ENERGY EFFICIENCY

IEA/4E/SEAD NETWORK STANDBY WORKSHOP – BEYOND 1-W
TOWARDS ENERGY EFFICIENCY IN THE DIGITAL AGE

17 SEPTEMBER PARIS

Vida Rozite

International Energy Agency

Joint workshop

- **International Energy Agency (IEA) Energy Efficiency Unit**
- **IEA Implementing Agreement for Efficient Electrical End-use Equipment (4E) Standby Power Annex**
- **Super Efficient Appliance Deployment (SEAD) Initiative working group on network standby**

Common objectives:

- **Tracking emerging issues and monitoring trends & providing recommendations on how to develop and implement effective energy efficiency policies**
- **Creating opportunities for sharing policy experiences**
- **Creating fora for discussion**

Key messages

- **Network connectivity** is a good thing – opportunity for new functions, services including energy saving

- But if left un-managed – energy **efficiency opportunities will be missed**

- **Network standby** is a topic of growing importance

- There is an **urgent** need for a policy response

- There are technical and policy **solutions**

- No need to start from scratch – but instead **opportunity to build on existing initiatives**

- Network standby is one issue – more work is needed on **promoting energy efficiency in networked systems and environments**

- Opportunities to utilise **energy saving opportunities** that networks can unlock should be identified and pursued

