be made public. This would allow the public to know which corporations were registered under the scheme. It is intended that commercially sensitive information would not be released under this clause.

319. Subclause (4) allows for regulations to specify which information, other than the name of the corporation, can be entered on the Register. It is intended that this may include administrative details (address, telephone, etc) of the controlling corporation as well as those of its subsidiaries.

320. Subclause (5) provides that a controlling corporation is registered once the Secretary has entered its name on the Register.

Clause 13 Secretary must register corporation

321. This clause requires that the Secretary must register a corporation that applies to be registered if he or she is satisfied that the corporation is obliged to apply.

Clause 14 Corporation may apply for deregistration

322. Subclause (1) allows for controlling corporations that are already registered to apply to the Secretary for deregistration.

323. Subclause (2) provides that the regulations will provide the requirements for the application for deregistration.

324. Subclause (3) provides the circumstances when the application for deregistration must be accepted and the controlling corporation's name removed from the register. The Secretary may approve de-registration when satisfied the controlling corporation's group is not likely to meet the energy use threshold for three consecutive years. This avoids the prospect of corporate groups with variable energy use having to frequently register and apply to de-register.

325. Subclause (4) provides that a controlling corporation is no longer registered if its name no longer appears on the Register.

PART 5 – ASSESSMENT PLAN

Clause 15 Registered corporation must submit assessment plan every 5 years

326. Subclauses (1) to (3) provide that registered corporations must submit an assessment plan to the Secretary in line with specific time period requirements. Corporations will initially have 18 months following the end of the trigger year to submit their assessment plans. They will then be obliged to submit a new assessment plan (if they continue to be registered) every 5 years.

327. The information provided to the Department under this clause will be treated as commercial in confidence. Reference is made to section 70 of the *Crimes Act 1914* to make clear that the appropriate treatment of confidential information by Commonwealth Officers is covered by that provision.

328. The requirement for an assessment plan has a dual purpose. Firstly, it provides flexibility for corporations to undertake assessments in line with their other business processes while still satisfying the Department they are compliant with the Act. Secondly, it will enable the Department to effectively manage the administration of the assessment and reporting functions by monitoring the timing of assessments over the five year cycle.

329. Subclause (4) allows for a controlling corporation to submit an assessment plan prior to its registration being accepted under Part 4. This means that it can submit an early plan if it wishes to undertake assessments to identify opportunities quickly.

330. Subclause (5) provides that a controlling corporation will have contravened this subclause if it fails to comply with subclauses (1) and (2). A penalty applies for a breach of these requirements.

Clause 16 Approval of assessment plan

331. Subclause (1) limits the application of this clause to those situations when the Secretary has been given an assessment plan under clause 15.

332. Subclause (2) outlines the circumstances when the Secretary must approve assessment plans that have been submitted and notify the corporation in writing. This will occur when the Secretary is satisfied that they meet the requirements in clause 18.

333. Subclause (3) provides that the Secretary will be taken to have approved the assessment plan if he or she hasn't refused to approve it within six months.

Clause 17 Refusal to approve assessment plan

334. Subclause (1) and (2) provide that when the Secretary has been given an assessment plan and he or she is not satisfied that it substantially meets the requirements outlined in clause 18, then he or she must refuse to approve it and notify the responsible controlling corporation in writing.

335. Subclause (3) provides that when the Secretary has refused an assessment plan, he or she must prepare a revised assessment plan, notify the corporation and invite comments from it.

336. Subclauses (4) and (5) allow for the Secretary to consequently approve the revised assessment plan after considering written comments from the controlling corporation.

337. Subclause (6) provides for the continued approval process if the assessment plan is not approved under subclause (4). This would occur if a corporation's comments convinced the Secretary that the revised plan was unacceptable. The Secretary would be required to refuse the revised plan, and prepare another.

338. This clause sets up a process for negotiation of an assessment plan that meets the requirements of both the controlling corporation and the Secretary. The Secretary will, however, have the power to determine the final assessment plan that will be used by the corporation.

Clause 18 Requirements for an assessment plan

339. Subclause (1) provides that the assessment plan must set out the controlling corporation's plan for carrying out its energy efficiency opportunities assessment or assessments of its group.

340. Subclauses (2) and (3) provide that the plan must cover a five year period from the end of the trigger year and that the required form may be set out in regulations.

