ESAA

ANNUAL ENVIRONMENT REPORT

2000

ESAA

contents

ESAA POLICY STATEMENT ON THE ENVIRONMENT

The Electricity Supply Association of Australia (ESAA) and its members are committed to excellence in environmental and resource management. They are committed to promoting sustainable development; social responsibility and community participation within the electricity supply business.

Sustainable development

ESAA and its members promote the production, transmission, distribution and use of electricity in Australia in a manner consistent with the principles of sustainable development. This approach seeks to achieve the integration of economic, environmental and social factors. Members are committed to ESAA's policy on sustainable development

Social responsibility

ESAA and its members promote a socially responsible approach to the management of Australia's electricity supply business. ESAA and its members work with government, business and the Australian community to develop practices that are equitable, safeguard human health and the environment, and minimise adverse social impacts and risks.

Community participation

ESAA and its members seek to achieve clear, open and honest communication with the community. ESAA and its members aim for flexible and responsible decision-making on all matters affecting the environment and to cooperate with the community and its representatives.

Environmental management

ESAA and its members are committed to the development of environmental management systems including performance standards and management plans, encouragement of cleaner production and the adoption of continual improvement principles to minimise environmental impacts. ESAA and its members are committed to employee environmental education, safe waste management and avoidance of potentially hazardous materials. Members are committed to complying fully with relevant environmental legislation and regulations. In circumstances where risks are uncertain and consequences are potentially serious, ESAA members will act prudently.

Resource management

ESAA and its members encourage the efficient production and responsible use of electricity. They promote sound resource management practices, efficient use of materials, recycling and waste reduction. ESAA and its members support research into reducing environmental impacts of the electricity supply business and development of renewable and alternative energy technologies. Members will work to minimise their impacts on air and water quality and support protection of natural areas and biological diversity.

1 INTRODUCTION

ESAA is very pleased to present its second annual Environmental Report for the calendar year 2000.

ESAA is the industry association that represents businesses in the Australian electricity industry supply chain. Its full members include all the main electricity supply businesses in the Australian States and Territories. The role of the association is becoming more significant as the businesses become more specialised in their business focus through continuing industry restructuring. The competitive energy market in which they are increasingly operating requires more industry involvement with national legislators and regulators compared with the former State-based and more integrated businesses.

ESAA continues to promote a high standard of environmental management. Our stakeholders expect it of us whether they are customers, governments or private owners. It is essential to the future of the industry to establish itself as responding to the needs of sustainable development. This report will outline more clearly how this aim is being achieved, whether through involvement in greenhouse activities with government or promoting the ESAA Code of Environmental Practice.

ESAA is committed to encouraging improved environmental management among its members. We expect members to be socially considerate and concerned with environmental management and environmental improvement, as well as being profitable. ESAA has long had an Environment Committee as part of its structure, bringing members together to exchange information and to develop common approaches for the industry to environmental issues. The Association's Code of Environmental Practice demonstrates clearly what it is doing to encourage better environmental management in the industry and how improved environmental management can be achieved. Thirty-six member businesses are committed to this Code.

The past year has seen the Association heavily involved in greenhouse policy matters and providing advice to the Federal Government on effective policy approaches to implement. Measures involved particularly the Mandated Renewable Energy Targets, the Generation Efficiency Standards, and discussion papers related to emissions trading. It has also continued to work with governments on the broad range of other environmental issues.

The past year has seen additional attention devoted to the concept of sustainable development and eco-efficiency and exploring how these may apply to the electricity industry. Specific actions have been:

- *creation of an Environment and Sustainable Energy Directorate within ESAA;*
- *publishing a brochure entitled 'Electricity for a Sustainable Future';*
- *organising the biannual environment conference on the theme 'Electricity and a Sustainable Energy Future'; and*
- *inaugurating an ESAA Environment Report Award.*

More detail on these matters is found later in this report.

ESAA will continue to develop a wide range of environmental initiatives to encourage sound environmental management by the industry to contribute to the pursuit of a more sustainable future for society at large.

Keith Orchison
Managing Director
ESAA Ltd.

2 ESAA ENVIRONMENTAL MANAGEMENT STRUCTURE

ESAA has provided an environmental service to members for many years, dealing with issues that affect the industry as a whole, under the auspices of its Directorate on Environment and Sustainable Energy. The Directorate provides advice to the ESAA Board, which makes policy decisions. The Directorate is advised by

- an Environment Committee, and
- an Electric and Magnetic Fields (EMF) Advisory Committee,

two standing committees representing members. The Directorate also operates

- a Taskforce on Greenhouse Gas Emissions Trading,
- a Reference Group on Mandated Renewables, and
- a Reference Group on Generation Efficiency.

Taskforces or reference groups are set up to work on specific topics and are disbanded when the work is completed. ESAA's Assistant Director – Environment and Sustainable Energy chairs the taskforce and reference groups.

The Directorate, chaired in 2000 by Snowy Hydro Trading Chief Executive Phil Williams, continues to pursue a wide range of environmental activities. This program is implemented by the ESAA Secretariat, the ESAA Environment Committee (chaired in 2000 by Geoff Willis, Chief Executive of Hydro Tasmania) and the ESAA EMF Advisory Committee (chaired by Paul Flanagan of Pacific Power).

