



LoadDown

THE STANDBY POWER NEWSLETTER

Efficient Electrical End-Use Equipment
International Energy Agency

Load Down is supported by the International Energy Agency 4E Implementing Agreement.

This edition of Load Down includes

- **4E broadens its horizons - Standby Power Annex ends**
- **More Data, Less Energy: IEA/4E Publication**
- **Policy Framework and Action plan for Networks**
- **Tracking Clean Energy Progress 2014**
- **Policy Briefs: Secondary Functions and Networks**
- **Power required for Functions Report**
- **Beyond 1 Watt: IEA/4E/ SEAD Workshop Paris 2013**

4E Broadens its Horizons – Evolution of the Standby Annex

Over the last five years 4E has made a valuable contribution to the global energy efficiency environment; however its mandated period of operation was to finish in 2014. Following a glowing review, that assessed the success and impact of the organization, the 12 member countries requested an extension for a second term from the IEA. The extension has been approved until 2019 and will see the implementation of a new strategic plan and an expansion of the group's activities. To reflect the new broader terms set out in the plan, 4E has made a minor modification to its name, now being known as the IEA Implementing

Agreement for Energy Efficient End-use Equipment. There have also been some changes to the internal mechanisms of 4E including the evolution of the Standby Power Annex.

The Standby Power Annex, with its membership of 10 countries, has made a significant contribution in the area of standby power. The research undertaken by the Annex has resulted in 32 publicly available reports, 9 policy briefs and seven international workshops in Europe, Asia and North America. The Annex was able to form close working relations with other



international organisations, working collaboratively with APEC, Asia Pacific Partnership, the IEA, SEAD and SELINA. Significantly the Annex's recent work on network standby

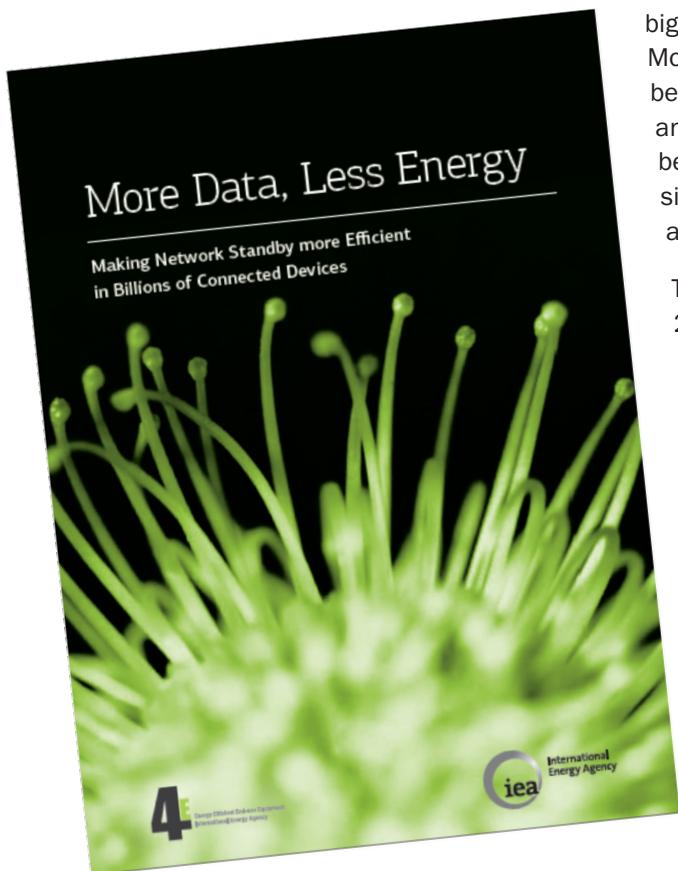
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In this Issue

4E broadens its horizons - Standby Power Annex ends – More Data, Less Energy: IEA/4E Publication – Policy Framework and Action plan for Networks – Tracking Clean Energy Progress 2014 – Policy Briefs: Secondary Functions and Networks – Power required for Functions Report – Beyond 1 Watt: IEA/4E/ SEAD Workshop Paris 2013

More Data, Less Energy

The much anticipated IEA/4E publication reporting on all aspects of network standby will be available free of charge in June 2014. The book entitled *More Data, Less Energy: Making network standby more efficient in billions of connected devices*, is the culmination of research and workshops conducted by the 4E Standby Power Annex and the IEA project team and comprehensively covers all aspects of network standby.



