



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

**ANNUAL REPORT**

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## Chair's Statement

**4E has hit the ground running in 2014, launching a range of ambitious new projects to tackle some of the key issues facing energy efficiency in the evolving world of appliances and equipment.**

Our latest Annex is a case in point: focusing on Electronic Devices and Networks (EDNA) it has quickly launched a range of initiatives on the Internet of Things and smart meters and, alongside the SSL Annex, smart lights. A commitment to establishing links with industry was well illustrated by the joint workshop on smart appliances held with the newly formed International Roundtable of Household Appliance Manufacturers.



EDNA isn't the only development flowing from our previous work on standby power. Together with the IEA, we published *'More Data, Less Energy'* which has over 27,000 downloads since July, and has led to the new G20 initiative on Networked Devices announced in November 2014. 4E will play a major role in the delivery of this project in time for the next Summit in Turkey.

Other highlights from 2014 include work on solid state lighting that amply demonstrate how 4E's work supports the development and implementation of energy efficiency policies by all governments. Two reports provide authoritative information on the life-cycle assessment and health impacts of LEDs so that governments can make evidence-based decisions. Most impressively, the SSL Annex also managed the world's largest ever examination of LED lighting testing proficiency across 18 countries in order to develop national and regional quality assurance programs.

While 4E's projects are designed to meet the needs of our member countries, the majority of outputs are freely available, and our new website makes it easy to access our growing body of work. During 2014, it is particularly gratifying to see that 4E materials have been used more frequently and in more countries than before, and our engagement with relevant industries has increased substantially.

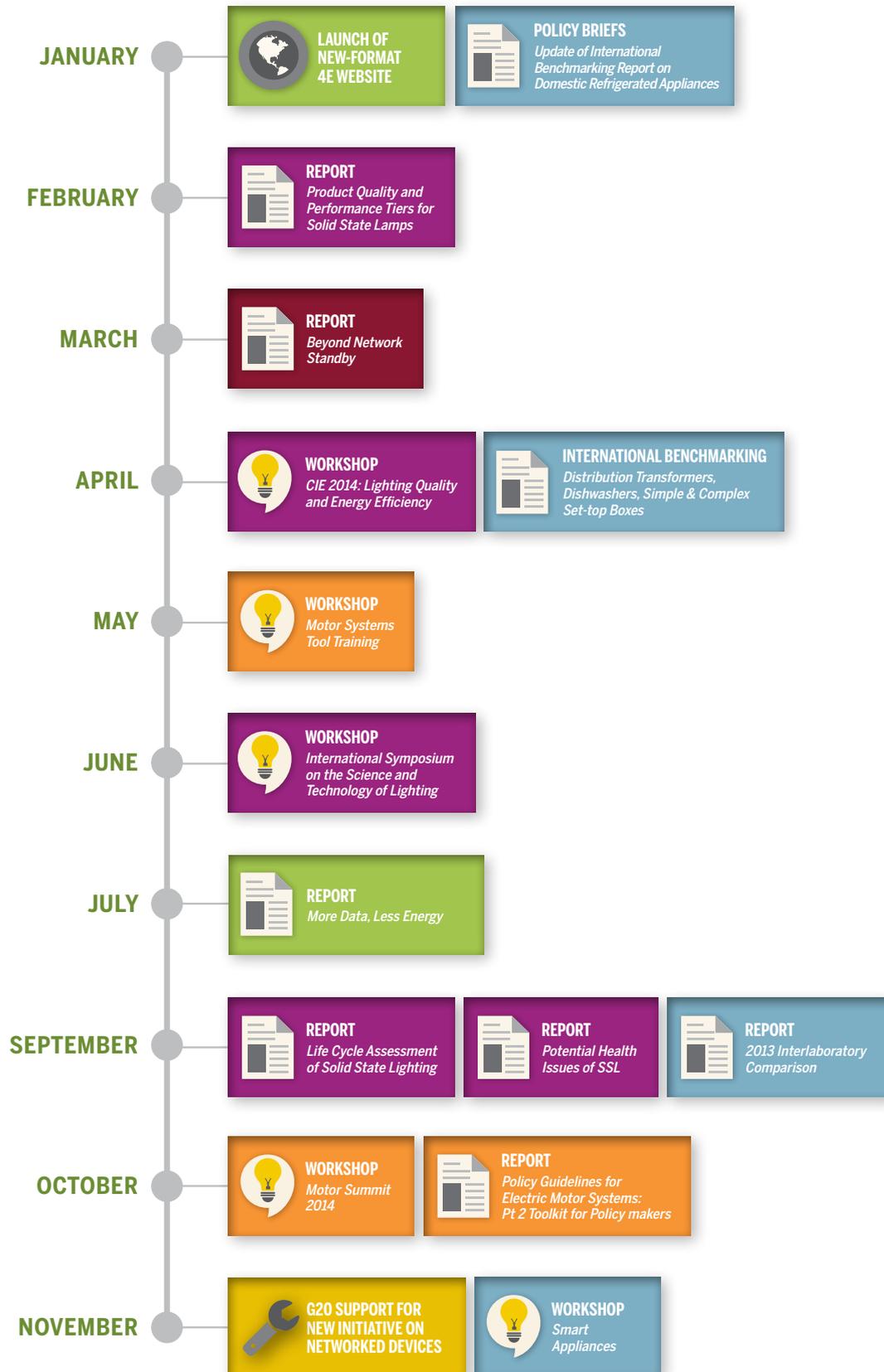
As we look forward into 2015 and beyond, we intend to continue to build on these past achievements, developing the energy efficiency expertise amongst governments and looking for further ways to enhance policies through international collaboration.

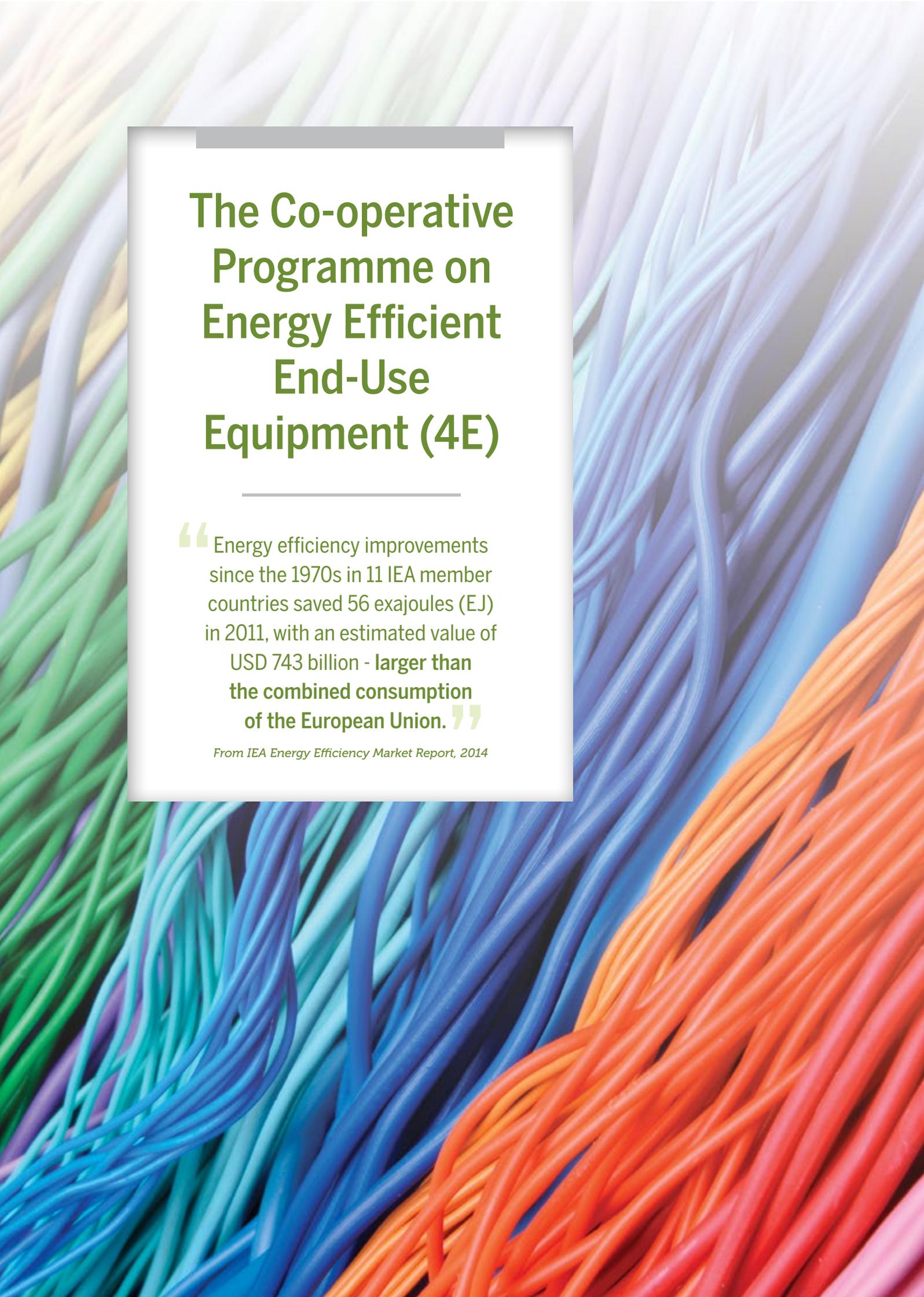
We will be helped in this task by the new appointments to the management team from Australia, Canada and the USA. In welcoming their commitment to 4E, I would also like to thank all those who have and continue to shape 4E, and who give their time and effort with such enthusiasm.

A handwritten signature in black ink that reads "Mike Walker".

Mike Walker  
Chairman 4E  
February 2015

## Key 4E achievements in 2014





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

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“Energy efficiency improvements since the 1970s in 11 IEA member countries saved 56 exajoules (EJ) in 2011, with an estimated value of USD 743 billion - **larger than the combined consumption of the European Union.**”

*From IEA Energy Efficiency Market Report, 2014*

## The importance of energy efficiency

Energy efficiency can no longer be viewed as a marginal activity. Analysis by the International Energy Agency (IEA) has shown that the quantity of energy avoided by on-going energy efficiency activities in member countries during 2011 was larger than actual demand met by any other single supply-side resource, including oil, gas, coal and electricity – making energy efficiency the largest or “first” fuel.

Aggregate annual investments in energy efficiency have been estimated at between USD 310-360 billion in 2011, which exceeds investments in renewable electricity or coal, oil and gas power generation. Harnessing further economically viable energy efficiency investments would facilitate a more efficient allocation of resources across the global economy, with the potential to boost cumulative economic output through 2035 by USD 18 trillion – larger than the current size of the economies of North America combined (i.e. the United States, Canada and Mexico).