The management structure for Environment Directorate within ESAA is shown in **Figure 1**.

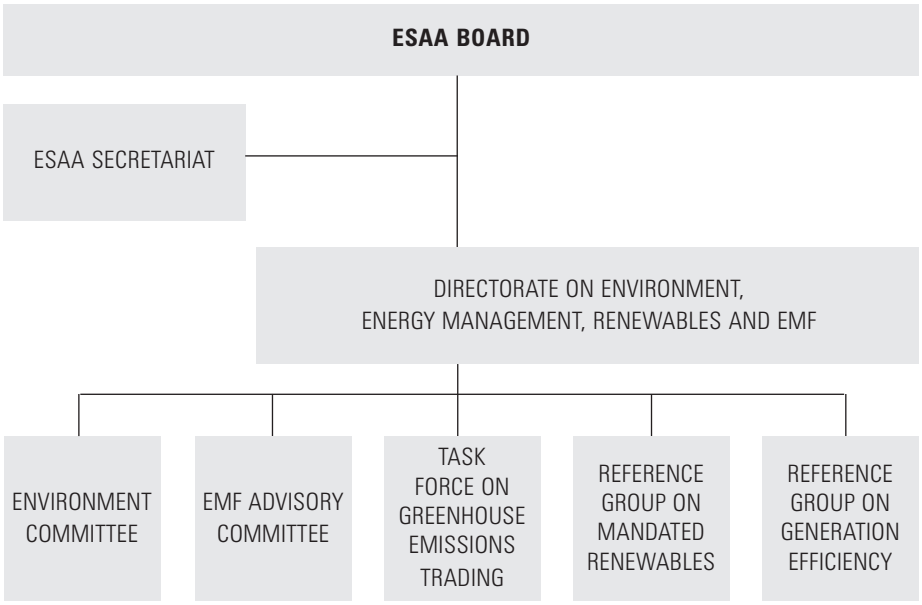

Figure 1. *ESAA management structure for environment and EMF.*

The Environment Committee develops proposals on environmental activities of interest to the industry as a whole and also keeps members informed of developments of common interest. The EMF Advisory Committee provides a similar service for the power frequency EMF issue.

Dr. Harry Schaap, Assistant Director – Environment and Sustainable Energy, manages the ESAA Directorate on Environment and Sustainable Energy.

Members contribute to the environment program provided through a voluntary annual fee of some $400 000 and to the EMF program through a voluntary annual levy of some $230,000 in 2000. The Association's issues management in these areas is also supported through the core annual subscription, which meets the costs of other senior staff and ESAA's Canberra Office.

The Directorate work program for the year covered the following key areas:

- greenhouse issues management;
- sustainable energy development and eco-efficiency;
- national environment protection measures and scheduled waste management;
- Code of Environmental Practice and industry self-regulation;
- energy supply and end-use efficiency;
- monitoring developments in the EMF issue;
- communicating EMF developments to members and the public;
- environmental benefits of electricity use;
- electricity supply and renewable energy sources;
- environmental legislation, regulation and standards;
- environmental management in business;
- industry environmental awareness;
- environmental research and innovation; and
- environmental support to individual businesses.

3 STAKEHOLDER RELATIONSHIPS

The main stakeholders for ESAA's environmental programs are the member businesses that subscribe to the service and also governments, customers and community representative groups. Ultimately however, the general public are the stakeholders as the results of ESAA and industry activities affect the whole community.

ESAA works extensively with governments, especially the Federal Government with whom there is significant involvement on many policy areas, for example the greenhouse issue and national environmental protection measures. There is some involvement with State governments, although this is related to specific member requirements. There is also a high level of interaction with other energy supply and energy intensive end-use industry associations as well as frequent contact with environment groups and regulators.

4 ESAA CODE OF ENVIRONMENTAL PRACTICE

ESAA adopted its Code of Environmental Practice in 1997 in order to provide clear guidance to its member businesses on a sound approach to managing environmental matters. The code is based on the ESAA policies covering environment, sustainable development, greenhouse response, demand management and energy efficiency, and electric and magnetic fields (EMF).

The ESAA Code of Environmental Practice consists of five policies on:

- sustainable development;
- social responsibility;
- community participation;
- environmental management; and
- resource management.

(The full policy statements are available as separate leaflets and are also reproduced on the second page of this report.)

The Code translates the ESAA environmental policies into *principles of environmental behaviour* and broadly based actions. Implementation of the Code is facilitated by the *Environmental Guidelines* that provide detailed items to be considered under a variety of environmental topics.

The Code of Environmental Practice has now been adopted by 37 electricity supply businesses out of a possible 47 and has been accepted by governments as an effective tool for industry self-regulation. Businesses, which have signed the Code register, are committed to adopt and implement the policies, principles and actions of the Code.

An essential feature of the Code is an annual audit of Code compliance within the business of each signatory. The first audit was reported in the ESAA Annual Environment Report for 1999. The audit for 2000 has been completed and is reported in the following section. The Code is reviewed every two years. This review is currently occurring and a revised Code is expected to be available in 2001.