The publication begins with an explanation of what network standby is and how it differs from the standby power that policy makers and the general public are familiar with. It discusses rapidly increasing connectivity in a broad range of products, exploring how “everything is becoming smart” and “network enabled”. While consumers are devouring this new convenience and the extra functionality provided by network enabled devices, the energy waste implications are big and getting bigger. Most of this energy will be used not performing any function, but simply being alert in case a signal from the network arrives.

The study reports “In 2013, a relatively small portion of the world’s population relied on more than 14 billion of these devices to stay connected. That number could skyrocket to 500 billion by 2050, driving dramatic increases in both energy demand and wasted energy... In 2013, such devices

consumed 616 terawatt hours (TWh) of electricity, surpassing the total electricity consumption of Canada. Studies show that for some devices, such as game consoles, up to 80% of the energy consumption is used just to maintain a network connection. Implementing best available technologies could reduce the energy demand of network-enabled devices by up to 65%.”

Collectively the potential savings from network connected devices is very large but at an individual product level the benefits for the consumer is small. This absence of market drivers; the speed at which devices are becoming network enabled and the rapid growth in ownership, dictates the need for urgent policy action. The report describes in detail the technologies and technical solutions as well as a range of policy options that are available to reduce energy waste. It acknowledges that the task of implementing change will require a cooperative approach from a broad suite of players, identifying policy makers; standards development organisations; software and hardware developers; designers; service providers and manufacturers, as all having a role to play in reducing the amount of energy used by network enabled devices.

Finally the book charts a path forward, presenting an action plan

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has bought attention to the need to expand energy efficiency efforts beyond simple standby into the new, more complex area of networks. The Standby Power Annex will formally

conclude in 2014 however the areas of work undertaken by the annex will be part of a new expanded annex; the Electronic Devices and Networks Annex (EDNA).

Launching in May 2014, the Electronic Devices and Networks Annex (EDNA) will target the growing

energy use from networks and networked equipment. EDNA will cover most types of electronic equipment and associated networks serving the information technology and related communication needs of consumers, businesses, institutions and utilities.

Policy Framework and Action plan for Networks

to reduce energy waste in network enabled devices. The plan calls on governments around the world to adopt three measures:

1. Develop network enabled device policies with key energy efficiency objectives;
2. Intensify international co-operation to develop technical foundations for policy making in this area
3. Work towards establishing and supporting international initiatives to promote energy efficiency in the broader context of digital economies.

In committing to these three measures it is anticipated that governments will pursue the following key actions

- Assess, analyse and align existing policy approaches
- Establish international technology standards
- Engage with industry to allow policy that builds confidence and encourages innovation
- Encourage the development of communication protocols that support energy efficiency
- Prioritise data collection including alignment of methodologies.

The book will leave readers in no doubt as to the size and urgency of tackling energy waste in network enabled appliances. The underlying message stressing the need for international cooperation across all parts of the ICT value chain is backed with an action plan, leading the way to create an environment where 'More Data Less Energy' becomes the way forward. The publication will be available at www.iea.org/etp/networkstandby from June 2014.

The Standby Annex has recently published the report *Beyond Network Standby: A policy framework and action plan for low energy networks*. This report is a companion piece to the IEA/4E *More Data Less Energy* publication offering a guide to the practical application of the concepts and technical details for the development of policies to combat energy waste in networks. Prepared by Lloyd Harrington and Bruce Nordman, the report offers readers an understanding of how networks operate, particularly how they use energy and how products that are connected to a network can minimise energy use. It breaks down technology options for reducing network energy by product type and detailing where the highest potential for energy savings exists.