341. Subclause (4) requires that the assessment plan must set out particular actions that need to be done to assess those opportunities. These actions will be further specified in regulations under this clause and under Part 6, Energy Efficiency Opportunities Assessments.

342. Subclauses (5) provides that the assessment plan must specify how the energy use of the controlling corporation's group as a whole is to be assessed or, if more appropriate, how energy use in particular operations of the group are to be assessed. The controlling corporation may decide that it will be more manageable to assess different operations of its group separately. For example, business units that carry on distinctly different types of activities, or those with a number of large energy using sites.

343. Subclauses (6) provides that the assessment plan must set out a deadline or deadlines for the actions referred to in subclause (4).

344. Subclauses (7) and (8) provide for regulations to set out details of any extra requirements for the assessment plan. This will include the types of actions the assessment plan must refer to and will link the requirements of the assessment procedure under Part 6 to the assessment plan proc

Clause 19 Registered corporation may seek variation to approved assessment plan

345. Subclause (1) provides that a registered corporation can apply for a variation to its assessment plan. This could occur if there are changes to the corporate group, such as acquisitions, mergers or disposal of subsidiaries.

346. Subclause (2) provides that the requirements under Clause 16 and Subclauses 17(1) and (2), regarding approval and refusal of assessment plans, will also apply to the application for variation to an assessment plan.

PART 6 – ENERGY EFFICIENCY OPPORTUNITIES ASSESSMENTS

Clause 20 Requirement to carry out energy efficiency opportunities assessments

347. Subclause (1) sets out the requirement for registered corporations to carry out energy efficiency opportunities assessments as outlined in their approved assessment plan.

348. Subclauses (2) and (3) provide that the regulations may set out further requirements, and sets out what those requirements will be in relation to. To meet the requirements of this clause, corporations will have to undertake a number of activities. Firstly, they will have to assess the business objectives for energy use and reduction (if any). Secondly, they will have to measure and analyse energy efficiency data. Finally, they will undertake a process to a minimum standard that identifies and evaluates energy efficiency opportunities.

349. Subclause (4) defines failure to comply with this clause. A civil penalty applies to contraventions.

PART 7 – REPORTING ABOUT ENERGY EFFICIENCY OPPORTUNITIES ASSESSMENTS

Clause 21 Overview

350. Provides an overview of the requirement for corporations to provide information on the outcomes of the assessment in a report to the public in accordance with Clause 22 and additional information in a report to the Secretary as per Clause 23.

Clause 22 Reporting to the public

351. Subclause (1) requires that controlling corporations provide information in a report to the public on how they have undertaken the energy efficiency opportunities assessment as set out in their assessment plan.

352. Subclause (2) allows for the regulations to specify the timing of the report.

353. Subclause (3) outlines the requirements for the content of the report. The report must cover the way in which the energy efficiency opportunities assessment was carried out and the outcomes of the assessment including the corporation's response to the assessment. The regulations may specify detailed requirements.

354. Subclause (4) allows for the form of the report to be specified in the regulations. It also requires that the report be signed by the chair of the board of directors or equivalent to ensure that senior executives give due consideration to the identified opportunities.

355. Subclause (5) allows for the regulations to specify the timing and manner of publication.

Clause 23 Reporting to the Secretary

356. Subclause (1) requires that controlling corporations provide information in a report to the Secretary on how they have undertaken the energy efficiency opportunities assessment as set out in their assessment plans. A penalty will apply for failure to meet the requirements of this subclause.

357. Reporting under this clause is for the purposes of ensuring compliance with the Act and to allow for program evaluation. The information provided to the Secretary under this clause will be treated as commercial in confidence. Reference is made to section 70 of the *Crimes Act 1914* to make clear that the appropriate treatment of confidential information by Commonwealth Officers is covered by that provision.

358. Subclause (2) allows for the regulations to specify the timing of the report.

359. Subclause (3) outlines the requirements for the content of the report. The report must contain the information provided for in the public report under clause 22 as well as any additional information required by the regulations.

360. Subclause (4) allows for the form of the report to be specified in the regulations.

361. Subclause (5) allows for the regulations to specify the timing and manner of the provision of the report.

PART 8 – POWERS OF INSPECTION

362. This Part sets up a standard process for verification of compliance with the requirements of the Act.

Division 1 – Overview

Clause 24 Overview of Part

363. This clause provides an overview of the main elements of this Part, briefly explaining the function of each Division.

