



# IEA Technology Collaboration Programme on Energy Efficient End-Use Equipment (4E)



// 2015 ANNUAL REPORT

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## Chair's Statement

**It is with great pleasure that I present the work of the IEA-4E Technology Collaboration Programme during 2015. It has been another year where 4E's work has continued to expand and gain more influence – and a year where COP21 gave energy efficiency a higher than ever profile.**

One significant milestone for 4E this year has been the formation of the 'Connected Devices Alliance (CDA)'; providing a forum for industry and governments to develop new joint initiatives on networked devices and recommend policy approaches to G20 governments. This valuable work will continue in 2016 and I expect it to gain considerable support under the G20 presidency of China.

While the CDA represents 4E's most formalised link with the private sector, it is not alone as an example of engagement with relevant sectors of industry in many different regions around the world. The International Motor Summit this year took place in China and attracted a significant local audience. The 4E ExCo was organised to coincide with the major Japanese CEATEC exhibition and our Smart Devices workshop included several representatives of Japanese industry associations.

Through the International Energy Agency (IEA) 4E also gains access to influential audiences, and in 2015 this included contributions to major publications such as the '*Energy Efficiency Market Report*' and '*Tracking Clean Energy Progress*.' We therefore welcome the IEA's strategy of seeking closer relations with 4E and other Technology Collaborations and look forward to exploring future joint opportunities.

4E's influence was further enhanced through the publication of '*Achievements of Energy Efficiency Standards and Labelling Programmes*' which has been extensively used by others to demonstrate the many benefits of appliance energy efficiency. 4E will consider publishing regular updates in the future.

As ever, the core of 4E's activities remain the detailed analysis and standards development work conducted by the Annexes on Motors, Solid State Lighting and Connected Devices. The output from all the 4E Annexes continues to grow, as does the range of their communication activities: evidenced by the release of three short videos in 2015 that effectively set the context for 4E's work.

Looking forward, as countries seek to fulfil their commitments made at COP21, the demand for expertise in implementing energy efficiency has got to grow. In this context, 4E has enormous potential to use the experience and commitment of its 12 member countries to turn these ambitions into reality.



Mike Walker  
Chairman 4E  
February 2016



# Key 4E achievements in 2015



# The Technology Collaboration Programme on Energy Efficient End-Use Equipment (4E)



A decarbonisation pathway with a strong focus on energy efficiency **offers much greater flexibility in decarbonising the energy supply** as well as **significant societal cost savings up to 2030.**

*Fraunhofer Institute for Systems and Innovation Research ISI, 2015.  
"How Energy Efficiency Cuts Costs for a 2-Degree Future"*



## The importance of energy efficiency

Leading up to COP21, Energy Ministers recommended five key steps to reduce GHG emissions from the energy sector, while maintaining the economic and sustainable development prospects of all regions. The first and foremost of these was: “Increasing energy efficiency in the industry, buildings and transport sectors”

This reflects the growing understanding of the unique, but previously undervalued, role that energy efficiency plays in delivering sustainable energy services.

Analysis by the International Energy Agency<sup>1</sup> (IEA) has shown that the quantity of energy avoided by on-going energy efficiency activities in 11 IEA countries<sup>2</sup> during 2010 was larger than actual demand met by any other single supply-side resource, including oil, gas, coal and electricity (see Figure 1) – making energy efficiency the largest or “first” fuel. This has been the result of cumulative investment in energy efficiency since 1974.

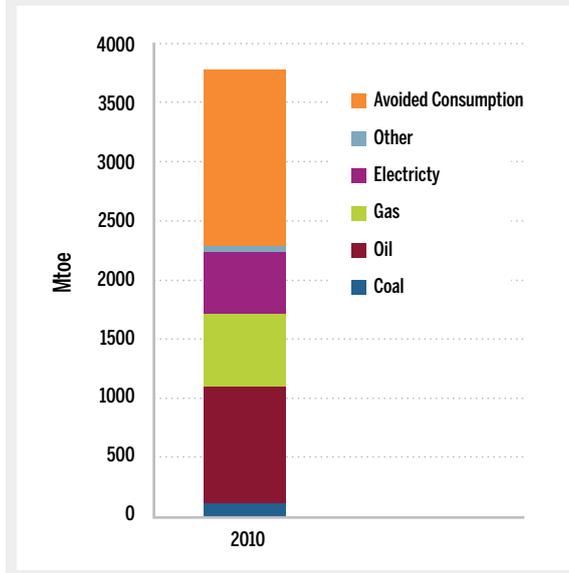
More recently, we have seen that energy efficiency has led to a decoupling of economic and energy growth<sup>3</sup>. In 2013, OECD energy consumption was equivalent to 2000 levels, while GDP expanded by 26% (see Figure 2).

Although often hidden, the impacts of energy efficiency investment since 1990 across all IEA countries are very concrete. In 2014 alone these benefits included<sup>4</sup>:

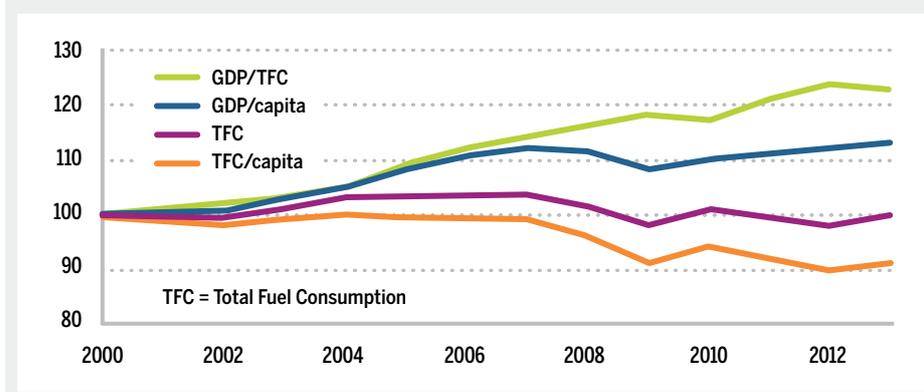
- ▶ 22 EJ in avoided fuel consumption (=32 EJ primary energy).
- ▶ USD 550 billion in saved costs to consumers.
- ▶ 190 Mtoe replaced energy imports by locally supplied efficiency.
- ▶ 820 MtCO<sub>2</sub> in greenhouse gas emissions reductions.

Energy efficiency programmes for appliance and equipment have contributed to these achievements, as outlined below.

**Figure 1: Contribution of energy efficiency compared to other energy resources consumed in 2010 in 11 IEA countries**



**Figure 2: Indices in OECD countries of end-use energy productivity (GDP/TFC), GDP per capita (2005 USD PPP), TFC per capita and TFC, 2000-13**



1 IEA, Energy Efficiency Market Report, 2013

2 Australia, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Sweden, the United Kingdom and the United States

3 IEA, Energy Efficiency Market Report, 2015

4 IEA, Energy Efficiency Market Report, 2015

## Impact of policies on appliances and equipment<sup>5</sup>

National energy efficiency standards and labelling (EESL) programmes have been in existence since the 1970s and now operate in more than 80 countries around the world, covering more than 50 different types of appliances and equipment in the commercial, industrial and residential sectors. While the design and coverage of EESL programmes vary according to national circumstances, they provide the cornerstone of most national energy efficiency and climate change mitigation strategies.

Based on evidence from a wide cross-section of countries with EESL programmes, the energy efficiency of major appliances in these countries have increased at more than three times the underlying rate of technology improvement.

One-off improvements of more than 30% have been observed when new EESL programmes have been first introduced to a market where few energy efficiency schemes had existed previously.

These substantial efficiency improvements for individual appliances and equipment have translated to national energy savings and reductions in CO<sub>2</sub> emissions. The most mature national EESL programmes covering a broad range of products are estimated to save between 10% and 25% of national or relevant sectoral energy consumption.

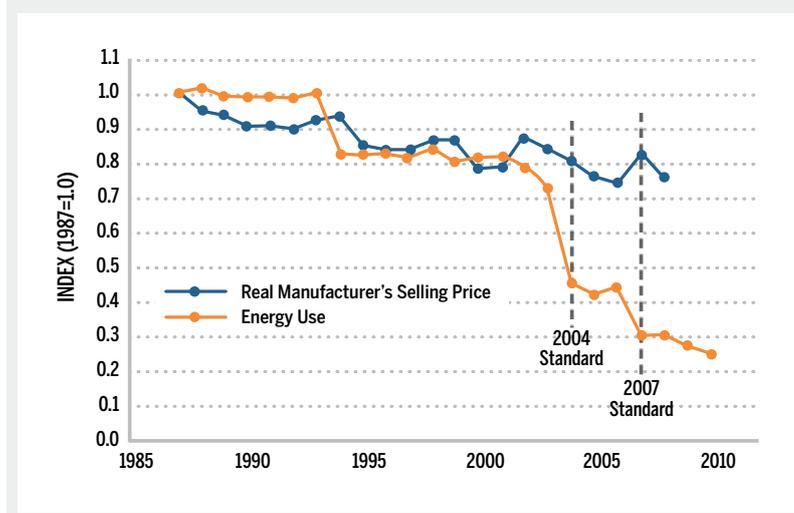
In all of the EESL programmes reviewed, the national benefits outweighed the additional costs by a ratio of at least 3 to 1, i.e. EESL programmes deliver energy and CO<sub>2</sub> reductions while also reducing total costs. This compares extremely favourably with the cost of other clean energy options and supports the conclusion from the International Energy Agency that end-use efficiency measures offer the least cost pathway to energy and CO<sub>2</sub> emission reductions.