Code of Practice Audit Results 2000

Commitment and adherence to the Code is demonstrated by annual auditing of signatory businesses against the actions associated with the five policies. Compliance of each action of the five policies of the Code is assessed according to *Table 1* below. The scores for each action of a particular policy are then averaged to provide a score for that policy.

Table 1 Explanation of Code compliance audit assessment and scores

AUDIT FINDING	SCORE
No evidence of any activities being undertaken to address a Code action	0
Code action planned and documented	1
Systems or processes being implemented	2
Systems or processes are implemented	3
Full integration into management decisions and business functions	4
Evidence of leadership or industry best practice in implementation and functioning of a Code action (Note that leadership or industry best practice may vary from year to year.)	5
A particular Code action is not applicable to the business	n/a

The 2000 audit of compliance of the 37 member businesses committed to the Code has been completed and the results of the annual audit presented in *Table 2*. Audit forms for 33 businesses were received for the 2000 audit and a number of businesses were unable to complete their audit forms. Powercor and Citipower only committed to the Code in the latter part of 2000 and were not required to complete their audit forms. Ecogen Energy and Australian National Power were unable to complete their forms on time due to lack of resources due to privatisation or sale processes. They are aware that they will need to complete their audits for 2001.

The audit reported an average compliance score for the industry of 3.6 (see *Table 2A*) out of a theoretical maximum of 5. This score indicated a status for implementation of the Code between *'Systems or processes are implemented'* and *'Full integration into management decisions and business functions'*.

Comparison with the first compliance audit in 1999 showed a marginal improvement in the overall level of compliance with the Code from the previous average result of 3.5. In considering this result, it needs to be remembered that two new businesses have joined in this period, other businesses have been restructured through ownership changes over the past year and another business audited their complete operations this year compared with only part of their operations in 1999. This result was considered acceptable given the three years since the Code was implemented.

Table 2A shows the average results across all businesses for each policy and for all policies combined. The average over all policies was 3.6. Average scores across all policies for individual businesses ranged from 2.2 to 4.6.

Table 2 ESAA Code of Environmental Practice audit results

Policy A	Sustainable development
Policy B	Social responsibility
Policy C	Community participation
Policy D	Environmental management
Policy E	Resource management

Table 2A Average audit results for each policy and for all policies combined

	MEAN SCORE	SAMPLE STANDARD DEVIATION	MAXIMUM	MINIMUM	MEAN SCORE (1999)
Policy A	3.8	0.5	4.6	2.4	3.6
Policy B	3.7	0.7	4.8	1.5	3.6
Policy C	3.8	0.6	4.8	2.3	3.6
Policy D	3.5	0.7	4.9	1.4	3.4
Policy E	3.5	0.7	4.7	1.4	3.3
All policies	3.6	0.6	4.6	2.2	3.5

Reports from all businesses were split into those where audits were performed by internal auditors and those where audits were performed by external auditors to see whether there was any bias in the results. There were 17 audits performed by internal auditors and 16 performed by external auditors. The results are shown in *Table 2B*. The means obtained from the internal audits and the external audits were 3.6 and 3.7 with sample standard deviations of 0.6 and 0.5. These results indicate that there was no significant difference between the two samples and provide confidence in the consistency of the audit process.

Table 2B Comparison of all policy scores for internally performed audits (17), externally performed audits (16) and all audits (33)

	MEAN SCORE	SAMPLE STANDARD DEVIATION	MAXIMUM	MINIMUM
Internal audits	3.6	0.6	4.6	2.2
External audits	3.7	0.5	4.4	2.3
All audits	3.6	0.6	4.6	2.2

Table 2C shows the frequency distribution of the 'All Policies' average audit score. No business scored less than 2.0 and one business scored in the highest range between 4.5 and 5.0.

Table 2C Frequency distribution (%) of average audit scores for 'all policies'

	PERCENT SCORING 0.0 TO 2.0	PERCENT SCORING 2.0 TO 2.5	PERCENT SCORING 2.5 TO 3.0	PERCENT SCORING 3.0 TO 3.5	PERCENT SCORING 3.5 TO 4.0	PERCENT SCORING 4.0 TO 4.5	PERCENT SCORING 4.5 TO 5.0
All policies	0	6	6	27	33	24	3

It was demonstrated in the 1999 audit that businesses with ISO14001 certification obtained higher average scores in Code compliance than businesses without certification by a fraction of a unit and this result also occurred in the 2000 audit, the difference being 0.3 of a unit. Of the nine businesses with an average score of 4.0 or greater in 2000, eight had ISO 14001 certification.

5 ENVIRONMENTAL PERFORMANCE MEASURES

ESAA

Table 3 summarises measures of ESAA's own environmental performance for 2000 as the national representative of electricity supply businesses. Many of the association's activities are difficult to quantify into numerical performance measures. These include the development of industry policy related to environmental issues effecting the industry and representation of these views to a range of government agencies. Such activities are reported on qualitatively in other sections of this report.

