Australian Government

Department of Resources, Energy and Tourism

ENERGY EFFICIENCY OPPORTUNITIES PROGRAM

CONTINUING OPPORTUNITIES 2011

Results of EEO Assessments reported by participating corporations

National Framework for Energy Efficiency

Energy Efficiency Opportunities

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1 INTRODUCTION

The Australian Government's Energy Efficiency Opportunities (EEO) Program is a legislated program that commenced in 2006 as a result of a 2004 Energy White Paper initiative. It was extended in 2011 under the Clean Energy Future package as a complementary measure to a carbon price, addressing information failures within corporations that prevent them from responding efficiently to price signals. Specifically, it provides corporations with detailed information, tools and assistance to assess energy use and improve the identification and implementation of cost effective energy efficiency opportunities. In doing so, corporations enhance their productivity and reduce energy consumption and emissions, thereby mitigating the impact of a carbon price on energy costs.

The EEO Program applies to large energy using corporations, covering all sectors including the mining, electricity generation, resource processing, manufacturing, transport and commercial services sectors.

Corporations are required to report to their board, to government, and publicly on the outcomes of their assessments and their business response. Implementation of identified opportunities and energy use savings is a business decision for firms.

This report presents high-level outcomes for the EEO Program. The results are compiled solely from data reported by the participating corporations in Government and/or Public Reports lodged in December 2011. The report indicates that substantial energy savings are being identified and implemented by corporations. This includes corporations that have recently joined the program and those that have been in the program for five years.

The data used to compile this report will be fed into a more detailed examination of the results of the Program. This will include more detailed analysis of the data, including changes over the five-year cycle, analysis of energy use indicators and a section on indirect costs. This report will be released at the end of the third quarter of 2012. It will also be used in the evaluation of the EEO Program being undertaken by ACIL Tasman that will be complete by the end of the fourth quarter in 2012.

It should be noted that this report does not provide interpretive analysis of outcomes (i.e. does not establish causality). Furthermore the report does not seek to address the question of additionality – what was the effect of the EEO Program over and above business as usual. These issues will be dealt with by the Program evaluation mentioned above.

1.1 SUMMARY OF THE EEO PROGRAM

The EEO Program targets large energy using corporations where the greatest potential for emissions and cost savings, derived through energy efficiency measures, is available. As of 1 May 2012, there were 319 corporations that used 0.5 PJ or more in energy per annum and were formally registered under the EEO Program. Of these corporations, 252 were required to report at the end of 2011 and 67 were not. Of the latter group, 31 were newly registered corporations in the Electricity Generation sector. Registered corporations use around 65% of Australia's total energy use. By comparison, all households and their associated cars account for less than 20% of Australia's total energy use.

The 252 corporations who reported at the end of 2011 can be broken down as:

- 174 existing corporations (2005–06 trigger year) – final Government Report for first 5-year cycle
- 9 existing corporations (2006–07 trigger year) – Public Report
- 15 existing corporations (2007–08 trigger year) – Public Report
- 54 new corporations (2008–09 trigger year) – first Government Report.

The 2011 results build on previous years and continue to indicate that Program participants are deriving substantial benefits from ongoing cost savings while achieving substantial energy and emissions savings.

1.2 APPROACH USED IN THIS REPORT

Streamlining

The energy use of participating corporations has been checked with 2011 energy consumption data reported under the National Greenhouse and Energy Reporting Act 2007. Future reports will use this data and participants will no longer be required to report energy use to the EEO Program.

Sectors

Energy savings data are primarily provided by corporations using the Australian and New Zealand Standard Industrial Classification (ANZSIC) structure. In order to demonstrate its significant contribution, the ANZSIC class 'industrial gas manufacturing' has been extracted from the subdivision of 'Basic Chemical and Chemical Product Manufacturing' and

grouped with the 'Oil and Gas Extraction' class to be categorised as 'Oil and Gas'. The remainder of the 'Basic Chemical and Chemical Product Manufacturing' subdivision has been categorised as 'Chemical Manufacturing'. The revised industry groupings will be referred to as 'sectors' for the remainder of this report.

So as to be more easily understood, some of the ANZSIC sub-divisions are referred to by more common usage names. The 'Primary Metal and Metal Product Manufacturing' subdivision has been simplified to 'Metals Manufacturing'; and 'Non-metallic Mineral Product Manufacturing' is categorised as 'Ceramic, Glass and Cement Manufacturing'.

Energy savings

In this report, energy savings are generally expressed in terms of either 'identified' energy savings, i.e. all energy savings identified through EEO assessments, regardless of the business response; and 'adopted' energy savings, which refers to the collective business response categories of 'implemented', 'implementation commenced' and 'to be implemented'.

Please note, totals in this report may not add up due to rounding.

1.3 OVERVIEW OF PROGRESS IN 2010–11 REPORTING PERIOD

Continuing Opportunities 2011 provides an overview of the latest EEO results aggregated from assessments undertaken from the start of the Program in July 2006 up to June 2011. The 252 corporations that reported indicated that they had assessed a total of 90% of their total energy use. This compares with 85% of assessed energy use in the 2009–10 reporting period.

Identified savings

As a result of the energy efficiency assessments undertaken as part of the EEO Program, reporting corporations had identified opportunities to save a total of 164.2 PJ of energy per year. This equates to 10% of the energy they assessed or 2.8% of Australia's total energy use. This is an increase of 15.7% on the energy savings reported last year (see Figure 1).

Adopted savings

Fifty-four per cent of the identified energy savings have been adopted by corporations. Adopted energy savings rose to 88.8 PJ or 1.5% of Australia's total energy use, a 17.6% increase on the adopted energy savings of 75.5 PJ reported last year (see Figure 1).

Figure 1 - Comparison of energy savings identified and adopted by corporations over the reporting years 2007–08 to 2010–11.

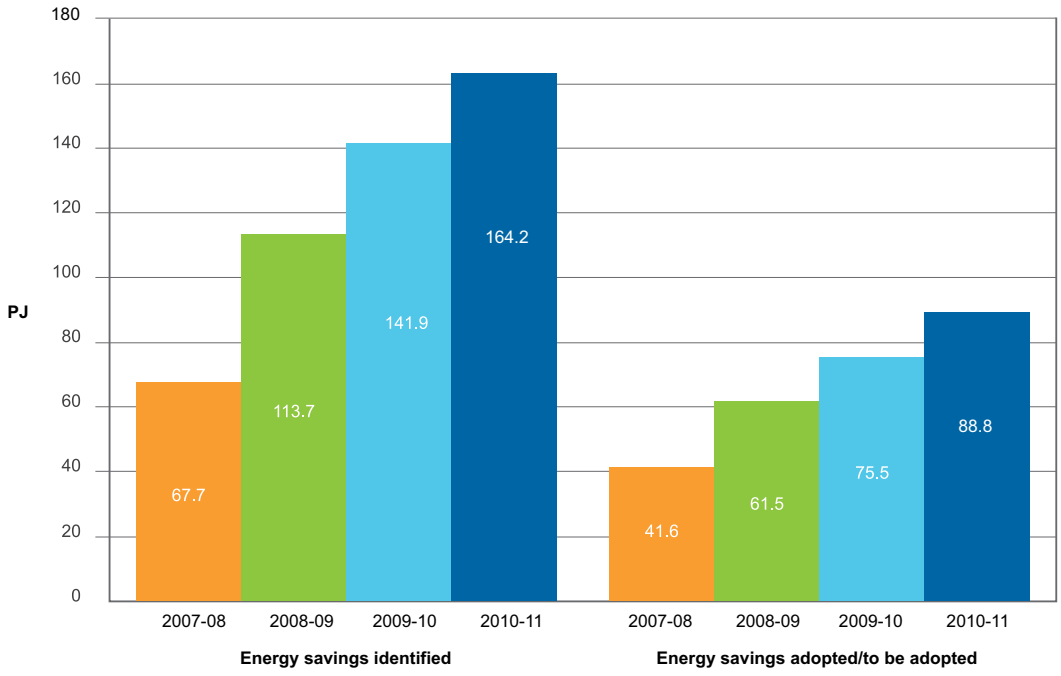


Table 1 shows the spread of the adopted savings by the stage of implementation and payback categories. 70.3% of energy efficiency projects adopted by corporations had a less than two- year payback. 14.6% (13 PJ) of energy savings were in the two to four-year payback period. The remaining 15.1% (13.5 PJ) of energy savings adopted were in projects with paybacks longer than four years, an increase from around 9% in 2009–10. While data sets for opportunities with paybacks over four years are incomplete due to voluntary reporting, the data obtained suggest that some corporations are considering the benefits of longer term energy efficiency investments in accordance with equipment lifecycles, plant maintenance and refurbishment schedules.