Appliances and equipment covered by EESL programmes have not only dramatically improved in efficiency over the past 20 years, but are also cheaper to purchase. While EESL programmes may have caused small changes in prices close to the implementation of new energy efficiency measures, they appear to have had little long-term impact on appliance price trends.

This is mainly due to the ability of appliance manufacturers to find new and cheaper ways to improve efficiency and to volume-related cost reductions. EESL programmes have been very successful in fostering innovation, expanding existing markets and opening up new market opportunities. This has led to enhanced employment outcomes, with 800,000 direct jobs created by EESL programmes in the EU and 340,000 jobs in the US.

A range of other benefits, including improvements in air-quality and the reduction of public expenditure on health, have been found to flow from EESL programmes, and provide additional justification for investment in these types of programmes. In jurisdictions where these types of policy objectives are of high national importance, the contribution made by such co-benefits can be sufficiently large in their own right to justify EESL programmes.

Figure 3: Price and energy trends for clothes washers in the USA



<sup>5</sup> See 'Achievements of EESL Programmes', 4E, 2015

In some very specific cases, the reduced energy costs resulting from EESL programmes may be used by householders and companies to purchase additional energy services (the rebound effect). In developed countries, this is likely to be limited to the use of heating, cooling, water heating and to a lesser extent lighting, mainly in low-income households. In many cases, these increased comfort levels may be an intended outcome of EESL programmes, for example when targeted at low-income households. Even when a rebound effect has been found to occur, EESL programmes have still demonstrated a net energy saving, and overall cost-effectiveness.

There is now overwhelming evidence that these programs have made a very significant contribution to the reduction of energy use and CO<sub>2</sub> emissions, and at a very much lower cost than could have been achieved by other clean energy supply options. All EESL programmes have the potential to expand in scope and ambition to deliver more energy and CO<sub>2</sub> savings, as well as beneficial additional policy outcomes.

## The role played by 4E

Through international collaboration, 4E enables national energy efficiency programmes to be consistently evaluated and improved so that they are ambitious, internationally aligned and effective. The 4E platform provides the means to achieve this at least cost to member governments through the pooling of resources.

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 to cover more appliances and equipment.
- ▶ Improving implementation and compliance through learning from the experience of others.

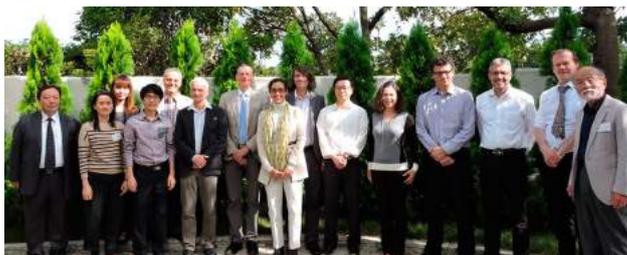
4E's international comparisons of appliance performance levels are used by policy makers to set national thresholds which enable their citizens to access the best performing products, now and into the future.

The 4E platform encourages countries to quickly expand their programme coverage by leveraging off on the work of other members. Similarly, the comparison of different implementation and administrative approaches enables countries to better understand and copy from strengths of other programmes.

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 programmes.



4E ExCo delegates, Copenhagen, Denmark, May 2015



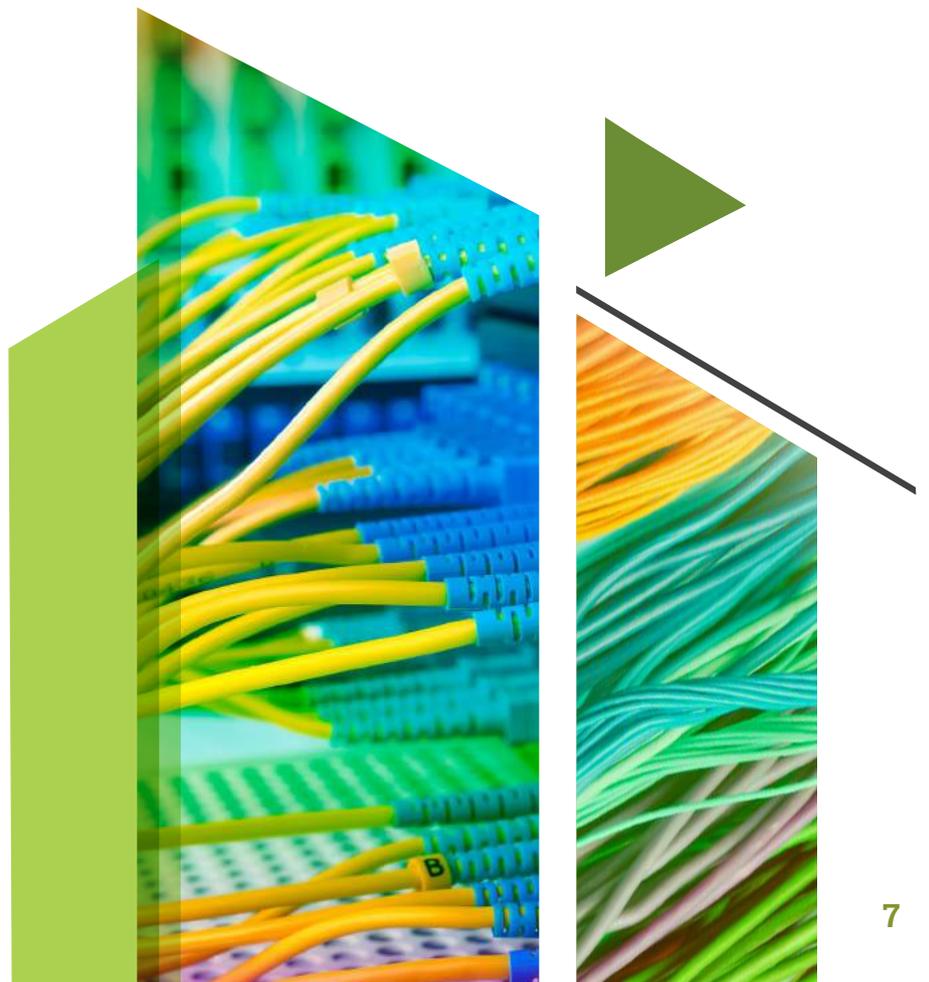
4E ExCo delegates, Makuhari, Japan, October 2015

# Overview of 4E Structure and Activities



As the world's need for energy continues to grow, **bright people with new ideas** will flock to the places that support efforts to **make cheap, reliable, clean energy**. Any country that wants to **lead the world in innovation and energy independence** should be doubling down on this research.

*Bill Gates, 'Energy Innovation Why We Need It and How to Get It', November, 2015*



## Executive Committee

4E is managed by an Executive Committee (ExCo) comprising one voting delegate from each participating country. Like all IEA Technology Collaboration Programs, 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.

During 2015, 4E office-holders included:

- ▶ **Chair of 4E:** Mike Walker (UK).
- ▶ **Vice-chairs of 4E:** Katherine Delves (Canada) and Hans-Paul Siderius (Netherlands). David Walker (Australia) served as vice-chair until he was replaced in October 2015 by Michelle Croker (Australia).

The 15th and 16th meetings of the Executive Committee (ExCo) were held in Copenhagen, Denmark (20 & 22 May 2015) and Makuhari, Japan, Korea (8-9 October 2015). Attendance at these meetings is shown in Table 1. A list of the members of the ExCo during 2015 is shown in Attachment 1.

### Future ExCo meetings will be as follows:

- ▶ **17th ExCo:** 25-26 May 2016, London, UK.
- ▶ **18th ExCo:** 17-18 November 2016, Ottawa, Canada.

Table 1: Attendance at 2015 ExCo Meetings

CONTRACTING PARTY	15TH EXCO - DENMARK	16TH EXCO - JAPAN
Australia	✓	A
Austria	✓	✓
Canada	✓	A
Denmark	✓	✓
France	✓	A
Japan	✓	✓
Korea	✓	✓
Netherlands	✓	✓
Sweden	✓	✓
Switzerland	✓	✓
United Kingdom	✓	✓
United States of America	✓	✓
Observers	IEA, IPEEC, SEAD	SEAD

Legend: A – absent/apologies

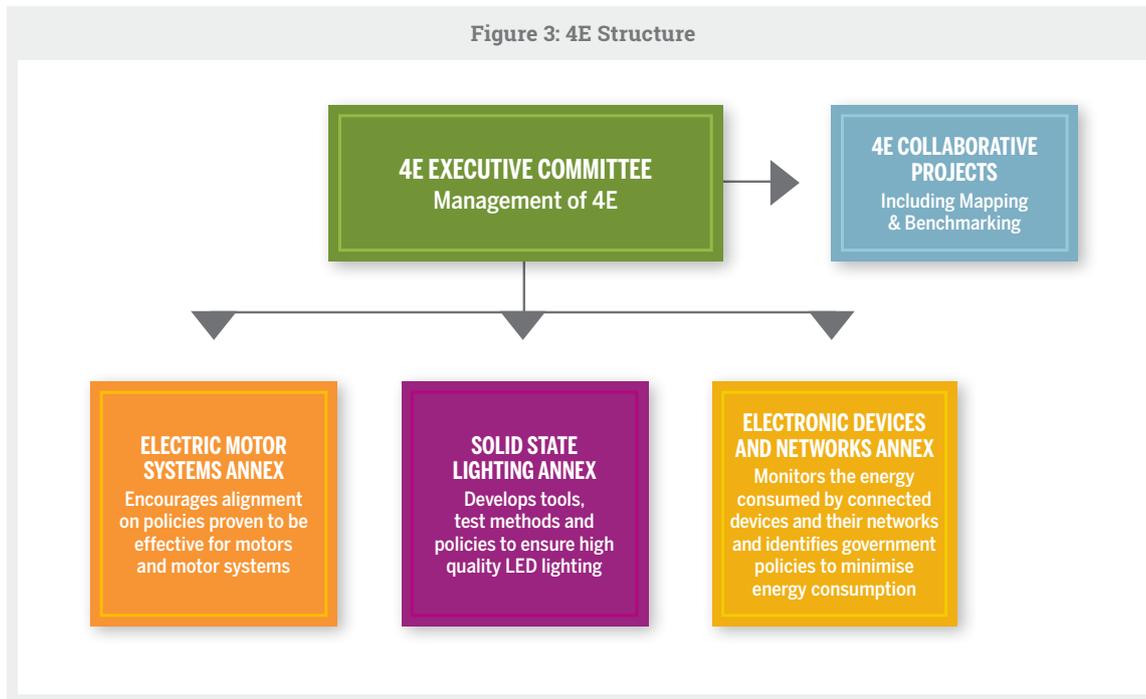
## Annexes

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.