Table 3 ESAA 2000 environmental performance measures[1]

ESAA ENVIRONMENTAL PERFORMANCE MEASURES	2000
Members businesses committed to the Greenhouse Challenge	38
Members businesses committed to the Code of Environmental Practice	37
Members businesses committed to the Code and audited	33
Attendance at ESAA environment conferences	
ESAA Environment Conference 2000	95
ESAA Renewable Energy Conference 2000	254
Attendance at ESAA EMF Scientific Workshop	50
Number of EMF inquiries answered	67

ESAA member businesses

It is useful for industry comparisons to also summarise electricity industry performance as measured by participation in some broad environmental activities that are easily assessed across the different sectors of the electricity industry and can also be used for comparison with other industry sectors.

Five such measures are:

- commitment to the Greenhouse Challenge Program;
- commitment to the ESAA (industry) Code of Environmental Practice;
- production of an annual environmental report;
- certification of environmental management system (EMS) to ISO 14001;
- provision of a Green Power scheme (applies only to retail/distribution businesses accredited by the Sustainable Energy Development Authority of NSW).

Table 4 provides a summary of performance of member businesses and the industry as a whole against these measures.

The measures adopted are not perfect indicators of performance. For example, some companies may have chosen to provide community information through means other than annual environmental reports and these means could be just as effective. Other companies may have very effective environmental management systems but have decided not to obtain certification to ISO 14001.

For detailed information on the environmental performance of individual ESAA member businesses, reports and information from the individual businesses should be consulted.

[1] *The number of member businesses for the purpose of Table 3 and 4 is 47.*

Table 4 **Summary of members committed to the Greenhouse Challenge Program, committed to ESAA Code of Environmental Practice, producing an annual Environmental Report, having an Environmental Management System (EMS) certified to ISO 14001 and operating a Green Power Scheme.**

MEMBER COMPANY (AS OF DECEMBER 2000)	GREENHOUSE CHALLENGE PROGRAM	ESAA CODE OF ENVIRONMENTAL PRACTICE	AUDIT OF ESAA CODE RECEIVED	ENVIRONMENTAL REPORT AVAILABLE	EMS ISO 14001 CERTIFIED	GREEN POWER SCHEME
ACTEW-ACL Corporation Ltd	1	1	1	1	1	1
AGL Electricity Ltd	1					1
Advance Energy	1	1	1			1
Alcoa Australia Ltd (Anglesea)	1			1		
Aurora Energy Pty Ltd	1	1	1		1	
Australian Inland Energy	1					1
Australian National Power (Synergen)		1				
CS Energy Ltd	1	1	1			
CitiPower Pty Ltd		1				1
Delta Electricity	1	1	1	1		
Ecogen Energy Corp Ltd	1	1			1	
Edison Mission Energy Pty Ltd	1	1	1		1	
ElectraNet SA	1	1	1			
ENERGEX Ltd	1	1	1		1	1
EnergyAustralia	1	1	1		1	1
Energy Brix Australia Corp	1					
Eraring Energy	1	1	1		1	
Ergon Energy (Network&Retail)	1	1	1		1	1
ETSA Utilities Pty Ltd		1	1			
Great Southern Energy	1					1
Hazelwood Power	1	1	1	1	1	
Hydro Tasmania	1	1	1	1	1	
Integral Energy	1	1	1			1
Loy Yang Power Pty Ltd	1	1	1	1		
Macquarie Generation	1	1	1			
NorthPower	1	1	1		1	1
NRG Ltd (Collinsville PS)						
NRG Flinders Ltd	1	1	1			
NRG Gladstone OS Pty Ltd	1	1	1			
NT Power Transmission Pty Ltd						
Origin Energy (1)						
Pacific Power	1	1	1	1		
Power and Water Authority NT	1	1	1			
Powercor Australia Ltd		1		1	1	1
Powerlink Queensland	1					
Snowy Mountains HEA	1	1	1	1		
Southern Hydro Partnership		1	1			
SPI PowerNet Pty Ltd	1	1	1		1	
Stanwell Corporation Ltd	1	1	1	1	1	
Tarong Energy Corporation Ltd	1	1	1	1	1	
TransGrid	1					
Transend Networks Pty Ltd	1	1	1		1	
TXU Australia Pty Ltd	1	1	1	1	1	1
TXU Torrens Island Pty Ltd (2)		1	1			
United Energy Ltd	1	1	1		1	1
Western Power Corporation	1	1	1	1		1
Yallourn Energy Pty Ltd	1	1	1		1	
TOTAL (number)	**38**	**37**	**33**	**13**	**20**	**15**
TOTAL (per cent)	**80.9**	**78.7**	**70.2**	**27.7**	**42.6**	**83.3 (a)**

NOTES: (a) Accredited retailers and distributors only (18)
(1) formerly Osborne Cogeneration (2) formerly Optima Energy

6 GREENHOUSE ACTIVITIES

Greenhouse issues management is a most important concern for the electricity supply industry as the electricity sector is one of the largest emitters of greenhouse gases, mainly carbon dioxide, of the various sectors in Australia. The issue is also a major concern for the Australian Government in seeking to meet national commitments under the United Nations Climate Change Convention and potentially the Kyoto Protocol.

ESAA has continued to play an active role in working with government, electricity supply businesses and industry in minimising greenhouse gas emissions. This is achieved through involvement with the Greenhouse Challenge Program and other greenhouse programs and policy initiatives of the Australian Government, mainly through the Australian Greenhouse Office, as well as a number of state government initiatives. *Table 5* presents some industry data related to greenhouse gas emissions.