Trends

- **standby energy use is increasing**

- **uptake of electronics is increasing**

- **energy demand of electronics is increasing**

- **products are increasingly networked**

- **product development is increasingly at a rapid rate**

- **ICT energy consumption is projected to grow at a rapid rate**

Regular standby – progress

**Average standby power of TVs (CRT, LCD and plasma)**
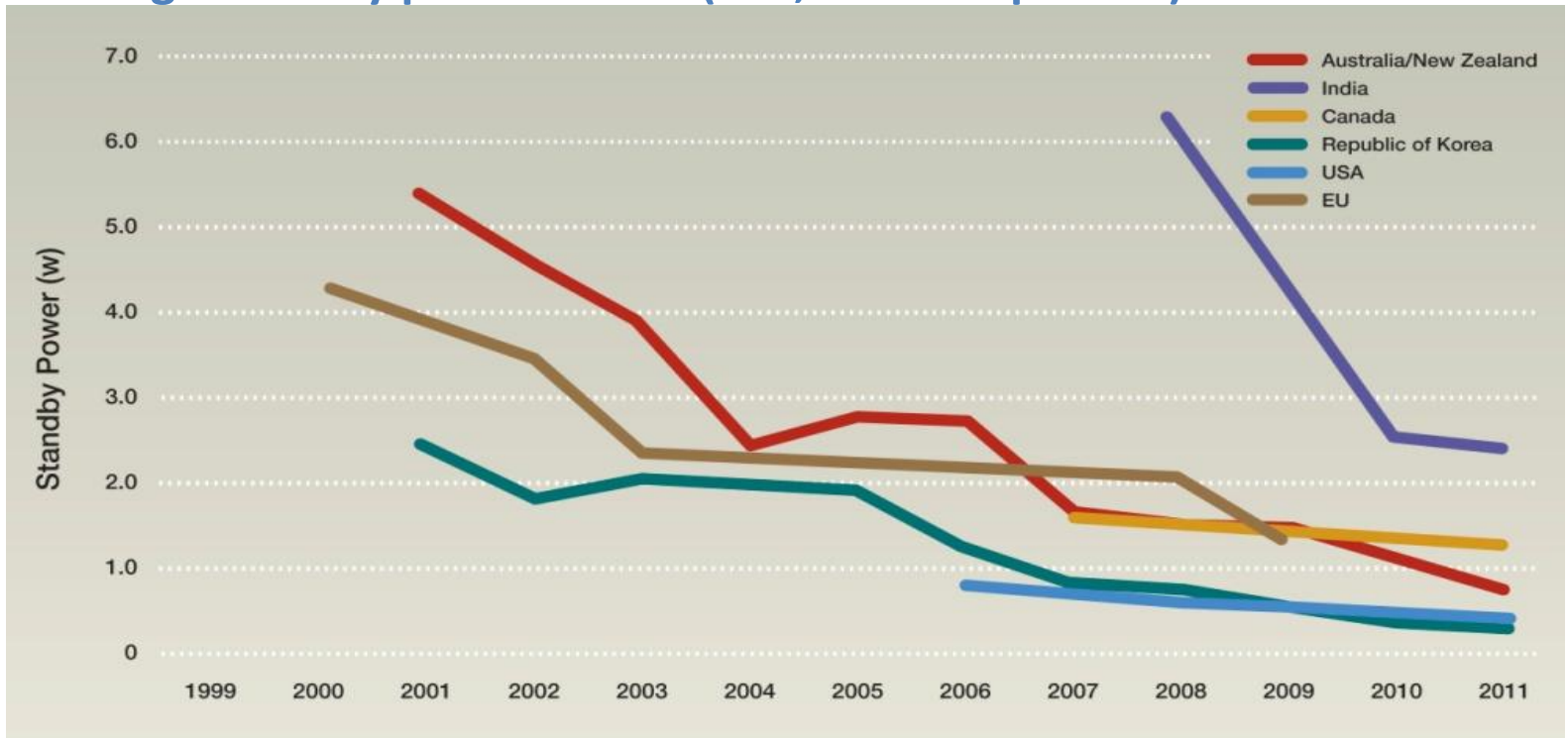
Source: IEA Implementing Agreement for Efficient Electrical
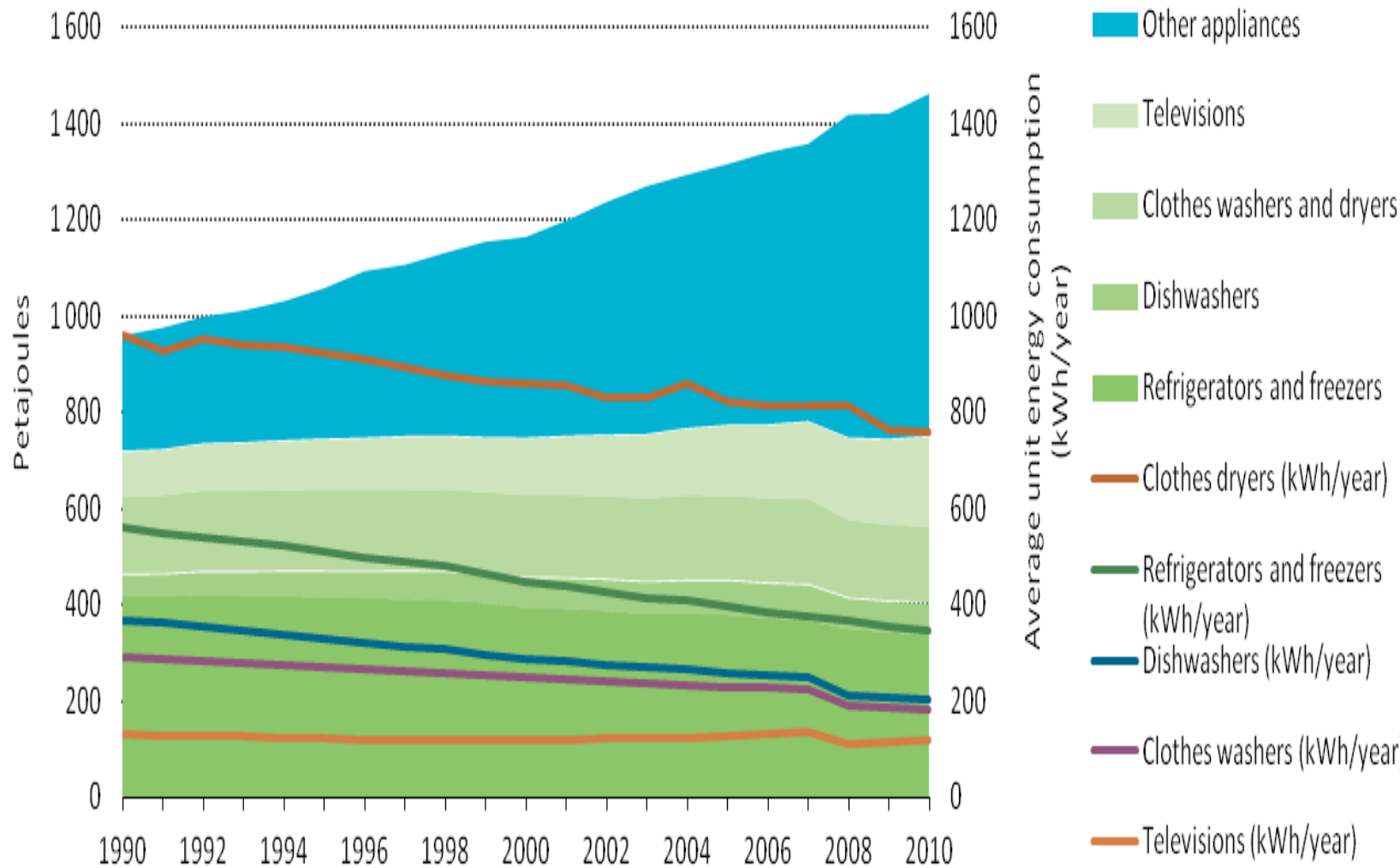End-use Equipment (4E), Mapping and Benchmarking Annex 2012.