Table 1 - Adopted savings by stage of implementation and payback period

Business response	<2 years (PJ)	2–4 years (PJ)	4+ years (PJ)	All paybacks (PJ)	Percentage of identified savings
Implemented	35.5	8.3	4.4	48.2	29
Implementation commenced	23.0	3.3	7.0	33.4	20
To be implemented	3.9	1.4	2.0	7.2	4
Total adopted savings	**62.4**	**13.0**	**13.5**	**88.8**	**54**
Percentage of adopted savings	**70.3**	**14.6**	**15.1**	**100**	

Net financial benefits of adopted savings

Corporations reported that the net financial benefits associated with adopted savings are worth an estimated $808m per annum. Table 2 shows the split of these benefits by industry sector. These savings represent an average net financial benefit of approximately $98 per tonne of CO_2-e reduced. These data are examined more closely in Chapter 3 of this report.

Table 2 – Net financial benefits of adopted savings by industry sector

Industry sector	Adopted savings (PJ)	Percentage	Net annual financial benefits ($m)	Percentage	$ per GJ
Metals Manufacturing	20.0	22.5	162.3	20.1	8.13
Oil & Gas	20.7	23.3	95.3	11.8	4.6
Food Manufacturing	4.7	5.3	21.1	2.6	4.53
Metal Ore Mining	**6.3**	**7.1**	**109.8**	**13.6**	**17.56**
Transport (Road, Rail, Water & Air)	10.2	11.5	93.8	11.6	9.19
Petroleum & Coal Manufacturing	5.0	5.6	30.6	3.8	6.18
Chemical Manufacturing	4.3	4.8	31.1	3.9	7.18
Ceramic, Glass & Cement Manufacturing	2.9	3.3	24.6	3.0	8.43
Coal Mining	3.5	3.9	86.6	10.7	24.93
Services	4.4	5.0	84.9	10.5	19.11
Other	6.8	7.7	67.4	8.4	9.84
All sectors	**88.8**	**100**	**807.6**	**100**	**9.09**

Greenhouse gas equivalent of adopted savings

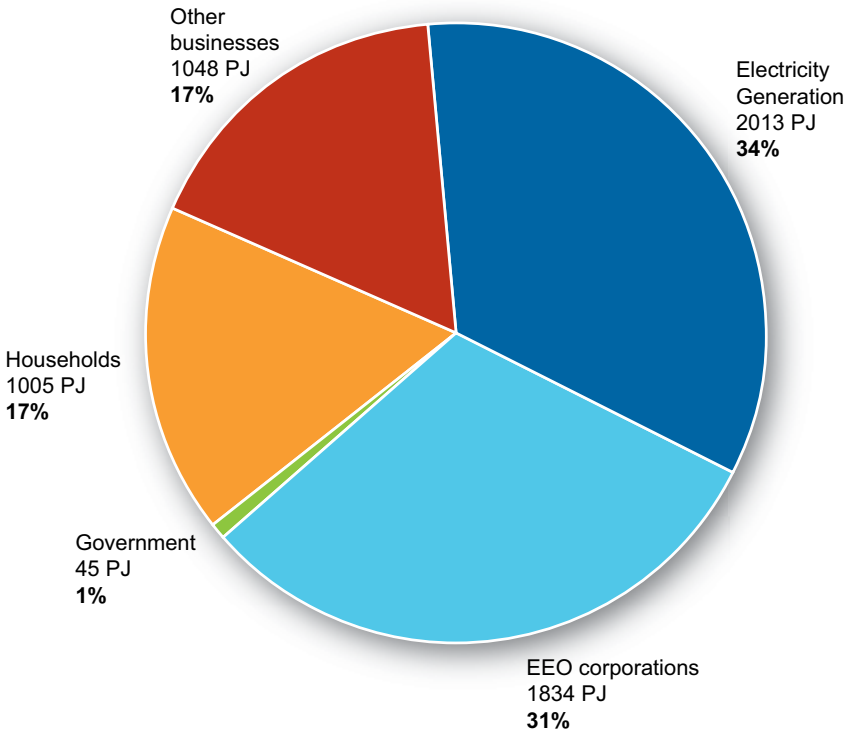
Corporations have reported adopted savings by fuel type which allows these savings to be converted into greenhouse gas emission savings. Adopted energy savings are the equivalent of emission reductions of 8.324 million tonnes of CO_2-e per annum, or 1.5% of Australia's total greenhouse gas emissions.

2 ENERGY USE OF REPORTING COMPANIES

The 252 reporting corporations used a total of 1,834 PJ in 2010–11. As shown in Figure 2, this represented almost a third (31%) of total Australian primary energy use. The energy use of these 252 corporations represented a larger share of Australia's total energy use than that of over 7.5 million households and their cars (17%) or the net energy inputs of the 700,000+ 'Other Businesses' not covered by the program (17%).

From 1 July 2011, the EEO Program was extended to electricity generation corporations. Based on energy use data supplied in registration data, these corporations use a total of 2,013 PJ of energy, which is 34% of Australia's total energy use. The inclusion of Electricity Generation has increased the coverage of the EEO Program to 65% of Australia's total energy use. The high proportion of total energy use covered by the EEO Program demonstrates the potential for corporations in the program to make a significant contribution to achieving Australia's energy and environmental policy objectives.

Figure 2 - Energy use of EEO reporting corporations as a proportion of total energy use in Australia, 2010–11



Total for Australia 5945 PJ

2.1 ENERGY USE BY INDUSTRY SECTOR

As noted above, the Electricity Generation sector is the largest energy user, at 2,013 PJ.
They have not been included in the results for the remainder of this report as they were not required to report in 2011.

Of the corporations that reported in 2011, as in previous years, Manufacturing, Oil and Gas, Transport and Mining were the industry sectors reporting the highest energy use in 2010–11.

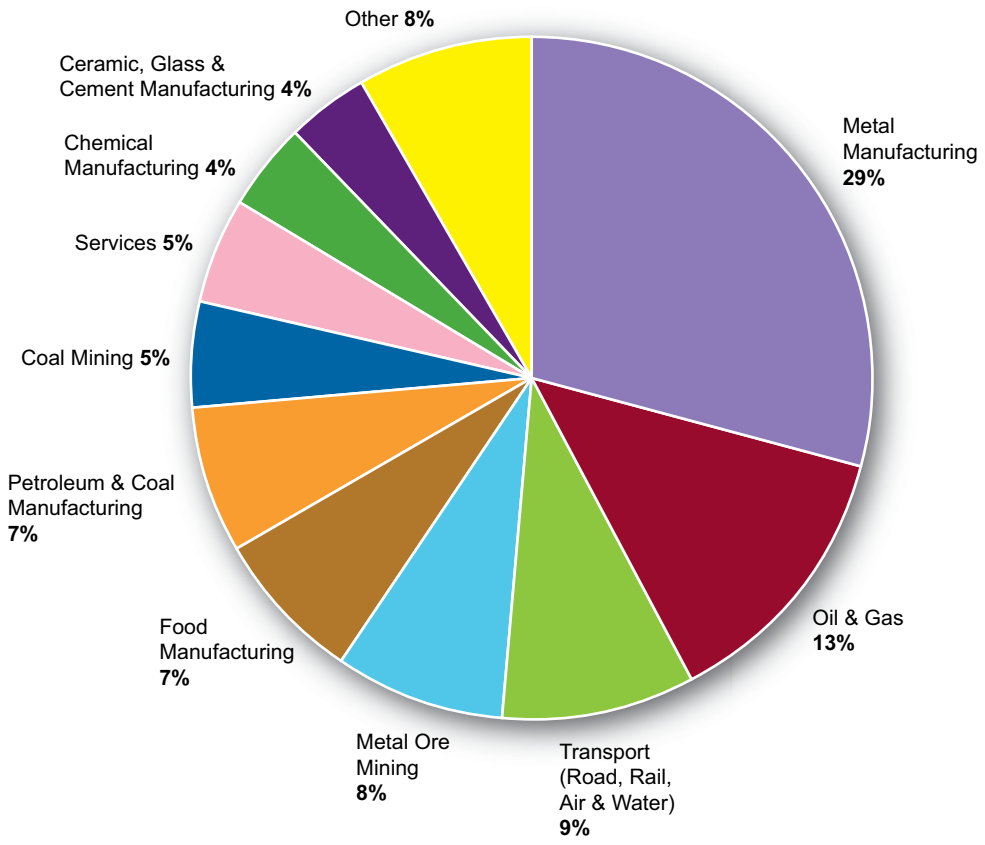
Almost a third of participants' energy use, or 534 PJ, was attributed to the manufacturer of metal products such as aluminium, nickel, iron, steel, zinc, lead, silver, gold and copper. The second largest energy-using industry sector was Oil and Gas, consuming 243 PJ, or 13% of participants' energy use. Activities in this sector include the conversion of gas into liquefied petroleum gas (LPG).

