4E

Efficient Electrical End-Use Equipment
International Energy Agency

Implementing Agreement for a Co-operative Programme on Efficient Electrical End-Use Equipment (4E)

Annual Report 2011

iea Energy Technology Network

Contents

Chair's Statement 3
Key 4E achievements in 2011 4
The Co-operative Programme on Efficient Electrical End-Use Equipment (4E) 6
Executive Committee 9
4E Annexes 10
4E Mapping and Benchmarking Annex 12
4E Electric Motor Systems Annex (EMSA) 19
4E Standby Power Annex 24
4E Solid State Lighting Annex 28
4E Outreach and Communication 35
4E Group Finances 37
4E Executive Committee Delegates 38
Membership of 4E Annexes 40
Annex Delegates 41
About the International Energy Agency (IEA) 46
IEA Implementing Agreements (IAs) 46

Figures

Figure 1: World energy-related CO2 emissions abatement in the 450 scenario relative to the New Policies Scenario 6
Figure 2: Global GHG abatement cost curve beyond business-as-usual to 2030 7
Figure 3: Projected energy consumption and waste by network-connected equipment worldwide 27
Figure 4: Visits to 4E websites by month in 2011 33
Figure 5: Change in of 4E website statistics, 2010-2011 34
Figure 6: Countries of origin – 4E website visitors in 2011 34
Figure 7: Allocation of 4E resources in 2011 37
Figure 8: Comparison of 4E resource allocation, 2010-2011 37

Tables

Table 1: Attendance at 2011 Executive Committee Meetings 9
Table 2: Proposed 4E communication activities for the period mid 2011- end 2012 32
Table 3: 4E Publications in 2011 35

Chair's Statement

This publication is the fourth edition of the 4E Implementing Agreement's Annual Report, and each successive year has brought a growing list of accomplishments. In 2011, we published 60 reports and papers including 8 newsletters, and we organised or presented at over 25 events and conferences.

This prodigious output reflects the enormous amount of work that has been done behind the scenes by 4E's national delegates, technical experts, consultants and Operating Agents throughout the year, and my heartfelt thanks goes to all of them for their dedication and hard work. And all this effort is bearing fruit, as evidenced by the repeated use of our materials by governments, policy makers and industry in speeches and reports.

It helps, of course, that energy efficiency has achieved a high profile in 2011, in part because it is recognised as an essential component in many national strategies to kick start economic revival through developing clean energy technologies. Here, 4E's evaluation of which energy efficiency policies have really worked, in lighting, motor systems and electronics, across most major economies, form a sound basis for governments to develop better national and international policies in the future.

4E has put greater emphasis on outreach activities throughout 2011, starting with the launch of a Communications Strategy in May, which reflects the priority given by members in ensuring that our messages reach key members of governments and industry. As a result, we will release a series of "policy briefs" that synthesise the major findings of our research and highlight the conclusions for national and international policy makers. The first two of these concise documents were released in September and will be followed by many more over the next year.

4E's collaborations also play a key role in broadening the influence and uptake of our work, and I am pleased to report a strengthening in 4E's interaction with the International Energy Agency Secretariat, the CEM, IPEEC and SEAD on a range of issues. During 2011, there has also been the opportunity to expand our dialogue with industry, most notably through the Solid State Lighting and Motor Systems Annexes.

When 4E was launched in 2008, many of us were not sure if it could succeed, and whether we could gain the commitment of a sufficient number of member governments to provide a robust forum for international collaboration. To date, we have exceeded my expectations and clearly the member governments continue to believe that 4E has a valuable contribution to make. In 2011 three Annexes developed exciting new work plans for their second term and all were endorsed by our national delegates.

Also looking into the future, we have commissioned scoping studies in potential new areas of work involving smart metering infrastructure and technology forcing standards, which could lead to major on-going projects. I look forward to reporting on these in our next Annual Report.

In the meantime, I urge you to study and enjoy this account of 4E's achievements over 2011.

Hans-Paul Siderius
Chairman, 4E
January 2012

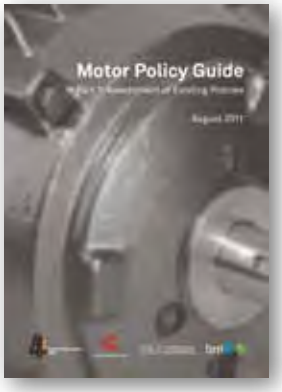
Key 4E Achievements in 2011

› Publication of residential air conditioner international benchmarking report

FEBRUARY

› Publication of eight reports on reducing standby power consumption

JUNE



› Publication of *Motor Policy Guide - Part 1: Assessment of Existing Policies*

AUGUST

MAY

› Open forum with representatives from Swiss government and industry

Roland Brüniger | Mark Ellis | Shane Holt

Hans-Paul Siderius | Davide Minotti | Mark Friedrichs

JULY

› Publication of domestic lighting international benchmarking report

› EEMODS '11 International conference on energy efficient electric motor systems

ee mods '11 conference
energy efficiency in motor driven systems

Key 4E Achievements in 2011

› Publication of *Standby Power and Low energy Networks: Issues and Directions*

› Publication of *Bright Spark* EDITION 3

› Publication of first two 4E policy briefs

› Publication of laundry dryers international benchmarking report

› Launch of Motor Systems Tool

SEPTEMBER

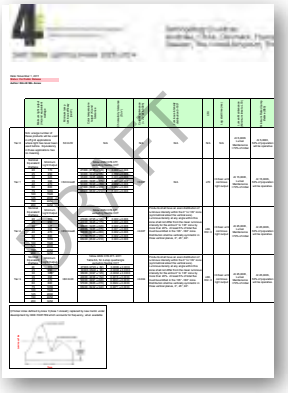
OCTOBER

› Launch of 4E new research projects

› Publication of television international benchmarking report

NOVEMBER

› Draft performance specifications for SSL products released for industry comment



The Co-operative Programme on Efficient Electrical End-Use Equipment (4E)

4E is an International Energy Agency (IEA) Implementing Agreement established in 2008 to support governments to formulate effective policies that increase production and trade in efficient electrical end-use equipment.

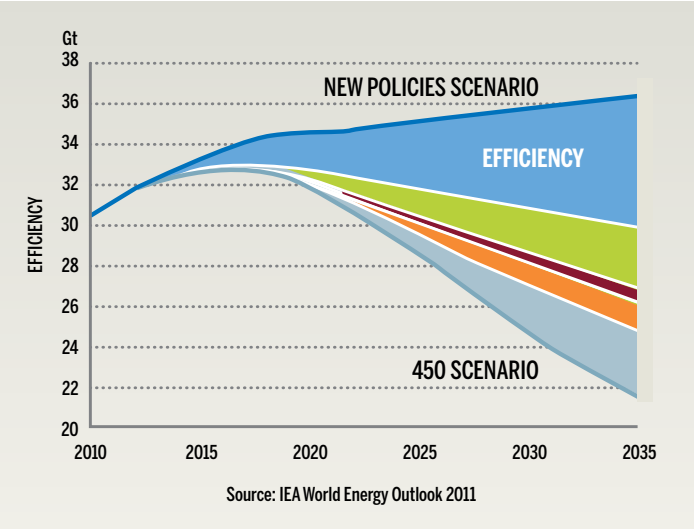
Globally, electrical equipment is one of the largest and most rapidly expanding areas of energy consumption, led by the growth in electronic devices providing greater connectivity, services and comfort to more people in developed and developing countries. However, this poses considerable challenges in terms of economic development, environmental protection and energy security.

In considering the solutions, most analysts have concluded that de-carbonizing the energy supply has associated additional costs and will take time to implement. Energy efficiency offers the most potential in the short to medium term, with the majority of efficiency gains to be found in the end-use sector (see Figure 1).

The savings from end-use efficiency are not only very large, but they are also amongst the cheapest, as illustrated by the abatement cost curve in Figure 2. This is bourn out by the evaluation of energy efficiency policies implemented over the previous decade in most major economies that shows conclusively that the resulting reduction in energy costs has vastly exceeded the total costs to consumers, industry and governments.

While we know that making individual appliances more efficient so they perform the same job using less electricity is the cheapest and quickest way to cut greenhouse emissions, influencing the efficiency of the millions of individual appliances sold today, orin the future, is complex. The large number of non-monetary barriers in this market, such as the lack of information, extended supply chains and disaggregated customers, impede the most efficient appliances from being developed, purchased and used.