## Energy efficiency co-benefits

Meeting energy demand through increased energy efficiency offers a range of advantages over other supply options, although many of these are not yet fully appreciated. Properly accounting for these multiple benefits will help policy makers optimize investments and send better socio-economic signals to the market. Some of the most significant benefits resulting from energy efficiency include:

- ▶ **Macroeconomic development:** Energy efficiency policies improve macroeconomic performance by stimulating economic growth and job creation
- ▶ **Public budgets:** Budgets for unemployment payments are reduced when energy efficiency policies lead to job creation
- ▶ **Health and well-being:** Improvements such as reduced incidents of respiratory and cardiovascular conditions, rheumatism, arthritis and allergies generate downstream social and economic impacts, including lower public health spending
- ▶ **Industrial productivity:** Energy efficiency leads to enhanced competitiveness, profitability, production and product quality, and improves the working environment while also cutting costs for operation and maintenance, and for environmental compliance
- ▶ **Energy delivery:** Energy efficiency lowers costs for energy generation, transmission and distribution, improved system reliability, dampened price volatility in wholesale markets and the possibility of delaying or deferring costly system upgrades

As noted by the IEA<sup>1</sup>, including the value of multiple benefits alongside traditional benefits has shown energy efficiency measures delivering returns as high as €4 for every €1 invested.

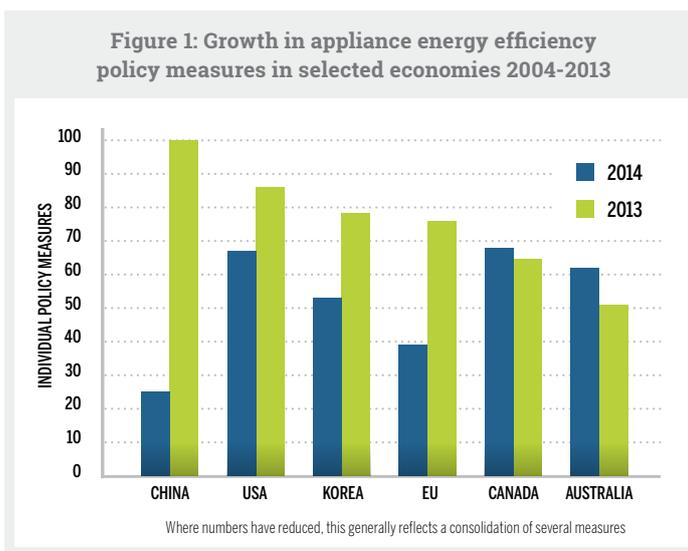
## Impact of policies on appliances and equipment

As the benefits of energy efficiency become better understood, more countries are implementing policy measures for appliances and equipment, since this sector consumes around 18,000 terawatt hours (TWh) of electricity and 375,000 petajoules (PJ) of primary energy each year and is one of fastest growing areas of energy consumption. Of these policies, Standards and Labelling (S&L) programs are the most widespread, existing in 81 countries and covering more than 55 product types<sup>2</sup>.

<sup>1</sup> IEA (2014) Capturing the Multiple Benefits of Energy Efficiency, Paris

<sup>2</sup> EES & Maia (2014) Energy Standards and Labelling Programs throughout the World in 2013

In fact, the number of individual policy measures for appliance and equipment has tripled since 2004, with growth occurring in most regions of the world. This is unsurprising given the effectiveness of these programs. International benchmarking undertaken by 4E, amongst others, continues to show the dramatic increase in energy efficiency of equipment that has occurred since the introduction of S&L policy measures (see Figure 1).

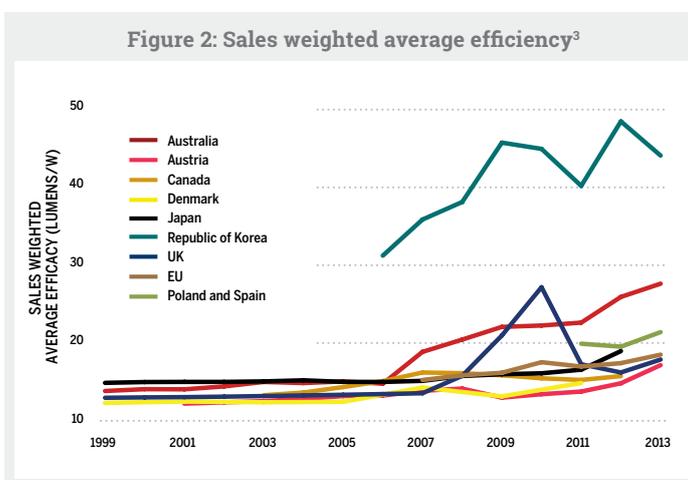


## The role played by 4E

While the achievements of appliance energy efficiency policies are significant, the potential future impact of these is even greater. Through international collaboration, 4E enables S&L programs to be consistently evaluated and improved so that they are ambitious and internationally aligned. The 4E platform provides the means to achieve this at least cost to member governments.

Working together through 4E, governments can grow the impact of energy efficiency policies substantially, through:

- ▶ Setting policies that reflect changes in technology and market conditions
- ▶ Expanding the scope of policies
- ▶ Improving implementation and compliance through learning from the experience of others



Energy efficiency policies have not only caused a dramatic increase in appliance efficiencies but there is now a growing body of evidence to show that they may also have contributed to reduced appliance costs<sup>4,5</sup>. This is contrary to conventional wisdom, which holds that consumers pay more for more efficient appliances and equipment.

<sup>3</sup> 4E Mapping & benchmarking of the impact of "phase-out" on lighting market (updated), March 2015

<sup>4</sup> In the US, average prices for appliances covered by energy efficiency standards have fallen by \$12 – far less than the predicted average increase of \$148 (see <http://aceee.org/research-report/e13d>). A similar impact has been noted in many other major economies and is partly attributed to the 'learning by doing' effect (see [http://www.iea.org/publications/freepublications/publication/Appliances\\_Ellis-1.pdf](http://www.iea.org/publications/freepublications/publication/Appliances_Ellis-1.pdf))

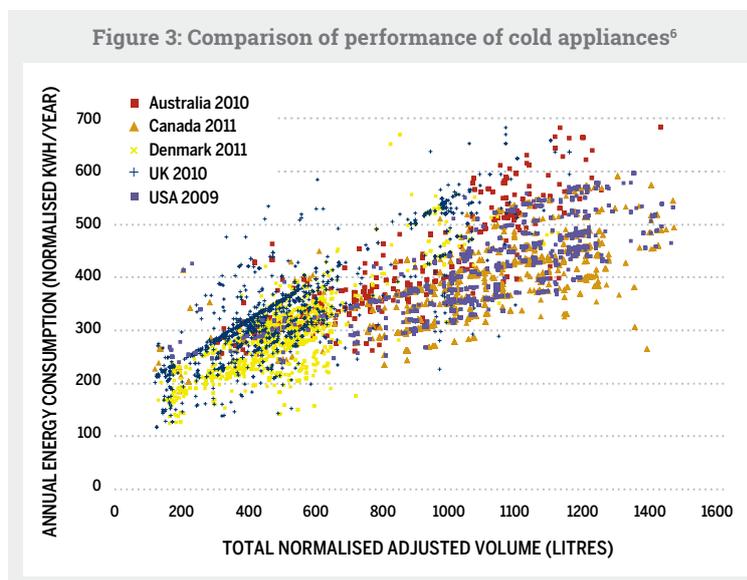
<sup>5</sup> Since prices for many regulated products appear to have fallen faster, or increased slower compared to other consumer items. See: R D Van Buskirk, C L S Kantner, B F Gerke and S Chu (2014) A retrospective investigation of energy efficiency standards: policies may have accelerated long term declines in appliance costs

This lower than expected long-term price trend suggests that it will be cost-effective to increase efficiency levels at a faster rate than we currently expect and allowing governments and industry to be more ambitious. As we have seen from 4E's international comparisons of appliance performance levels, not all citizens in similar advanced economies have access to the best performing products (see Figure 3).

Access to this type of information can be used by policy makers in their routine cycle of review for S&L programs to ensure that they continue to provide cost-effective benefits into the future.

Similarly, 4E provides a platform for countries to compare approaches and better understand how they can expand to cover more types of equipment, building on the work of other members.

As economies increasingly seek the opportunities to meet future energy demand through the more efficient use of current energy resources, there is huge potential to learn from the experiences of others and to collectively explore some of the technological and policy challenges ahead. This is particularly evident in the field of appliances and equipment, a large proportion of which are internationally traded. Since 2008, 4E has enabled the twelve member governments to develop collaborations and co-ordinate activities to strengthen and grow their own national programs.



4E ExCo delegates, Jeju Island, Korea, November 2014

<sup>6</sup> 4E Mapping & benchmarking for domestic refrigerated appliances, January 2014

# Overview of 4E Structure and Activities

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“4E has hit the ground running in 2014, launching a range of ambitious new projects to tackle some of the key issues facing energy efficiency in the evolving world of appliances and equipment.”

*Mike Walker, 4E Chair*

## Executive Committee

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.

At the end of 2013, the ExCo agreed to change the name of 4E to '*Energy Efficient End-use Equipment*' to enable consideration of appliances and equipment using fuels other than electricity. In May 2014 a new Legal Text was approved to reflect the revised objectives, formalise administrative arrangements and clarify the treatment of Intellectual Property issues.

In November 2014, the ExCo made the following appointments for the forthcoming 2 years:

- ▶ **Chair of 4E:** Mike Walker (UK) re-appointed
- ▶ **Vice-chairs of 4E:** Katherine Delves (Canada) and David Walker (Australia)  
Hans-Paul Siderius (Netherlands) re-appointed

The 13th and 14th meetings of the Executive Committee (ExCo) were held during 2014 in Utrecht (15-16 May) and JeJu Island, Korea (5-6 November). Attendance at these meetings is shown in Table 1. A list of the members of the ExCo during 2014 is shown in Attachment 1.

### Future ExCo meetings will be as follows:

- ▶ 15th ExCo: 20 & 22 May 2015, Copenhagen, Denmark
- ▶ 16th ExCo: 8-9 October 2015, CEATEC, Japan

Table 1: Attendance at 2014 ExCo Meetings

CONTRACTING PARTY	13TH EXCO - NETHERLANDS	14TH EXCO – KOREA
Australia	✓	✓
Austria	✓	✓
Canada	✓	✓
Denmark	✓	✓
France	A	A
Japan	✓	✓
Republic of Korea	✓	✓
Netherlands	✓	✓
Sweden	✓	✓
Switzerland	✓	✓
United Kingdom	✓	✓
United States of America	✓	✓
Observers	IEA, EC, IPEEC, SEAD	SEAD

Legend: A – absent/apologies

Under an agreement approved in May 2014 representatives of the Super-efficient Equipment and Appliance Deployment (SEAD) initiative may attend 4E ExCo meetings as non-voting but fee-paying members and SEAD representatives that are not 4E members may be participants in 4E Annex meetings. It is envisaged that this will provide access to 4E work to a wider range of governments

## Annexes

Targeted collaborative research and development activities under 4E are undertaken within our Annexes, each of which has a particular 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.