The other sectors with the largest energy use in 2010–11 were:

- Transport – Road, Rail, Water & Air (171 PJ)
- Metal Ore Mining (140 PJ)
- Petroleum and Coal Product Manufacturing (127 PJ)
- Food Manufacturing (120 PJ)
- Services (96 PJ)
- Coal Mining (93 PJ)
- Chemical Manufacturing (81 PJ)
- Ceramic, Glass and Cement Manufacturing (75 PJ).

Energy use by the remaining industry sectors has been aggregated under the category 'Other' in Figure 3 and includes corporations in the Construction and Other Manufacturing sectors.

Figure 3 - Top energy users by industry sector 2010–11 (Total 1834 PJ)

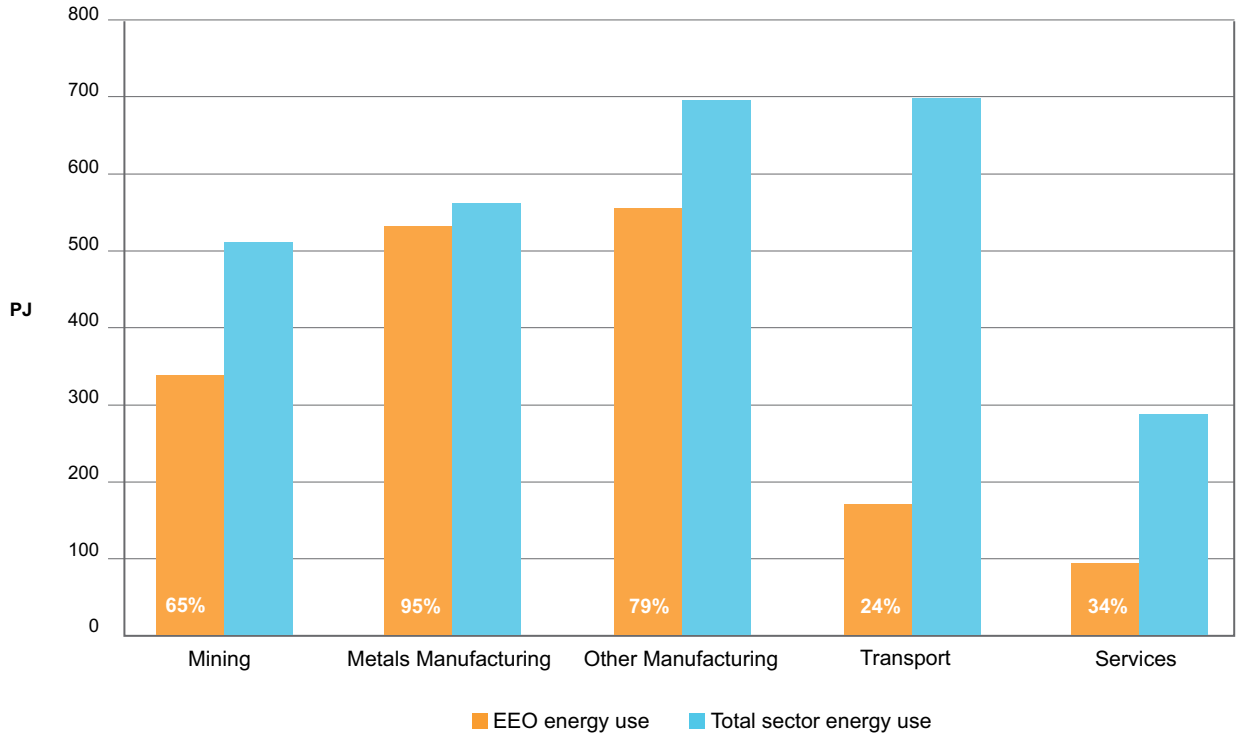


2.2 EEO ENERGY USE COMPARED TO TOTAL SECTOR ENERGY USE

When broken down by key industry sectors, EEO participants make up 95% of the total energy use in the Metals Manufacturing sector, 79% of the remainder of the Manufacturing sector and 65% of the Mining sector. This is to be expected, given that these sectors are dominated by large energy users, the intended focus of the EEO Program.

Conversely, EEO participants make up only 34% of the total energy use in the Services sector and 24% of the total energy use in the Transport sector. These two sectors comprise a large number of small to medium corporations and businesses that do not reach the program threshold of 0.5 PJ. Interestingly, a number of corporations in the services sector have recently exceeded the threshold and reported under the program, resulting in an increase in the portion of the sector's energy use covered by the EEO program.

Figure 4 - EEO energy use compared to total industry sector energy use 2010–11



Source: Total Sector Energy Use: Australian Energy Statistics – Energy Update 2011 - Table F - Australian energy consumption, by industry and fuel type 2009-10 - energy units EEO Energy Use: 2011 EEO Program Data

AYArktos via Wikimedia

2.3 LEVEL OF ENERGY USE ASSESSED BY CORPORATIONS

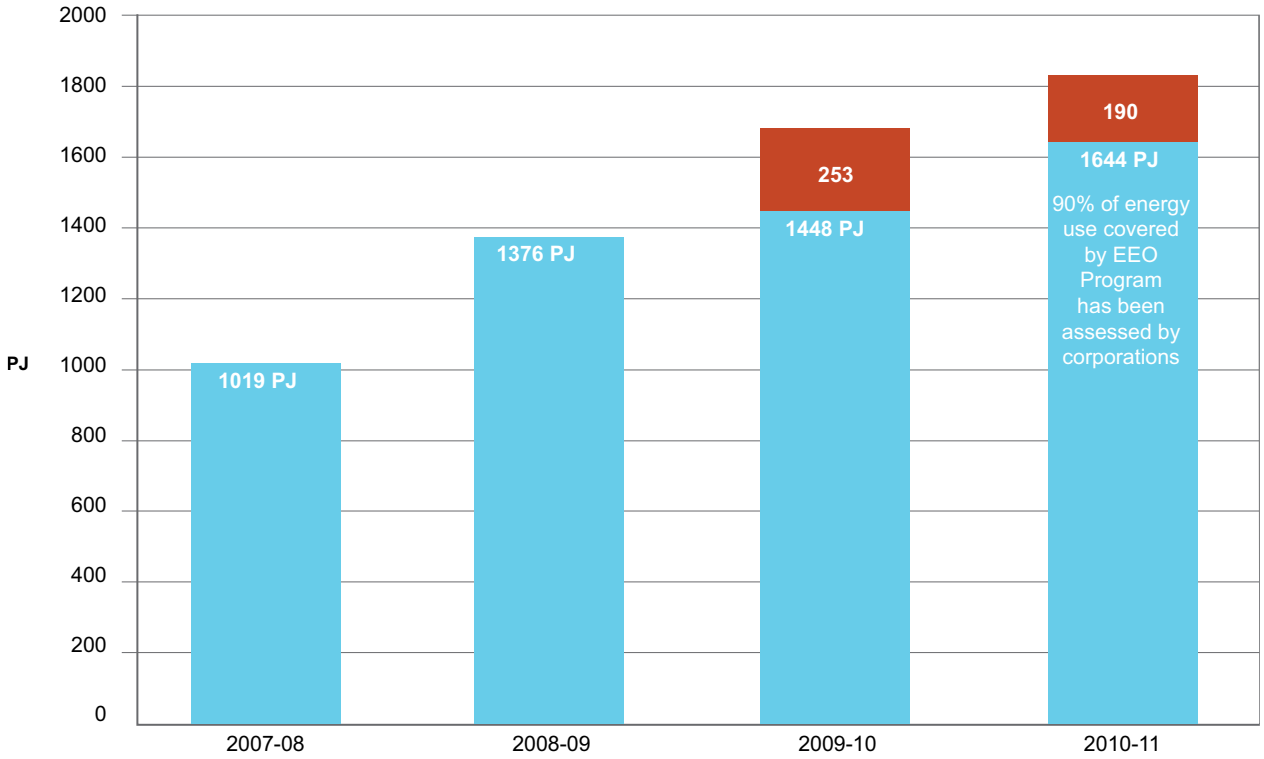
In the first five-year cycle of the EEO Program, corporations are required to assess at least 80% of their total energy use and the energy use of all sites using more than 0.5 PJ of energy annually.