**But standby energy consumption is increasing –
in some countries up from 10% of total
residential demand to 16%**

Appliances and equipment – where to focus future efforts

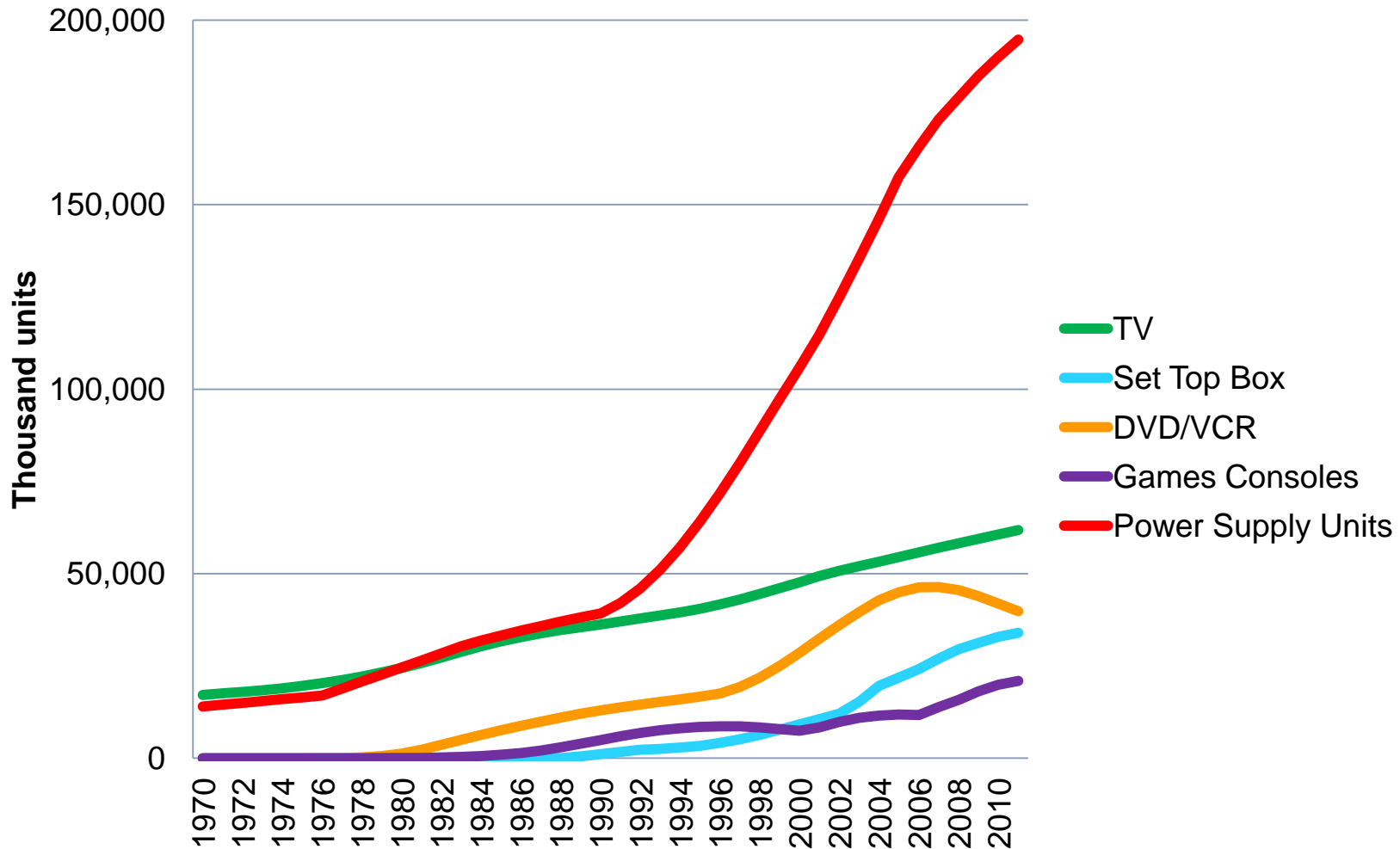**UK total electricity consumption by household domestic appliances 1979 to 2011**
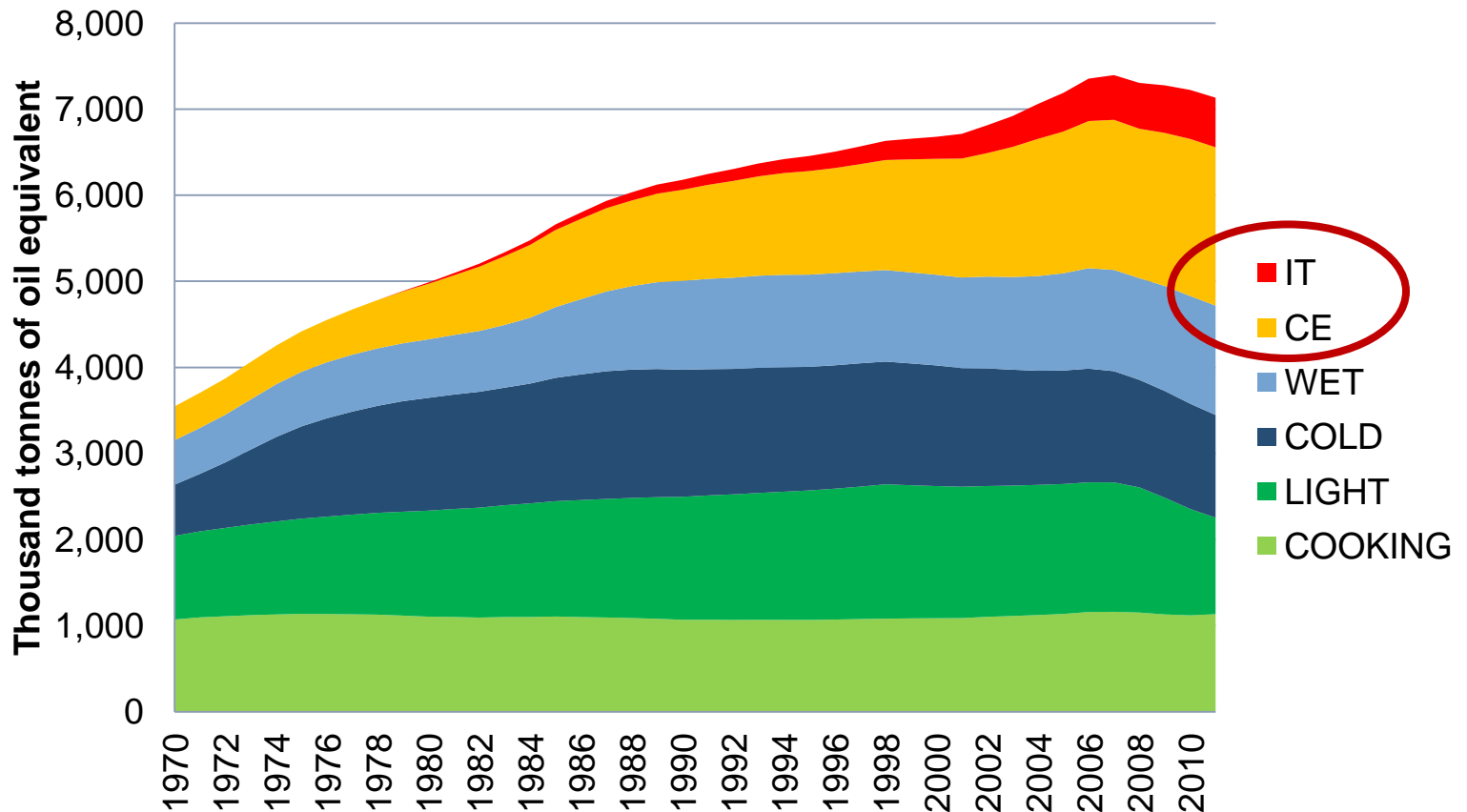
In selected OECD countries