Table 5 Electricity Industry Greenhouse Statistics – 1999

Greenhouse Performance Measure	Value
Total greenhouse gas emissions from electricity sector	172 Mt CO_2e
Electricity sector percentage of total Australian greenhouse gas emissions (excludes land use clearing)	37.5 %
CO_2 intensity of electricity consumed	0.985 kg CO_2e per kWh
Percentage of electricity generated from renewable energy sources (mainly hydro)	8.7%

Source: National Greenhouse Gas Inventory – Analysis of Trends and Greenhouse Gas Indicators 1990- 1999. Australian Greenhouse Office 2001

Total emissions for the electricity sector were 172 Mt of CO_2e in 1999, the latest year for which data are available from the National Greenhouse Gas Inventory. This is some 37.5% of total Australian greenhouse gas emissions, excluding land-use change aspects. Total annual emissions from the electricity sector have risen in most years since 1990 in order to supply Australia's growing electricity needs. The CO_2 intensity of electricity consumed is 0.985 kg CO_2e per kWh. It is expected to stabilise or fall in future years as more efficient additional coal, gas and greenhouse gas free renewable energy based generation enters the supply mix. Renewable energy, mainly hydro-electric, generation provided about 8.7% of electricity in 1998 and this proportion is slowly decreasing. This is because the proportion of coal-generated electricity is slowly increasing as new demand is met by mainly coal-fired generation and some gas based generation.

Without the existing efforts made by government and the industry to improve the efficiency of energy generation and use, and increase in the use of renewable energy technologies, emissions would have been higher than currently measured. Clearly more needs to be done to reduce greenhouse gas emissions in a least-cost way while satisfying customer needs. ESAA is continuing to work with government and other industry sectors on a number of programs to achieve this end.

Greenhouse Challenge Program

ESAA was one of the first industry associations to enter into a co-operative agreement with the Federal Government under the Greenhouse Challenge program. This facilitating agreement with the Federal Government requires ESAA to assist its members to join the program and reduce greenhouse gas emissions. ESAA is also a member of the Greenhouse Challenge Program Joint Consultative Committee.

The success of this government-industry partnership program is demonstrated through 38 major electricity businesses having joined the Greenhouse Challenge program (see *Table 3*). Collectively these businesses have reduced emissions by 16 million tonne cumulatively to 2000 and they are working to reduce greenhouse gas emissions by 6 million tonnes per annum by 2003. The Greenhouse Challenge program has been independently audited during 2000 and this has confirmed that participants are accurately reporting their emissions and emission reductions.

Emission reductions are currently ahead of schedule and ESAA is working with its members to ensure that further reductions can be achieved. This can be more readily facilitated by implementation and clarification of the 'no disadvantage' principle for businesses committed to early action, together with some form of potential credit for early action. Government is considering early action options through the Australian Greenhouse Office. A small number of uncommitted electricity supply businesses are being encouraged to join the Greenhouse Challenge.

Greenhouse Issue Management

ESAA was able to commit more time in 2000 to greenhouse abatement response activities than the previous year. In particular, the following greenhouse gas abatement measures and renewable energy activities will impact significantly on electricity supply businesses:

- efficiency standards for power generation;
- mandatory targets for the uptake of renewable energy in electricity supply;
- accelerating energy market reform; and
- Renewable Energy Action Agenda.

In addition, significant effort was expended in responding to the Australian Greenhouse Office discussion papers on domestic emissions trading and aspects of the Federal Government's greenhouse gas response package as part of the Goods and Services Tax deal, including the Greenhouse Gas Abatement Program.

ESAA was a member of the Commonwealth-State working groups as part of the Greenhouse Energy Group charged with the responsibility to find acceptable least-cost means of implementing the generation efficiency and mandated renewable measures.

The Working Group on generation efficiency has concluded its deliberations with the publication of its generation efficiency report and technical guidelines for assessing generation efficiency. The measure requires to be implemented through voluntary but legally binding agreements between the Federal Government and individual generators. The measure is expected to save up to 4 million tonnes of greenhouse gas emissions per annum by 2005 and cost up to $240 million over a five-year period. Most affected generation businesses have difficulties with the proposed legal instrument for the measure and ESAA has proposed an alternative implementation process using an addition to the established Greenhouse Challenge agreements.

Cabinet endorsed key recommendations of the Renewable Energy Working Group. It has placed a limit on the measure of 9500 GWh of new renewables-based electricity by 2010 to be maintained to 2020, incorporating a system of renewable energy certificate trading in order to competitively source the electricity, and a potential liability of $40 per MWh through the tax-based renewable energy shortfall charge. Legislation to introduce the measure was passed by Parliament in December 2000. The measure is expected to come into operation in April 2001 and, when fully operational, will reduce emissions by up to 8 million tonnes per annum.