By June 2011, the 252 reporting corporations had collectively assessed 90% of their energy use, representing an increase from 85% at June 2010, 82% at June 2009 and 57% at June 2008 (see Figure 5). The 90% of assessed energy use reported for 2011 includes:

- 53 corporations that had assessed 100% of their energy use
- 123 corporations that had assessed at least 80% of their energy use
- 76 corporations that had assessed up to 80% of their energy use.

It should be noted that the corporations in the final category above have not yet completed their first five-year cycle and, as such, are not required to have assessed 80% or more of their energy at the time of reporting.

Figure 5 - Energy use assessed as percentage of energy use



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3 ENERGY SAVINGS – IDENTIFIED AND ADOPTED

As at June 2011, the 252 reporting corporations had identified opportunities to save 164.2 PJ of energy per year, equivalent to 2.8% of Australia's energy use or the energy use of 3.28 million Australian households. This is a 15.7% increase on the 141.9 PJ of savings reported in June 2010.

Corporations reported that 88.8 PJ or 54% of the identified energy savings have been adopted. This is equivalent to 1.5% of Australia's total energy use. The 88.8 PJ is a 17.6% increase on the adopted energy savings of 75.5 PJ reported last year.

3.1 IDENTIFIED AND ADOPTED ENERGY SAVINGS AS A PROPORTION OF ENERGY ASSESSED

The proportion of energy savings, as a percentage of assessed energy use, highlights some significant outcomes. Fifty-two companies (21%) reported identified energy savings of over 20% of their assessed energy use, a combined 73.7 PJ of savings. In total, 170 of the 252 corporations (i.e. over 67%) reported identified energy savings of more than 5% of their assessed energy use, a combined 143.2 PJ of savings (see Table 3 below).

Eleven corporations reported no identified savings. Reasons reported for this included extenuating operational circumstances that prevented the completion of assessments, and the reduced scope to find cost-effective opportunities for companies that sourced their energy from process by-products that would otherwise incur disposal costs.

Table 3 - Identified savings ranges as a percentage of assessed energy use

Energy savings (percentage of assessed energy use)	Number of corporations	Identified savings (PJ)	Adopted savings (PJ)
0	11 (4%)	0.0 (0.0%)	0.0 (0.0%)
0<2	22 (9%)	0.6 (0.4%)	0.4 (0.5%)
2<5	49 (19%)	20.5 (12.5%)	10.4 (11.7%)
5<10	64 (25%)	28.8 (17.5%)	14.6 (16.4%)
10<20	54 (21%)	40.6 (24.7%)	25.2 (28.4%)
20+	52 (21%)	73.7 (44.9%)	38.2 (43.0%)
Total	**252**	**164.2**	**88.8**

3.2 IDENTIFIED ENERGY SAVING BY INDUSTRY SECTOR

Potential energy savings reported in 2010–11 were divided into the industry sectors shown in Figure 6a (see also section *1.3 Approach used in this Report* on pp. 2–3).

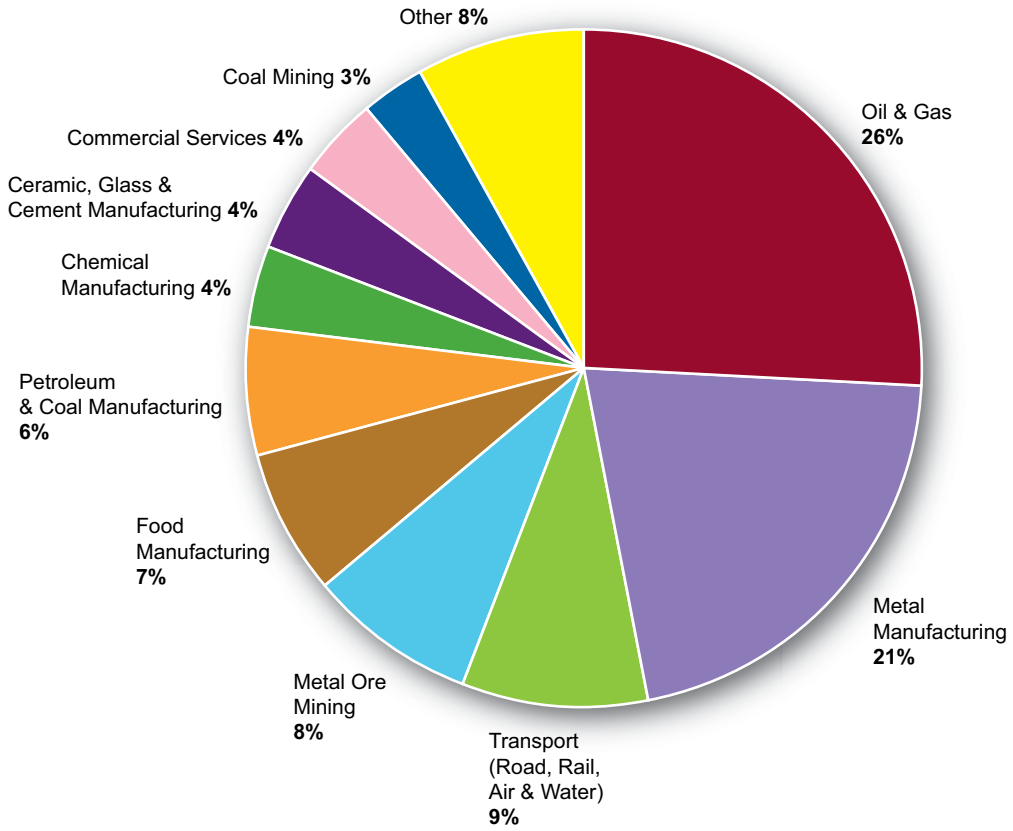
Corporations in the Oil and Gas and Metals Manufacturing sectors identified the largest energy savings, with 43.6 PJ (21% of energy assessed) of savings for Oil and Gas and 34.8 PJ (7% of energy assessed) of savings for Metals Manufacturing.

While both industries are large energy users, the energy savings identified by the Oil and Gas sector were proportionately larger at 26.5% of total energy savings compared to 21.2% for Metals Manufacturing with much smaller proportions for the other eight sectors. The identified energy savings in other sectors over 2010–11 were:

- Transport (Road, Rail, Water, Air) (14.1 PJ)
- Metal Ore Mining (13.4 PJ)
- Food Product Manufacturing (12.1 PJ)
- Petroleum and Coal Product Manufacturing (9.1 PJ)
- Services (7.3 PJ)
- Ceramic Glass and Cement Manufacturing (6.1 PJ)
- Chemical Manufacturing (5.9 PJ)
- Coal Mining (4.7 PJ).

As observed in other years, the industries with the highest energy use were typically the industries that identified the highest energy savings.