The 4E structure is shown in Figure 3, 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 USA in 2015.

Reports on all Annexes are included later in this report.



## 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 2015 included:

### **Mapping & Benchmarking**

International benchmarking enables governments to compare the performance of appliances and equipment in different regions, and better understand the potential for improvement.

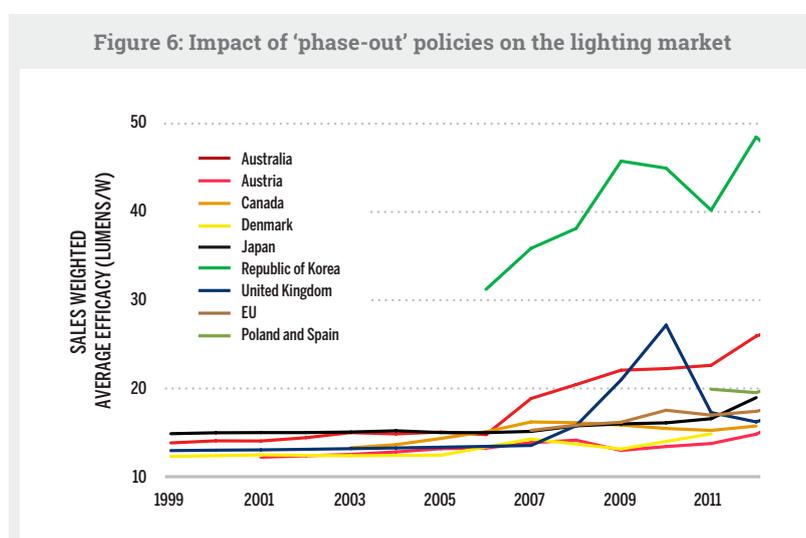
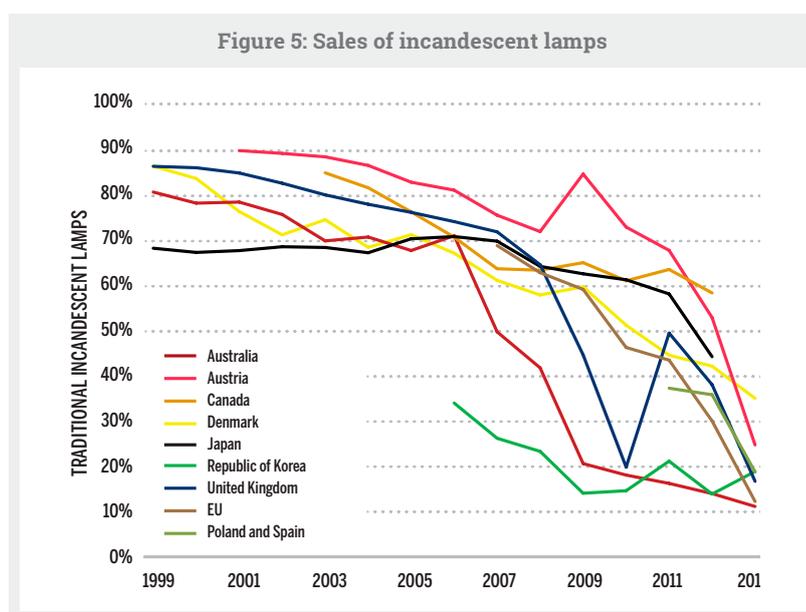
Each of the 4E countries participates in the projects, supplying energy/performance related data on products, which is then analysed to allow the relative benchmarking of the energy performance of those products over time. The results are reviewed alongside information on government policies and cultural variables in each of the markets. Any lessons learned from the best performing countries are highlighted to help improve product performance elsewhere.

Benchmarking is a key activity of 4E and since 2014 has been undertaken on a project basis under the guidance of the ExCo.

Key Mapping and Benchmarking outputs in 2015 have included:

- ▶ Two major international benchmarking reports:
  - Impact of 'phase-out' regulations on lighting markets (updated) (see Figure 4 and Figure 5).
  - Packaged liquid chillers.
- ▶ The '*Energy Efficiency Roadmap for Electric Motors and Motor Systems*'.
- ▶ Dissemination:
  - One new policy brief: the Impact of 'phase-out' regulations on lighting markets.
  - The translation of nine policy briefs published into Korean and German.
  - A webinar on the impact of 'phase-out' regulations on lighting markets hosted by the Clean Energy Solutions Centre.

During 2015, work has also commenced on a major study of water heaters, covering a range of equipment types and fuels. The results are expected to be published in 2016.



## G20 Energy Efficiency Action Plan: Networked Devices

In 2015, the United Kingdom and IEA managed an on-going dialogue between representatives from governments and the global industry under the G20 Networked Devices Task Group<sup>6</sup> in order to identify and agree projects and policy options that will improve the energy efficiency of networked devices into the future. This work was co-ordinated through 4E, and funded by 4E with contributions from SEAD.

Global attention to the energy implications of networked devices is a priority since the number of new and existing networked devices is expanding rapidly, such that eventually almost all appliances and equipment will be networked. Therefore small changes in energy performance due to network connectivity<sup>7</sup> could have very large impacts. Already the current annual standby power consumption of networked devices is estimated at over 600 TWh, which is greater than Canada's total annual electricity consumption for 2011.

The impetus provided by the G20 Networked Devices Task Group in 2015 has led to the establishment of the 'Connected Devices Alliance' (CDA), a network of 300 government and industry participants across the many key sectors that influence the energy consumption of networked devices and their networks<sup>8</sup>.

To date, the CDA has tracked developments in technology, research and voluntary industry initiatives. A series of dialogues between industry and government representatives has led to a greater understanding of the issues, including the need to take globally co-ordinated action to:



- ▶ Realise a world where devices and networks optimise energy management while delivering increased energy productivity across all sectors.
- ▶ Maximise network-enabled energy savings and minimise the energy consumption from all networks and networked devices.

It is clear that the rapid evolution of technologies in both developed and developing countries will require longer-term attention, and that there are benefits for governments and industry from undertaking co-ordinated global action.

In 2015, the CDA has developed the following key projects:

- ▶ A set of global Definitions that will underpin the development of policies and initiatives in this field.
- ▶ Design Principles to provide guidance on the key features of energy efficient networked devices, networks and communication protocols for designers, manufacturers and authors.
- ▶ Policy Principles to encourage a common global framework for the development of government policies and measures.
- ▶ A Centre of Excellence, "Connected Devices By Design", to provide governments and industry with an accessible source of information on best practices and energy savings opportunities in networked devices and networks.
- ▶ The development of Awards to recognise significant achievements in technical protocols, industry initiatives and policies through the SEAD 'Global Efficiency Medal'.

Key outputs of the CDA in 2015 included:

- ▶ Two government/industry workshops hosted by the IEA in Paris.
- ▶ The Technical Report underpinning recommendations to G20 Energy Ministers.
- ▶ A set of recommendations for G20 Energy Ministers.
- ▶ A public report summarising the activities of the CDA.

<sup>6</sup> One of six initiatives under the 'G20 Energy Efficiency Action Plan: Voluntary Collaboration on Energy Efficiency', launched after the G20 Summit in November 2014

<sup>7</sup> See short explanatory video: <http://edna.iea-4e.org/about>

<sup>8</sup> The CDA is described in this short video: <https://www.youtube.com/watch?v=H9grCy3bltc>

## Achievements of Energy efficiency standards and labelling programmes

The aim of this 4E project was to catalogue the achievements to date of one of the largest and longest running types of energy efficiency programmes.

National energy efficiency standards and labelling (EESL) programmes have been in existence since the 1970s and have grown since this date, so that now EESL programmes operate in more than 80 countries around the world. However, the scale and scope of their achievements are not always well-understood.

This record was drawn from over 100 publications that detail the evidence of the impacts of EESL programmes in 20 countries, covering more than 25 different product types.

The recorded impacts from EESL programmes summarised in this report included:

- ▶ Increases in the energy efficiency of appliances, equipment and lighting technologies, over and above autonomous rates of change.
- ▶ Reductions in national energy consumption and associated greenhouse gas emissions savings.
- ▶ Changes in the consumer purchase price of appliances and equipment.
- ▶ Delivery of co-benefits, such as employment, health and energy security.
- ▶ The effects on manufacturing innovation and market transformation.
- ▶ The additional energy services purchased by beneficiaries of energy efficiency fuel bill reductions – the ‘rebound’ effect.

The most mature national EESL programmes covering a broad range of products are estimated to save between **10% and 25%** of national or relevant sectoral energy consumption.

In all programmes reviewed, the national benefits outweighed the additional costs by a ratio of at least **3 to 1**.  
*Note: Impacts take account of likely rebound effect.*

## Co-ordination with other organisations

As one of 40 Technology Collaboration Programmes<sup>9</sup> established under 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 2015 these included ‘Tracking Clean Energy Progress’ and the ‘Energy Efficiency Market Report’.