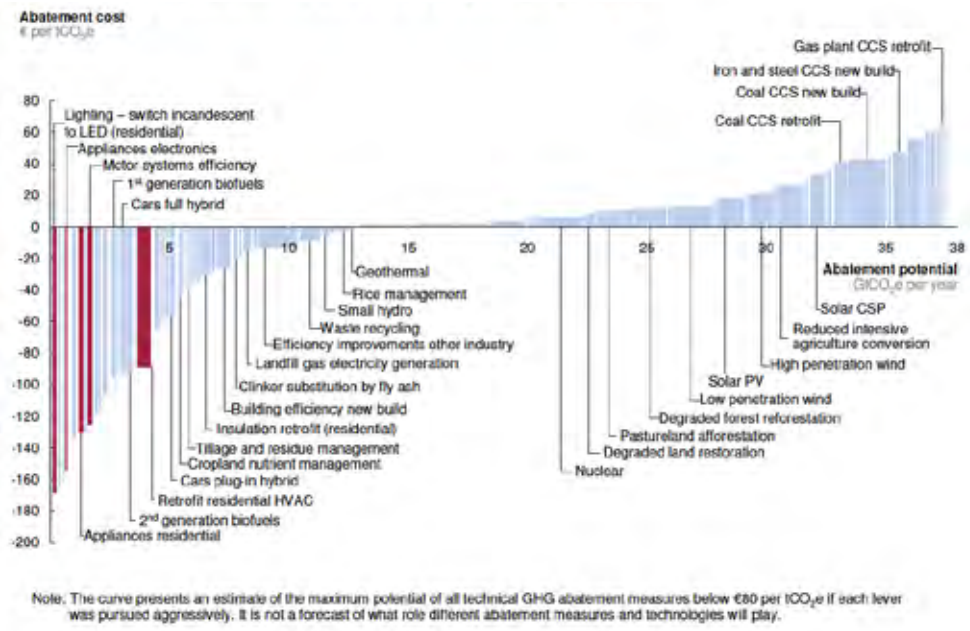
Figure 1: World energy-related CO_2 emissions abatement in the 450 scenario relative to the New Policies Scenario



> "The cheapest energy is the one we do not consume"
>
> *European Commission, Brussels, 22 June 2011*

The Co-operative Programme on Efficient Electrical End-Use Equipment (4E)

Figure 2: Global GHG abatement cost curve beyond business-as-usual to 2030



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €80 per tCO_2e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.

This is why policies to encourage investment in efficient end-use technologies are so important and a major reason for the establishment of the 4E Implementing Agreement. As the international trade in appliances grows, many of the reputable multi-governmental organisations, for example the Clean Energy Ministerial (CEM), the International Partnership for Energy Efficiency Cooperation (IPEEC) and the International Energy Agency (IEA), have highlighted the role of international cooperation and the exchange of information on energy efficiency as crucial in providing cost-effective solutions to climate change.

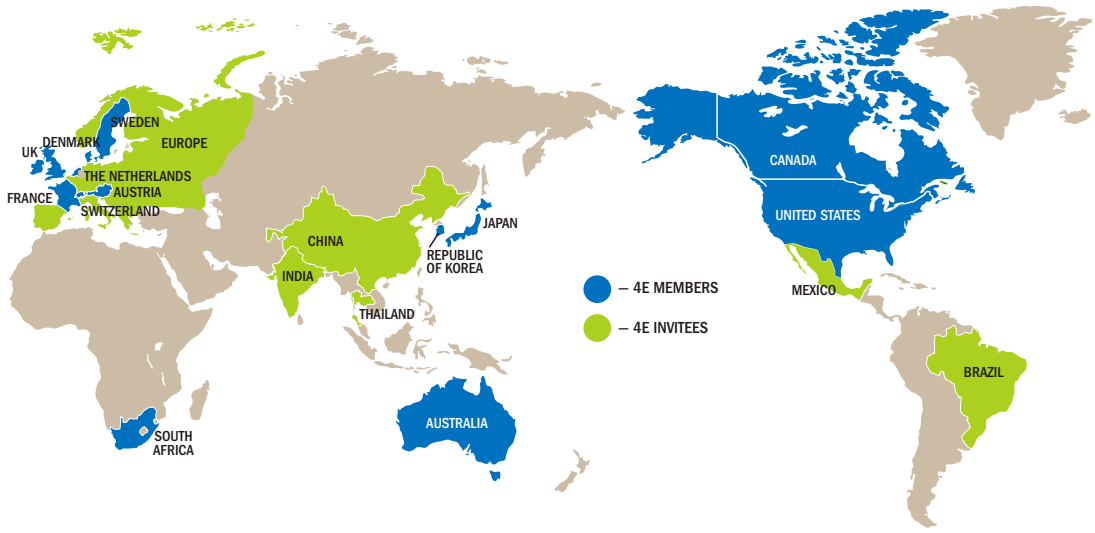
> "Efficiency policies are by far the largest source of abatement in end-use sectors relative to the New Policies Scenario. They are responsible for 91% of buildings sector direct abatement."
>
> *World Energy Outlook 2011*

The Co-operative Programme on Efficient Electrical End-Use Equipment (4E)

Thirteen countries from the Asia-Pacific, Europe, North America and Africa have now joined together under the forum of 4E to share information and transfer experience in order to support good policy development in the field of energy efficient appliances and equipment.

However, 4E does more than sharing information – it also initiates projects designed to meet the policy needs of participants, enabling better-informed policy making, as described later in this report. Participants find that pooling of resources is not only an efficient use of available funds, but results in outcomes that are far more comprehensive and authoritative.

4E is managed by an Executive Committee (ExCo) comprising one voting delegate from each participating country. Like all IEA Implementing Agreements, participation is open to all countries. The executive group meets twice yearly to manage the work programme of 4E, including the dissemination of 4E's research results. Secretariat functions for the ExCo are provided by the Operating Agent, funded by annual membership fees.



"As we recover from this recession, the transition to clean energy has the potential to grow our economy and create millions of jobs — but only if we accelerate that transition. Only if we seize the moment."

Barack Obama

Executive Committee

The seventh and eighth meetings of the Executive Committee (ExCo) were held during 2011. These were convened in Zurich (19-20 May) and Sydney (13-14 October). Attendance is indicated in Table 1.

The Executive Committee made the following appointments in 2011:

- In May, the 4E Operating Agent contract held by Mark Ellis and Associates was extended to 28 February 2014
- In October, Dr Mike Walker (UK) replaced Mr. Davide Minotti as one of the Vice-Chairs for 4E for a period of 2 years

In addition, the following extensions were approved for three Annexes that were approaching the end of their initial period:

- Mapping & Benchmarking – extended to April 2015[1]
- Electric Motor Systems – extended to October 2014[1]
- Standby Power Annexes – extended to February 2014

Future ExCo meetings will be as follows:

- 10-11 May 2012, 9th ExCo Meeting Stockholm, Sweden
- 5-9 November 2012, 10th ExCo Meeting Tokyo, Japan

Table 1: Attendance at 2011 Executive Committee Meetings

CONTRACTING PARTY	7TH EXCO - ZURICH	8TH EXCO - SYDNEY
Australia	✔	✔
Austria	✔	A
Canada	✔	✔
Denmark	✔	✔
France	✔	✔
Japan	✔	✔
Korea	✔	✔
Netherlands	✔	✔
Switzerland	✔	✔
South Africa	A	✔
Sweden	✔	✔
UK	✔	✔
USA	✔	✔
Observers	IEA, WEF	IEA

Legend: "A" = apologies

[1] These end dates (which are subject to agreement) continue the life of the 4E Implementing Agreement beyond the current expiry date of 28 February 2014.