Two 4E Annexes formally came to end in early 2014, although aspects of their work continue under a new structure. International Mapping and Benchmarking activities, which previously occurred within a separate Annex, are now continued as projects under the guidance of the ExCo. The Standby Power Annex has also ceased, but the issue of network standby is still being addressed through the new Electronic Devices and Networks Annex (EDNA).

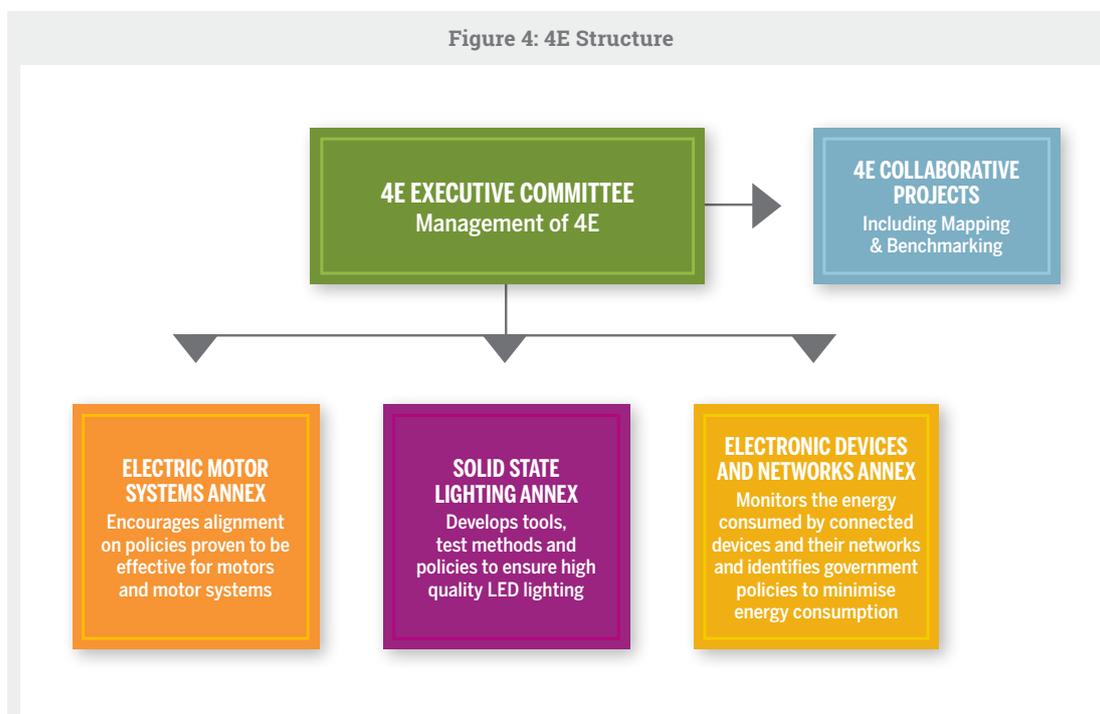
The 4E structure is shown in Figure 4, and this highlights the three active Annexes:

- ▶ **Electric Motor Systems Annex (EMSA)**, launched in October 2008 and led by Switzerland
- ▶ **Solid State Lighting (SSL) Annex**, launched in June 2010 and chaired by Sweden
- ▶ **Electronic Devices and Networks Annex (EDNA)**, launched in 2014 and chaired by the Netherlands

Reports on all Annexes are included later in this report.



Figure 4: 4E Structure



## 4E Projects

4E members initiate projects into areas of research relevant to policies for efficient end-use equipment. These may be special one-off activities or result in the development of an Annex or other avenues for pursuing more in-depth consideration.

Active projects in 2014 included:

### **G20 Energy Efficiency Action Plan: Networked Devices**

4E and SEAD is providing the platform for international cooperation on Networked Devices for one of six new initiatives endorsed by G20 Leaders at their Australian Summit in November 2014.

Although network connectivity increases opportunities for energy management, such as controlling the temperature setting of ones air conditioner by smart phone, it also adds to energy consumption as appliances use 'network standby' power just to remain connected to the network. As shown in the joint IEA/4E publication, "*More Data, Less Energy*"; the current annual standby power consumption of networked devices is over 600 billion kilowatt-hours, which is greater than Canada's 2011 annual electricity consumption. With up to 50 billion devices forecasted to be connected to networks by 2020, global standby power consumption is projected to nearly double by 2025.

The G20 Project will co-ordinate governments, experts and industry to encourage innovative responses, including goals, to the challenge of energy consumed by networked devices, and report back to the next G20 meeting to be held in Turkey in late 2015.

### **Engagement with International Standardisation Organisations**

Methods of testing products for energy performance underpin most energy efficiency policies, such as minimum standards, labels, awards and financial incentives) and therefore 4E encourages the use of test procedures and efficiency metrics that are:

- ▶ Repeatable (i.e. the same product measured repeatedly in the same test laboratory will produce the same results)
- ▶ Reproducible (i.e. the same results will be recorded if the same product is tested in different laboratories, assuming the laboratories have been accredited to do the test)
- ▶ Representative (i.e. the results measured under the test are representative of the average of what would be expected when the product is used *in situ*)
- ▶ Affordable (i.e. the cost of doing the test is not prohibitive)
- ▶ Viable (i.e. practicable and not unduly burdensome but also being enforceable in such a way that their intent and prescriptions cannot be readily circumvented)

As a result, a joint initiative between 4E and the IEA and Super-efficient Equipment and Appliance Deployment (SEAD) Initiative was launched in November 2012, to develop more effective mechanisms for engaging with the IEC and ISO.

### **Policy Driven Innovation (PDI)**

This project seeks to show high-level government officials how ambitious energy productivity goals can be achieved through internationally coordinated efficiency levels and longer-term performance targets for appliances and equipment. This approach could provide increased regulatory certainty for industry and encourage the market entrance of new efficient technologies.

## International Mapping and Benchmarking

Benchmarking is a key activity of 4E and until early 2014 was conducted by the 4E Mapping and Benchmarking Annex, as noted previously. These activities are now organised on a project basis by the ExCo, and the results made available on the Mapping and Benchmarking website.

## Smart Metering Infrastructure

This research program considered the energy efficiency implications of Non-Intrusive Appliance Load Monitoring (NIALM) and Smart Metering Consumption (SMC), and explored the potential for further 4E involvement in these areas. The SMC work is now being continued as a task within the Electronic Devices and Networks Annex (EDNA).

## Co-ordination with other organisations

As one of 40 Energy Technology Initiatives established in the framework of the International Energy Agency (IEA), 4E has a particularly close relationship with the IEA Secretariat and provides expert input to many IEA publications on end-use energy efficiency.

For example, in 2014 these included *"Tracking Clean Energy Progress"* and *"Energy Technology Perspectives"*. For the first time in 2014, 4E issued a joint publication with the IEA: *"More Data. Less Energy"*.

4E also provides regular progress reports to IEA member governments and liaises with other Implementing Agreements. The IEA's Energy Efficiency Division provides a report to each 4E ExCo meeting, and is often represented at these meetings.

From 2014 4E has formalised its relationship with the Super Efficient Appliance Deployment (SEAD) initiative, enabling representatives of SEAD to participate in 4E meetings. In addition to facilitating greater co-ordination, this will give developing countries greater access to 4E work.

Through the G20 initiative on Networked Devices, 4E is also working with the International Partnership on Energy Efficiency Co-operation (IPEEC), a group comprising senior government energy efficiency officials, which is tasked with reporting to the G20.

In addition, 4E regularly liaises with a range of public and private sector groups with an interest in end-use energy efficiency, including APEC, the World Bank, the World Economic Forum, Sustainable Energy for All, international standards organizations and industry groups. Recognising the unique contribution that each is playing in the development of public policy, 4E continues to engage these organisations to promote a better understanding of issues relating to the efficiency of end-use equipment.

4E also engages with many industry sectors through the work of our Annexes and participation in international standardisations activities.

“Including the value of multiple benefits alongside traditional benefits has shown energy efficiency measures delivering returns as high as €4 for every €1 invested.”

*Maria van der Hoeven, Executive Director,  
International Energy Agency*

# Annex Achievements in 2014

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“Some people call energy efficiency low-hanging fruit. I would even say energy efficiency is fruit lying on the ground. **We only need to bend over and pick it up.**”

*Harry Verhaar, head of global and public affairs  
at Philips Lighting*

## Electric Motor Systems Annex (EMSA)

The **Electric Motor Systems Annex (EMSA)** focuses on improving the efficiency of electric motor systems. Electric motors drive pumps, fans, compressors and any auxiliary components to which they may be attached, including variable speed drives, gears, transmission belts and brakes. Motor systems are responsible for over 40% of global electricity use with a savings potential of 20% to 30%. EMSA helps to:

- ▶ Raise awareness on the large energy savings potential in motor systems and showing the way to realize these
- ▶ Advise policy makers in the design and implementation of coherent motor systems policy instruments
- ▶ Develop sufficiently robust international standards that support policy implementation
- ▶ Enhance international exchange on policy experience, challenges and lessons learned
- ▶ Build capacities of engineers working for motor and machine manufacturers and industrial motor systems users

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

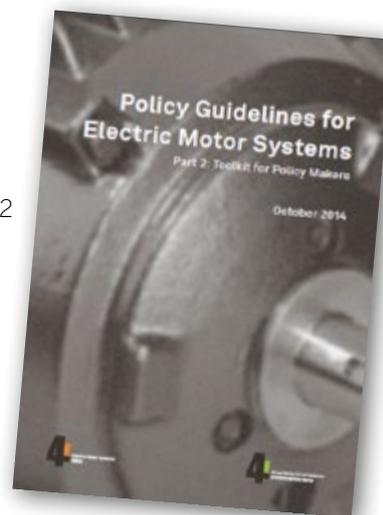
- ▶ The co-operation and exchange between EMSA countries reduces the costs of designing motor system policies and increases the chances of successful implementation. Through its outreach and publications, EMSA makes governments around the world aware of policy opportunities and the latest motor system policy developments in different regions (such as Australia, China, Europe, Japan, North America)
- ▶ 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, both manufacturers and end users of motor systems, 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 optimizing 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 improving the energy efficiency in the industrial sector and built environment