4E also provides regular progress reports to IEA member governments and liaises with other Technology Collaboration Programmes. 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 European Commission DG ENER, the World Bank, the World Economic Forum, Sustainable Energy for All, international standards organisations 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.

<sup>9</sup> Previously known as Implementing Agreements

## Annex Achievements in 2015



With these elements in place, markets now have the clear signal they need to **unleash the full force of human ingenuity** and scale up investments that will generate low-emissions, resilient growth.

**What was once unthinkable has now become unstoppable.**

*Ban Ki-moon, Secretary-General of the United Nations,  
at closing of COP21 Paris, 12 December 2015*



## 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 attached components, 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 shows the way to realise these.
- ▶ Advise policy makers in the design and implementation of coherent motor systems policy instruments.
- ▶ Develop sufficiently robust international standards to support policy implementation.
- ▶ Enhance international exchange on policy experience, challenges and lessons learnt.
- ▶ Build capacity amongst engineers working for motor and machine manufacturers and industrial motor systems users.

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.
- ▶ 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. This will not only save energy but also reduce the risks and costs of production through optimising processes, reducing waste, lowering emissions and improving equipment performance; creating jobs and improving the competitiveness of national economies.
- ▶ EMSA makes the professional community aware of necessary changes and the implications of improving energy efficiency in the industrial sector and built environment.



### Major achievements in 2015

- ▶ EMSA members stimulated the global debate of policy makers, standards developers, experts and industry concerning the efficiency of electric motor systems and market transformation options at EEMODS (the international conference on Energy Efficiency in Motor Driven Systems, September 2015) in Helsinki, Finland; through ten presentations, a plenary closing speech and an interview for a Finnish magazine.



EEMODS, Helsinki, Finland, September 2015

- ▶ EMSA representatives worked 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 supported the production of testing evidence through independent laboratories to inform the development process for international technical standards.
- ▶ EMSA representatives advised the European Commission on the revision of motor regulation (EC) No 640/2009 (Lot 30) and fan regulation (EU) No 327/2011. Denmark supported the revision of regulation (EC) No 640/2009 (Lot 30) by presenting independent testing evidence on the losses of variable frequency drives.
- ▶ EMSA and the Danish Technological Institute (DTI) produced and delivered a series of five webinars on efficient electric motor systems.
- ▶ EMSA enhanced its reputation as an important inter-governmental collaboration and source of expertise on policies for efficient motor systems.

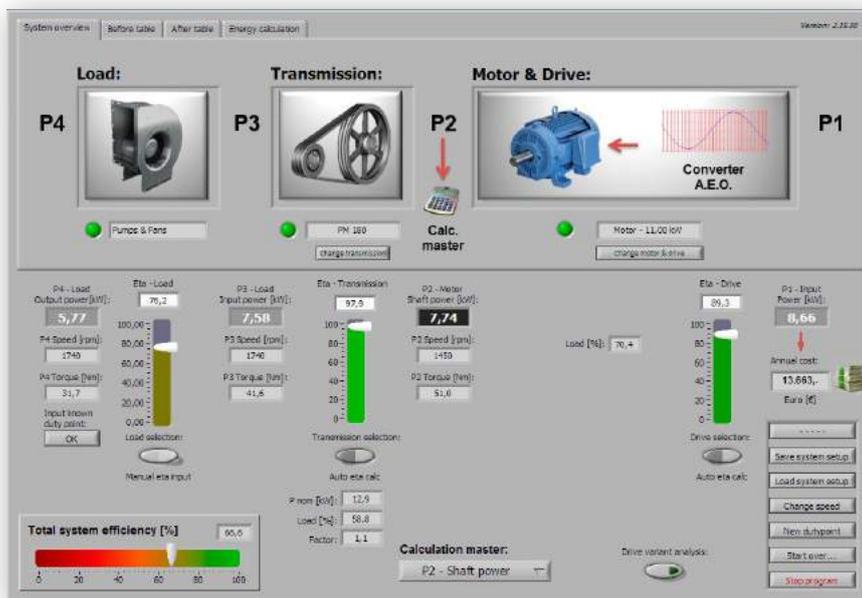
### Annex Participants

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

### Annex Observers

Japan, Sweden

A complete record of EMSA Annex activities in 2015 and participants are included in Attachment 2.



## Solid State Lighting (SSL) Annex

The goal of the SSL Annex is to develop simple tools to help governments and consumers all over the world quickly and confidently identify which solid-state lighting (SSL) products have the necessary quality and performance levels to effectively reduce lighting energy demand. To address these and other challenges with SSL technologies, the 4E SSL Annex provides an international platform to share and support policy development at a national and regional level.

### Major achievements in 2015

In 2015, the Annex continued to advance its work on a set of agreed tasks, with specific milestones and achievements including:

- ▶ Issued quality and performance specifications covering 7 lighting products for public review.
- ▶ Conducted extensive testing of 'smart lamps' and presented findings.
- ▶ Provided technical support to the Clean Energy Ministerial's SEAD Global Efficiency Awards.
- ▶ Published the 2013 Interlaboratory Comparison (2013 IC) in the IEA's Energy Technology Initiatives.
- ▶ Published and presented a peer-reviewed paper on the SSL Annex's 2013 IC at the eceee 2013 Summer Study.
- ▶ Participated in COP21 side event organised by Ademe (FR), providing overview of SSL Annex's work.
- ▶ Produced a summary of 'lessons learned bringing LEDs to market' in support of the launch of the Global Lighting Challenge at COP21.
- ▶ Briefed the Japanese lighting industry in Tokyo.
- ▶ Presented smart lamps test findings to Light Europe (London).
- ▶ Published peer-reviewed article in Journal on Solid State Lighting.
- ▶ Launched an animated info-video and new website design.



### Annex Participants

Australia, Denmark, France, Republic of Korea, Sweden, United Kingdom, United States of America.

The Netherlands withdrew in 2015.

China participates in the expert group only.

### Annex Observers

Japan, India

**A complete record of the SSL Annex activities in 2015 and participants are included in Attachment 3.**

## Electronic Devices and Networks Annex (EDNA)

The **Electronic Devices and Networks Annex (EDNA)** was established by 4E in 2014 to assist member governments to maximise the energy efficiency opportunities offered by connected devices. These opportunities include reducing network standby energy (the energy used by connected devices to maintain network connectivity) and also taking advantage of the controllability of connected devices, which can lead to more intelligent operation and significant energy savings (“intelligent efficiency”).

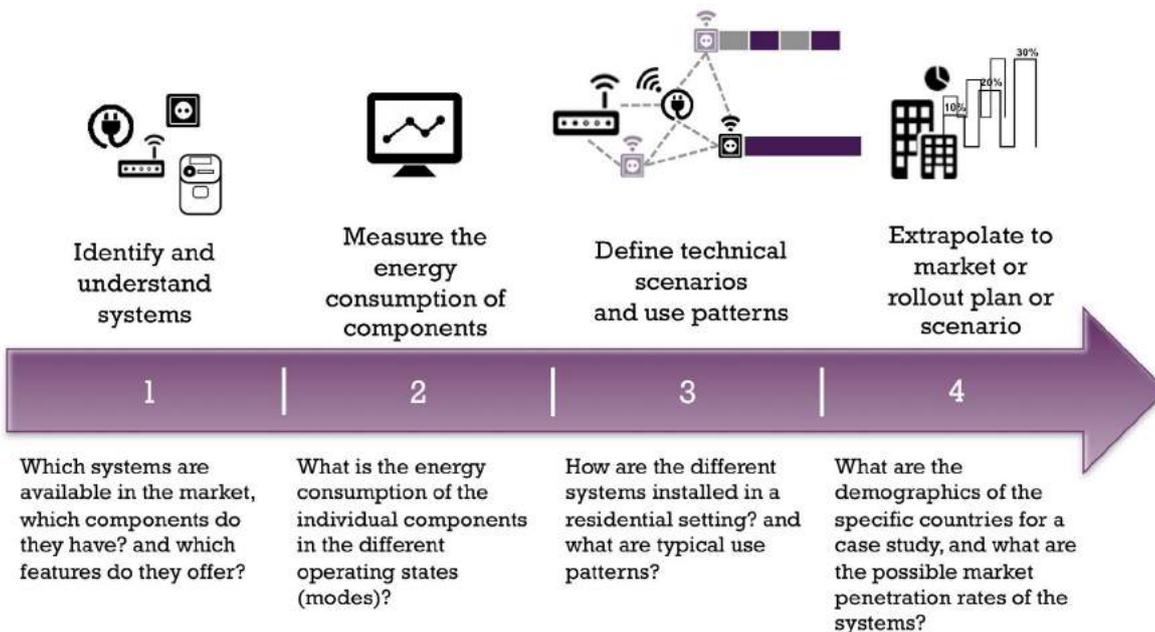
In 2015, its second year of operation, EDNA continued in its role as an inter-governmental platform for policy development in the area of connected devices. This work follows on from the 4E Standby Power Annex that concluded its work in May 2014 - as network standby power became the next frontier of policy focus.

Aside from the 4E-sponsored Connected Devices Alliance (an industry-government collaboration), EDNA remains the sole international agency for government policy co-operation on connected devices. It does however complement the work of, and facilitate collaboration between, other national organisations, for example ACEEE in the area of intelligent efficiency, and sovereign government agencies which develop network standby policies and regulations such as in the European Union, Korea and the United States.