Consumer electronics

Number of CE appliances owned by UK households 1970-2011

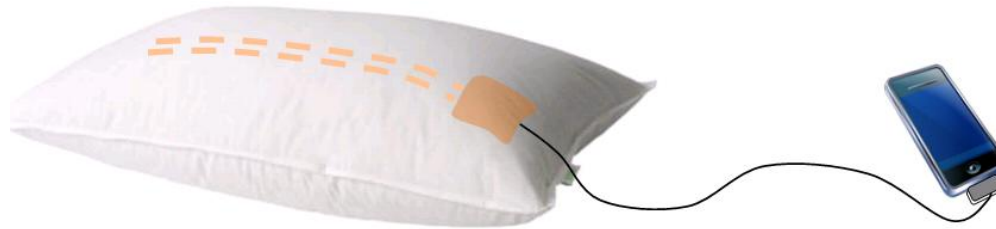**UK DECC Statistics 2012**

Everything is becoming "smart"

Smart glasses

Sensors that collect and send data

Smart metering

Pillows for healthcare and communication
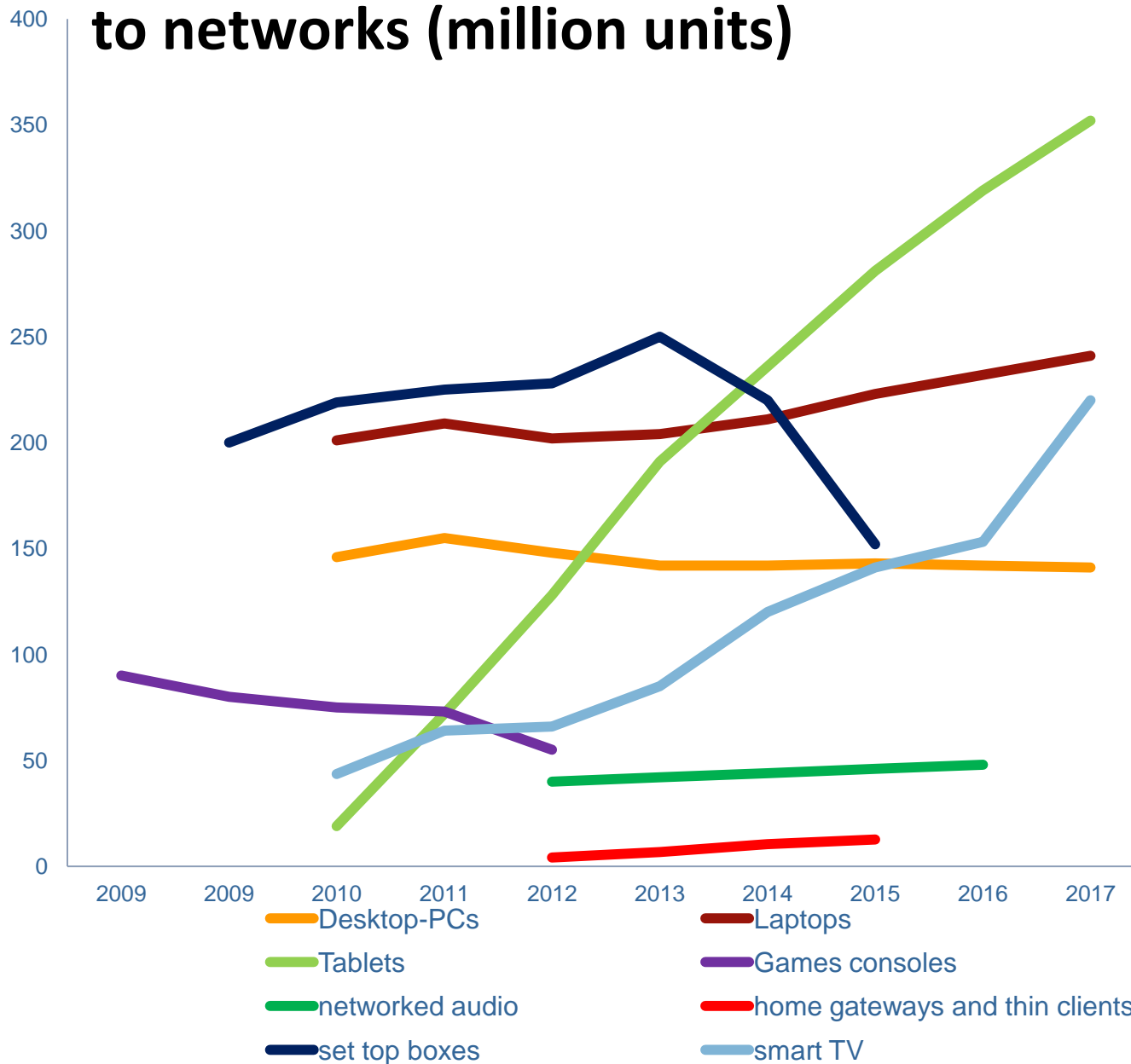
Smart coffee table

Businesses are networked

Communications

- Server and broadband systems,
- Cloud data storage
- Smart phones, tablets…
- WIFI, GPS

Smart grids and meters

Internet TV online entertainment gaming and movies…

Increasing network connectivity

Control

Building management systems, SCADA, Smart sensors, Logistics management , Traffic controls, condition monitoring…

Media

TVs, radio, audio, computing, Imaging equipment, gaming…

Integrated home networks Home gateways, lighting controls, smart appliances, NEST, Green button…

Smart TV, Internet and video displays in appliances

Appliances

Whiteware, lighting, kitchen appliances, health products, power tools,

Networked homes already exist

Sales and forecasts of products that can connect to networks (million units)

Legend:
- Desktop-PCs
- Laptops
- Tablets
- Games consoles
- networked audio
- home gateways and thin clients
- set top boxes
- smart TV

© OECD/IEA 2010

On (in use or active) mode → **Performing tasks**

Low power modes with network connectivity →
- **Establishing a link**
- **Sending/receiving information**
- **Checking Activation requirement**

Network standby
- Getting products to power down
- Reducing energy consumption in low power modes with network connectivity