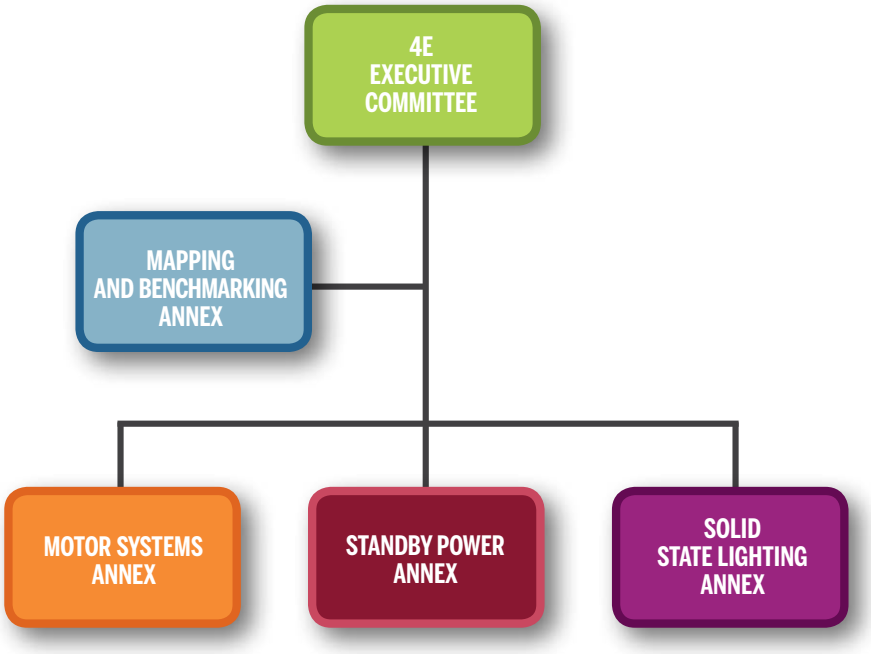
4E Annexes

The main collaborative research and development activities under 4E are undertaken within a series of Annexes, each of which has a particular project focus and agreed work plan. These work plans, and their respective budgets, are typically set for a three year period and are negotiated amongst the participating countries.

- **Electric Motor Systems Annex (EMSA)**, launched in October 2008 and led by Switzerland
- **Mapping and Benchmarking Annex**, launched in April 2009 and led by the United Kingdom
- **Standby Power Annex**, launched in April 2009 and led by Australia
- **Solid State Lighting (SSL) Annex**, launched in June 2010, co-led by France, Japan and the United States

Reports on each of these four Annexes are included in the following section of this report.

Due to the pivotal role that the Mapping and Benchmarking Annex plays in identifying policy gaps and informing future priorities for 4E, all participants are obliged to belong to, and fund, activities within this Annex. Otherwise, membership of all other Annexes is voluntary, depending on the priorities of individual countries.



4E Annexes

New Projects

In October 2011, the 4E Executive Committee (ExCo) initiated two new research projects into the important areas of Standards Policy Development and Smart Metering. These projects are conceived as preliminary explorations into the topic areas that may lead to the development of new Annexes or other avenues for pursuing more in-depth consideration. The results of each project will be presented to the ExCo in Sweden in May 2012.

Technology Forcing Standards

Led by Canada, this project will provide members of the 4E (ExCo) with a briefing on the potential for technology forcing standards to stimulate growth in the energy efficiency of appliances and equipment at a greater pace than is being achieved by most current national policy approaches.

Smart Metering Infrastructure

This project has two components: an examination of the direct energy consumption of smart meters and related equipment; and the potential for Non-Intrusive Appliance Load Monitoring (NIALM) to provide information on the end-use consumption of single appliances or items of equipment. Led jointly by Austria and Switzerland, this scoping study will explore the trade-offs between the energy consumption resulting from the deployment of new smart metering infrastructure and the potential gains at the consumer side.

Co-ordination with other organisations

There are many other national, regional or global organisations that share with 4E a common interest in certain energy efficiency topics. Through co-ordinating our activities with these, 4E can ensure a greater audience for its messages while also ensuring that our work is directed towards areas that enhance, rather than duplicate, efforts to improve energy efficiency.

2011 has seen the development of 4E's collaboration with a diverse range of organisations, including the Super-efficient Equipment and Appliance Deployment (SEAD) initiative on benchmarking projects. Co-operation with SEAD on motors and in delivering messages to the third Clean Energy Ministerial also began towards the end of 2011.

Through the Buildings and Electricity Co-ordination Groups, 4E also liaises with the other IEA Implementing Agreements with shared interests. In January 2011, 4E Chair Hans-Paul Siderius attended the Building Coordination Group and the Electricity Co-ordination Group meeting in April 2011.

4E has a close relationship with the International Energy Agency (IEA) and provides regular progress reports to member governments through the End Use Working Party (the last being in September 2011). In addition, the IEA's Energy Efficiency Division provides a report to each 4E ExCo meeting, and is often represented at these meetings. In 2011, 4E and the Secretariat have embarked on a joint project in the field of network standby, and several 4E members have assisted with the production of 4E reports in this area.

Mapping and Benchmarking Annex

The Mapping and Benchmarking Annex was established in April 2009 to provide policy makers with a single source knowledge-base on product performance and associated policy tools employed by economies across the world, thus addressing the need for easy-to-understand, credible and reliable information for informing policy-making at national and regional levels.

This is achieved through:

- Mapping of the changing energy efficiency performance of electrical products in specific countries/regions over a number of years, with an indication of the policies and other drivers that contribute to the evolving product efficiency over that time
- Benchmarking of product efficiency within individual countries/regions compared against others to identify differences in product performance over time, and the potential causes of these differences, and to outline the energy saving potential through policy promotion of better performing products in individual, regional and global markets

Major Achievements During 2011

Major reports on the comparison of product energy efficiency, consumption and performance across international bordershave been produced for air conditioners and laundry dryers, each with valuable observations for policy makers seeking to enhanced product performance. Further, full market analysis of the early impacts of various strategies for the phase-out of inefficient lamps has illustrated major differences in approach and outcomes between countries, and highlighted issues that policy makers may wish to consider when developing new policies for managing new market entrance of LEDs.

Information and recommendations drawn from these new reports, combined with those from preceding years (on domestic refrigeration appliances and TVs) have been:

- Extensively used by participating Governments for briefing senior management, colleagues and national stakeholders and in discussions with third party governments
- Considered in several impact assessment studies for the Ecodesign implementing measures of the European Commission (e.g. air conditioners), in the ecodesign evaluation study and in the *JRC Energy Efficiency Status Report 2011*
- Incorporated in promotional material for consumer awareness, as well as in academic papers informing analysts and industry of cross boundary opportunities for product improvement and signalling possible directions of future policy

Mapping and Benchmarking Annex

Publications in 2011

NAME	DATE IN 2011	ACCESS
4th Annex newsletter	February	Public
Residential air conditioners benchmarking report	February	Public
5th Annex newsletter	April	Public
Laundry dryers national/regional mapping documents for: Australia, Austria, Canada, Denmark, Switzerland, USA, UK, EU	April	Public
Lighting national/regional mapping documents for: Australia, Austria, Canada, Denmark, France, Republic of Korea*, Switzerland, USA, UK, EU, Taiwan	June	Public except Republic of Korea* - restricted to members
Lighting benchmarking document	July	Public
Laundry dryers benchmarking document	September	Public
Domestic cold appliances policy brief	September	Public
Annex overview policy brief	September	Public

Mapping and Benchmarking Annex

Outreach in 2011

The table below gives a snapshot of some of the relevant events held during 2011.

EVENT	DATE IN 2011	LOCATION	INTENDED AUDIENCE
Workshop on ECODESIGN and Energy efficiency	January	Montan University, Austria	Attendees to the Masters program Industrial Energy Technology, faculty members, researchers
IEA Austrian Networking Meeting	March	Vienna, Austria	Delegates from Austria to all IEA Annexes, ministry officials, researchers, companies
Ecodesign & energy labelling, UK government stakeholder meeting	March	London, UK	All main stakeholders in energy efficiency industry
Presentation on Resources and Energy efficiency at the Environmental Cluster of Upper Austria	March	Linz, Austria	Companies and regional authorities
Presentation on Resources and Energy efficiency, Chamber of Commerce in Upper Austria	April	Linz, Austria	Companies and regional authorities
EEDAL Conference: presentation of M&B results	May	Copenhagen, Denmark	Policy officials from international governments, industry and other stakeholders
Symposium on Resource efficiency at the company Saubermacher	May	Graz, Austria	Companies and regional authorities
Presentation to European Commission on IEA 4E	June	Brussels, Belgium	Products team in DG Energy
IEA National Coordination Meeting at the Austrian Institute of Technology (AIT)	June	Vienna, Austria	Delegates from Austria to all IEA Annexes, ministry officials, researchers, companies
Office of Energy Efficiency Extended Management Committee	August	Ottawa, Canada	Managers in Office of Energy Efficiency
National Advisory Committee Meeting	September	Hamilton, Canada	Senior Representatives of Energy Efficiency Stakeholders
Austria in the IEA-4E, meeting at the Ministry of Technology	September	Vienna, Austria	Officials from Transport, Innovation, Technology and Finance ministries, delegates to IEA-4E
Brazilian Study Tour on climate change policies: presentation including M&B	October	London, UK	Brazilian Government officials
Austria in the IEA-4E, meeting at the Austrian Energy Agency.	October	Vienna, Austria	Officials from Transport, Innovation, Technology and Finance ministries, delegates to IEA-4E
Ecodesign & energy labelling, UK government stakeholder meeting	November	London, UK	All main stakeholders in energy efficiency industry

Mapping and Benchmarking Annex

Outreach in 2011 continued

EVENT	DATE IN 2011	LOCATION	INTENDED AUDIENCE
UNDP Study Tour on energy efficient products policy: presentation including M&B	November	London, UK	Turkish Government and UNDP officials responsible for products policy
Electrical & Electronic Equipment and the Environment 2011 conference	November	London, UK	Industry and stakeholders with interests in environmental impacts and legislation on electrical equipment
Swiss Conference on electric and electronic appliances	November	Bern, Switzerland	All Swiss stakeholders

Management/Experts Meetings Held in 2011

NAME	LOCATION	DATE
7th Annex management meeting	Teleconference	February 2011
8th Annex management meeting	Zurich, Switzerland	May 2011
9th Annex management meeting	Teleconference	August 2011
10th Annex management meeting	Sydney, Australia	October 2011

Mapping and Benchmarking Annex

By September 2011, the Annex had produced 54 individual mapping documents, and cross-country benchmarking on five products, with a further two well advanced. These have proved to be so useful in the development of policies amongst Annex members and others that it was agreed in October 2011 to extend the Annex life for a further three years, through to April 2015.