Figure 6a – Identified energy savings by industry sector



3.3 ADOPTED ENERGY SAVING BY INDUSTRY SECTOR

As mentioned in Chapter 1 of this report, in 2010-11 corporations have reported adopted energy savings of 88.8 PJ across the various industry sectors. These were divided into industry sectors shown in Figure 6b (see also the section *1.3 Approach used in this Report* on pages 3-4).

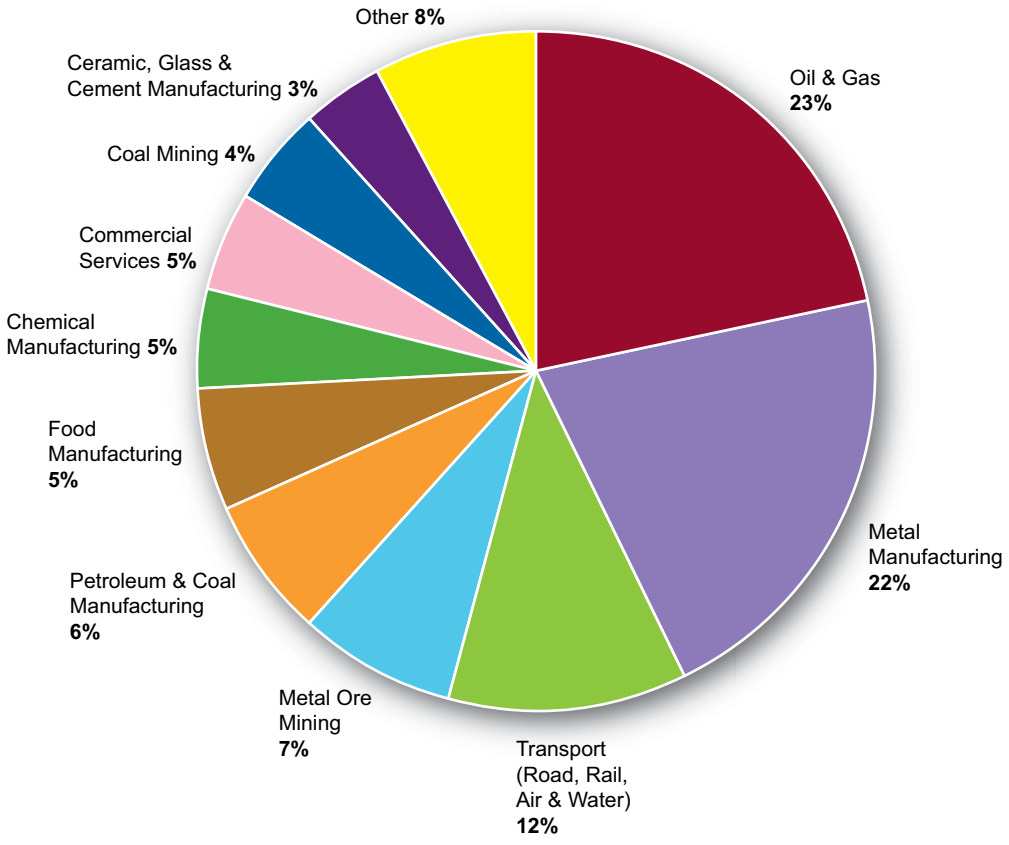
Corporations in the Oil and Gas and Metals Manufacturing sectors adopted the largest energy savings, with 20.7 PJ (10.1% of energy assessed) of savings for Oil and Gas and 20 PJ (3.9% of energy assessed) of savings for Metals Manufacturing.

As was the case for identified energy savings discussed in section 3.2, the adopted energy savings by the Oil and Gas sector were proportionately larger at 23.3% of total adopted energy savings compared to 22.4% for Metals Manufacturing with much smaller proportions for the other eight sectors. The adopted energy savings in other sectors in 2010–11 were:

- Transport (Road, Rail, Water, Air) (10.2 PJ)
- Metal Ore Mining (6.3 PJ)
- Petroleum and Coal Product Manufacturing (5 PJ)
- Food Product Manufacturing (4.7 PJ)
- Services (4.4 PJ)
- Chemical Manufacturing (4.3 PJ)
- Coal Mining (3.5 PJ)
- Ceramic Glass and Cement Manufacturing (2.9 PJ).

As expected, the industries with the highest energy use were typically those which had adopted the highest energy savings.

Figure 6b – Adopted energy savings by industry sector



3.4 INDUSTRY SHARE OF ENERGY SAVINGS

Industry share of identified savings

Corporations in the EEO Program have together identified energy savings of 10% (Figure 7), compared to 9.8% in 2010, 8.3% in 2009 and 6.6% in 2008.

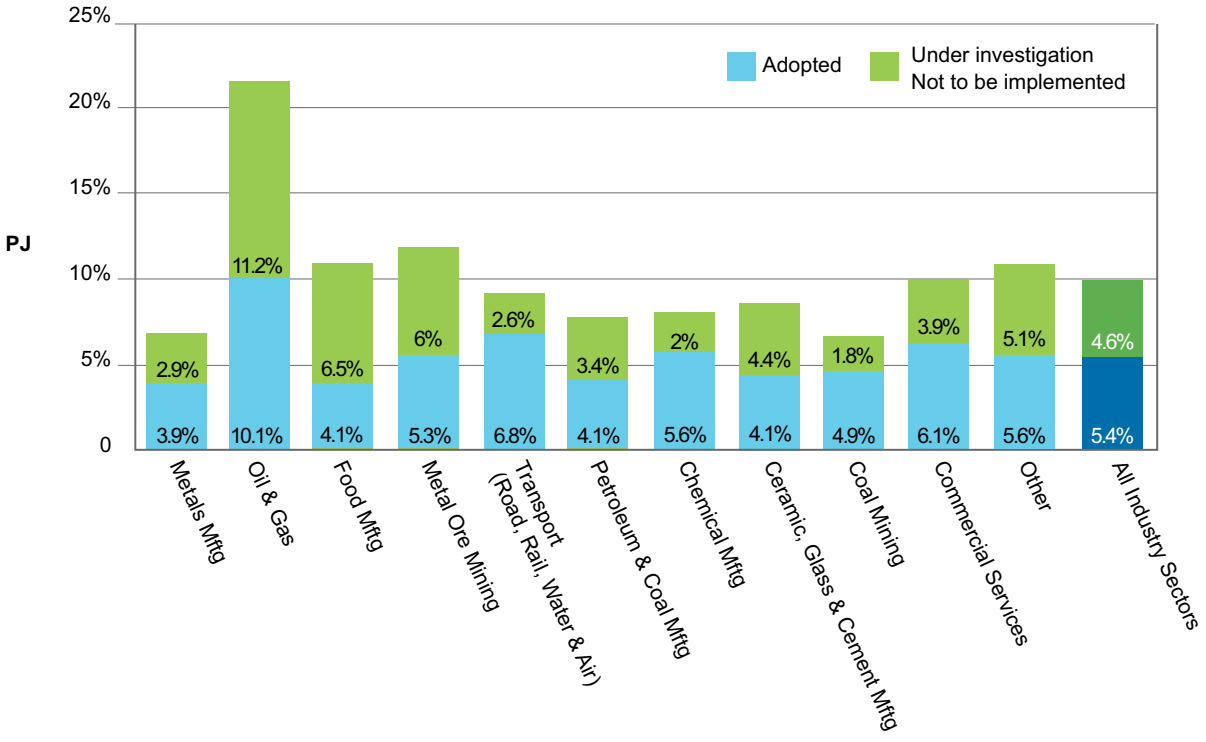
The level of energy savings identified by the Oil and Gas sector, at 21.3% of energy assessed, is the highest savings proportion of any industry sector in 2010–11. The notable growth in energy savings identified by this industry over the last three reporting years is largely due to the completion of Woodside Petroleum's assessment of its large energy using Karratha Gas Plant in Western Australia and Santos' assessment of its Port Bonython fractionation plant.

Industry share of adopted energy savings

Corporations in the EEO program have combined adopted energy savings equivalent to 5.4% of the energy assessed to date (Figure 7), compared to 5.1% in 2010, 4.5% in 2009 and 4.2% in 2008.

The proportion of adopted energy savings range from 10.1% of the energy assessed in the Oil and Gas sector to 3.9% of the energy assessed in the Metals Manufacturing sector.