EMDA member delegates & 2014 Motor Summit, Zurich

### Major achievements in 2014

- ▶ EMSA provided a platform for a global debate for policy makers, standards developers, research, academia and industry concerning the efficiency of electric motor systems and possible market transformation avenues at the Motor Summit on 7-9 October 2014 in Zurich, Switzerland
- ▶ EMSA is recognized as an important international group in the field of motor systems efficiency by other organizations and at international for a (e.g. Motor Summit, EEMODS, ECEEE)
- ▶ EMSA hosted the SEAD Global Efficiency Medal Competition Award Ceremony at the Motor Summit 2014 in Zurich
- ▶ EMSA representatives work on the development of IEC standards for efficiency classes of converter-fed motors in IEC 60034-30-2, the revision of testing standards for motors fed by converters in IEC 60034-2-3 and the new IEC 61800-9-2 on testing and efficiency classes for motors and converters (motor systems)
- ▶ EMSA representatives are advising the European Commission on the revision of motor regulation (EC) No 640/2009 (Lot 30) and fan regulation (EU) No 327/2011
- ▶ EMSA is working with the IECEE (IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components) on a global motor labeling program



### Annex Participants

Australia, Austria, Denmark, Netherlands, Switzerland, United States of America

### Annex Observers

Japan, Sweden (Observer status withdrawn in 2014)

**A complete record of EMSA Annex activities in 2014 and participants are included in Attachment 2.**

## Solid State Lighting Annex

**Solid State Lighting (SSL)** has the potential to provide high-quality, energy-efficient lighting that surpasses traditional technologies and offers a lower life-cycle cost. However, there is a wide variation in the performance and quality of SSL products currently found on the market, and some of the poor-quality products could undermine consumer confidence in SSL, delaying market penetration and the associated energy and environmental benefits.

Launched in July 2010, the IEA 4E SSL Annex is a joint initiative of nine countries working together to address common challenges with SSL technologies. The Annex member countries understand there are significant advantages in engaging in an international collaboration and joint activities relating to SSL performance and quality.



A new Annex work plan was launched 1 July 2014 and includes the following 11 new Tasks:

- ▶ **Task 1.** Application of new CIE Test Method – looks at the application and relevance of the new CIE test standard for LED lamps, luminaires and to determine its potential to be used as a regulatory test standard
- ▶ **Task 2.** Characterisation of Product Lifetime – this activity works to understand the lifetime issues, looking at all existing literature and methods
- ▶ **Task 3.** Guidance on Lifetime Testing – this task will provide guidance to member country governments on lifetime testing of SSL products, including specific photometric aspects of SSL product lifetime
- ▶ **Task 4.** Interlaboratory Comparison (Goniophotometer) – a new global interlaboratory comparison test programme on directional lamps, light engines (e.g., Zhaga Consortium modules, etc.) and road/street lighting luminaires
- ▶ **Task 5.** Market Lessons Learned – summarise lessons learned by governments on the introduction of SSL products, extracting lessons learned and pitfalls to avoid
- ▶ **Task 6.** Quality and Performance Tiers – this activity supports the harmonisation of voluntary and mandatory programme performance requirements for SSL products around the world
- ▶ **Task 7.** New Features that Impact Energy Consumption – evaluating the energy consumption of new features such as colour-tunability, network access, active thermal control, light flux output, etc.
- ▶ **Task 8.** Benchmarking Performance of SSL Products – an internal benchmark performance database of SSL products to enable the sharing of data amongst member countries
- ▶ **Task 9.** Lighting Facts International Database – extending the US DOE's Lighting Facts programme global, through customised, country-specific user interfaces
- ▶ **Task 10.** Best Practice in International MV&E Programmes – methods of developing more cost-effective and efficient Monitoring, Verification and Enforcement (MV&E) programmes, serving as a guide for policy makers on cost, test methods, sample sizes, performance metrics, uncertainty, etc.

## Major achievements in 2014

The SSL Annex published the following three major research outcomes that draw together work undertaken over several years:

- ▶ **2013 Interlaboratory Comparison** – the world's largest interlaboratory comparison on solid state lighting (SSL), comparing 110 laboratories worldwide. It will help governments and test labs around the world ensure that new products sold are of high quality and meet the claimed performance. <http://ssl.iea-4e.org/task-2-ssl-testing/2013-ic-final-report>
- ▶ **Life-Cycle Assessment** – a meta-study of all the current life-cycle assessment studies on Light Emitting Diode (LED) lamps and luminaires compared with conventional lighting technologies. Energy in use is the dominant environmental impact of lighting systems, and energy-efficient LED systems could significantly reduce the impact of illuminating our buildings and outdoor areas. <http://ssl.iea-4e.org/task-1-quality-assurance/life-cycle-assessment-report>
- ▶ **Health Impacts Study** – a meta-study of the literature relating to human health impacts of SSL, and whether SSL is safe to illuminate our homes, buildings and outdoor areas. The review concluded that SSL technology is not expected to have more direct negative impacts on human health with respect to non-visual effects than other lighting technologies. <http://ssl.iea-4e.org/task-1-quality-assurance/health-aspects-report>
- ▶ The Annex began work on a new website which is designed around a thematic structure of the Tasks, covering product performance, testing and standards, policy and enforcement, and health and environment, and clearly presents the work of the Annex



## Annex Participants

Australia, Denmark, France, The Netherlands, Republic of Korea, Sweden, United Kingdom, United States of America. China participates in the expert group only

## Annex Observers

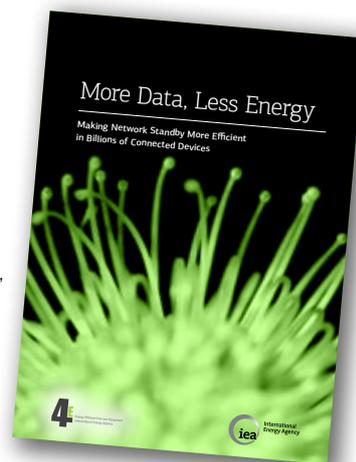
Japan

**A complete record of SSL Annex activities in 2014 and participants are included in Attachment 3.**

## Electronic Devices and Networks Annex (EDNA)

The **Electronic Devices and Networks Annex (EDNA)** was established in May 2014 to cover most types of electronic equipment and associated networks serving the information technology and related communications needs of consumers, businesses, institutions and utilities. This is intended to capture computers, televisions, telephones, supporting audio/video equipment, energy use monitoring devices and management systems, office equipment, and related electronic devices, as well as the networks they serve.

The joint IEA-4E publication '*More Data, Less Energy*' estimates that in 2013 around 14 billion devices were network connected, and that this number could rise to 100 billion by 2030. These devices can be controlled remotely, and this offers enormous opportunities for energy management. At the same time, there is a responsibility to ensure that such devices use a minimal amount of energy to stay connected. Many more appliances and equipment are expected to take advantage of network connectivity. In homes this might include lights, smoke alarms, whitegoods, entertainment systems, security systems, thermostats and more. In the fast-paced world of consumer electronics, this list is growing rapidly. Similar trends are emerging in commercial buildings (e.g. building management) and in industrial environments (e.g. wireless sensors).



The EDNA annex seeks to work closely with its member governments in order to co-ordinate policy initiatives aimed at addressing this problem, with a focus on delivering outcomes beyond what may be achieved by one country acting alone. EDNA's goals are:

**To monitor, measure, report and compare the extent of, and changes in, energy consumed by electronic devices and associated networks within Annex participant countries and other select locations; and**

**To support the alignment of government policies (including voluntary or mandatory approaches) which permit participating Annex members to minimise excessive energy consumption by electronic devices and associated networks.**

EDNA was chaired by the Netherlands in 2014 and will be chaired by the USA in 2015 and Australia in 2016.

### Major achievements in 2014

Since the Annex launch in May 2014, EDNA has built considerable momentum including:

- ▶ The production of a short video to help explain the issue of energy consumed by network connected devices: <http://edna.iea-4e.org/about>
- ▶ **Launch of Task 1 - Smart Metering and Energy Monitoring Systems:** Studies show that smart meters offer energy savings potential of 5 to 15% of household energy consumption. However, a comprehensive estimate of efficiency has yet to include the parasitic energy use of smart metering infrastructure. There are trade-offs between the energy consumption resulting from the deployment of new smart metering infrastructure, and the potential gains at the consumer side, by enabling monitoring and feedback on their energy consumption

This Task will explore these issues and consider the magnitude of the impact of smart metering and energy monitoring systems, and deliver a series of recommendations to be considered by policy makers.

- ▶ **Launch of Task 2** - Energy Efficiency of the Internet of Things: This Task is a first step to tackle the widespread field of energy efficiency in the internet of things (IoT). It aims to enhance the market and technology knowledge, to prioritize the topics to address, to develop high-level recommendations on policies, and to identify the most important areas for further work. The task has the following objectives:
  - Provide an overview of the structure of IoT and prioritize the categories with the highest energy impact potential based on expected proliferation
  - Assess energy consumption for prioritized categories based on used technologies and measurements, including analysis of options to reduce energy consumption and impact estimate of this
  - Develop initial high-level recommendations for policy objectives and measures
  - Identify the most important topics, which should be investigated in further work
- ▶ EDNA is collaborating with the International Roundtable of Household Appliance Manufacturer Associations (IRHMA) to address the energy cost of smart appliances. At workshop in Korea participants from IRHMA and 4E pledged to pursue a dialogue among appliance manufacturers, regulators, standardization organisations and other stakeholders to ensure that the “energy cost” of network-connected appliances is considered
- ▶ A joint workshop in Korea in November 2014 with the 4E Solid State Lighting Annex kicked off a collaboration between the Annexes to address the network standby energy associated with ‘smart lamps’. EDNA has also published test results of 11 models of Smart Lamps purchased in the USA in 2014, and it is expected that this testing program will be expanded in 2015

### **Annex Participants**

Australia, Austria, Canada, Denmark, France, The Netherlands, Sweden, Switzerland, UK, USA

### **Annex Observers**

Japan, Republic of Korea

**A complete record of EDNA activities in 2014 and participants are included in Attachment 4.**

## Mapping and Benchmarking Annex

Benchmarking enables governments to compare the performance of appliances and equipment in different regions, and better understand the potential for improvement. Benchmarking is a key activity of 4E and until 2014 was conducted by the 4E Mapping and Benchmarking (M&B) Annex.

Under the Strategic Plan for 4E's second term, Mapping and Benchmarking work is continued on a project basis under direct control of the ExCo and this replaces the current M&B Annex. Consequently, the M&B Annex formally ceased in March 2014. Some of the key achievements of the M&B Annex are noted in the box below.