The new Work Plan will:

a) Increase the number of products benchmarked to assist effective policy making across a wider range of electricity consuming products. Within these benchmarkings, additional analysis will be conducted to:

- Increase comparisons of national product policies, particularly those relating to mandatory and voluntary minimum performance standards, product performance declaration and labelling
- Estimate the potential for efficiency improvements/consumption reductions through identification of best available technology, undertaking stock model projections, etc.

b) Continue to expand the visibility of the Annex and promote the key outcomes and recommendations to policy makers and key stakeholders, thus increasing the likelihood of action to improve product efficiency/ reduce consumption

PRODUCT	RELEASE DATE
Domestic cold appliances	August 2010
Televisions	October 2010
Air conditioners	February 2011
Lighting	July 2011
Laundry dryers	September 2011
Washing machines	April 2012
Notebook computers	April 2012
Network standby	June 2012
Refrigerated vending machines	September 2012 *
Integral retail display cabinets	September 2012 *
Domestic refrigerated appliances (revision)	October 2012
Desktop PCs	January 2013 *
Set-top boxes	June 2013 *
Dishwashers	June 2013 *

The focus of the Annex is on household and commercial products that consume significant quantities of electricity, now or in the future

** subject to change as workplans for future years are approved.*

Mapping and Benchmarking Annex

2012 planned outreach activities

EVENT	DATE IN 2012	LOCATION	INTENDED AUDIENCE
Clean Energy Ministerial	April	London, UK	Ministers and senior policy officials from G20
Presentation at event "Energy of the Future" (Ministry of Technology)	May	Vienna, Austria	Policy makers in energy fields, companies, funding and investment agencies, researchers, regional planners, media
Ecodesign & energy labelling, UK government stakeholder meeting	May	London, UK	Industry stakeholders
Energy Efficiency Workshop with industry	June	Vienna, Austria	Companies, researchers, funding agencies, regional authorities
IEA National Coordination Meeting	June	Vienna, Austria	Delegates from Austria to all IEA Annexes, ministry officials, researchers, companies
Special publication of the work of IEA-4E Annexes for Austria (in German)	September	Austria	Policy makers in energy fields, companies, researchers, regional planners and authorities

Experts Meetings Planned for 2012

NAME	LOCATION	DATE
11th Annex management meeting	Teleconference	23 February 2012
12th Annex management meeting	Stockholm	9-10 May 2012
13th Annex management meeting	Teleconference	August 2012
14th Annex management meeting	Tokyo	November 2012

Mapping and Benchmarking Annex

Participants

LEAD COUNTRY	United Kingdom
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Korea did public relation about Korea's good result of refrigerators and air conditioners through IEA 4E Mapping and Benchmarking Annex

전자신문

국산 가전 에너지효율 '넘버원'

Electric Motor Systems Annex (EMSA)

The Electric Motor Systems Annex (EMSA) focuses on improving the efficiency of motors and the core motor system. The latter includes pumps, fans, compressors and any auxiliary components to which they may be attached, including variable speed drives, gears, transmission belts and brakes. Through working with government policy makers, motor manufacturers and Original Equipment Manufacturers (OEMs), and motor system users, EMSA's goal is to increase the worldwide energy efficiency of motor systems by 20% to 30% within 20 years. As electric motor systems are responsible for over 40% of global electricity use, this represents a significant potential saving.

Launched in October 2008, EMSA has played a unique role in assisting the development and implementation of policies for motors and motor systems:

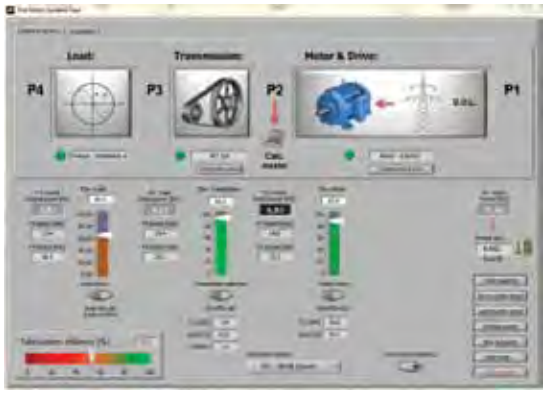
- The cooperation and exchange between EMSA countries reduces the costs of designing motor system policies and increases the chances of successful implementation. The outreach of EMSA makes governments in Japan and in large BRICS countries like Brazil, China and India, who are not members of EMSA, aware of their policy opportunities
- EMSA's involvement in the international standards development process helps to ensure that technical standards are sufficiently robust to support replication and enforcement. This is complemented by work to build testing capacity and performance amongst EMSA's network of public and private laboratories around the world
- EMSA's work encourages industry to direct more attention to the issue of motor systems efficiency. Efficient motor systems not only save energy but also reduce the risks and costs of production through optimising processes, reducing waste, lowering emissions and improving equipment performance. High-profile businesses create jobs and improve the competitiveness of national economies
- EMSA makes the larger professional community aware of necessary changes and the implications of energy efficiency in the industrial sector

PHOTOGRAPH BY THOMAS BURLA, SWITZERLAND

Electric Motor Systems Annex (EMSA)

Major Achievements During 2011

- Publication of the *Motor Policy Guide* analysing existing motor systems policy instruments in different parts of the world (Australia, China, Europe, USA) and providing recommendations for successful policy design
- Completion of the *Motor Systems Tool* to optimise the efficiency of a motor system, taking into account load characteristics, transmission, motor and controls. It is intended for engineers, machine builders, energy consultants and others working on analysing existing and optimizing new machine systems
- Publication of *Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems*[2] with EMSA Operating Agent Conrad U. Brunner as co-author
- Publication of *Walking the Torque* with EMSA Member Hugh Falkner and 4E ExCo Vice-Chair Shane Holt as authors
- Expansion of global EMSA network to 2,000 representatives of governments, industry and research interested in motor systems efficiency issues
- Expansion of EMSA membership to include the United States
- Publication of the *EMSA Newsletter* in Japanese, as well as English, German and Chinese



"[The Report] fills an important gap in the energy and climate debate by putting some hard facts on the table about a topic on which independent measurement and analysis have been lacking. But it also clearly points to the central role of policy makers in realising the potential savings from electric motors: efficiency levels are highest where policy makers have been most active, such as in the US, Canada and China."

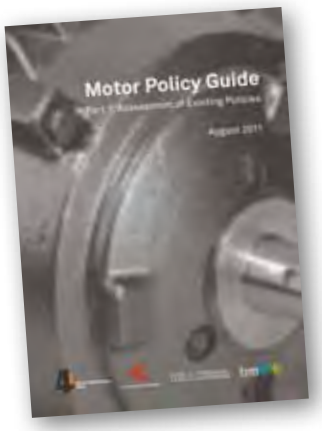
Joseph M Hogan, Chief Executive Officer and Member of the Group Executive Committee of ABB Ltd, Switzerland, August 2011, in response to the publication of EMSA's Motor Policy Guide.

[2] Paul Waide, Conrad U. Brunner, et al.: Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems. International Energy Agency Working Paper, Energy Efficiency Series, Paris 2011..