Figure 7 - Identified and adopted energy savings as a percentage of assessed energy use



John O'Neill via Wikimedia

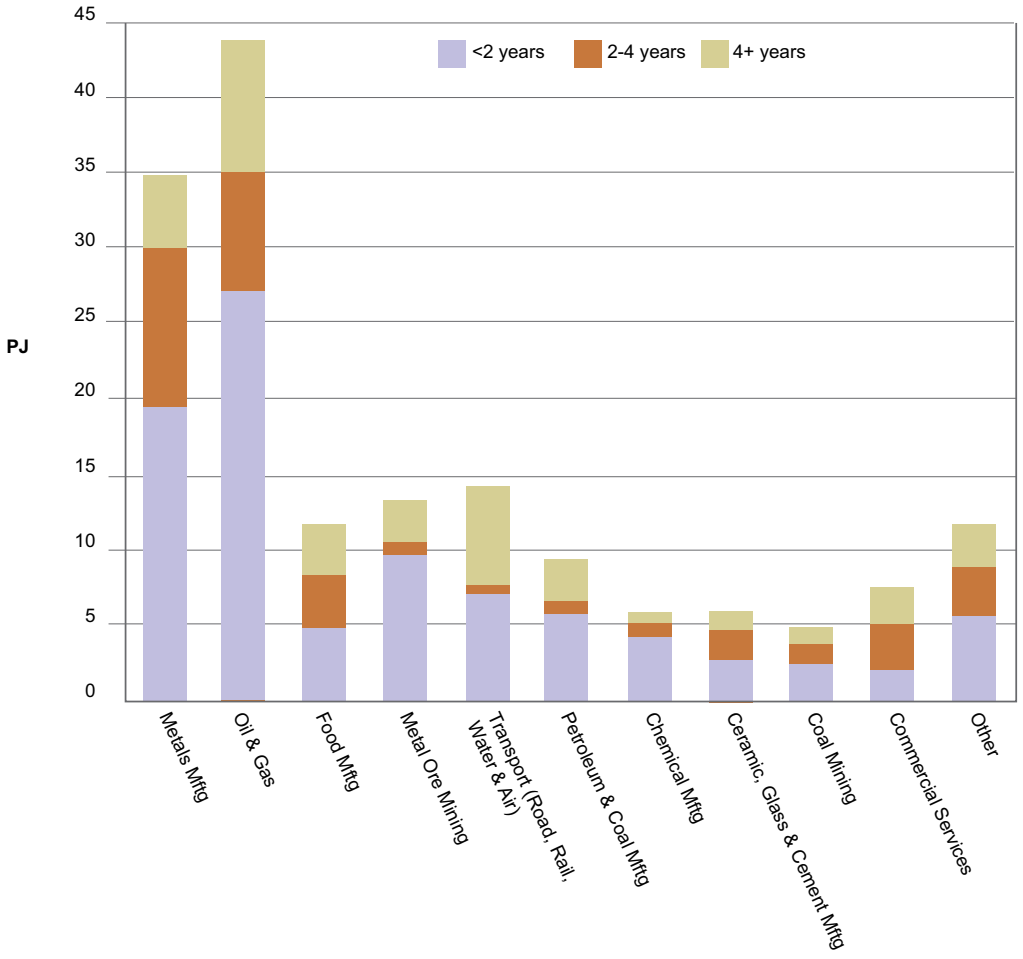
3.5 IDENTIFIED ENERGY SAVINGS BY PAYBACK PERIOD

As in past years, the majority of energy saving opportunities identified and reported by corporations had payback periods of two years or less (see Figure 8a). Specifically 56% of identified energy savings had a payback of two years or less, 21% had a payback of between two and four years and 23% had a payback of four years or more.

The Metal Ore Mining and Chemical Manufacturing sectors in particular reported that 71% and 68% of the savings identified respectively were in projects with paybacks shorter than two years.

Interestingly, as in 2009–10, the Transport sector reported high levels of energy savings in projects with payback periods greater than four years. These voluntarily reported savings accounted for approximately 45% of all energy savings reported by the sector, and may reflect the longer payback periods of opportunities such as upgrading or replacing large pieces of transport equipment.

Figure 8a - Identified energy savings by payback period

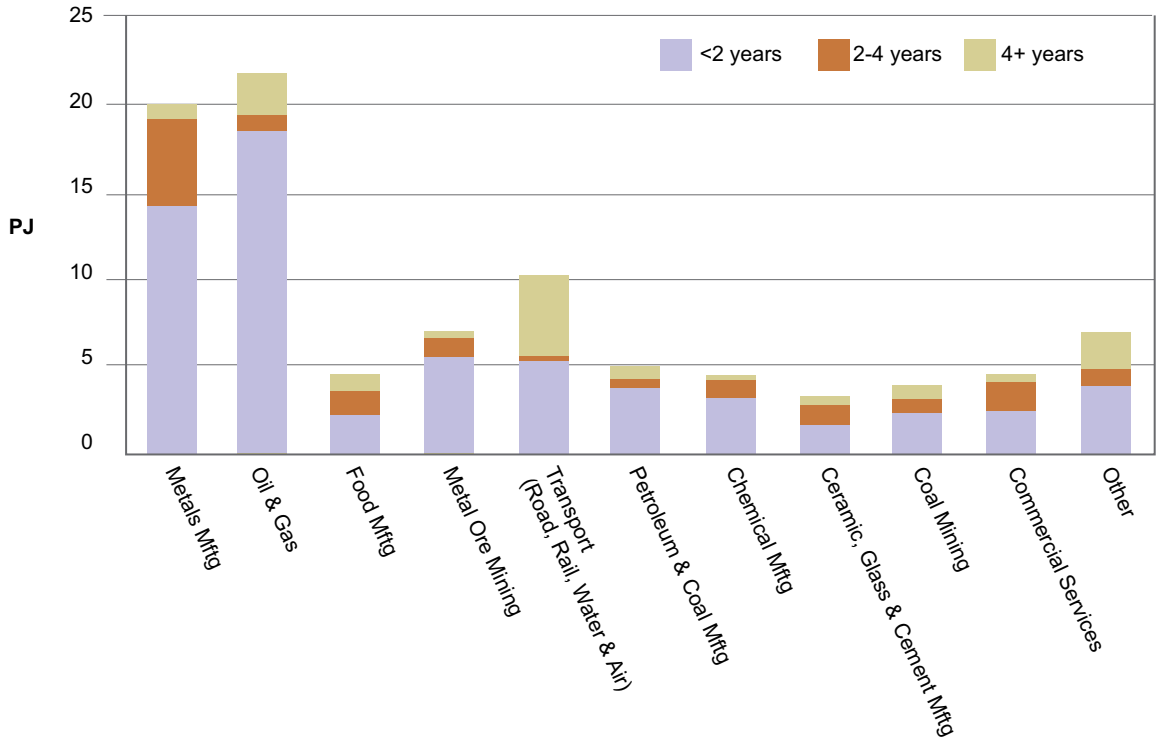


3.6 ADOPTED ENERGY SAVINGS BY PAYBACK PERIOD

As with identified savings, the majority of energy savings adopted by corporations also had paybacks of two years or less (see Figure 8b). Specifically 70% of adopted savings had a payback of two years or less, 15% had a payback of between two and four year and 15% had a payback of four years or more.

The Oil and Gas and Metal Ore Mining sectors in particular reported that 91% and 85% (respectively) of adopted savings by each industry sector were in projects with less than two-year paybacks.

Figure 8b - Adopted energy savings by payback period



3.7 NET FINANCIAL BENEFITS OF IDENTIFIED SAVINGS BY INDUSTRY SECTORS

A major incentive for corporations to implement identified energy efficiency opportunities is the likely financial benefit that will accrue. Corporations are asked to include all quantifiable costs and benefits in their payback equations, so the following figures include energy savings, maintenance cost savings and productivity benefits, as well as capital costs, cost of assessment, and other ongoing costs over the first four years. As such, dollar savings do not simply correlate to savings in energy costs paid by corporations.

Corporations reported that the net financial benefit of their identified energy savings was $1.3 billion. In total, these projects would reduce energy use by 164.2 PJ (Table 4a). On average, the financial benefits equate to a saving of $7.99 per gigajoule of energy saved.