Division 2 – Appointment of authorised officers and identity cards

Clause 25 Appointment of authorised officers

364. Subclause (1) provides that the Secretary may appoint a person as an authorised officer to carry out the inspection and verification functions set out in this Part.

365. Subclause (2) provides that authorised officers must comply with any directions of the Secretary. For example, this may include a requirement to follow all occupational, health and safety regulations of premises they inspect.

Clause 26 Identity cards

366. This clause requires that authorised officers be issued with and carry an identity card when performing functions under this Part.

Division 3 – Powers of authorised officer

Subdivision A – Monitoring Powers

Clause 27 Authorised officer may enter premises by consent or under monitoring warrant

367. Subclause (1) provides that an authorised officer may enter premises and exercise monitoring powers to substantiate information provided under the Act, or to determine whether the Act has been complied with.

368. Subclause (2) provides that an authorised officer may only enter business premises where the occupier has consented to the entry and the authorised officer has, on request, shown his or her identity card to the occupier, or where the authorised officer is entering the premises under a monitoring warrant.

369. Subclause (3) provides that an authorised officer must leave the premises when asked to do so by the occupier if he or she is on those premises with the consent of the occupier.

Clause 28 Monitoring powers of authorised officers

370. Subclause (1) sets out the monitoring powers of authorised officers.

371. Subclause (2) provides that an authorised officer may operate equipment at the premises to assess the correctness of information provided by the occupier under the Act.

372. Subclause (3) provides that an authorised officer may use facilities at the premises to download and copy certain documents and information and to remove those copies from the premises.

Subdivision B – Power of authorised officer to ask questions and seek production in certain circumstances

Clause 29 Authorised officer may request persons to answer questions

373. Subclause (1) provides that an authorised officer who has been given permission by the occupier to enter premises, may ask the occupier to answer questions and produce documents related to the operation of the Act.

374. Subclauses (2) and (4) provide that where an authorised officer has been issued with a monitoring warrant, the occupier, and persons who apparently represent the occupier, must comply with a request to answer questions and produce documents, unless the answer to the question or production of the document may incriminate the person or expose the person to a penalty.

375. Subclause (3) provides that it is an offence to not comply with subclause (2).

Division 4 – Obligations and incidental powers of authorised officers

Clause 30 Authorised officer must produce identity card on request

376. This clause provides that an authorised officer cannot exercise any powers under this Part if he or she does not show his or her identity card at the request of the occupier.

Clause 31 Consent

377. This clause provides that an authorised officer can only enter premises without a warrant if the authorised officer has asked for the consent of the occupier, having informed the occupier that he or she is entitled to refuse consent, and the occupier has voluntarily given his or her consent.

Clause 32 Announcement before entry

378. This clause provides that before an authorised officer enters premises under a warrant, he or she must announce that he or she is authorised to enter, and give any person at the premises the opportunity to allow the authorised officer to enter the premises.

Clause 33 Details of monitoring warrant to be given to occupier etc. before entry

379. This clause sets out certain requirements of authorised officers when executing a monitoring warrant.

Clause 34 Use of electronic equipment in exercising monitoring powers

380. Subclause (1) provides that an authorised officer may operate electronic equipment on the premises in order to exercise monitoring powers, as long as the authorised officer believes, on reasonable grounds, the equipment will not be damaged.

381. Subclause (2) provides that the authorised officer may secure the electronic equipment in certain circumstances where he or she requires expert assistance to operate the equipment.

382. Subclauses (3) to (8) set out certain requirements for, and limitations on, securing equipment for the purposes of executing monitoring powers under this Act.

383. Subclause (9) defines *premises* for the purposes of this clause.

Clause 35 Compensation for damage to electronic equipment

384. This clause provides that compensation is payable to the owner of equipment operated under clause 31 which is damaged because an authorised officer has exercised insufficient care in operating the equipment, or in selecting a person to operate the equipment.

Division 5 – Occupier’s rights and responsibilities

Clause 36 Occupier entitled to be present during execution of monitoring warrant

385. This clause provides that, when present, the occupier is entitled to observe the execution of a monitoring warrant, unless the occupier impedes the execution. This clause does not prevent the execution of the warrant in two or more areas of the premises at the same time.

Clause 37 Occupier to provide authorised officer with all facilities and assistance

386. This clause requires an occupier to assist an authorised officer executing a monitoring warrant.

Division 6 - Warrants

Clause 38 Monitoring warrants

387. This clause sets out the procedures to be followed and requirements to be met when obtaining and issuing a monitoring warrant for the purposes of this Act.