During the year, the Australia Greenhouse Office released the final two of four discussion papers on a national emissions trading scheme. The papers deal with 'crediting the carbon' and 'designing the market'. ESAA made submissions on all four papers. Late in 2000, the Australian Greenhouse Office also released a discussion paper on providing credit for early greenhouse action and on allocation preferences for emissions permits under a potential greenhouse gas emissions trading scheme. ESAA is considering its response to both papers at the time of writing. The Australian Greenhouse Office and the Ministerial Council on Greenhouse are considering drawing together the views on emissions trading in an additional strategy paper.

ESAA's Greenhouse Gas Emissions Trading Taskforce continued to work through the complex greenhouse gas emissions trading issues and draft responses to government discussion papers. A meeting of chief executive officers of member businesses established an ESAA Policy Statement on Greenhouse Gas Emissions Trading. The ESAA Board subsequently endorsed the policy statement.

ESAA and its members were active participants in a process initiated by federal industry and energy minister Minchin to establish a Renewable Energy Action Agenda. Ministers Minchin and Hill launched the Action Agenda in June 2000. ESAA is a member of the Renewable Energy Implementation Group. The group is responsible for ensuring that all 25 action items are implemented. The group reports to a CEO group that reports to the Minister in 12 months time.

As well as approving the ESAA Greenhouse Gas Emissions Trading Policy statement, the ESAA Board also endorsed an ESAA Energy Policy Statement. Together with existing policies on environment, energy efficiency, sustainable development and greenhouse response, these policies form a very effective foundation for greenhouse issues management in the coming year.

ESAA has provided comment on the draft Third Assessment Report of Working Group 2 of the Intergovernmental Panel on Climate Change (IPCC). ESAA was involved with other industry associations in providing advice to the government on a suitable approach to the Conference of the Parties in November 2000.

Sulphur hexafluoride (SF_6), which is used as an insulating medium in the industry, has now been included as a greenhouse gas. SF_6 emissions make only a minor contribution to the enhanced greenhouse effect compared to carbon dioxide. The Australian Greenhouse Office is currently working with businesses to develop a co-operative program for reporting SF_6 emissions from the industry for the National Greenhouse Gas Inventory and to develop appropriate management and handling guidelines to reduce future emissions.

7 SUSTAINABLE DEVELOPMENT

'Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.'

(Our Common Future-World Commission on Environment and Development 1987)

The concept of sustainable development and its application to the electricity industry has been a particular focus for this year by the Directorate, which has been renamed the Environment and Sustainable Energy Directorate. The Directorate has focused much of its effort on greenhouse related work (see above), which is a major issue in sustainable development for the electricity industry.

A brochure entitled *'Electricity for a Sustainable Future'* was released during the year. The brochure explains what the industry is doing to reduce the environmental effects of electricity production and use, and how this relates to developing a more sustainable future. This includes improved environmental management systems, encouraging energy efficiency and supporting the use of renewable energy technologies. The brochure is available from ESAA and members offices and also on the ESAA web site.

The two-yearly environment conference of the ESAA was held in Melbourne this year and its theme was 'Electricity and a Sustainable Energy Future'. As a lead speaker, it featured John Hill, the Sustainable Development Business Manager from TXU Europe, who spoke on his companies sustainability projects in the UK.

The conference also featured the presentation of the inaugural ESAA Environment Report Award to Stanwell Corporation. Their report was notable for reporting on current business performance and articulating a long-term vision, including sustainability concepts.

ESAA has continued to urge the Federal Government to develop an integrated sustainable energy policy for Australia which recognises the need for economic and energy security, environmental effectiveness (including greenhouse response) and social equity.

ESAA is working with government to establish an industry eco-efficiency agreement that will enshrine a life-cycle approach to business activities.

8 EMF ACTIVITIES

EMF Management

The program of electric and magnetic field (EMF) issues management activities has continued within ESAA. These include:

- monitoring and reviewing the latest scientific research and reports, policy developments and litigation; and
- communicating this information to members and other stakeholders.

The EMF Advisory Committee supervises management of EMF issues. The work of supporting members in the provision of information and advice has continued, as has the handling of the many inquiries by members of the public and other stakeholders concerned about the EMF issue. ESAA has continued to maintain close links with its international affiliates. The number of EMF queries from the public handled by ESAA was 67 in 2000 compared with 100 in 1999.

Overseas EMF studies

No major EMF review studies were reported in 2000 but there was a continuation of reporting of research studies and re-analyses of past epidemiological studies, so called meta-analyses. Many of the studies examined associations observed between EMF exposure and childhood leukemia and leukemia in occupationally exposed adults. The results obtained from such studies continue to provide variable results on the possible health effects of EMF and further studies are continuing.

A major current epidemiological study is the UK Childhood Cancer Study. It issued a second report during 2000 that examined the effects of distance from electrical supply equipment and calculated magnetic field strengths in relation to the incidence of childhood cancer in the UK. Overall, the results of this study were consistent with the results of the earlier study of the UK Childhood Cancer Study (UKCCS) published in December 1999. The authors thus concluded that

> *"We find no evidence that proximity to electrical installations or the magnetic fields they produce in the UK is associated with increased risk of childhood leukaemia or any other cancer."*

ESAA's long standing policy of acting prudently in relation to the EMF issue continues, including practicing prudent avoidance, when undertaking new construction activities and not allowing an ill-informed debate to develop, leading to confusion in the community. Both Federal and State governments have endorsed the ESAA policy approach in Australia.