Interestingly, although the largest energy savings of 43.6 PJ were identified in the Oil and Gas sector, the highest dollar saving of $238.2 million was found in the Metals Manufacturing sector. The Mining sector (metal ore and coal) identified $306.1 million worth of savings combined.

The highest dollar per GJ savings were identified in the Coal Mining sector at $27.8 per GJ followed by the Services sector with $17.1 per GJ. Factors that may have an impact on the dollar savings per GJ of energy saved could include the combination of prices paid for energy sources, investment costs or payback periods of identified opportunities, and the value of other non-energy benefits such as reduced maintenance costs and improvements in productivity.

Table 4a - Identified savings and net annual financial benefits by industry sector

Industry sector	Identified savings (PJ)	Net annual financial benefits ($m)	$ per GJ
Metals Manufacturing	34.8 (21%)	238.2 (18%)	6.84
Oil & Gas	43.6 (27%)	216.5 (17%)	4.97
Food Manufacturing	12.1 (7%)	39.9 (3%)	3.31
Metal Ore Mining	**13.4 (8%)**	**174.4 (13%)**	**13.06**
Transport (Road, Rail, Water & Air)	14.1 (9%)	135.6 (10%)	9.16
Petroleum & Coal Manufacturing	9.1 (6%)	40.4 (3%)	4.43
Chemical Manufacturing	5.9 (4%)	42.5 (3%)	7.18
Ceramic, Glass & Cement Manufacturing	6.1 (4%)	46.7% (4%)	7.70
Coal Mining	4.7 (3%)	131.7 (10%)	27.81
Commercial Services	7.3 (4%)	125.1 (10%)	17.08
Other	13.1 (8%)	121.1 (9%)	9.23
All sectors	**164.2**	**1312.2**	**7.99**

3.8 NET FINANCIAL BENEFITS OF ADOPTED SAVINGS BY INDUSTRY SECTORS

Of the energy savings identified to date, companies have adopted 88.8 PJ of energy savings, achieving savings of over $800 million across industry sectors (Table 4b) averaging $9.09 per gigajoule of energy saved. The higher overall dollar per GJ savings of adopted opportunities reflects the increased financial value of these initiatives, an influential factor which has led or will lead to their implementation.

As discussed in Section 3.4, the largest energy savings were identified in the Oil and Gas sector; accordingly, this sector reported the largest adopted energy savings, at 20.7 PJ. Similarly, the highest dollar saving from adopted opportunities of $162.3 million was found in the Metals Manufacturing sector. The Mining sector (metal ore and coal) realised $196.4 million worth of savings combined from adopted opportunities.

The highest dollar per GJ savings were identified in the Coal Mining sector at $24.9 per GJ followed by the Services sector with $19.1 per GJ and may reflect the increasing cost of diesel and electricity.

Table 4b - Adopted savings and net annual financial benefits by industry sector

Industry sector	Identified savings (PJ)	Net annual financial benefits ($m)	$ per GJ
Metals Manufacturing	20.0 (22%)	162.3 (20%)	8.13
Oil & Gas	20.7 (23%)	95.3 (12%)	4.60
Food Manufacturing	4.7 (5%)	21.1 (3%)	4.53
Metal Ore Mining	**6.3 (7%)**	**109.8 (14%)**	**17.56**
Transport (Road, Rail, Water & Air)	10.2 (11%)	93.8 (12%)	9.19
Petroleum & Coal Manufacturing	5.0 (6%)	30.6 (4%)	6.18
Chemical Manufacturing	4.3 (5%)	31.1 (4%)	7.18
Ceramic, Glass & Cement Manufacturing	2.9 (3%)	24.6% (3%)	8.43
Coal Mining	3.5 (4%)	86.6 (11%)	24.93
Commercial Services	4.4 (5%)	84.9 (11%)	19.11
Other	6.8 (8%)	67.4 (8%)	9.84
All sectors	**88.8**	**807.6**	**9.09**

4 BUSINESS RESPONSE

Under the EEO Program, corporations are required to present energy assessment results to decision makers for consideration and then to report to their board and publicly on their business responses to opportunities. Corporations report their business responses under five categories: implemented, implementation commenced, to be implemented, under investigation, or not to be implemented.

4.1 BUSINESS RESPONSE TO ENERGY SAVINGS

As of June 2011, EEO corporations reported adopting projects that would deliver 88.8 PJ of energy savings (Tables 5a and 5b). This is an increase of 13.3 PJ since June 2010, and indicates that corporations adopted more than half, or 54%, of the energy savings identified in assessments.

Nearly three quarters (70%) of energy efficiency projects adopted by corporations, had a less than two-year payback; 15% were in projects with two to four-year paybacks and 15% or 13.5 PJ, were in projects with beyond four-year paybacks, a noteworthy increase from around 9% in 2009–10. The data set for opportunities with paybacks beyond four years is not complete, as this is voluntary information only provided by some corporations. However, the data obtained suggest that some corporations are considering the benefits of energy efficiency in core business decisions to upgrade or invest in new plant and/or equipment, particularly in the transport and service sectors.

Twenty-three per cent of the corporations' identified energy savings were under investigation, with the potential to deliver a further 38 PJ in savings each year. Projects with less than two-year paybacks made up 19.7 PJ, or just over half of the energy savings currently under investigation.

As shown in Figure 9, opportunities classified by participants as not to be implemented primarily had longer paybacks of two to four years (31.6%) or more than four years (43.5%); 24.9% of these had a payback period of less than two years.

These data indicate a clear trend. Adopted projects have a lower payback period than projects not to be implemented. Specifically, 70% of implemented projects have a less than two-year payback versus 51.4% for projects under investigation and 24.9% for projects not to be implemented.

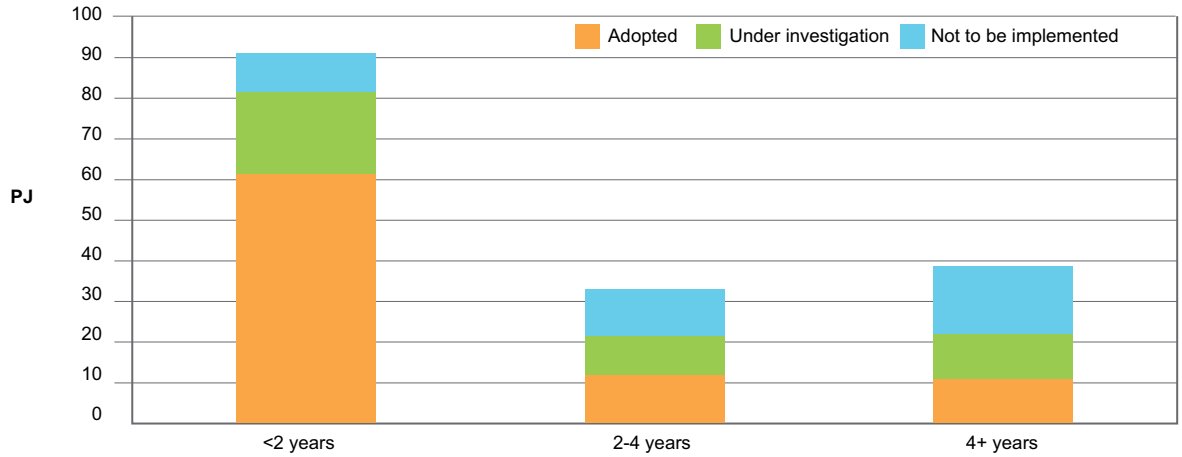
Table 5a - Identified savings by business response and payback period

Business response	<2 years (PJ)	2–4 years (PJ)	4+ years (PJ)	All paybacks (PJ)	Percentage of identified savings
Under investigation	19.7	9.7	9.0	38.3	23%
Adopted	62.4	13.0	13.5	88.8	54%
Not to be implemented	9.2	11.7	16.1	37.0	23%
Total identified savings	**91.2**	**34.4**	**38.6**	**164.2**	**100**