Electric Motor Systems Annex (EMSA)

Publications in 2011

NAME	DATE IN 2011	ACCESS
EMSA Newsletter 1/2011 (English, German, Chinese)	February	Public
Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems	May	Public
Walking the Torque	May	Public
EMSA Newsletter 2/2011 (English, German, Chinese)	June	Public
Motor Policy Guide	August	Public
Motor Systems Tool	September	Public
Papers presented at EEMODS'11: - *Harmonized standards for motors and systems: global progress report and outlook* (Conrad U. Brunner) - *Testing centres network: guide for motor testing* (Sarah Hatch) - *EMSA analysis of motor policies around the world* (Konstantin Kulterer) - *The Motor Systems Tool. An outcome of Task B of the 4E EMSA project* (Sandie B. Nielsen) - *Global effort for efficient motor systems: EMSA* - *Incentive program for motor systems efficiency in industry: first experiences from Easy in Switzerland* (Rita Werle)	September	Public
EMSA Newsletter 3/2011 (English, German, Chinese, Japanese)	November	Public



EU mandates for standards on electric motors, and variable speed drives and power drive systems include the sentence:

"As appropriate, CEN, CENELEC and ETSI will consult organisations of other global standardisation and policy initiatives such as the IEA Electric Motor System 4E Annex."

Electric Motor Systems Annex (EMSA)

Outreach in 2011

EVENT	DATE IN 2011	LOCATION	INTENDED AUDIENCE
Energy Efficiency in Motor Driven Systems	September	Alexandria, USA	Policy makers, standards developers, motor manufacturers, OEMs, researchers

Management/Experts Meetings Held in 2011

NAME	LOCATION	DATE
5th EMSA meeting	Zurich, Switzerland	May
6th EMSA meeting	Washington DC, USA	September

In October 2011 it was agreed that EMSA would be extended for a second term to October 2014. The focus of EMSA's work for this period will be:

1. Encouraging more countries to introduce mandatory motor Minimum Energy Performance Standards (MEPS) with Japan, India and Russia among the first

2. Assisting countries to extend the coverage of motor MEPS to include more technology types; include permanent magnet and switched reluctance motors; and have fewer exceptions

3. Encouraging more countries to raise motor MEPS levels up to IE3, and to extend their scope to include variable frequency drives and motor systems efficiency (e.g. MEPS for pumps, fans, compressors)

4. Improving the ability of countries to enforce policy measures through the establishment of globally harmonized testing practices and through mechanisms to track motors embedded into machines

5. Informing Original Equipment Manufacturers (OEMs) about the benefits of installing highly efficient motors into their machines and using the concept of Life Cycle Costing (LCC) in their sales strategy

6. Educating industrial end-users about adopting energy management schemes, as well as other stakeholders like energy service companies (ESCOs) and suppliers

7. Assisting in the development of mechanisms to provide cheaper and faster on-site evaluation of motor systems for the industrial user

8. Encouraging the timely replacement of motors, and rules for quality rewinding and replacement after 20 years of motor use

Electric Motor Systems Annex (EMSA)

Outreach Planned for 2012

EVENT	DATE IN 2011	LOCATION	INTENDED AUDIENCE
EMSA Newsletter 1/2012 (English, German, Chinese, Japanese)	March		EMSA global network
Motor efficiency workshop	May	Stockholm, Sweden	Policy makers, motor manufacturers, OEMs, researchers
EMSA Newsletter 2/2012 (English, German, Chinese, Japanese)	June		EMSA global network
EMSA Newsletter 3/2012 (English, German, Chinese, Japanese)	October		EMSA global network
Motor Summit 2012	December	Zurich, Switzerland	Policy makers, standards developers, motor manufacturers, OEMs, researchers, testing centres
EMSA Workshop 1	December	Zurich, Switzerland	Policy makers, standards developers, motor manufacturers, OEMs, researchers, testing centres
EMSA Workshop 2	December	Zurich, Switzerland	Policy makers, standards developers, motor manufacturers, OEMs, researchers, testing centres

Experts Meetings Planned for 2012

NAME	LOCATION	DATE
7th EMSA meeting	Stockholm, Sweden	8-9 May
8th EMSA meeting	Zurich, Switzerland	3 December

Participants

Australia, Austria, Denmark, Netherlands, Switzerland, USA

LEAD COUNTRY	Switzerland
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Standby Power Annex

The overall goal of the Standby Power Annex is to support the development, alignment and implementation of policies aimed at minimising the amount of energy wasted by electrical appliances in low power modes (standby). The Annex provides tools and information to assist decision makers monitor and report changes in standby mode consumption and aids the development and implementation of policies.

These objectives are achieved through the following key areas of work:

1. **Alignment of data collection methodology** – provides policy makers with baseline information and a tool which can assist in the design, monitoring and evaluation of different policy approaches

2. **Horizontal Policy Framework** – provides policy makers with a framework to develop a successful horizontal standby power policy

3. **Evaluation Framework** – provides an instrument to design an evaluation approach which will not only be more transparent but enable different policy approaches to be compared and contrasted

4. **Network Standby Research** – provides a comprehensive overview of what network standby is, the size of the problem, opportunities for reducing wasted energy, and steps required to move towards developing policy options to tackle the issue

Major Achievements During 2011

- Publication of nine reports – The Annex published seven reports investigating different aspects of the network standby issue, including a global estimate of network standby consumption, potential savings and available cutting edge technology. These reports had been commissioned in collaboration with the now defunct APP project. The Annex also published two reports one proposing a horizontal policy approach and another presenting best practice evaluation approaches for standby policies

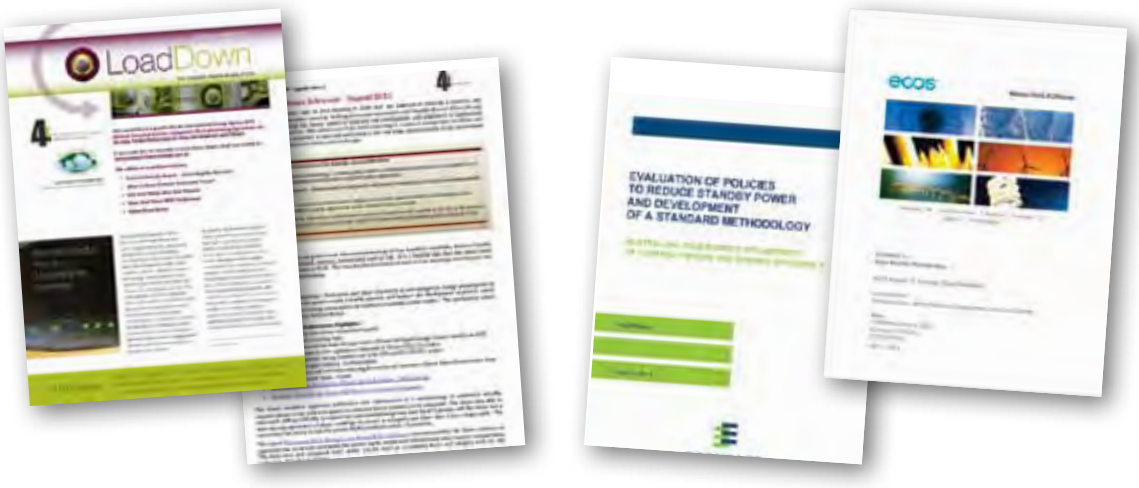
- Cooperation and collaboration with other international standby projects - The Annex formally established relationships with the IEA network standby project and the CEM SEAD network standby collaboration group. Both these relationships assist in ensuring the Annex resources are optimised and that duplication of research is not occurring. Additionally, these collaborations bring the Annex work to a broader audience and promote global recognition of standby issues particularly those relating to network standby

- Review standby power status including development of new Annex work plan – The Annex members spent time reflecting on the work that had been undertaken in the field of standby power over the last three years to determine what had been achieved and if there were issues in standby power that still needed to be addressed. This review took into account the work of the Annex as well as past and future planned works of other international bodies operating in the standby power field. As a result the Annex developed a new comprehensive workplan looking forward for the next three years

Standby Power Annex

Publications in 2011

NAME	DATE IN 2011	ACCESS
LoadDown Newsletter Edition 8	January	Public
Cutting Edge Technology Feasibility Study	June	Public
Energy reporting on networks	June	Public
Estimate of the Energy Wasted by Network Connected Equipment	June	Public
Examples of Low Energy Product Designs - *Standby Power: The Phantom in the Machine* - *Ac-Dc Power Supplies: Building a Better Brick* - *Battery Chargers: Getting Energized About Efficiency* - *Small Networking Equipment: Making the Connection to Energy Efficiency* - *Power Factor Correction: An Energy Efficiency Perspective* - *Indicators and Displays: A Judicious Use of Light*	June	Public
Investigation and Exploration of Network Power Consumption in Set Top Boxes, VOIP Telephones and Games Consoles	June	Public
List of Technical Standards for Equipment Connected to Energy-Using Networks	June	Public
Power Scaling in Proportion to Data Processing	June	Public
Testing Products with Network Connectivity	June	Public
LoadDown Newsletter Edition 9	August	Public
Provision of a horizontal policy approach to standby power	August	Public
Standby Power Annex – What is there still to Do?	August	Members
What has the Annex Achieved – August 2011	August	Public
Evaluation of policies to reduce Standby Power and Development of Standard Methodology	November	Public



Standby Power Annex

Management/Experts Meetings Held in 2011

NAME	LOCATION	DATE
4th Standby Annex management meeting	Zurich, Switzerland	May
Interim management meeting	Teleconference	August
5th Standby Annex management meeting	Sydney, Australia	October

The achievements of the Annex thus far have provided valuable information and useful instruments to support policy development in the field of standby power. Through its monitoring work, the Annex has identified the energy wasted in networked products as a critical issue for government's wishing to address low power modes. In response, the Annex was granted an extension to April 2014 in order to provide greater focus on the issue of network standby.