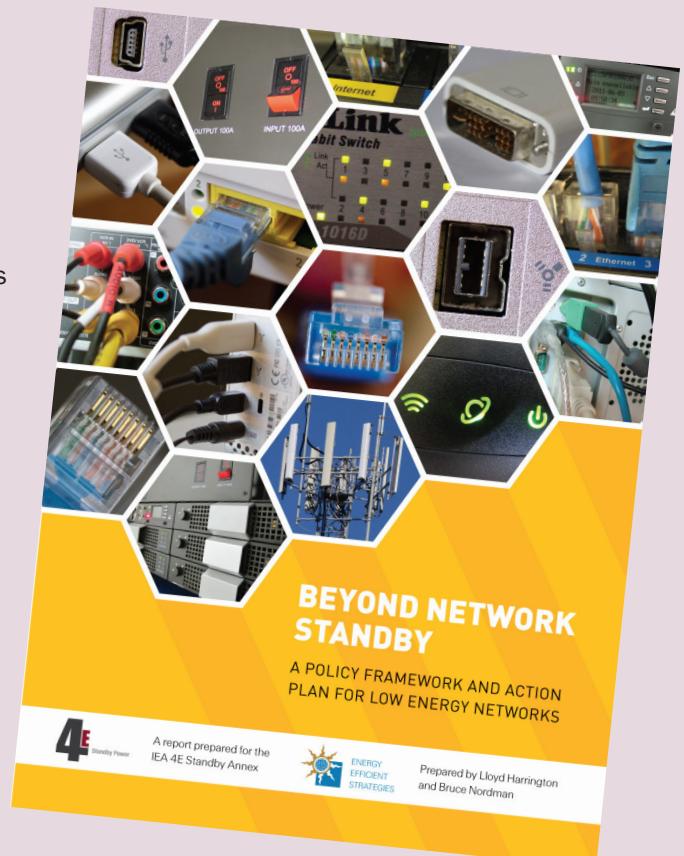
The report also explains the *IEA guiding principles for good network design* in terms of real world applications outlining the practical policy elements and approaches that are most relevant to each individual principle. The authors discuss the importance of establishing definitions relating to networks and standardizing test procedures. Recommendations for the structure and format of these, in order to support a successful policy environment are clearly laid out in the report.

Beyond Network Standby concludes by advocating a

path forward for energy efficiency policy to address energy waste in networks. The policy framework documents 3 key elements for each product type:

1. Overview of the product purpose, design, usage and characteristics that affect energy consumption and how this can be reduced
2. The types of product characteristics, attributes and energy technologies that are desirable in a low energy network context
3. Energy policy elements that can encourage and reward these desirable attributes in real products when operated across a range of typical use.

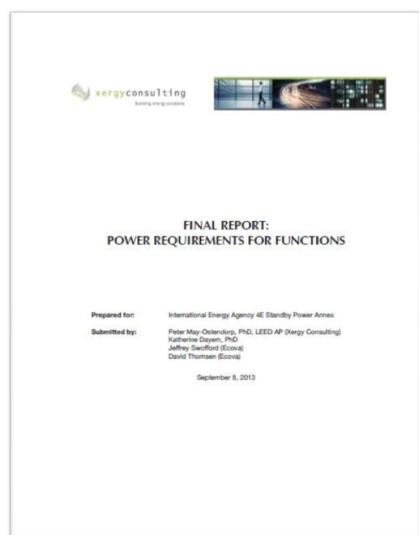
The report is available on the Standby Annex website @ <http://standby.iea-4e.org/documents-results/network-standby>.



Power required for Functions Report

The Standby Power Annex has released a new report, *Power Requirements for Functions*. This report by Xergy Consulting builds on the previous work (ECOVA's Mapping Secondary Product Functions report) examining in greater detail several high-priority secondary functions to further quantify their power requirements and provide the technical background that might be required to advance horizontal policy action associated with these functions.

The report concludes that Energy efficient technologies and design approaches exist for all the secondary functions and if employed could reduce energy waste across a broad range of consumer products. These types of energy savings can be encouraged using Horizontal policies that ensure secondary functions employ best-available technologies and are aggressively power-managed.



Even in cases where vertical policy measures are still required having a foundation of horizontal secondary function power requirements can vastly simplify the process.

Key examples of saving opportunities include:

- Information Displays - Standby power can be eliminated by cutting power to the display when not needed currently this power management strategy is used successfully in mobile devices and printers.
- Networking Wired – Energy Efficient Ethernet (EEE) adjusts power use to the amount of data being transferred. Currently installed EEE is often not enabled by manufacturers. Policy requiring EEE to be both installed and enabled would improve efficiency.
- Networking Wi-Fi – Components exist that have the potential to scale down Wi-Fi power by over 90% by allowing a low-power state to be entered when there is no network traffic. As with EEE the use of the component does not guarantee products are designed to engage the energy efficiency potential.
- Power Supply – A dedicated standby power supply can reduce losses during ac-dc conversion by about 80% and cut overall standby power by more than half.
- IR Sensing – Energy savings can be achieved by allow microprocessors in the receiver to power down when no signal is being received.