General EMF activities

On 27 October 2000 ESAA hosted the ninth annual EMF Scientific Workshop in Melbourne. Attended by some 50 delegates, the workshop provided an opportunity for scientists and others interested in research into the possible health effects of EMF and radio frequency fields (RF) to come together and exchange information about the work being undertaken by them. An overseas speaker from Great Britain, Josh Berle, from the Federation of the Electronics Industry, spoke on the Stewart Report into the effects of mobile phones and follow-up work occurring as a result of the committee's findings.

A submission was made to the Senate Inquiry into Electromagnetic Radiation setting out the ESAA position and offering to provide assistance to the Inquiry on EMF matters if requested. The Inquiry is focused on the radio frequency issue (particularly the effects of mobile phones) rather than EMF and is expected to report in the first half of 2001.

9 OTHER ENVIRONMENTAL ACTIVITIES

International Energy Agency Activities

ESAA, its members and some outside organisations, continue to support a number of International Energy Agency (IEA) programs, including:

- Demand-side Management (Energy Efficiency) Program;
- Greenhouse Gas R&D Program;
- Photovoltaic Power Systems (PVPS) Program;
- Solar Photovoltaic and Chemical Energy Systems (Solar PACES) Program; and
- Wind Program.

Since the abolition of the Energy Research and Development Corporation in 1998, financial support from the Federal Government for these programs has ceased, although all of them focus on making electricity supply and use more sustainable, affordable and efficient. On behalf of the Australian PVPS Consortium, ESAA has applied for an industry development grant under the Australian Greenhouse Office's Renewable Energy Commercialisation Program.

The IEA programs are advancing a wide range of issues, including cost effective energy efficiency programs that are commercially viable, electricity generation options that reduce or eliminate the production of greenhouse gases, and more commercially-focussed photovoltaic applications in the built environment.

The ESAA Renewable Energy Conference 2000 was co-hosted by the IEA PVPS Program and the IEA Solar PACES Program.

ESAA Environment Report Award

The inaugural ESAA Environment Report Award was presented at the ESAA Environment Conference on 23 November 2000 in Melbourne. The report award is to encourage members to improve their reporting of environmental matters to the public. Nine reports were entered for the award although more reports than this are prepared by the industry (see *Table 4*). The reports were judged by an independent panel using the Australian Government publication 'A Framework for Public Environmental Reporting' of March 2000 for guidance on assessment. The award was presented to Stanwell Corporation by the ESAA Managing Director, Keith Orchison. Stanwell Corporation's report was notable for reporting on current business performance and articulating a long-term vision including sustainability concepts. Other reports commended by the panel were those of Western Power and Delta Electricity.

Scheduled Waste Management

With management plans in place for polychlorinated biphenyls (PCBs), hexachloro-benzene (HCB), and organo-chlorine pesticides (OCPs), the National Advisory Body (NAB) on Scheduled Wastes, of which ESAA is a key participant, has met once during the year as an implementation review body.

In order to contribute to the five-year implementation review of the PCB Management Plan by the NAB, ESAA has circularised its members to assess their views of the effectiveness of the Plan and to determine progress in removal of PCBs. The survey results showed that the majority of equipment containing pure PCB material had been disposed of since the plan commenced in 1996. Electricity supply businesses remain on schedule to meet the required phase-out dates for other categories of PCB-containing equipment. While there are some concerns in some jurisdictions regarding implementation of the Plan and regarding the disposal of contaminated solids, which has not progressed as well as that for liquid wastes, it is clear great progress has been made in disposal of PCB material. Much of the pure and concentrated PCB material held by the electricity industry has been destroyed in accordance with the Plan.

Requirements of the OCP Management Plan are minor for electricity supply businesses and the network businesses, which are mostly affected, are well positioned to meet requirements.

Environment Protection and Biodiversity Conservation Act

The Environment Protection and Biodiversity Conservation Act came into force in July 2000. The Act is triggered on a number of grounds where environmental impacts affect federal responsibilities, such as international treaties (e.g. the Ramsar Convention) or Commonwealth lands.

Although greenhouse matters are potentially subject to binding international treaty obligations, greenhouse was not originally included as a 'trigger' issue for environmental assessment and approval under the Environment Protection and Biodiversity Conservation Act. However, greenhouse is listed under the Act as an issue of national significance. The Federal Government has been consulting on the issue of including a greenhouse 'trigger' under the Act and ESAA has provided input to the process. The outcome has not yet been finalised and discussions with the states and industry are still proceeding. A greenhouse 'trigger' would have a significant influence on the assessment of major new power generation and network enhancement projects.

Some regulations associated with the functioning of the Act have been issued and ESAA has been involved in providing comment on draft regulations in consultation with other industry associations.

National Environment Protection Measures

ESAA members have reported their emissions to the National Pollutant Inventory (NPI) in accordance with the measure. ESAA also contributed to the public consultation concerning the recent variation to the NPI Measure. There is some concern that the industry NPI workbook is not complete for all emissions and the ESAA Environment Committee is undertaking further work.