The key goals of the new work plan can be summarised as:

- To build on the horizontal policy approach with the aim of promoting a workable internationally harmonised policy framework. This will include providing details of the power required for functions, te functions present in modes and the energy management specifications
- To deliver a policy framework to tackle energy wasted by networked products in low power modes
- To develop a web-based portal to global standby power data which will provide a knowledge base to assist policy makers; and to design a data collection methodology for field measurement of networked products
- To communicate the work of the Annex to assist policy makers and stakeholders to make optimum decisions by keeping them up to date with the latest facts and research into standby power

Outreach Planned for 2012

EVENT	DATE IN 2012	LOCATION	INTENDED AUDIENCE
Networked standby data collection, methodology and policy development workshop (IEA/4E/SEAD)	7-8 May	Stockholm, Sweden	International experts and practitioners in the area of networked standby
North American regional workshop (IEA/4E/SEAD)	To be confirmed	USA or Canada	Industry and policy makers

Experts Meetings Planned for 2012

NAME	LOCATION	DATE
6th Standby Annex management meeting	Stockholm, Sweden	7 May
7th Standby Annex management meeting	Tokyo, Japan	5 November

Standby Power Annex

Participants

Australia, Austria, Canada, Denmark, Korea, Netherlands, Sweden, Switzerland, UK, USA

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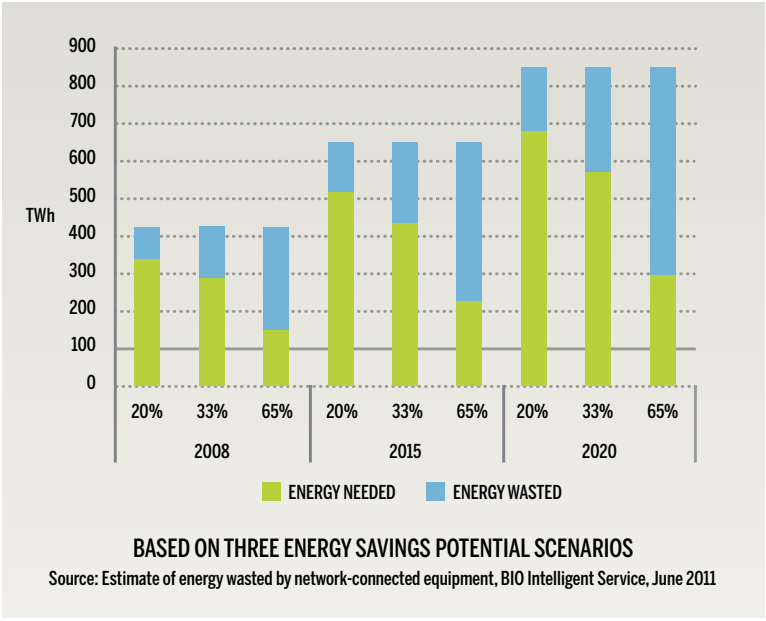
Figure 3: Projected energy consumption and waste by network-connected equipment worldwide



BASED ON THREE ENERGY SAVINGS POTENTIAL SCENARIOS

Source: Estimate of energy wasted by network-connected equipment, BIO Intelligent Service, June 2011

Solid State Lighting Annex

Solid State Lighting (SSL) has the potential to provide artificial lighting more efficiently than more prevalent current technologies, at competitive lifetime costs. However the wide variation in performance of SSL sources currently in the market severely threatens consumer confidence in SSL lighting, thereby delaying market acceptance and slowing down penetration rates.

Launched in June 2010 with a four year life, the goal of the new SSL Annex is to develop simple tools to help governments and consumers easily identify which SSL lighting products have the necessary efficiencies and quality levels to effectively reduce the energy currently consumed by artificial lighting. The SSL Annex works internationally to support the work that is being carried out on a national level to address the main challenges with SSL technologies.

The three main tasks of the SSL Annex are to:

1. **Develop SSL Quality Assurance** by working to clarify the SSL market worldwide, to reduce the risks in using SSL and to provide governments and consumers with recommendations that they can trust when investing in SSL products

2. **Harmonize SSL Performance Testing by:** working with global testing laboratories to increase the quality and confidence of SSL laboratory test results; working to assess a range of existing SSL test procedures; and building a system of testing that is manageable, robust and acceptable to a broad range of stakeholders

3. **Develop Standards and Accreditation Infrastructure** by working with existing accreditation bodies to develop a structure for world-wide interim reliability of SSL testing laboratories' performance data

Solid State Lighting Annex

Major Achievements During 2011

- Initiation of round robin tests on six lamps between the following 'Nucleus Laboratories' in Asia, Europe and USA:
  - National Institute of Standards and Technology (NIST, USA)
  - National Lighting Test Center (NLTC, China)
  - Dutch Metrology Institute (VSL, The Netherlands)
  - National Metrology Institute of Japan (NMIJ, Japan)
- Development and public release for comment of draft performance tiers and definitions for the following four categories of solid state lights and luminaires:
  - SSL omnidirectional replacement lamps
  - SSL directional replacement lamps
  - SSL downlight fixtures
  - Linear LED fluorescent replacement lamps
- Engagement of 20 SSL lighting experts from eight countries and the European Commission

Publications in 2011

NAME	DATE IN 2011	ACCESS
Definitions for Solid State Lighting Performance Tiers	November	Public
Draft Performance Tiers, Omni-directional lamp	November	Public
Draft Performance Tiers, Directional lamp	November	Public
Draft Performance Tiers, Downlight fixture	November	Public
Draft Performance Tiers, Linear Replacement	November	Public

Solid State Lighting Annex

Outreach in 2011

EVENT	DATE IN 2011	LOCATION	INTENDED AUDIENCE
Illuminating Engineering Society (IES) Technical Procedures Committee (TPC)	October	San Diego, CA	SSL test experts, industry
APEC member governments, Asia Lighting Compact (ALC) meeting	November	Singapore	APEC governments, Asia Lighting Compact stakeholders

Management/Experts Meetings Held in 2011

NAME	DATE IN 2011	ACCESS
2nd Experts' Meeting	March	Gaithersburg, Maryland, USA
3rd Experts' Meeting	September	Stockholm, Sweden
Management Teleconferences (x7)	May, July, September, October, November (2), December	Teleconferences

Outreach Planned for 2012

EVENT	DATE IN 2011	LOCATION	INTENDED AUDIENCE
Press Conference	5 March	San Diego, CA	SSL test experts, industry
LED Symposium	8 March	Tokyo, Japan	Japanese industry, stakeholders, press
Light + Build Stakeholder Workshop	17 April	Frankfurt, Germany	European stakeholders (industry, consumer groups, governments)
NEMA Lighting Division Meeting	19 April	Baltimore, Maryland, USA	US Lighting Industry Association

Solid State Lighting Annex

Experts' Meetings Planned for 2012

NAME	DATE IN 2011	ACCESS
4th Experts' Meeting	5-7 March	Tokyo, Japan
5th Experts' Meeting	12-14 September	Beijing , China

Participants

Australia, Denmark, France, Japan, Netherlands, Sweden, UK, USA

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Outreach and Communication

The Communications Strategy, adopted by 4E in May 2011, sets the framework and priorities for communication activities undertaken by members of the Implementing Agreement, the various Annexes and those employed to undertake analysis by 4E. It provides a broad framework for 4E communications, highlighting the most important requirements for the development of materials and activities in order to for 4E to meet its objectives.