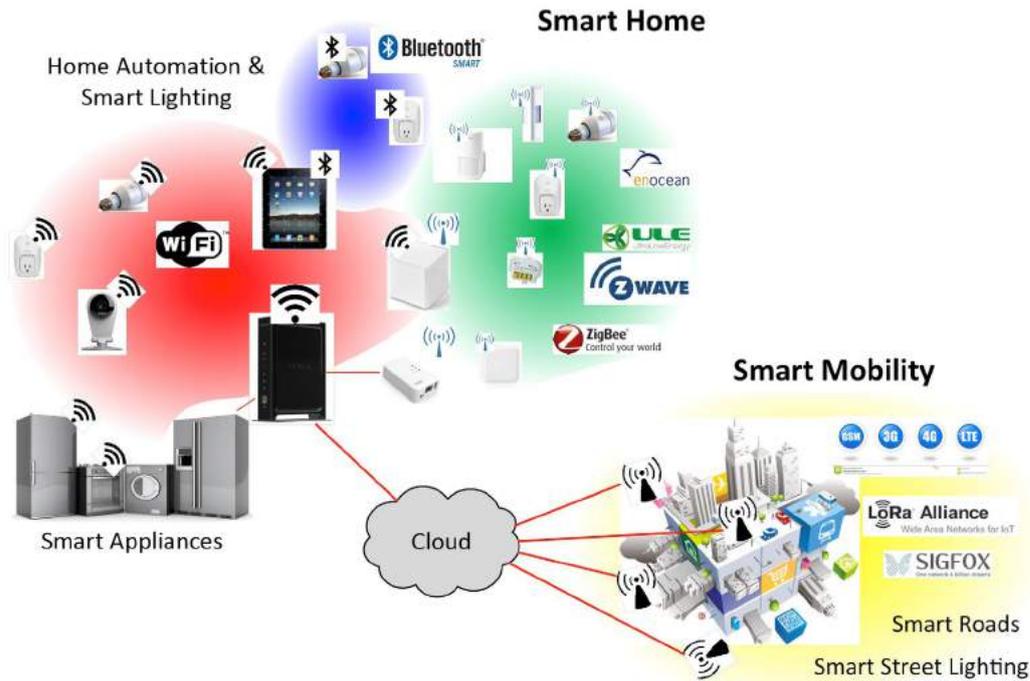
### Major achievements in 2015

In 2015 the EDNA annex achieved the following:

- ▶ Ongoing execution of Task I - Smart Metering and Energy Monitoring Systems, including delivery of the technical overview and several country case studies.



- ▶ Ongoing execution of Task II - Energy Efficiency of the Internet of Things, including delivery of materials covering market and technology trends and energy impacts.



- ▶ Launch of Task III: Intelligent Efficiency, which aims to study the policy opportunities for encouraging intelligent efficiency.
- ▶ Launch of Connected Devices by Design, a web-based library of information on best practices for networked devices and networks.
- ▶ Launch of a project to study the policy opportunities for encouraging devices to become “energy aware”.



- ▶ Launch of “Basket-of-Products” testing, to undertake basic, large-scale testing of the standby power consumption of connected devices.
- ▶ Delivery of a joint industry-government workshop on “smart devices” in Tokyo in October 2015, at which more than 40 officials from Japanese industry, Japanese Government agencies and EDNA met to discuss the energy saving opportunities and challenges presented by network-connected electronic devices.

## Annex Participants

Australia, Austria, Canada, Denmark, France, Japan (joined in 2015), Republic of Korea (joined in 2015), Netherlands, Sweden, Switzerland, UK, USA

## Annex Observers

SEAD

**A complete record of EDNA activities in 2015 and participants are included in Attachment 4.**

## 4E Outreach and Communication



Between 2008 and the end of 2015, there have been a **total of 660 publications, workshops, presentations** and other outreach activities undertaken by 4E.



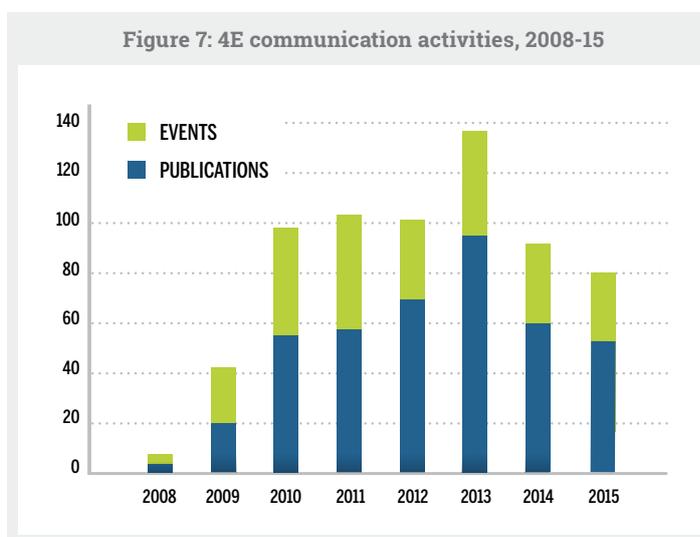
4E's outreach is guided by the 4E Communication Strategy that covers the period 2014-2019 and provides the framework and priorities for communication activities over these five years. These are reviewed at each ExCo meeting, where the Strategy may be amended as required to address changing circumstances,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

Implementation responsibility and funding is shared between the ExCo and individual Annexes.

The key communication tasks include:

- ▶ Maintain the 4E website as the hub of information on 4E activities.
- ▶ Produce Annual Reports, newsletters and other freely available materials on 4E activities.
- ▶ Expand the 4E network to include private and public organisations with an interest in 4E activities.
- ▶ Disseminate specific policy-related Annex and ExCo messages.
- ▶ Disseminate the output of ExCo Projects (e.g. G20, Mapping & Benchmarking, etc).

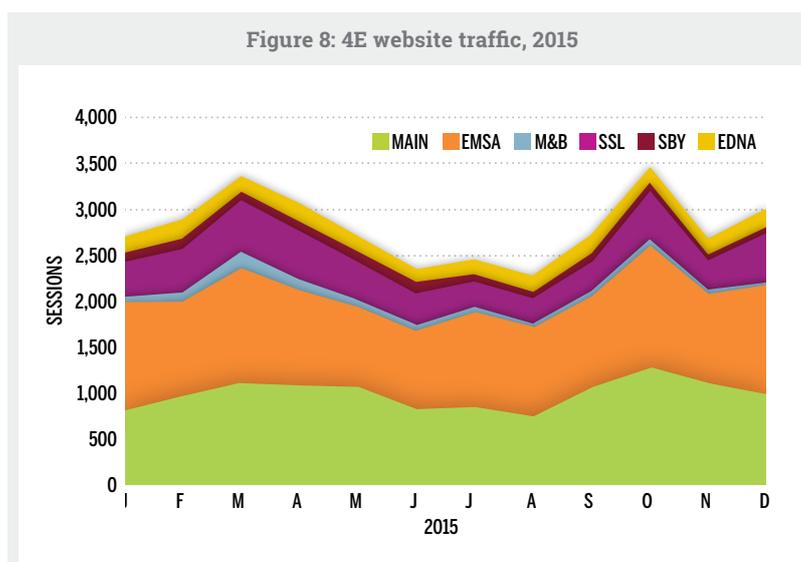
Between 2008 and the end of 2015, there have been a total of 660 publications, workshops, presentations and other outreach activities undertaken by 4E. As shown in Figure 7, the increase in the scope of research activities has led to a steady growth in the number of 4E outputs up to 2013. The slight 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.



## 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 8, use of these 4E websites continues to rise and in 2015 received nearly 35,000 visits, an increase of 10% compared to the previous 12 months.

The location of 4E's site traffic is extremely geographically diverse, with visitors from around 150 separate countries. 50% of website traffic comes from countries that are not current members of 4E, with high usage by organisations based in India, Germany, Brazil and China.



In 2015, a new linked site was developed for the Centre of Excellence under the Connected Devices Alliance (CDA) to increase the understanding of the potential energy saving opportunities and best practices in networked devices and the networks within which they operate.

The Centre of Excellence – called ‘Connected Devices By Design’ (<http://cda.iea-4e.org>) is primarily aimed at governments, industry, academics and NGOs and aims to provide open, independent and authoritative information to support energy efficiency policy development.



## Videos

4E has produced three short animated videos to highlight the work of EDNA, the SSL Annex and the Connected Devices Alliance. The EDNA video is now available in English, Japanese, Danish and Swedish.



## Publications

4E has released a total of 52 new publications during 2015, as shown in Table 2. These range from newsletters and promotional materials to highly technical reports, reflecting the diverse audience for 4E work.