### Major achievements 2009-2014<sup>7</sup>

Under the M&B Annex, 12 governments have engaged in frank discussions over a sustained period to gain a deeper understanding of each others successes and failures in product policy implementation and outcomes. The tangible result of this work includes:

- ▶ 14 international applicable product definitions
- ▶ 88 mappings of national product performance and associated policy backgrounds
- ▶ 14 consistent and comprehensive international benchmarking for individual product categories
- ▶ 15 Policy Briefs providing summaries of research and implications for policy makers
- ▶ 13 presentations and over 40 detailed product spreadsheets for direct use by participants
- ▶ 20 promotional webinars
- ▶ 3 policy workshops
- ▶ Input to IEA publications, Clean Energy Ministerial, etc.

Since 2008, the M&B Annex has grown in influence and is now considered to be one of the most authoritative and credible sources of information on the impacts of products policy. Its effects have been felt in various ways, including:

- ▶ The Annex analyses have become widely dispersed, are frequently cited by governments and industry, and have been used extensively in IEA publications
  - For example, Viktor Sundberg, Vice President of Electrolux showing a M&B graph of washing machines in his keynote speech at the DG ENER Conference on Product Policy
- ▶ The international comparisons of MEPS levels and the relative performance of products already available in some markets has given policy makers the confidence to raise their levels of ambition
- ▶ The detailed discussions on the various policy approaches (Top Runner, Energy Star, MEPS, Labels) and the experience shared amongst 4E members has helped to inform better national/regional policies
- ▶ The Annex outputs have provided policy makers with demonstrable evidence of successes in policy implementation, while at the same highlighted areas where there is potential for improvement and fine-tuning
- ▶ These outputs have been used to bring forward changes in national regulations and provide the rationale for program renewal
- ▶ It should be noted that while the depth of international policy and product analysis undertaken by the M&B Annex was rare in 2008, the quantity and quality of work in this field has increased since then. As a result, the outputs of the 4E M&B Annex compliments work by SEAD and others to create a range of analytical resource that is helping to shape the policy development debate

**A complete record of M&B activities in 2014 are included in Attachment 5.**

<sup>7</sup> The following summarises the final evaluation report of the Annex.

## Standby Power Annex

After 5 years, 4E Standby Power Annex formally concluded in May 2014. In order to focus more clearly on some of the emerging challenges the new Annex on Electronic Devices and Networks (EDNA) has been established and will build on work of the Standby Annex.

Under the 4E Standby Power Annex, the governments of Australia, Austria, Canada, Denmark, Korea, The Netherlands, Sweden, Switzerland, the UK and the USA joined together to:

**Monitor and report the extent of, and changes in, energy consumption by electrical appliances in low-power modes (standby power); and support the development of policies which seek to minimise excessive energy consumption by products in standby power modes.**

In undertaking this mission, the Annex delivered:

- ▶ 44 publications, including 32 reports, 9 policy briefs
- ▶ 11 editions of the *Load Down* newsletter
- ▶ Workshops/Conference
- ▶ Collaborations with APP, APEC, SELINA, IEA and SEAD

The initial focus of the Annex included standby power in stand-alone products, data collection, and the development of horizontal policy and evaluation tools. The Annex's later work on network standby has brought attention to the need to expand energy efficiency efforts beyond simple standby into the new, more complex areas of networks.

### **Major achievements 2009-2014**

- ▶ The international alignment of data collection methodologies, providing policy makers with baseline information and a tool which can assist in the design, monitoring and evaluation of different policy approaches
- ▶ Development of a Horizontal Policy Framework, establishing a framework for national policy makers to initiate effective horizontal standby power policy
- ▶ An international Evaluation Framework, providing an evaluation that will not only be more transparent but enable different policy approaches to be compared and contrasted
- ▶ Research establishing network standby as an issue in need of investigation. This work was followed up with workshops, collaborations and publications aimed at increasing the awareness and understanding of network standby globally
- ▶ The joint publication with the IEA of *More Data, Less Energy*, the culmination of research and workshops conducted by the Annex and the IEA. It comprehensively covers all aspects of network standby and contains a call to action, recommending Governments around the globe take steps to reduce the energy waste associated with network-enabled products
- ▶ Policy Framework for Network Standby, providing a policy framework and action plan for establishing policies to achieve low energy networks

The 4E Standby Annex website will remain in place to provide an on-going reference for policy makers, industry and other parties, giving access to all the reports and research undertaken by the Annex, while new work will be recorded on the EDNA website.

A copy of the full report on the achievements of the 4E Standby Power Annex can be found on the 4E website at: [http://standby.iea-4e.org/files/otherfiles/0000/0108/SPA\\_Major\\_Achievements\\_of\\_the\\_Annex\\_final.pdf](http://standby.iea-4e.org/files/otherfiles/0000/0108/SPA_Major_Achievements_of_the_Annex_final.pdf)

**A complete record of Standby Power Annex activities in 2014 are included in Attachment 6.**

# 4E Outreach and Communication

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“ Between 2008 and the end of 2014, there have been a total of 580 publications, workshops, presentations and other outreach activities undertaken by 4E. ”

4E's outreach is guided by a Communication Strategy that covers the period 2014-2019 which sets the framework and priorities for communication activities over these five years. Implementation is shared between the ExCo and individual Annexes and is reviewed at each ExCo meeting, where the Strategy may be amended as required to address changing circumstances, funding and opportunities.

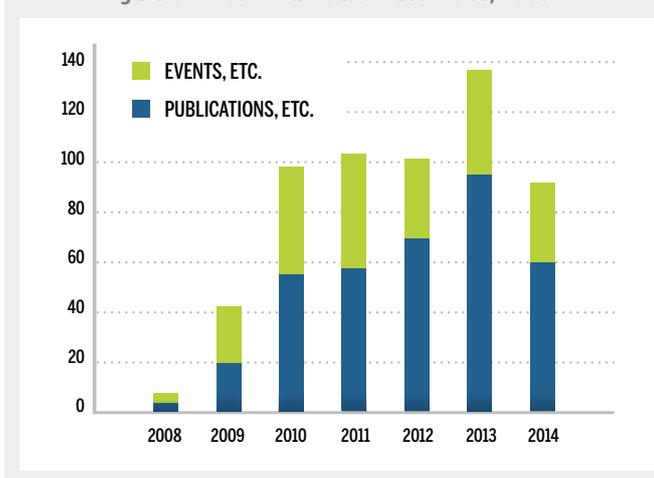
**The key communication tasks include:**

- ▶ Maintain the 4E website as the hub of information on 4E activities
- ▶ Produce Annual Reports, newsletters and other general materials on 4E activities
- ▶ Expand the 4E network
- ▶ Disseminate product specific policy Annex and ExCo messages
- ▶ Disseminate the output of ExCo Projects (e.g. G20, international standardisation, etc)

Individual activities under the Communication Strategy are funded through the ExCo and Annex budgets.

Between 2008 and the end of 2014, there have been a total of 580 publications, workshops, presentations and other outreach activities undertaken by 4E. As shown in Figure 5, the increase in the scope of research activities has led to a steady growth in the number of 4E outputs up to 2013. The slight reduction in 2014 reflects a greater emphasis on major in-depth technical publications that presented the results of research undertaken over many years. As Annexes progress with their new work plans, it is expected that outputs will once again ramp up.

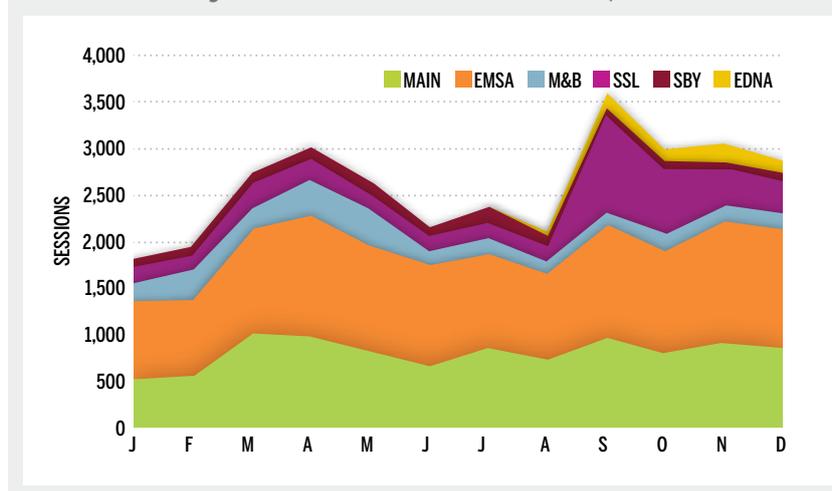
**Figure 5: 4E communication activities, 2008-14**



## Websites

4E operates a group of linked websites that are the hub of 4E's communication activities, providing access to all 4E publications and notice of forthcoming events. As shown in Figure 6, use of these 4E websites continues to rise and in 2014 received 31,500 visits, an increase of 22% compared to the previous 12 months.

**Figure 6: Number of visits to 4E websites, 2014**

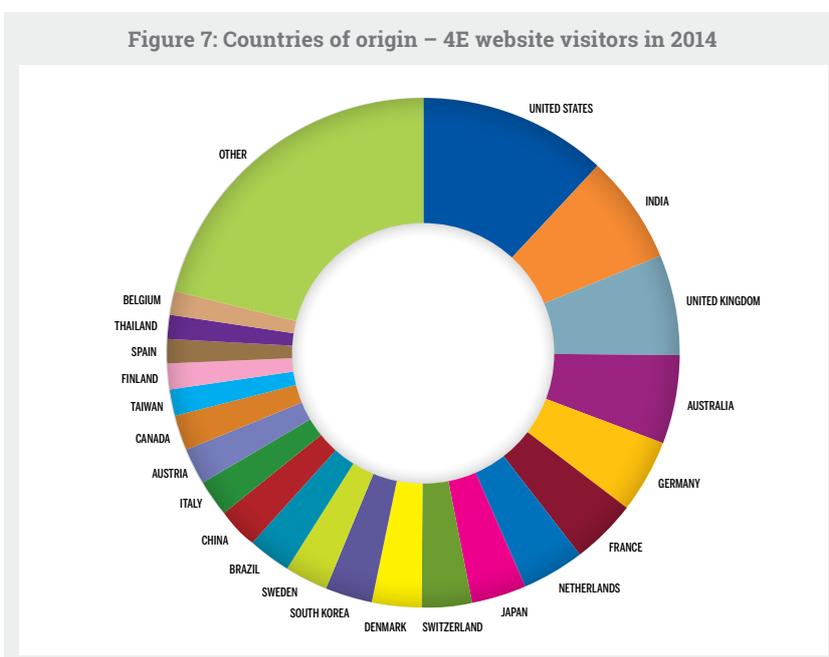


The location of 4E's site traffic is extremely geographically diverse, with visitors from around 150 separate countries (see Figure 7). Significant use is made of the information contained on the websites by non-member countries, particularly India, Germany, Brazil and China, with 50% of website traffic coming from countries that are not current members of 4E.