ANZECC Water Management Guidelines

The ANZECC Water Management Guidelines are important to the industry and community for guidance on managing water resources and water discharges throughout Australia. First draft Guidelines were issued for public comment in 1998. ESAA members considered that, although these draft guidelines were a useful scientific summary of water quality management and updated the previous guidelines, they were too complex for general use and a user-friendlier guide would appear to be needed, especially for the general public. The first draft Guidelines have been revised by Environment Australia and the industry is awaiting the final issue of the Guidelines early in 2001.

Eco-efficiency Agreement

Environment Australia is seeking to develop Eco-efficiency Agreements with industry associations as a means of promoting eco-efficiency principles and practices in different industry sectors. Such agreements offer financial support to encourage specific programs. ESAA has prepared a draft Eco-efficiency Agreement for consideration by Environment Australia and negotiations to formalise the agreement are progressing. The agreement recognises and encourages association programs to promote eco-efficiency within the electricity supply businesses. A number of projects to promote eco-efficiency concepts to the industry have been proposed by ESAA for support from Environment Australia.

10 HEALTH AND SAFETY MATTERS

Health and safety matters are covered under the second policy statement of the ESAA Code of Environmental Practice on 'Social Responsibility'. Performance of member businesses in complying with this Policy is provided in *Table 2* and it clear that they are carrying out their responsibilities in this area.

Industrial health and safety matters are generally handled by member businesses themselves together with regulatory bodies at state or territory level to ensure compliance. ESAA plays a significant role in promoting safety through industry guidelines and conferences, and short courses on the subject. The Generation, Transmission and Distribution Directorates are actively involved in a National Electricity Networks Safety Steering Committee. This committee, in which the technical regulators also participate, produces codes and guidelines addressing safety issues.

Nevertheless, the activities of the Environment and Sustainable Energy Directorate have significant health and safety implications, both for employees and the general public. Many of these have already been discussed in this report, such as the work on management and disposal of hazardous materials such as PCBs and the long-standing program to understand if EMF has health effects on the community.

An area that has not been discussed explicitly is the concern over the possible effects of radio-frequency transmitters and health, associated with increasing mobile phone use and base stations transmissions. ESAA is monitoring developments in this area in association with the EMF program and has provided some advice to members related to current knowledge and issues within the industry. Public inquiries are directed to the appropriate agency.

11 RESEARCH ACTIVITIES

ESAA is actively supporting IEA programs on the development of renewable energy technologies (see Section 8). Individual member businesses are also supporting the development of renewable energy generation in Australia, including the work of Pacific Solar supported by Pacific Power and support by various businesses for the Australian Cooperative Research Centre on Renewable Energy (ACRE).

Individual member businesses also actively support research and development of new technologies for the generation of electricity using both black and brown coal through the Commonwealth Government Cooperative Research Centre program. Such new technologies will increase the thermal efficiency of generation and reduce emissions to the environment (including greenhouse gases) per unit of electricity produced.

Other businesses are supporting the development work on fuel cells by Ceramic Fuel Cells Pty Ltd. Fuel cells offer the prospect of high efficiency in converting gaseous fuels into electrical energy with few waste products.

12 EDUCATION PROGRAMS

The biennial environment conference of the ESAA was held in Melbourne on the 23 and 24 November 2000 with its theme 'Electricity and a Sustainable Energy Future'. Some 95 delegates attended the conference from the electricity industry as well as from government and the community. Unlike previous conferences, the second day of the conference was a tour of the Latrobe Valley and about 30 delegates attended.

As detailed previously, the ESAA Renewable Energy Conference was held in Sydney in March 2000 in association with two IEA renewable energy programs. The comprehensive multi-session program was attended by 250 delegates.

In addition, ESAA staff members and member businesses participated in numerous environmental and sustainable energy conferences and workshops.

ESAA also conducts a number of residential summer schools and shorter courses that include a focus on environmental management and sustainable energy issues management within industry businesses.

13 CONTACTS FOR FURTHER INFORMATION

Other available ESAA environmental publications are:

- ESAA Code of Environmental Practice,
- ESAA environmental policies,
- Proceedings of conferences on the environment, and
- Proceedings of conferences on renewable energy.

These are available from ESAA's Melbourne Office:

located at	Level 11, 459 Little Collins Street, Melbourne, Vic 3000. GPO Box 1823Q Melbourne Vic 3001.
telephone	(03) 9670 0188
fax	(03) 9670 1069
email	sanderson@esaa.com.au

There is also other environmental information available on the ESAA Internet web site: **www.esaa.com.au**

For more detailed information on the environmental activities of ESAA, contact

Dr Harry Schaap, Assistant Director - Environment and Sustainable Energy, schaap@esaa.com.au

or

Mr Richard Hoy, Program Manager - Environment and EMF, hoy@esaa.com.au

Further information on general ESAA activities is available in the ESAA Annual Report, which is published on the Internet web site. Further information on the electricity industry in Australia is available in the publication Electricity Australia that provides a description of the industry's assets (e.g. power stations) and operating statistics (e.g. resource usage, energy produced and financial data). These reports are available from ESAA offices in Sydney, Canberra and Melbourne.

For information on environmental activities of your local electricity business, contact their local office and ask what information they have available. Resources could include brochures, Annual Reports or Environmental Reports.

ESAA