Table 5b - Adopted savings by stage of implementation and payback period

Business response	<2 years (PJ)	2–4 years (PJ)	4+ years (PJ)	All paybacks (PJ)	Percentage of identified savings
Implemented	35.5	8.3	4.4	48.2	29%
Implementation commenced	23.0	3.3	7.0	33.4	20%
To be implemented	3.9	1.4	2.0	7.2	4%
Total identified savings	**62.4**	**13.0**	**13.5**	**88.8**	**54**

Figure 9 - Identified savings by payback period and business response



4.2 BUSINESS RESPONSE BY INDUSTRY SECTOR

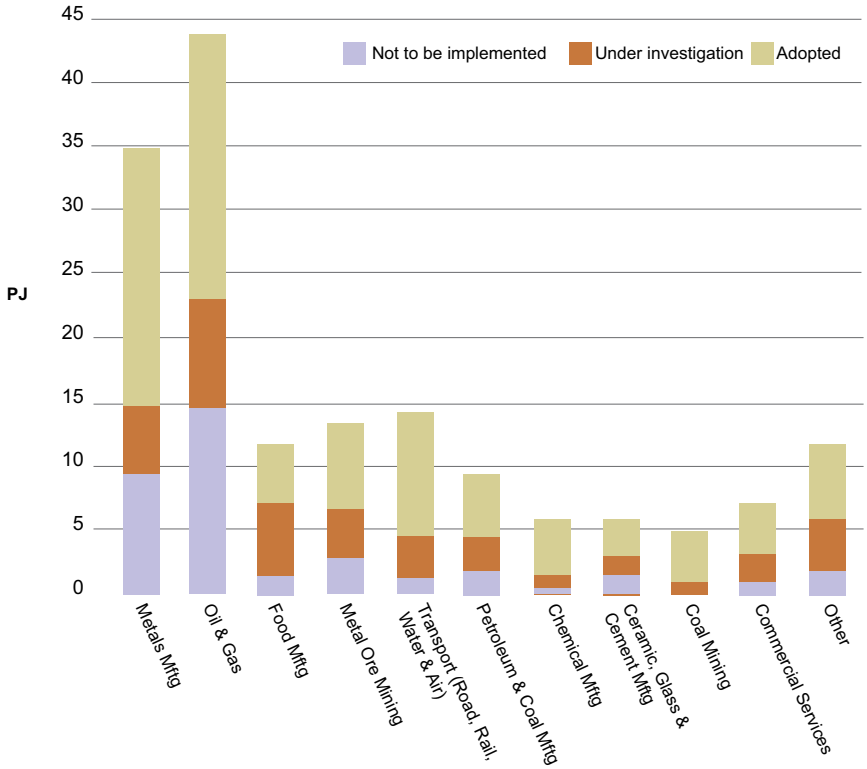
In 2010–11, corporations in the Oil and Gas sector (20.7 PJ) and Metals Manufacturing sector (20 PJ) adopted the greatest amount of energy savings. Together these two industries were responsible for 46% of the energy savings adopted by all EEO participants as at June 2011.

The highest rates of opportunity adoption were in Coal Mining (75%), Chemical Manufacturing (73%), and Transport (72%) as illustrated in Figure 10 (yellow bar in graph indicates proportion of opportunities adopted). Rates of adoption of energy efficiency opportunities across the remaining industries varied between 60% in the Services sector to 39% in the Food Manufacturing sector.

Approximately 47% of the energy savings identified by Food Manufacturing, about 34% of Metal Ore Mining and 33% of the Other sectors were under investigation.

The highest proportion of identified savings categorised as 'not to be implemented' was in the Oil & Gas sector. Businesses in this industry had determined that they would not proceed with 14.9 PJ, or 34.3%, of their identified energy savings.

Figure 10 - Business response to identified energy savings by industry sector



5 APPROACHES TO SAVING ENERGY

Corporations are required to describe three examples of significant energy saving opportunities in their public reports. Whilst far from a complete representation, the selection of opportunities, discussed in section 5.1 below illustrates the diverse range of approaches being adopted by the 252 reporting corporations to improve their energy efficiency. Further examples can be found on the significant opportunities register on each industry sector page at: www.ret.gov.au/energy/efficiency/eeo/industry-sector/Pages/sectors.aspx

5.1 TYPES OF OPPORTUNITIES

- Throughout the program, many corporations have reported low or no-cost energy saving measures involving behavioural change, procedural improvements, operator training and other initiatives. For instance, Cootes Transport Group has implemented an opportunity involving the prioritisation of the most fuel-efficient trucks on longer distance tasks whilst taking into account payloads. This initiative has the potential to save the company 13,000 GJ per year.
- At Newcrest Mining Cadia Valley Operations, explosives are used to fracture rocks so they can be transported to the crushing area. The explosives mostly comprise diesel, and are provided in liquid form. Holes are drilled into the rock, explosives poured in and then detonated. Only a certain amount of explosives is required to fracture the rock, and any excess is wasted. Implementation of improved quality control methods to ensure that the depths of holes are no greater than required has resulted in savings estimated at over 5,000 L of diesel per year.
- Certain energy savings initiatives reported by EEO corporations involve improvements to current technologies or the transition to new, more energy-efficient technologies. The food manufacturer Heinz-Watties is implementing a new thermally efficient dual-fired boiler to utilise more biogas produced from the waste water treatment bioreactors, potentially saving 43,476 GJ per year. This opportunity is expected to reduce coal usage by 841 tonnes per year and reduce electricity consumption by 1875 kWh per year from the lowered use of the other boilers, induction fans, pumps and ash conveyors.
- Food manufacturer Simplot is implementing a co-generation project for its Ulverstone, Tasmania, site. The company has ordered new equipment, including a 7.9 MW gas turbine and a heat recovery steam generator. This project will eliminate the use of coal on the site and significantly reduce Scope 1 and 2 greenhouse gas emissions. This project will also reduce energy use on the site by about 43,000 GJ.
- Other initiatives reported by companies highlight the variety of energy saving measures identified throughout the first five years of the program. For example, Australia Post has introduced the National Energy Management Plan (NEMP). The NEMP used the findings from the energy audited as part of the EEO process at major sites and delivery centres, and extrapolated this out to all remaining Australia Post sites. The opportunities were rolled up into one investment initiative, the NEMP, which was approved by the Australia Post board in December 2009, securing $11.2 million dollars for implementation.
  The NEMP has focused on reducing energy in major mail and delivery centres through the introduction of items such as more energy-efficient lighting, motion sensors, improvements to air-conditioning systems, skylights, etc. A significant saving was identified with the trial of induction lamps as a replacement for high-bay metal halide lights, with an estimated saving of around 35%. Additional savings in reduced heat load are also expected during the summer season. Once the program is fully implemented, 11,000 GJ of energy and 30,000 tonnes of carbon emissions will be saved. This is equivalent to approximately 10% of Australia Post's annual scope 1 and 2 greenhouse gas emissions. Financial savings are estimated to be over $3.5 million
- At the Nyrstar Port Pirie Pty Ltd Lead Refinery, an opportunity has been identified to save 80,000 GJ of energy per annum. Injection of waste steam into the blast furnace has the potential to reduce the amount of coke required in the combustion process as well as improving the metal content of the product.
- National Australia Bank's two data centres are responsible for approximately 39% of total energy use. Through the implementation of opportunities identified and reported in previous years, significant energy efficiency improvements have been achieved. Initiatives include chiller upgrades, a server virtualisation program, decommissioning of redundant IT security infrastructure, waste heat recovery systems, and lighting efficiency improvements.
- Murray Goulburn Co-operative is implementing an initiative to utilise biogas generated at its Leongatha Waste Water Treatment Plant as a fuel to generate base load electricity via an internal combustion engine and generator. The electricity generated will feed directly into the plant, directly offsetting demand from the grid by approximately 10%. Two gen-sets have been installed, with electrical outputs of 500 kW and 260 kW potentially saving 32,000 GJ per annum.
- Mining Company Rio Doce has constructed a cross pit earthen bridge at one of its mine sites from the pit to the low wall spoil dumps. The bridge will reduce the coal haulage distance required to travel to the coal handling and preparation plant, and to spoil dumps for placement of overburden/parting materials. The shorter travel distances will reduce haul truck requirements and haul road maintenance, thereby reducing the quantity of diesel fuel consumed per tonne of coal produced

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