The development of this strategy reflects the view of 4E members that it is a priority to ensure that the results of our analysis and research activities are communicated clearly and to the appropriate audience in order maximise their potential impact. The Strategy covers a period to the end of 2012 and covers 12 discrete activities that have been identified as the most effective way to harness 4E's resources in meeting our objectives (see Table 2).

Table 2: Proposed 4E communication activities for the period mid 2011- end 2012

	TITLE	QUANTITY	TARGET	CHANNEL
EXISTING ACTIVITIES				
1.	2011 Annual Report	1	General	4E website, 4E delegates
2.	*Bright Spark*	3	General	Mail to subscribers, 4E website, 4E delegates
3.	Govt-govt outreach to non-member countries	10	Non-member governments	Government to government official communications
4.	ExCo host meetings	3	Local government officials, industry, consumer groups, NGOs, etc.	Seminar or workshop
5.	Presentations at key events	4-5	General or target groups	Conference or workshop
6.	Optimise website visibility	1	General	Website
7.	Linkages with IEA	2-3	Governments and industry	Varied
8.	Contact lists	1	General	Targeted mail
FUTURE ACTIVITIES				
9.	Annex dissemination plans	4	Stakeholder group for each Annex	Varied
10.	High level briefing sheets	5-6	Politicians, senior level government officials, industry	Targeted mail, 4E delegates, website
11.	Regional 4E briefings	4	Government officials in 4E member and non-member countries	Face to face meetings
12.	Standard organisations	2	Standards development	Submission, face to face meeting

Outreach and Communication

4E high-level outreach

The launch of a series of high-level Policy Briefs to summarise our key findings and conclusions on individual topics is one of the key new initiatives under the Communication Strategy. These two-page sheets will conform to a consistent style and display strong 4E branding, together with concisely worded messages. The first two of these were published in September 2011, and have subsequently been distributed to key policy makers and made available on the 4E website.

- Mapping and Benchmarking: Annex Overview (M&B0)
- Mapping & Benchmarking: Refrigerators & Freezers (M&B1)

In addition to the publication of policy briefs, 4E provides face-to-face briefings for senior policy makers, and in June a 4E delegation met with the European Commission to provide an update on our research findings.

Preparation also began in 2011 to prepare materials for presentation to the Clean Energy Ministerial (CEM3) to take place in April 2012 and hosted by the UK. 4E is aiming to use the results of benchmarking for refrigerators and standby

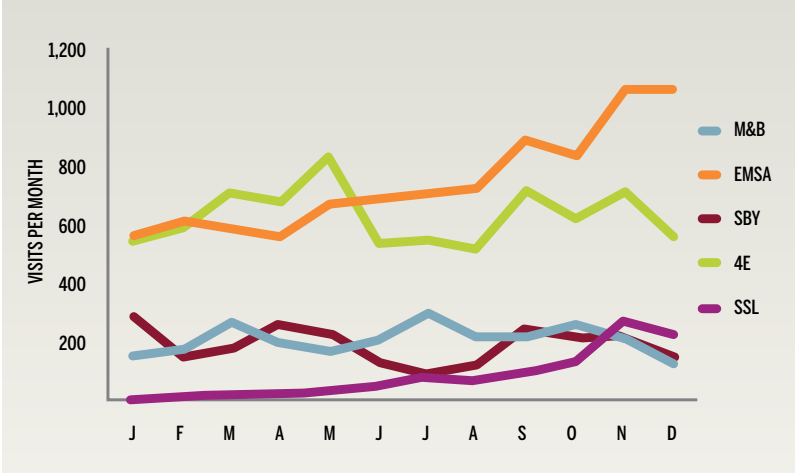
power to deliver messages about: the potential for energy efficiency to provide climate mitigation; the effectiveness of previous policy measures and the large opportunities available through international collaboration.

Website

The 4E dedicated websites are the hub of 4E's communication activities both to a wider audience and, through the restricted areas, to ExCo delegates. 4E operates a group of linked websites: a main site and one for each Annex, with the latest addition being the SSL Annex site in March 2011.

These websites allow access to all 4E publications, give notification of events and provide background information. The site is regularly updated and 'news' items are posted frequently.

Figure 4: Visits to 4E websites by month in 2011



Outreach and Communication

Collectively, 4E websites received 22,000 visits during 2011, an increase of nearly 40% compared to the previous year (see Figure 4). The number of page views also increased by 25% to more than 58,000. Compared to 2010, the number of unique visitors rose by nearly 50% to 14,000 in 2011 (see Figure 4). The location of 4E's site traffic is increasingly diverse, with visitors from 130 separate countries (see Figure 5).

During 2011, the site was upgraded to improve functionality and visibility. Sprang Media have been maintained as the host and to provide expert advice and assistance where required.

Figure 5: Change in number of visits to 4E website between 2010 and 2011

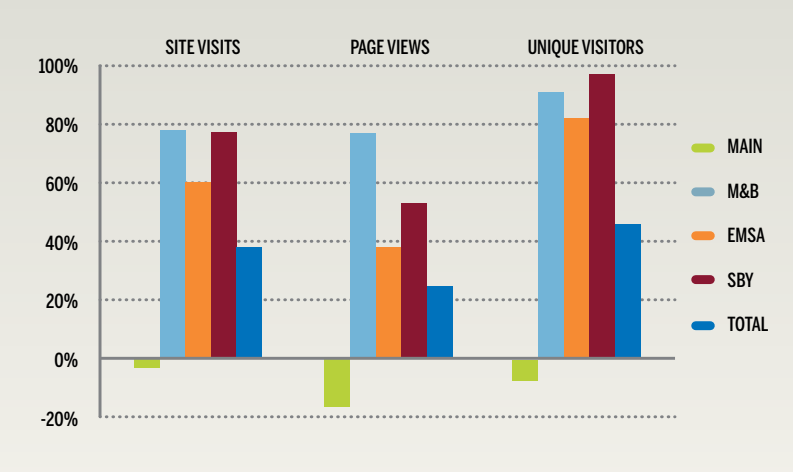
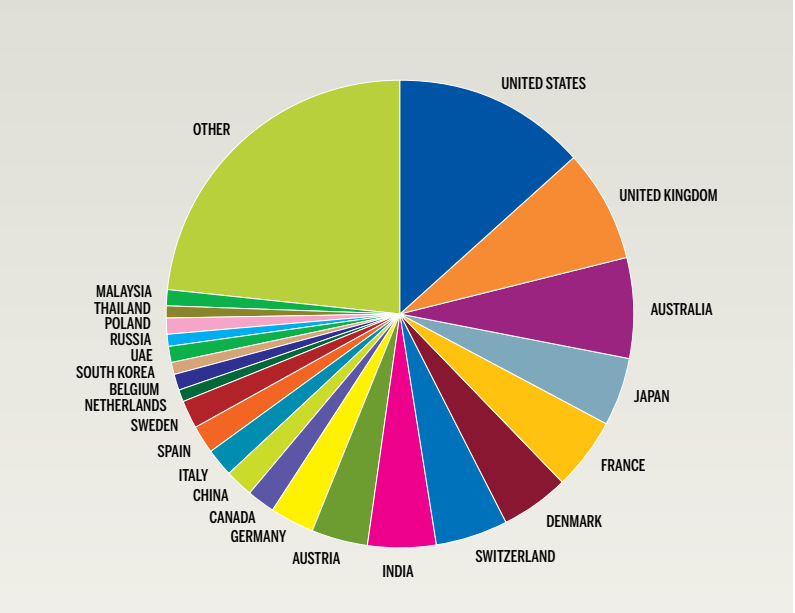


Figure 6: Countries of origin – 4E website visitors in 2011



Outreach and Communication

Publications

4E has released 60 publications during 2011 (see Table 3), including eight newsletters aimed at promoting the work of the Implementing Agreement and its Annexes to a wide range of stakeholders. EMSA produced three newsletters (in several languages), while the Mapping & Benchmarking Annex and the Standby Power Annex each published two. The third edition of *'Bright Spark'* covering all of 4E activities was launched