Having been redesigned in 2013, work on the main 4E site in 2014 has been restricted to ensuring that information remains up-to-date. However, the restructuring of 4E has resulted one new site for the Electronic Devices and Networks Annex, as well as the following alterations to Annex sites:

- ▶ **Mapping & Benchmarking:** Although there is no longer a separate Annex for Mapping & benchmarking, the site is maintained to provide access to previous publications and webinars, and the results of new M&B projects are posted on this site
- ▶ **Standby Power:** The legacy of the Standby Power Annex is still available on the previous Annex site, but new work in this field has been transferred to the stewardship of EDNA, and therefore all information relating to new work is available on the EDNA site

Figure 7: Countries of origin – 4E website visitors in 2014



## Publications

4E has released a total of 60 new publications during 2014, as shown in Table 2. These range from newsletters and promotional materials to highly technical reports, reflecting the diverse audience that is targeted by 4E.

The majority of newsletters and Policy Briefs have been published in several languages, including Japanese, Korean, German, French, Russian and Chinese.

Figure 8: New 4E publications, 2014

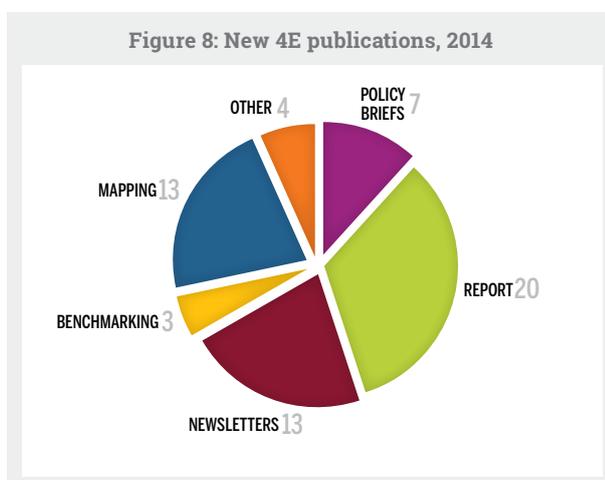


Table 2: All 4E Publications, 2014

DATE	SOURCE	TITLE
January	SSL Annex SSL Annex	Solid State Lighting Interlaboratory Comparison: Individual European laboratory results
		Solid State Lighting Interlaboratory Comparison: European Interim Report
	4E	Policy Brief: Refrigerators and Freezers (updated) MB11
February	SSL Annex	SSL Product Quality and Performance Tiers: Non-Directional Lamps
		SSL Product Quality and Performance Tiers: Directional Lamps
		SSL Product Quality and Performance Tiers: Downlights
		SSL Product Quality and Performance Tiers: Fluorescent Tubes (Non-Retrofit)
		SSL Product Quality and Performance Tiers: Fluorescent Tubes (Retrofit)
		Communiqué of the IEA 4E SSL Annex and the Commission Internationale de l'Eclairage
April	Standby Power	<i>Load Down</i> newsletter issue 14
	M&B Annex	Mapping for distribution transformers for Australia, Canada, Korea and the USA
		International Benchmarking Report: Distribution Transformers
	Standby Power	Beyond Network Standby: A Policy Framework and Action Plan for Low Energy Networks
	M&B Annex	International Benchmarking Report: Simple and Complex Set Top Boxes
		International Benchmarking Report: Dishwashers
	4E	<i>Bright Spark</i> newsletter edition 5
		Policy Brief: Dishwashers MB12
		Policy Brief: Distribution transformers MB14
		Policy Brief: Set Top Boxes MB13
	EMSA	14th EMSA newsletter
	Standby Power	Evaluation report on activities and outcomes of 4E Standby Power Annex
July	4E	More Data, Less Energy: Making Network Standby More Efficient in Billions of Connected Devices (Joint IEA and 4E publication)
		Standards & Labelling programs throughout the world
August	4E	4E 2013 Annual Report
		Policy Brief: Refrigerators and Freezers (updated) MB11 (German)
September	M&B Annex	Outcomes of the IEA 4E Mapping and Benchmarking policy discussions (update 1)
	4E	Updated 'Frequently Asked Questions' info sheet
		<i>Bright Spark</i> newsletter edition 6
	SSL Annex	Report on 2013 Solid State Lighting Interlaboratory Comparison
	4E	Policy Brief: More Data less Energy SP8
		Policy Brief: Lowering the Energy Waste of Extra Functionality SP7
	SSL Annex	Report on Life Cycle Assessment of Solid State Lighting
		Report on Potential Health Issues of Solid State Lighting
M&B Annex	Product definition for domestic lighting (updated)	
October	EMSA	Policy Guidelines for Electric Motor Systems: Pt 2 Toolkit for Policy makers
	SSL Annex	Press Release: SSL Annex Congratulates Winners of the Nobel Prize in Physics
November	EDNA	Explanatory video of network connected devices
		Communiqué from Smart Appliances workshop held in Korea in November 2014
		Report on testing of Smart Lamps
	M&B Annex	Mapping for domestic lighting for Australia, Austria, Canada, Denmark, EU, Japan, Korea, UK and the USA

## Workshops & Conferences

4E organized, or made presentations at 18 workshops, conferences or specialist meetings of policy makers and scientific experts held in Europe, North America and the Asia-Pacific during 2014 (see Table 3).

**Table 3: 4E workshops and presentations, 2014**

DATE	SOURCE	TITLE	
January	4E	Conference on Products Policy - International Trends in Ecodesign and Energy Labelling, Brussels	
April	SSL Annex 4E	IEA 4E SSL Annex 8th Experts Meeting, Delft	
		CIE 2014 "Lighting Quality and Energy Efficiency", a Special Session on Quality Assurance and Standardisation for LED lighting – Regional and International Efforts, Kuala Lumpur	
		Special SSL Annex seminar at the Frankfurt Light+Build Fair, Frankfurt	
May	EMSA	Efficient Electric Motors Workshop, Canberra	
		Motor Systems Tool training, Utrecht	
		11th EMSA Experts meeting, Utrecht	
June	SSL Annex	14th International Symposium on the Science and Technology of Lighting (LS14), Lake Como	
	4E	Contribution of Electrical Appliances to the Efficient Buildings of 2020, Austria	
	EMSA	EMSA presentations at ECEEE Industrial Summer Study, Arnhem	
October	EMSA	EMSA Workshops at Motor Summit 2014, Zurich	
		EMSA presentations at Motor Summit 2014, Zurich	
		12th EMSA Experts meeting, Zurich	
	SSL Annex	IEA 4E SSL Annex 9th Experts meeting, Oregon	
November	EMSA	EMSA presentation at IEA energy efficiency in SMEs workshop, Paris	
	EDNA	Smart appliances workshop, JeJu Island	
	SSL	EDNA	'Smart Lights' workshop, JeJu Island
	SSL Annex		Global Efficient Lighting Forum, United Nations Environment Programme, en.lighten initiative, Beijing

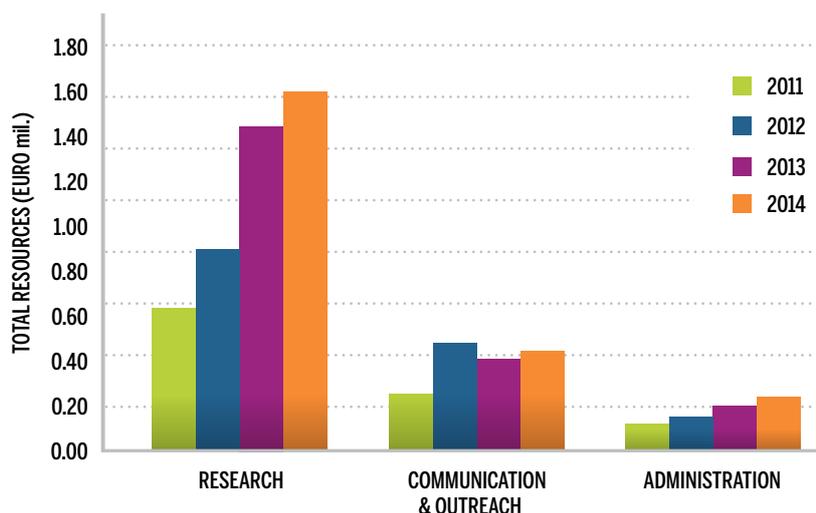
# 4E Group Finances

“Over 70% of resources were directed towards research, while expenditure on communication and outreach activities accounted for 20%.”

4E activities are made possible through a combination of annual fees and in-kind work by national experts committed by member countries. In 2014, the total cost of 4E activities is estimated to be €2.3 million, of which cash contributions funded approximately 40%.

The expansion of activities in 2014, including the launch of EDNA, has meant that 4E total resources have risen by 12% compared to 2013, although this remains in-line with previous trends (see Figure 9).

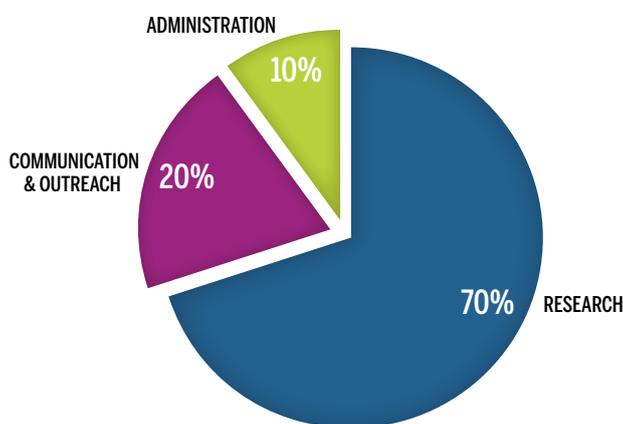
**Figure 9: Comparison of 4E resource allocation, 2011-2013**



As shown in Figure 10, over 70% of resources were directed towards research, while expenditure on communication and outreach activities accounted for 20%. The share of resources devoted to administration, including financial management, coordination and member liaison, remains around 10%, which is similar to previous years.

For 2014, the ExCo decided to reduce the annual 4E membership fee for contracting parties by €5,000 to reflect the reduced costs of undertaking mapping and benchmarking activities and in acknowledgement of tight national budgets. While Annex membership fees can vary from year to year depending upon the agreed work program, the 2014 Annex membership fees have remained in-line with previous years. The 2014 annual fees are shown in Table 4.