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

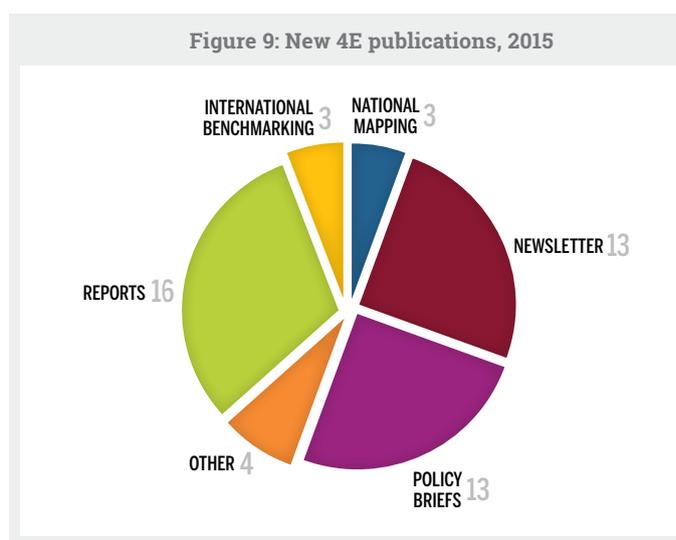


Table 2: All 4E Publications, 2015

DATE	SOURCE	TITLE
Jan-15	4E	G20 Energy Efficiency Action Plan: Networked Devices workshop discussion document
		G20 Networked Devices Workshop Communiqué
		Mapping for Electric Motors: Australia, Canada and USA
Feb-15	4E	International Benchmarking Report: Electric Motors (unpublished)
	EDNA	Report: Smart lamps testing
	4E	G20 Networked Devices Report to ESWG Meeting 1
Mar-15	4E	Policy Brief: Updated impact of 'phase-out' regulations on lighting markets
		International Benchmarking Report: Updated impact of 'phase-out' regulations on lighting markets
Apr-15	4E	Scoping study on electric motor extended products - unpublished
		<i>Bright Spark</i> newsletter Ed. 8
		4E 2014 Annual Report
		Press Release: Smart Wireless Lighting Also Needs To Be Energy Smart
May-15	4E	G20 Networked Devices Workshop Communiqué
		G20 Networked Devices Report to ESWG Meeting 2
Jun-15	4E	G20 Networked Devices Workshop: Summary of Working Group Proposals from Day 1
		G20 Networked Devices Workshop: Progress Report
Jul-15	EMSA	Newsletter 1/2015
Aug-15	4E	G20 Networked Devices Technical Report to ESWG
		International Benchmarking Report: Packaged Liquid Chillers
Sep-15	4E	<i>Bright Spark</i> newsletter Ed. 9
	EMSA	Policy Briefs, EMSA 0, EMSA 1 EMSA 2
	4E	Report: Achievements of EESL Programmes
	EDNA	Measurement Guideline for network standby power testing
Oct-15	4E	Policy Brief: Updated Domestic Refrigerated Appliances MB11 (Korean)
	4E	Policy Brief: Dishwashers MB12 (Korean)
	4E	Policy Brief: Distribution transformers MB14 (Korean)
	4E	Policy Brief: Updated impact of 'phase-out' regulations on lighting MB15 (Korean)
	EDNA	Technical overview and country case studies for the Task: Smart Metering and Energy Monitoring Systems
	EDNA	Overview of market and technology trends and energy impacts, for the Task - Energy Efficiency of the Internet of Things
	EDNA	Outcomes from Smart Devices Workshop held in Tokyo
	EDNA	Explanatory video of network connected devices (Japanese)
Nov-15	4E	Report: Energy Efficiency Roadmap for Electric Motors and Motor Systems
		Policy Brief: Set-top boxes MB13 (German, Korean)
		Policy Brief: Dishwashers MB12 (German)
		Policy Brief: Distribution transformers MB14 (German)
		Policy Brief: Updated impact of 'phase-out' regulations on lighting MB15 (German)
		International Benchmarking Report: Packaged Liquid Chillers
		CDA Technical Report on Progress with International Initiatives on Networked Devices
Dec-15	SSL	Report: Lessons Learned Bringing LEDS to Market
	EMSA	Newsletter 2/2015
	4E	<i>Bright Spark</i> newsletter Ed. 10

## Workshops & Conferences

4E organised, or made presentations at 22 workshops, conferences or specialist meetings of policy makers and experts held in Europe, North America and the Asia-Pacific region during 2015 (see Table 3).

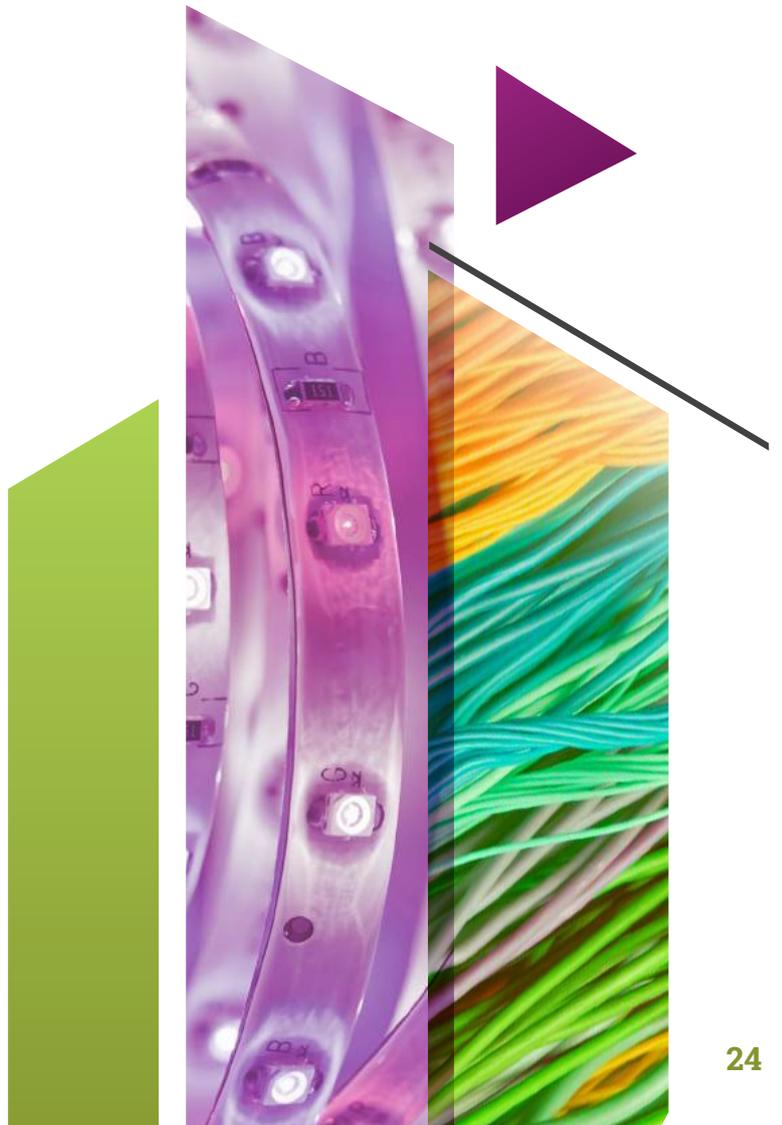
**Table 3: 4E workshops and presentations**

DATE	SOURCE	TITLE
Jan-15	4E	G20 Networked Devices Workshop, Paris, France
Mar-15	4E	Webinar: Updated impact of 'phase-out' regulations on lighting markets
May-15	EDNA	3rd Management Committee Meeting, Copenhagen, Denmark
	EMSA	13th EMSA meeting, Copenhagen, Denmark
		Workshop and laboratory visit, Copenhagen, Denmark
	4E	G20 Networked Devices workshop, Copenhagen, Denmark
Jun-15	SSL	Workshop: SPARC conference, Sydney, Australia
	SSL	10th Experts meeting, Portland, USA
Jun-15	SSL	Workshop: ECEEE Summer study, Hyères, France
	4E	G20 Networked Devices workshop, Paris, France
Jul-15	EMSA	Workshop: Motor Summit, Zhenjiang, China
Aug-15	EMSA	Workshop: ACEEE Summer Study on Energy Efficiency in Industry, Buffalo, USA
Sep-15	EMSA	Workshop: Energy Efficiency in Motor Driven Systems (EEMODS), Helsinki, Finland
		14th EMSA meeting, Helsinki, Finland
Oct-15	EDNA	Smart Devices workshop, CEATEC, Japan
	EMSA	Webinars: on efficient electric motor systems in collaboration with the Danish Technological Institute (DTI)
	EDNA	4th Management Committee meeting
Nov-15	SSL	11th Experts meeting, London, UK
Dec-15	EMSA	Workshop on motor policies for Indonesia, Jakarta
	EDNA	Presentation at ACEEE Intelligent Efficiency workshop, Boston, USA

## 4E Group Finances

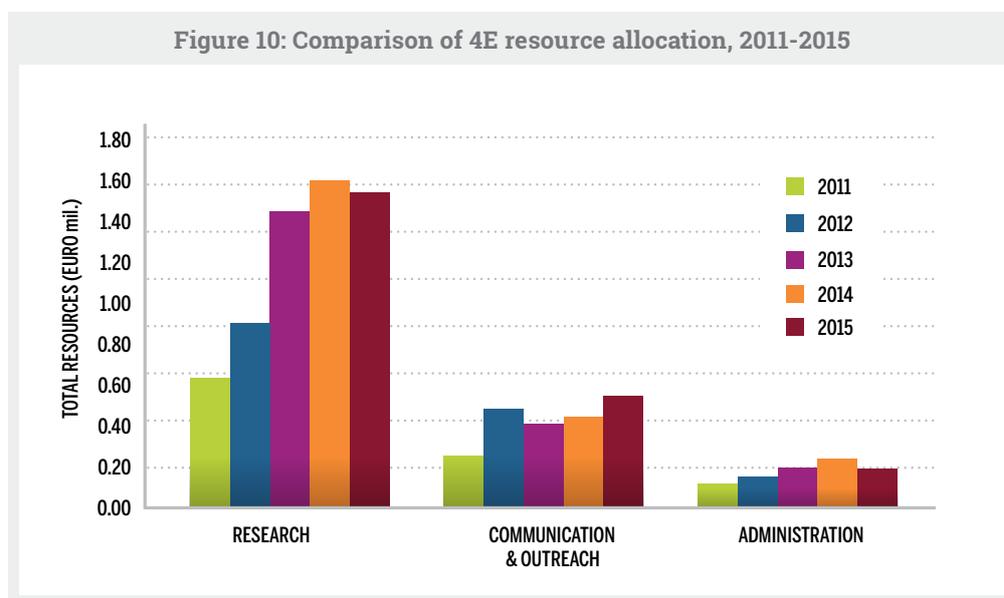


**Over 60% of resources were directed towards research**, while expenditure on communication and outreach activities has **increased to 27%**.