Table 3: 4E Publications in 2011

DATE	SOURCE	TITLE
January	Standby Power	*LoadDown Newsletter Edition 8*
February	M&B Annex	*4th Annex newsletter*
	M&B Annex	*Residential air conditioners benchmarking report*
	EMSA	*EMSA Newsletter 1/2011*
March	4E	*2010 Annual Report*
April	M&B Annex	5th Annex newsletter
	M&B Annex	Laundry dryers national/regional mapping documents for: Australia, Austria, Canada, Denmark, Switzerland, USA, UK, EU
May	EMSA	*Energy-Efficiency Policy Opportunities for Electric Motor-Driven Systems*
	EMSA	*Walking the Torque*
June	M&B Annex	Lighting national/regional mapping documents for: Australia, Austria, Canada, Denmark, France, Republic of Korea, Switzerland, USA, UK, EU, Taiwan
	EMSA	*EMSA Newsletter 2/2011*
	Standby Power	*Cutting Edge Technology Feasibility Study*
	Standby Power	*Energy reporting on networks*
	Standby Power	*Estimate of the Energy Wasted by Network Connected Equipment*
	Standby Power	*Examples of Low Energy Product Designs*
	Standby Power	*Investigation and Exploration of Network Power Consumption in Set Top Boxes, VOIP Telephones and Games Consoles*
	Standby Power	*List of Technical Standards for Equipment Connected to Energy-Using Networks*
	Standby Power	*Power Scaling in Proportion to Data Processing*
	Standby Power	*Testing Products with Network Connectivity*

Outreach and Communication

Table 3: 4E Publications in 2011 continued

DATE	SOURCE	TITLE
July	M&B Annex	*Lighting Benchmarking document*
August	EMSA	*Motor Policy Guide*
	Standby Power	*LoadDown Newsletter Edition 9*
	Standby Power	*Provision of a horizontal policy approach to standby power*
	Standby Power	*Standby Power Annex – What is there still to Do?*
	Standby Power	*What has the Annex Achieved – August 2011*
September	4E	*3rd 'Bright Spark' Newsletter*
	M&B Annex	*Laundry dryers Benchmarking document*
	M&B Annex	*Annex overview policy brief*
	M&B Annex	*Refrigerators & freezers policy brief*
	EMSA	*Motor Systems Tool*
	EMSA	Papers presented at EEMODS'11: - *Harmonized standards for motors and systems: global progress report and outlook* - *Testing centres network: interpretative guide for motor testing* - *EMSA analysis of motor policies around the world* - *The Motor Systems Tool. An outcome of Task B of the 4E EMSA project* - *Global effort for efficient motor systems: EMSA* - *Incentive program for motor systems efficiency in industry: first experiences from Easy in Switzerland*
November	EMSA	*EMSA Newsletter 3/2011*
	Standby Power	*Evaluation of policies to reduce Standby Power and Development of Standard Methodology*
	SSL Annex	*Definitions for Solid State Lighting Performance Tiers*
	SSL Annex	*Draft Performance Tiers, Omni-directional lamp*
	SSL Annex	*Draft Performance Tiers, Directional Lamp*
	SSL Annex	*Draft Performance Tiers, Downlight fixture*
	SSL Annex	*Draft Performance Tiers, Linear Replacement*

Group Finances

Cash and in-kind support for 4E activities during 2011 are estimated to total €960,000, of which cash contributions comprise 60%. As shown in Figure 7, the majority of resources were directed towards research, while approximately one-third was spent on communication and outreach activities. Administration, including financial management coordination and member liaison, used 13% of resources.

In 2011 total resources deployed fell by an estimated 6% compared to 2010 but communications and outreach has grown by 22% (see Figure 8). Administration costs have remained constant, despite the addition of the SSL Annex in June 2010.

Figure 7: Allocation of 4E resources in 2011

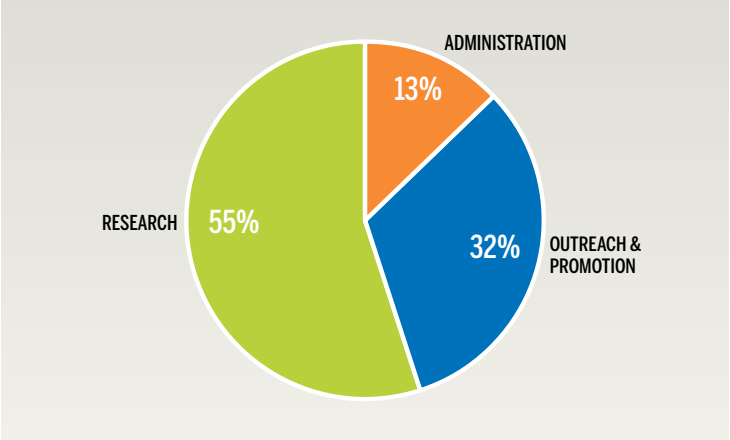
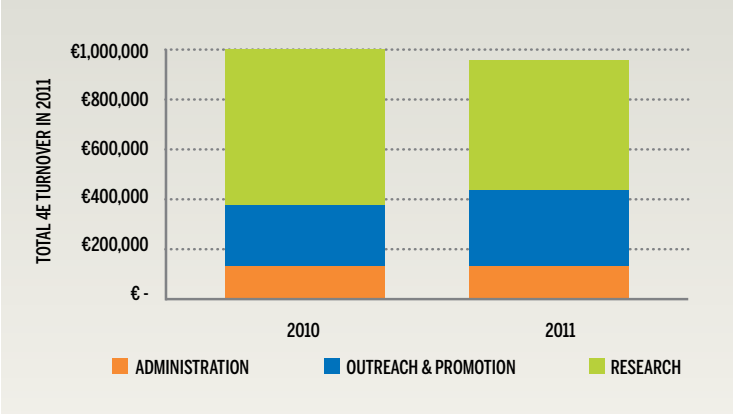


Figure 8: Comparison of 4E resource allocation, 2010-2011



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Membership of 4E Annexes

COUNTRY	M&B	MOTOR SYSTEMS	STANDBY POWER	SOLID STATE LIGHTING
AUSTRALIA	●	●	●	●
AUSTRIA	●	●	●	
CANADA	●		●	
DENMARK	●	●	●	●
FRANCE	●			●
JAPAN	●			●
REPUBLIC OF KOREA	●		●	
THE NETHERLANDS	●	●	●	●
SOUTH AFRICA	●			
SWEDEN	●		●	●
SWITZERLAND	●	●	●	
UNITED KINGDOM	●		●	●
USA	●	●	●	●

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Solid State Lighting (SSL)

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Solid State Lighting (SSL)

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About the International Energy Agency (IEA)

The IEA was established as an autonomous agency in November 1974. Its mandate is two-fold: to promote energy security amongst its member countries through collective response to physical disruptions in oil supply; and to advise member countries on sound energy policy.

The IEA carries out a comprehensive programme of energy co-operation among 28 advanced economies, each of which is obliged to hold oil stocks equivalent to 90 days of its net imports.

The Agency aims to:

- Secure member countries' access to reliable and ample supplies of all forms of energy; in particular, through maintaining effective emergency response capabilities in case of oil supply disruptions
- Promote sustainable energy policies that spur economic growth and environmental protection in a global context – particularly in terms of reducing greenhouse-gas emissions that contribute to climate change
- Improve transparency of international markets through collection and analysis of energy data
- Support global collaboration on energy technology to secure future energy supplies and mitigate their environmental impact, including through improved energy efficiency and development and deployment of low-carbon technologies
- Find solutions to global energy challenges through engagement and dialogue with non-member countries, industry, international organisations and other stakeholders

With a staff of around 190, mainly energy experts and statisticians from its 28 member countries, the IEA conducts a broad programme of energy research, data compilation, publications and public dissemination of the latest energy policy analysis and recommendations on good practices.

IEA Implementing Agreements (IAs)

To support the IEA's core issues, the IEA created a legal contract – the Implementing Agreement – and a system of standard rules and regulations that would allow interested member and non-member governments to pool resources and research the development and deployment of particular technologies.

This IEA technology collaboration programme is open to IEA member and non-member countries.

Typically, participants are:

- Governmental or energy technology entities representing governments
- Research institutes and universities
- Energy technology companies

For more than 30 years, technology collaboration has been a fundamental building block among IEA member and non-member countries in facilitating the progress of new or improved energy technologies. In 2007, there were 41 collaborative projects with several thousand participants from 72 countries, organisations or companies working in the areas of Cross-Cutting Activities, End-Use (buildings, electricity, industry, transport), Fossil Fuels, Fusion Power, Renewable Energies and Hydrogen.

Each Implementing Agreement has a unique scope and range of activities, although the work typically includes technology and policy assessments, research projects, information exchange and the dissemination of results and experiences.

About the International Energy Agency (IEA)

International energy technology collaboration provides many advantages to participants, including:

- Reduced cost and avoidance of duplication of work
- Greater project scale
- Information sharing and networking
- Linking IEA member countries and non-member countries
- Linking research, industry and policy
- Accelerated development and deployment
- Harmonized technical standards
- Strengthened national research, development and demonstration (RD&D) capabilities

Further information is available at:
http://www.iea.org/techno/index.asp