Tracking Clean Energy Progress 2014 Includes Networked Devices

Tracking Clean Energy Progress 2014 www.iea.org/etp/tracking/ examines progress in the development and deployment of key clean energy technologies. Each technology and sector is tracked against interim 2025 targets in the IEA 2014 Energy Technology Perspectives 2°C scenario, which lays out pathways to a sustainable energy system in 2050. Deployment of solar photovoltaics (PV), onshore wind and electric vehicles (EVs) is still increasing rapidly, but their growth rates are slowing. Growth of coal-fired power generation exceeds that of all non-fossil fuels combined. Nuclear power generation is stagnating. Development of carbon capture and storage (CCS) remains slow. These trends reflect inadequate political and financial commitment to long-term sustainability of the global energy system. The report also examines the energy implications of our increasingly digital economies focusing particularly on the hidden energy costs networked devices.

The report is an excerpt to ETP 2014 and together they provide specific recommendations to governments on how to scale up deployment of key technologies toward a secure, clean and competitive energy future.

Visit www.iea.org/etp/tracking/ for interactive tools, additional data, presentations and more.

4E Standby Annex Policy Briefs

The Annex will shortly release two additional policy briefs as a result of the research it commissioned in 2013.

Lowering the Energy Waste of Extra Functionality (SP7)

This brief explains secondary functions describing the similarities of secondary functions across a broad range of products and how increasing the efficiency of these functions, can significantly reduce low power mode waste across the market. The briefing summarises the results of two reports commissioned by the annex; *'Power Requirements For Functions'* and *'Mapping Secondary Product Functions to Products and Operational Modes'*

More Data, Less Energy: Addressing Energy Waste in Networks (SP8)

This briefing looks at the enormity of energy waste in networks and how Governments might begin to address the issue with concerted global action. The information provided in this policy brief is drawn from two new Annex reports: *'More Data Less Energy: Making Network Standby More Efficient in Billions of Connected Devices'*, jointly published with the IEA and *Beyond Network Standby: A Policy Framework and Action Plan for Low Energy Networks*.

The Standby Power Annex has published nine policy briefs in total all of which are available on the 4E website. Briefings are available in English, French, German, Korean and Japanese.

Beyond 1 Watt: IEA/4E/ SEAD Workshop Paris 2013

The IEA/4E/SEAD joint network standby workshop was held on 16-17 September 2013 in Paris, France. The two day workshop was attended by industry representatives, experts and government officials including delegates from the IEA Energy Efficiency Working party. The objective of the workshop was to help future-proof energy efficiency policy-making by providing insights into trends and energy implications of increasing network-connectivity. Focus was placed on how to limit standby power consumption of network-connected appliances and policies and supporting measures needed to improve energy efficiency.

The meeting provided lively and fruitful discussions on how networked products can be more energy efficient, the progress being made in policy implementation, future issues that need to be addressed and how industry and governments can work together. Presentations established that energy waste associated with networks is a real and large problem only getting larger. Industry is supportive of working together with

governments and has appreciated the interaction with the 3 international bodies (IEA, 4E and SEAD) involved in the 2012-13 workshops. The workshop heard about several countries that have begun to introduce policy and regulation to reduce network waste (EU, US, Energy Star, Korea & Switzerland). Participants agreed that work needs to be initiated at the global level to raise government awareness. Tackling issues at the basic design phase especially protocols for how devices communicate and encouraging the utilisation of energy efficient components/opportunities that already exist would elicit greater energy savings. It was emphasized that if Power Scaling or using the appropriate level of power for the task can become normal practice this would be the most efficient way to tackle the waste. Into the future we need to look at whole system energy use as products become more and more interconnected.

The presentations from the workshop are available at www.iea.org/workshop/iea4eseadnetworkstandbyworkshop.html

SEAD Network Standby Collaboration Group

The SEAD Network Collaboration Group is expected to publish 2 reports in 2014. The *Standardized Definitions for Network Standby & Application to Televisions* report, which sets out proposed approaches for network standby and proposes definitions for network standby that are sufficiently high level to be product independent, but simultaneously applicable to a wide range of products that already contain network standby functionality.

The Real World Usage report: has collected information on actual

network traffic on networked equipment from a representative sample of UK households. The methodology will be shared with other countries to allow similar data to be collected by Governments around the world.

It is anticipated that SEAD will continue to work closely with 4E and the new EDNA committee, in developing any new programmes.

Information about the SEAD projects can be directed to Nicole Kearny (nkearny@clasponline.org)