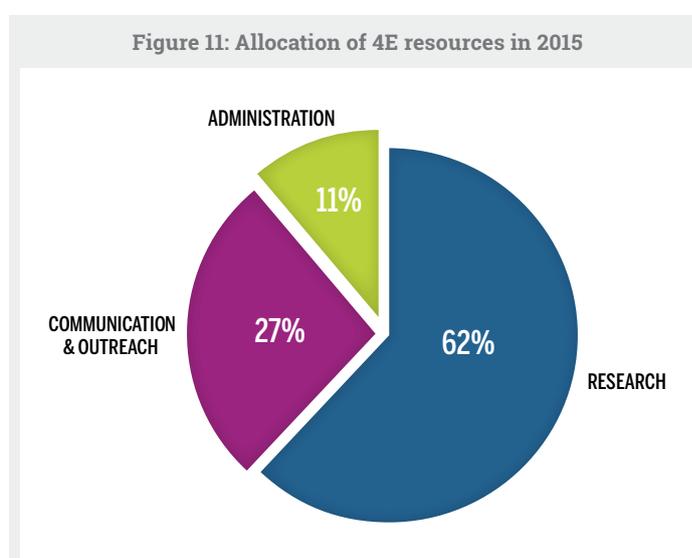
4E activities are made possible through the contributions of member countries: taking the form of annual fees and substantial in-kind work by national experts. In 2015, the total cost of 4E activities is estimated to be €1.9 million, of which the annual fees and voluntary contributions of the 12 member countries and SEAD funded approximately 45%.

In 2013 the Executive Committee unanimously decided to reduce 4E membership fees and end the stand-alone Mapping & Benchmarking Annex during 2014 in acknowledgement of tight national budgets. As a direct result, the total resources available to 4E in 2015 fell by 18% compared to the previous year (see Figure 10).



As shown in Figure 11, over 60% of resources were directed towards research, while expenditure on communication and outreach activities has increased to 27%. The share of resources devoted to administration, including financial management, coordination and member liaison, has fallen in real terms compared to 2014, and remains around 11% of total costs.

While Annex membership fees can vary from year to year depending upon the agreed work programme, the 2015 Annex membership fees have remained in-line with previous years, as shown in Table 4.



**Table 4: 4E membership fees, 2015**

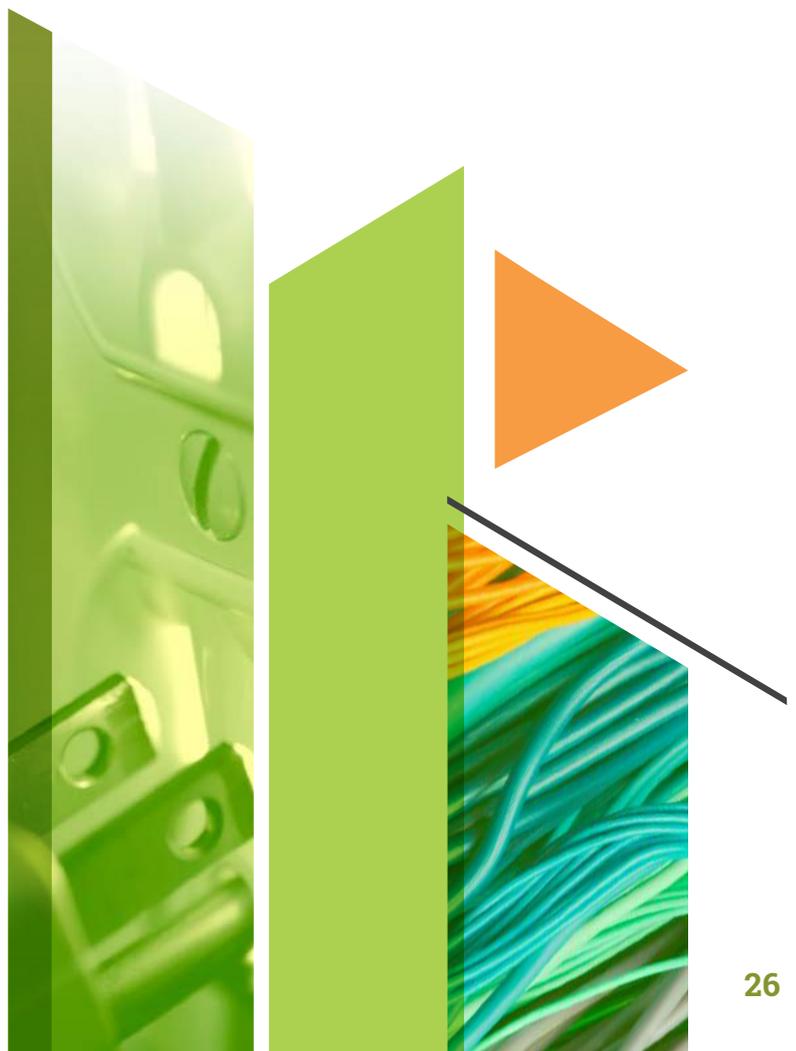
EXECUTIVE COMMITTEE	€20,000
ELECTRIC MOTOR SYSTEMS ANNEX (EMSA)	€15,000
SOLID STATE LIGHTING ANNEX (SSL)	€22,000
ELECTRONIC DEVICES AND NETWORKS ANNEX (EDNA)	€15,000

## Attachments



Looking forward, as countries seek to **fulfil their commitments made at COP21**, the demand for expertise in implementing energy efficiency has got to grow. In this context, 4E has enormous potential to **use the experience and commitment of its 12 member countries** to turn these ambitions into reality.

*Mike Walker, 4E Chair*



# Attachments

## Attachment 1: 4E Executive Committee Delegates

CONTRACTING PARTY	NOMINATION	NAME & DETAILS	EMAIL/TELEPHONE
AUSTRALIA	Primary	<b>Ms Michelle Croker (Vice-Chair)</b> Department of Industry, Innovation and Science	Michelle.Croker@industry.gov.au
	Alternate	<b>Mr Richard Miles</b> Department of Industry, Innovation and Science	Richard.Miles@industry.gov.au
AUSTRIA	Primary	<b>Mr Michael Hübner</b> Federal Ministry for Transport, Innovation and Technology	michael.huebner@bmvit.gv.at <b>Tel:</b> +43 1 711 62 652922
	Alternate	<b>Dr Adriana Diaz</b> Ecodesign Company GmbH Engineering and Management Consultancy	diaz@ecodesign-company.com <b>Tel:</b> +43 1 40 35 611-31
CANADA	Primary	<b>Ms Debbie Scharf</b> Director, Equipment Division Office of Energy Efficiency Natural Resources Canada	Debbie.Scharf@NRCan-RNCan.gc.ca <b>Tel:</b> +1 613 996 4359
	Alternate	<b>Ms Katherine Delves (Vice-Chair)</b> Chief, Standards Development Office of Energy Efficiency Natural Resources Canada	Katherine.Delves@NRCan-RNCan.gc.ca <b>Tel:</b> +1 613 947 1207
	Alternate	<b>Mr Jamie Hulan</b> Team Leader, Standards Development Office of Energy Efficiency Natural Resources Canada	Jamie.Hulan@NRCan-RNCan.gc.ca <b>Tel:</b> +1 613 992 9641
DENMARK	Primary	<b>Mr Peter Nielsen</b> Senior Policy Advisor Construction and Energy Efficiency Danish Energy Agency	pen@ens.dk <b>Tel:</b> +45 3392 6735
	Alternate	<b>Mr Bjarke Hansen</b> Construction and Energy Efficiency Danish Energy Agency	bjh@ens.dk <b>Tel:</b> +45 3392 7588
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	Alternate	<b>Ms Therese Kreitz</b> Responsible for International Affairs ADEME	therese.kreitz@ademe.fr <b>Tel:</b> +33 4 93 95 79 84
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	Alternate	<b>Mr Ichiro Tsubota</b> Energy Conservation Technology Department NEDO	tsubotaicr@nedo.go.jp <b>Tel:</b> +81 44 520 5281
	Alternate	<b>Ms Arisa Numata</b> NEDO	numataars@nedo.go.jp <b>Tel:</b> +81 44 520 5281

## Attachment 1: 4E Executive Committee Delegates continued

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REPUBLIC OF KOREA	Primary	<b>Mr Euy-Kyung Kim</b> Director, Energy Efficiency Standardization and Certification Center, KEMCO	lekek@kemco.or.kr <b>Tel:</b> +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 <b>Tel:</b> +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 <b>Tel:</b> +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 <b>Tel:</b> +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 <b>Tel:</b> +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 <b>Tel:</b> +41 44 760 0066
	Alternate	<b>Mr Markus Bleuer</b> Appliances and Competitive Tenders Section Swiss Federal Office of Energy (SFOE)	markus.bleuer@bfe.admin.ch <b>Tel:</b> +41 58 462 69 24
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	Alternate	<b>Dr Mike Walker (Chair)</b> Business and Local Energy Use Directorate Department for Energy and Climate Change	mike.walker@decc.gsi.gov.uk <b>Tel:</b> +44 300 068 8152
USA	Primary	<b>Mr Jeremy Domm</b> Electronic Products Manager Building Technologies Office US Department of Energy	jeremy.dommu@ee.doe.gov <b>Tel:</b> +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 <b>Tel:</b> +1 202 586 0124