**Figure 10: Allocation of 4E resources in 2014**



**Table 4: 4E membership fees, 2014**

EXECUTIVE COMMITTEE	€20,000
ELECTRIC MOTOR SYSTEMS ANNEX (EMSA)	€15,000
SOLID STATE LIGHTING ANNEX (SSL)	€22,000
ELECTRONIC DEVICES AND NETWORKS ANNEX (EDNA)	€15,000

# Attachments

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“As we look forward into 2015 and beyond, we intend to continue to build on these past achievements, developing the energy efficiency expertise amongst governments and looking for further ways to enhance policies through international collaboration.”

*Mike Walker, 4E Chair*



# Attachments

## Attachment 1: 4E Executive Committee Delegates

CONTRACTING PARTY	NOMINATION	NAME & DETAILS	EMAIL/TELEPHONE
AUSTRALIA	Primary	<b>Mr David Walker (from 8 May 2014) (Vice-Chair)</b> Appliance and Industrial Energy Efficiency Branch Department of Industry	david.walker@industry.gov.au Tel: +61 2 6243 7183
	Alternate	<b>Mr Shane Holt (from 8 May 2014)</b> Appliance and Industrial Energy Efficiency Branch Department of Industry	shane.holt@industry.gov.au Tel: +61 2 6243 7706
AUSTRIA	Primary	<b>Mr Michael Hübner</b> Federal Ministry for Transport, Innovation and Technology	michael.huebner@bmvit.gv.at Tel: +43 1 711 62 652922
	Alternate	<b>Dr Adriana Diaz</b> Ecodesign Company GmbH Engineering and Management Consultancy	diaz@ecodesign-company.com Tel: +43 1 40 35 611-31
CANADA	Primary	<b>Ms Debbie Scharf (from 22 May 2014)</b> Director, Equipment Division Office of Energy Efficiency, Natural Resources Canada	Debbie.Scharf@ NRCan-RNCan.gc.ca Tel: +1 613 996 4359
	Alternate	<b>Ms Katherine Delves (Vice-Chair)</b> Chief, Standards Development Equipment Division Office of Energy Efficiency, Natural Resources Canada	Katherine.Delves@ NRCan-RNCan.gc.ca Tel: +1 613 947 1207
	Alternate	<b>Mr Jamie Hulan (from 22 May 2014)</b> Team Leader, Standards Development, Office of Energy Efficiency, Natural Resources Canada	Jamie.Hulan@ NRCan-RNCan.gc.ca Tel: +1 613 992 9641
DENMARK	Primary	<b>Mr Peter Nielsen</b> Senior Policy Advisor Construction and Energy Efficiency Danish Energy Agency	pen@ens.dk Tel: +45 3392 6735
	Alternate	<b>Mr Bjarke Hansen</b> Construction and Energy Efficiency Danish Energy Agency	bjh@ens.dk Tel: +45 3392 7588
FRANCE	Primary	<b>Mr Nicolas Dore (from 11 Sept 2014)</b> Deputy Head, Building Department ADEME	nicolas.dore@ademe.fr Tel: +33 4 93 95 72 62
	Alternate	<b>Ms Thérèse Kreitz</b> Responsible for International Affairs ADEME	therese.kreitz@ademe.fr Tel: +33 4 93 95 79 84
JAPAN	Primary	<b>Mr Masahide Shima (from 1 Apr 2014)</b> Director General for International Projects Group, Energy Conservation Technology Department, NEDO	shimamsh@nedo.go.jp Tel: +81 44 520 5281
	Alternate	<b>Mr Ichiro Tsubota (from 1 Apr 2014)</b> Energy Conservation Technology Department NEDO	tsubotaicr@nedo.go.jp Tel: +81 44 520 5281
	Alternate	<b>Ms Hinako Kaji</b> Energy Conservation Technology Department, NEDO	kajihnk@nedo.go.jp Tel: +81 44 520 5281

## Attachment 1: 4E Executive Committee Delegates continued

CONTRACTING PARTY	NOMINATION	NAME & DETAILS	EMAIL/TELEPHONE
REPUBLIC OF KOREA	Primary	<b>Mr Euy-Kyung Kim</b> Director, Energy Efficiency Standardization and Certification Center, KEMCO	lekek@kemco.or.kr Tel: +82 31 260 4240
	Alternate	<b>Mr Je En Kim</b> Ministry of Knowledge Economy	jekim@mke.go.kr
NETHERLANDS	Primary	<b>Mr Hans-Paul Siderius (Vice-Chair)</b> Senior Expert Netherlands Enterprise Agency	hans-paul.siderius@rvo.nl Tel: +31 88 602 2609
	Alternate	<b>Ms Elske van Efferink</b> Ministry of Economic Affairs	e.vanefferink@minez.nl
SWEDEN	Primary	<b>Dr Peter Bennich</b> Policy Officer, Energy Efficiency Department The Swedish Energy Agency, Testlab	peter.bennich@ energimyndigheten.se Tel: +46 73 625 6782
	Alternate	<b>Mr Carlos Lopes</b> Coordinator for Ecodesign and Energy Labelling The Swedish Energy Agency, Testlab	carlos.lopes@ energimyndigheten.se Tel: +46 70 550 3430
SWITZERLAND	Primary	<b>Dr Michael Moser</b> Scientific Advisor, Energy Research Section Swiss Federal Office of Energy (SFOE)	michael.moser@bfe.admin.ch Tel: +41 58 465 36 23
	Alternate	<b>Mr Roland Brüniger</b> R. Brüniger AG Consultant, Swiss Federal Office of Energy (SFOE)	roland.brueeniger@ r-brueniger-ag.ch Tel: +41 44 760 0066
	Alternate	<b>Mr Markus Bleuer (from 14 Aug 2014)</b> Appliances and Competitive Tenders Section Swiss Federal Office of Energy (SFOE)	markus.bleuer@bfe.admin.ch Tel: +41 58 462 69 24
UNITED KINGDOM	Primary	<b>Ms Samantha Kennedy (from 4 Sept 2014)</b> Deputy Director Department for Energy and Climate Change	samantha.kennedy@ decc.gsi.gov.uk Tel: +44 300 068 8377
	Alternate	<b>Mr Mike Walker (Chair)</b> Energy Efficiency Deployment Office Department for Energy and Climate Change	mike.walker@decc.gsi.gov.uk Tel: +44 300 068 8152
UNITED STATES OF AMERICA	Primary	<b>Mr Jeremy Dommu (from 3 Sept 2014)</b> Electronic Products Manager Building Technologies Office US Department of Energy	jeremy.dommu@ee.doe.gov Tel: +1 202 586 9870
	Alternate	<b>Mr Mark Friedrichs</b> Senior Policy Analyst Building Technologies Office US Department of Energy	mark.friedrichs@ee.doe.gov Tel: +1 202 586 0124

## Attachment 2: Electric Motor Systems (EMSA) 2014 Record of Activities & Delegates

### RECORD OF ACTIVITIES

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2014</b>			
EMSA Newsletter*	April 2014	Subscribers & public	
Policy Guidelines for Electric Motor Systems: Part 2 Toolkit for Policy Makers	October 2014	Public	
EMSA Newsletter*	December 2014	subscribers & public	
<b>OUTREACH IN 2014</b>			
Efficient Electric Motors Workshop	May 2014	Industry, government, test lab	Australia
Motor Systems Tool training	May 2014	Industry	Utrecht
EMSA presentations at ECEEE Industrial Summer Study	June 2014	Industry, research, consultants	Arnhem
EMSA Workshops at Motor Summit 2014	October 2014	Industry, academia, government, standards developers	Zurich
EMSA presentations at Motor Summit 2014	October 2014	Industry, academia, government, standards developers	Zurich
EMSA presentation at IEA energy efficiency in SMEs workshop	November 2014	Government, industry, academia	Paris
<b>MANAGEMENT/EXPERTS MEETINGS HELD IN 2014</b>			
11th EMSA meeting	May 2014	Delegates of Annex members	Utrecht
12th EMSA meeting	October 2014	Delegates of Annex members	Zurich
<b>OUTREACH PLANNED FOR 2015</b>			
EMSA participation at ACEEE Summer Study on Energy Efficiency in Industry	August 2015	Government, utilities, consultants	Buffalo, NY
EMSA presentations at EEMODS'15	September 2015	Government, industry, academia	Helsinki
<b>MANAGEMENT/EXPERTS MEETINGS PLANNED FOR 2015</b>			
13th EMSA meeting	May 2015	Delegates of Annex members	Copenhagen
14th EMSA meeting	September 2015	Delegates of Annex members	Helsinki

\* The EMSA Newsletter has around 4 000 subscribers from over 70 different countries and is published in English, Chinese, Japanese, Russian and German.

## Attachment 2: Electric Motor Systems (EMSA) 2014 Record of Activities & Delegates

### COUNTRY DELEGATES

COUNTRY	NAME	ORGANISATION	EMAIL	PHONE
AUSTRALIA	Maria Godinez	Department of Industry and Science	maria.godinez@industry.gov.au	+ 61 2 6243 7199
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DENMARK	Sandie B. Nielsen	Austrian Energy Agency	sbn@teknologisk.dk	+45 72 20 10 00
NETHERLANDS	Maarten van Werkhoven	Danish Technological Institute	mvanwerkhoven@tpabv.nl	+31 23 536 80 90
SWITZERLAND	Conrad U. Brunner Rita Werle	TPA advisors Impact Energy Inc.	cub@impact-energy.ch rita.werle@impact-energy.ch	+41 44 226 30 70 +1 202 586 98 70
UNITED STATES OF AMERICA	John Cymbalsky Chad Gallinat	Department of Energy	john.cymbalsky@ee.doe.gov chad.gallinat@hq.doe.gov	+1 202 586 94 66 +1 202 586 94 66
<b>LEAD COUNTRY</b>		<b>SWITZERLAND</b>		
<b>ANNEX CHAIR</b>		<p><b>Roland Brüniger</b> Swiss Federal Office of Energie c/o R. Brüniger AG, Engineering &amp; Consulting Zwillikerstr. 8, CH-8913 Ottenbach Switzerland Email: roland.brueiniger@r-brueniger-ag.ch Tel: +41 44 760 00 66</p>		
<b>OPERATING AGENT From 1 November 2014</b>		<p><b>Maarten van Werkhoven</b> TPA advisors Generaal Winkelmanlaan 31 2111 WV Aerdenhout Netherlands Email: mvanwerkhoven@tpabv.nl Tel: +31 23 536 80 90</p>		
<b>To 31 October 2014:</b>		<p><b>Conrad U. Brunner</b> A+B International Gessnerallee 38a, CH-8001 Zurich Switzerland Email: cub@cub.ch Tel: +41 44 226 30 70</p>		
<b>EMSA COORDINATOR</b>		<p><b>Rita Werle</b> Impact Energy Inc. Gessnerallee 38a, CH-8001 Zurich Switzerland Email: rita.werle@impact-energy.ch Tel: +41 44 226 30 70</p>		