PART 9 - MISCELLANEOUS

Clause 39 Delegation

388. Clause 38 enables the Secretary to delegate his or her powers under this Act.

Clause 40 AAT review of decisions

389. This clause sets out the kinds of decisions that may be reviewed by the Administrative Appeals Tribunal (AAT).

Clause 41 Regulations

390. This clause provides that regulations may be made under the Act.

SCHEDULE 1- CONSEQUENCES OF CONTRAVENING CIVIL PENALTY PROVISIONS

1 Declarations of contravention

391. Subclause (1) requires that a Court must make a declaration of contravention if they are satisfied that a controlling corporation has contravened one or more of the following subclauses: 9(1) controlling corporation must apply to be registered; 15(5) provide an assessment plan in the period specified; 20(4) carry out assessments in line with the approved assessment plan and regulations; 22(1) reporting to the public in line with the form and timing specified; 23(1) report to the Secretary in line with the form and timing specified.

392. Subclause (2) outlines the requirements for the declaration.

2 Declaration of contravention is conclusive evidence

393. Clause 2 provides that a declaration is conclusive evidence of the matters referred to in subclause 1(2).

3 Pecuniary penalty orders

394. Subclause (1) provides that a Court may order a corporation to pay the Commonwealth a penalty up to 1000 penalty units if a declaration of contravention has been made under Clause 1 and the contravention is serious.

395. Subclause (2) sets out that the penalty is a civil debt to the Commonwealth and its enforceability.

4 Who may apply for a declaration or order

396. Subclause (1) allows for the Minister (or a delegate) to apply for a declaration or pecuniary penalty order.

397. Subclause (2) states that no other person can apply except those authorised by this clause.

398. Subclause (3) clarifies that Subclause (2) does not exclude the operation of the *Director of Public Prosecutions Act 1983*.

5 Time limit for application for a declaration or order

399. Clause 5 provides that proceedings for a declaration of contravention or pecuniary penalty order must be started within six years of the contravention.

6 Civil evidence and procedure rules for declarations of contravention and civil penalty orders

400. Clause 6 requires that the Court must apply the rules of evidence and procedure for civil matters when hearing proceedings for a declaration or a pecuniary penalty order.

7 Civil proceedings after criminal proceedings

401. Clause 7 sets out that a Court can not make a declaration of contravention or a pecuniary penalty order against a controlling corporation that has been convicted of an offence constituted by conduct that is substantially the same.

8 Criminal proceedings during civil proceedings

402. Subclause (1) provides that proceedings for a declaration of contravention or a pecuniary penalty order against a controlling corporation are stayed if criminal proceedings have begun for substantially the same conduct.

403. Subclause (2) allows for the resumption or dismissal of proceedings if the controlling corporation is not convicted of the offence.

9 Criminal proceedings after civil proceedings

404. Clause 9 allows for criminal proceedings to begin even after a declaration of contravention or pecuniary penalty order has been made.

10 Minister requiring person to assist

405. Subclause (1) allows the Minister to require a person to provide assistance in connection with an application for declaration of contravention or pecuniary penalty order or criminal proceedings. A penalty of five penalty units applies if a person does not comply with the subclause.

406. Subclause (2) limits the Minister's power to only require a person to assist with a declaration or order if it appears they did not contravene a civil penalty provision and they can give information relevant to the application.

407. Subclause (3) limits the Minister's power to only require a person to assist with criminal penalty proceedings if it appears they will not be a defendant in the proceedings and the person is an employee or officer of the defendant.

408. Subclause (4) allows that the Minister can require the person to assist under subclause (1) even if civil or criminal proceedings have not begun.

409. Subclause (5) provides that a person cannot assist if they are or have been a lawyer in the civil proceedings or for a defendant in the criminal proceedings.

410. Subclauses (6) and (7) outlined the form of the requirement of subclause (1).

11 Relief from liability for contravention of civil penalty provision

411. Subclause (1) defines *eligible proceedings* for this clause.

412. Subclause (2) provides situations where a Court may relieve a controlling corporation from eligible proceedings.

413. Subclauses (3) and (4) provide that a controlling corporation may seek relief from a Court if they believe eligible proceedings may be begun against them.

414. Subclause (5) outlines the application of subclause (2) in situations where a case is tried by a judge and jury.