## Attachment 2: Electric Motor Systems (EMSA) 2015 Record of Activities & Delegates

### RECORD OF ACTIVITIES

NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2015</b>			
EMSA Newsletter 1/2015*	July 2015	subscribers & public	
Policy Brief #0: Electric Motor Systems Annex overview	September 2015	public	
Policy Brief #1: Motor Systems Tool for efficient system design	September 2015	public	
Policy Brief #2: Policy Guidelines for Electric Motor Systems	September 2015	public	
4E EMSA Energy efficiency roadmap for electric motors and motor systems	October 2015	public	
EMSA webinars on Leonardo, a series of six in cooperation with DTI	October 2015 – Feb 2016	subscribers & public	
<b>OUTREACH IN 2015</b>			
EMSA Workshop and Lab visit	May	Industry, experts	Copenhagen
EMSA participation at the Motor Summit China	June	government, utilities, industry, consultants	Zhenjiang
EMSA participation at ACEEE Summer Study on Energy Efficiency in Industry	September	government, utilities, consultants	Buffalo, NY
EMSA presentations at EEMODS '15	September	industry, academia, government, standards developers	Helsinki
EMSA Finnish Workshop	September	Government, research	Helsinki
EMSA participation at Workshop on Motor Policies for Indonesia	December	Indonesian government, industry	Jakarta
<b>MANAGEMENT/EXPERTS MEETINGS HELD IN 2015</b>			
13th EMSA meeting	May		Copenhagen
14th EMSA meeting	September		Helsinki
<b>OUTREACH PLANNED FOR 2016</b>			
EMSA presentations at eceee Industrial Summer Study 2016	September	government, academia, consultants	Berlin
EMSA participation at Motor Summit 2016	October	government, industry, academia	Zurich
2 Newsletters EMSA	April, November		
<b>MANAGEMENT/EXPERTS MEETINGS PLANNED FOR 2016</b>			
15th EMSA meeting	May		London
16th EMSA meeting	Oct		Zurich

\* 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) 2015 Record of Activities & Delegates

### COUNTRY DELEGATES

COUNTRY	NAME	ORGANISATION	EMAIL	PHONE
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SWITZERLAND	Conrad U. Brunner Rita Werle	Impact Energy Inc.	cub@impact-energy.ch rita.werle@impact-energy.ch	+41 44 226 30 70
USA	John Cymbalsky Chad Gallinat	Department of Energy	john.cymbalsky@ee.doe.gov chad.gallinat@hq.doe.gov	+1 202 586 98 70 +1 202 586 94 66
<b>LEAD COUNTRY</b>		<b>SWITZERLAND</b>		
<b>ANNEX CHAIR</b>		<b>Roland Brüniger</b> Swiss Federal Office of Energie c/o R. Brüniger AG Engineering & Consulting Zwillikerstr. 8, CH-8913 Ottenbach Switzerland Email: roland.brueiniger@r-brueiniger-ag.ch Tel: +41 44 760 00 66		
<b>OPERATING AGENT</b>		<b>Maarten van Werkhoven</b> TPA advisors Generaal Winkelmanlaan 31 2111 WV Aerdenhout Netherlands Email: mvanwerkhoven@tpabv.nl Tel: +31 23 536 80 90		
<b>EMSA COORDINATOR</b>		<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		

## Attachment 3: Solid State Lighting (SSL) 2015 Record of Activities & Delegates

RECORD OF ACTIVITIES			
NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2015</b>			
4E SSL Annex News: An internal newsletter for the Management Committee from the Operating Agent.	February	Members Only	
'IEA 4E SSL annex: providing governments with the tools to accelerate market adoption of SSL products,' in Journal of Solid State Lighting.	May	Public	
'110 labs in world's largest interlaboratory comparison of LED test labs – improving testing competency to support market transformation' at eceee 2015 Summer Study.	June	Public	
SSL Annex Video on website.	October	Public	
"Lessons Learned Bringing LEDs to Market" Executive Briefing for COP21.	December	Public	
Article in IEA Energy Technology Initiatives 2015 on the Interlaboratory Comparison 2013.	Unpublished in 2015	Public	
<b>OUTREACH IN 2015</b>			
Presentation of paper at the eceee 2015 Summer Study	June	Policy makers, NGOs, industry, consultants, research	Hyères, France
SEAD Policy Exchange Conference Call	September	SEAD Member Governments	Teleconference
SSL Annex/Exco Workshop	October	4E ExCo and Annex experts, Japanese government and industry	Tokyo
Informal workshop for Japanese Industry	October	Japanese industry and government officials	Tokyo
<b>MANAGEMENT COMMITTEE MEETINGS HELD IN 2015</b>			
Management Committee call	June 2015		Teleconference
Management Committee call	October 2015		Teleconference
<b>EXPERT MEETINGS HELD IN 2015</b>			
IEA 4E SSL Annex's 10th Experts Meeting	May 2015		Sydney, Australia
IEA 4E SSL Annex's 11th Experts Meeting	November		London, UK
<b>OUTREACH PLANNED FOR 2016</b>			
Strategies in Light, 2016	March	Investors, Researchers, Policy Makers	Santa Clara, California, USA
CIE 2016 Lighting Quality and Energy Efficiency Conference	March	Researchers, Academics	Melbourne, Australia
<b>EXPERT MEETINGS PLANNED FOR 2016</b>			
IEA 4E SSL Annex 12th Expert Meeting	April		Beijing, China
IEA 4E SSL Annex 13th Expert Meeting	October		Copenhagen, Denmark

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

#### COUNTRY DELEGATES

COUNTRY	NAME	ORGANISATION	EMAIL	PHONE
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NETHERLANDS	Michiel Brons	Dutch Metrology Institute (VSL)	mbrons@vsl.nl	+31 15 269 1626
REPUBLIC OF KOREA	Jin-Soo Kim	Korea Energy Agency	gemjin@kemco.or.kr	+82-31-260-4242
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<b>ANNEX CHAIR</b>	<b>Mr Peter Bennich</b> Coordinator for Lighting The Swedish Energy Agency, Testlab Sweden Email: peter.bennich@energimyndigheten.se Tel: +46 73 625 6782			
<b>OPERATING AGENT</b>	<b>Mr Nils Borg</b> Borg & Co. AB Sveavägen 98, 4 tr, 113 50 Stockholm, Sweden. Email: SSL.Annex@gmail.com Tel: +46 70 585 31 74			

## Attachment 4: Electronic Devices and Networks Annex (EDNA) 2015 Record of Activities & Delegates

RECORD OF ACTIVITIES			
NAME	DATE	INTENDED AUDIENCE	LOCATION
<b>PUBLICATIONS IN 2015</b>			
Measurement Guideline for network standby power testing	September	Restricted to members	
Technical overview and country case studies for the Task - Smart Metering and Energy Monitoring Systems	October	Restricted to members	
Overview of market and technology trends and energy impacts, for the Task - Energy Efficiency of the Internet of Things	October	Restricted to members	
Outcomes from Smart Devices Workshop held in Tokyo	October	Public	
Explanatory video of network connected devices (Japanese language)	October	Public	
<b>OUTREACH IN 2015</b>			
Smart Devices Workshop	October	Industry Government	Tokyo
Presentation at ACEEE Intelligent Efficiency Workshop	December		Boston
<b>MANAGEMENT/EXPERTS MEETINGS HELD IN 2015</b>			
3rd Annex management meeting	May		Copenhagen
4th Annex management meeting	October		Tokyo
<b>OUTREACH PLANNED FOR 2016</b>			
(Tentative) Workshop on Intelligent Efficiency	TBA	Industry & government	TBA
<b>MANAGEMENT/EXPERTS MEETINGS PLANNED FOR 2016</b>			
5th Annex management meeting	May		London
6th Annex management meeting	October (TBC)		Beijing

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

### COUNTRY DELEGATES

COUNTRY	NAME	ORGANISATION	EMAIL	PHONE
AUSTRALIA	Ms Michelle Croker	Department of Industry Innovation and Science	michelle.croker@industry.gov.au	+61 2 6213 7383
AUSTRIA	Dr Adriana Diaz Triana	EcoDesign Company	diaz@ecodesign-company.com	+43 1 40 35 611 33
CANADA	Ms Micheline Brown	Natural Resources Canada	micheline.brown@ nrcan-rncan.gc.ca	+1 613 947 8774
	Ms Katherine Delves	Natural Resources Canada	Katherine.Delves@ NRCan-RNCan.gc.ca	+1 613 947 1207
DENMARK	Mr Peter Nielsen	Danish Energy Agency	pen@ens.dk	+45 3392 6735
FRANCE	Mr Alain Anglade	ADEME	alain.anglade@ademe.fr	+33 493 957 935
JAPAN	Mr Masahide Shima	NEDO	shimamsh@nedo.go.jp	
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## About the IEA



Through these TCPs, of which there are currently more than forty including 4E, **experts from governments, industries, businesses, and international and non-governmental organisations** from both IEA member and non-member countries **unite to address common technology challenges and share the results of their work.**



## 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 and analysis.

An autonomous organisation, the IEA examines the full spectrum of energy issues and advocates policies that will enhance the reliability, affordability and sustainability of energy in its 29 members countries and beyond.

The four main areas of IEA 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

There are no quick fixes to long-term energy challenges. To find solutions, governments and industry benefit from sharing resources and accelerating results.

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 IEA Technology Collaboration Programmes (TCPs) (formally known as Implementing Agreements).

Through these TCPs, of which there are currently more than forty including 4E, experts from governments, industries, businesses, and international and non-governmental organisations from both IEA member and non-member countries unite to address common technology challenges and share the results of their work.

Each Implementing Agreement has a unique scope and range of activities. Further information is available at: <http://www.iea.org/tcp>

A video explaining the role of TCPS is can be viewed at: <https://www.youtube.com/watch?v=1WxyZfbqwHY&feature=youtu.be>