### Attachment 3: Solid State Lighting (SSL) Annex Record of Activities & Delegates

#### RECORD OF ACTIVITIES

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2014</b>			
Individual participant Result Reports sent to each participating lab in group Europe (produced by Nucleus lab VSL, the Netherlands)	January 2014	Report confidential – each PRR sent to the lab covered by the PRR	
Regional Interim Report – Europe (produced by Nucleus lab VSL, the Netherlands)	January 2014	Restricted to participating labs in group Europe	
Product Quality and Performance Tiers: Non-Directional Lamps	February 2014	Public	
Product Quality and Performance Tiers: Directional Lamps	February 2014	Public	
Product Quality and Performance Tiers: Downlights	February 2014	Public	
Product Quality and Performance Tiers: Fluorescent Tubes (Non-Retrofit)	February 2014	Public	
Product Quality and Performance Tiers: Fluorescent Tubes (Retrofit)	February 2014	Public	
Communiqué of the IEA 4E SSL Annex and the Commission Internationale de l'Éclairage	12 February 2014	Public	
2013 Interlaboratory Comparison, Final Report. SSL Annex Tasks 2 and 3.	10 September 2014	Public	
Life Cycle Assessment of SSL	17 September 2014	Public	
Potential Health Issues of SSL	24 September 2014	Public	
Press Release re: Nobel Prize, SSL Annex Congratulates Winners of the Nobel Prize in Physics	10 October 2014	Public	
<b>OUTREACH IN 2014</b>			
Special SSL Annex seminar at the Frankfurt Light+Build fair	4 April 2014	Lighting sector; energy-efficiency experts	Frankfurt
CIE 2014 "Lighting Quality and Energy Efficiency", a Special Session on Quality Assurance and Standardisation for LED lighting – Regional and International Efforts	April 23 - 26, 2014	Lighting standardisation experts and scientists	Kuala Lumpur / Malaysia
14th International Symposium on the Science and Technology of Lighting (LS14)	22-27 June 2014	Lighting researchers; Lighting scientists	Como Lake (Italy)
Special SSL/EDNA internal workshop at the November ExCo, intended for ExCo members not familiar with SSL issues	5 November 2014	ExCo members, IEA 4E experts (Other than SSL Annex experts)	Korea
Global Efficient Lighting Forum, United Nations Environment Programme, en.lighten initiative	11-12 November 2014	Policy makers; energy-efficiency financiers, lighting sector	Beijing, China

### Attachment 3: Solid State Lighting (SSL) Annex Record of Activities & Delegates continued

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>MANAGEMENT COMMITTEE MEETINGS HELD IN 2014</b>			
Management Committee	20 January 2014	Delegates of Annex members	Teleconference
Management Committee	24 February 2014	Delegates of Annex members	Teleconference
Management Committee	25 March 2014	Delegates of Annex members	Teleconference
Management Committee	27 May 2014	Delegates of Annex members	Teleconference
Management Committee	29 September 2014	Delegates of Annex members	Teleconference
Management Committee Conference Call / Joint SSL Annex/EDNA Meeting	3,5 November 2014	Delegates of Annex members	Teleconference (linked to ExCo in Korea)
Management Committee Conference Call	15 December 2014	Delegates of Annex members	Teleconference
<b>EXPERT MEETINGS HELD IN 2014</b>			
IEA 4E SSL Annex 8th Experts Meeting	7-9 April 2014	SSL Annex experts	Delft, Netherlands
IEA 4E SSL Annex 9th Experts Meeting	15-17 October 2014	SSL Annex experts	Portland, Oregon
<b>OUTREACH PLANNED FOR 2015</b>			
Symposium on Advanced Lighting Science and Technology	22-23 January 2015	Researchers, Academics, policy-makers, energy- efficiency experts	Shanghai, China
Participation by SSL Experts in the Australian SPARC conference, held back-to-back with 10th Experts Meeting	27-29 May 2015	Australian and international lighting experts and industry	Sydney, Australia
SSL Annex briefing for IEC TC-34	27 May 2015	Industry Technical Experts on IEC TC-34 Committee	Sydney, Australia
ECEEE 2015 Summer Study	1-6 June 2015	Policy makers; energy-efficiency financers, lighting sector	Toulon/Hyères, France
<b>EXPERT MEETINGS PLANNED FOR 2015</b>			
IEA 4E SSL Annex 10th Experts Meeting	25-27 May 2015	SSL Annex experts	Sydney, Australia
IEA 4E SSL Annex 11th Experts Meeting	October 2015	SSL Annex experts	(Europe, TBD)

### Attachment 3: Solid State Lighting (SSL) Annex Record of Activities & Delegates continued

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## Attachment 4: Electronic Devices and Networks Annex (EDNA) 2014 Record of Activities & Delegates

### RECORD OF ACTIVITIES

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2014</b>			
Indicative testing of smart lamps	November 2014	Public	
Communiqué from smart appliances workshop held in Korea in November 2014	November 2014	Public	
Explanatory video of network connected devices	November 2014	Public	
<b>OUTREACH IN 2014</b>			
Smart appliances workshop	November 2014	Government and appliance industry experts	Jeju, Korea
<b>MANAGEMENT/EXPERTS MEETINGS HELD IN 2014</b>			
1st Annex management meeting	May 2014	Delegates of Annex members	Utrecht, Netherlands
2nd Annex management meeting	November 2014	Delegates of Annex members	Jeju, Korea
Smart lights collaborative workshop with SSL Annex	November 2014	4E national delegates, members of EDN A& SSL Annexes	Jeju, Korea
<b>OUTREACH PLANNED FOR 2015</b>			
Smart products workshop (tentative)	October 2015	Government and industry experts	Japan
<b>MANAGEMENT/EXPERTS MEETINGS PLANNED FOR 2015</b>			
3rd Annex management meeting	May 2015	Delegates of Annex members	Copenhagen, Denmark

## Attachment 4: Electronic Devices and Networks Annex (EDNA) 2014 Record of Activities & Delegates continued

### COUNTRY DELEGATES

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## Attachment 5: Mapping & Benchmarking 2014 Record of Activities & Delegates

### RECORD OF ACTIVITIES

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2014</b>			
Policy brief for domestic refrigerated appliance (updated)	January 2014	Public	
Mapping for distribution transformers for Australia, Canada, Korea and the USA	April 2014	Public	
Simple and complex set-top boxes benchmarking report	April 2014	Public	
Dishwasher benchmarking report	April 2014	Public	
Policy brief for distribution transformers	April 2014	Public	
Policy brief for set-top boxes	April 2014	Public	
Policy brief for dishwashers	April 2014	Public	
Distribution transformers benchmarking report	May 2014	Public	
Policy brief for domestic refrigerated appliance (updated): German	August 2014	Public	
Product definition for domestic lighting (updated)	September 2014	Public	
Mapping for domestic lighting for Australia, Austria, Canada, Denmark, EU, Japan, Korea, UK and the USA	November 2014	Public (some restrictions)	
<b>MANAGEMENT/EXPERTS MEETINGS HELD IN 2014</b>			
19th Annex management meeting	February 2014	Delegates of Annex members	Teleconference
20th Annex management meeting	May 2014	Delegates of Annex members	Utrecht, Netherlands

## Attachment 5: Standby Power Annex 2014 Record of Activities & Delegates

### RECORD OF ACTIVITIES

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2014</b>			
Beyond Network Standby: A Policy Framework and Action Plan for Low Energy Networks – Energy Ef-	March 2014	Public	
Load Down Edition 14	April 2014	Public	
Summary of activities and outcomes of 4E Standby Power Annex	April 2014	Public	
More Data, Less Energy: Making Network Standby	July 2014	Public	
Policy Brief: More Data, Less Energy: Addressing	September 2014	Public	
Policy Brief: Lowering the Energy Waste of Extra	September 2014	Public	
<b>MANAGEMENT/EXPERTS MEETINGS HELD IN 2014</b>			
8th Annex management meeting	May 2014	Delegates of Annex members	Utrecht, Netherlands

# About the IEA

“Through a flexible and effective framework, the IA mechanism enables IEA member and non-member countries, businesses, industries, international organisations and non-government organisations to share research and best practice.”

## About the International Energy Agency (IEA)

The International Energy Agency (IEA) is an autonomous organisation which works to ensure reliable, affordable and clean energy for its 29 member countries and beyond.

Founded in response to the 1973/4 oil crisis, the IEA's initial role was to help countries co-ordinate a collective response to major disruptions in oil supply through the release of emergency oil stocks to the markets.

While this continues to be a key aspect of its work, the IEA has evolved and expanded. It is at the heart of global dialogue on energy, providing authoritative statistics, analysis and recommendations.

Today, the IEA's four main areas of focus are:

- ▶ **Energy security:** Promoting diversity, efficiency and flexibility within all energy sectors
- ▶ **Economic development:** Ensuring the stable supply of energy to IEA member countries and promoting free markets to foster economic growth and eliminate energy poverty
- ▶ **Environmental awareness:** Enhancing international knowledge of options for tackling climate change; and
- ▶ **Engagement worldwide:** Working closely with non-member countries, especially major producers and consumers, to find solutions to shared energy and environmental concerns

## Energy Technology Initiatives

The IEA energy technology network is an ever-expanding, co-operative group of more than 6 000 experts that support and encourage global technology collaboration.



At the core of the IEA energy technology network are a number of independent, multilateral energy technology initiatives – the Implementing Agreements (IAs). The IAs encourage technology-related activities that support energy security, economic growth, environmental protection and engagement worldwide. Through a flexible and effective framework, the IA mechanism enables IEA member and non-member countries, businesses, industries, international organisations and non-government organisations to share research and best practice on existing and breakthrough technologies, to fill existing research gaps, to build pilot plants and to carry out deployment or demonstration programmes.

These energy technology initiatives (formally known as Implementing Agreements or 'IAs') function within a framework created by the IEA - the *International Framework for International Energy Technology Collaboration*. At the head of this network is the IEA Committee on Energy Research and Technology (CERT).

The 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

Each Implementing Agreement has a unique scope and range of activities. There are currently 40 IAs working in the areas of efficient end-use, fossil fuels, fusion and renewables. To date, more than 1 400 topics have been addressed.

Further information is available at <http://www.iea.org/techinitiatives>