Active Standby(or idle) mode → **Awaiting further instruction**

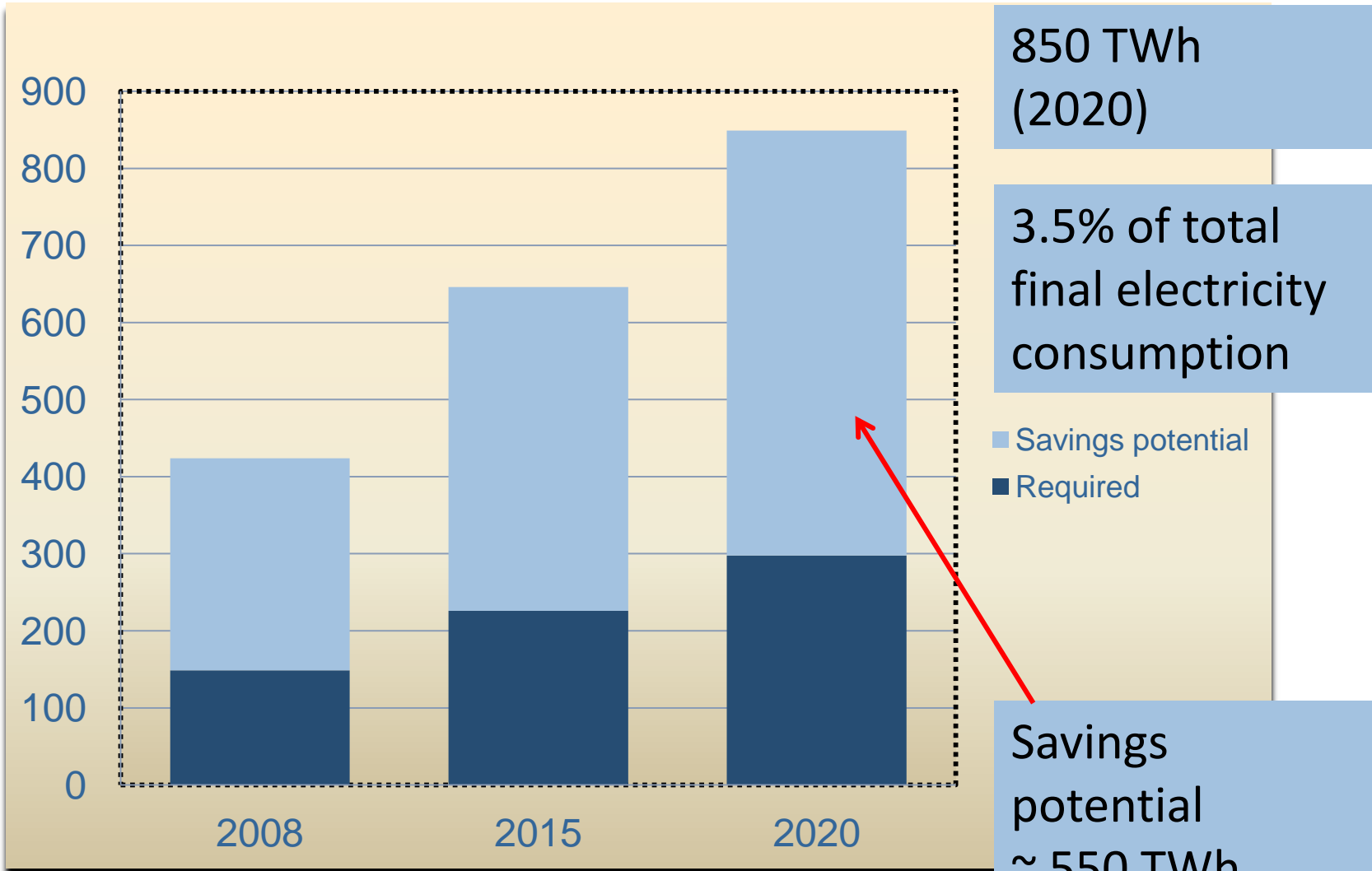**Passive Standby (or sleep) mode** → **Asleep, ready for reactivation**

Off mode → **No tasks undertaken**

Global estimated savings potentials (TWh)*

850 TWh (2020)

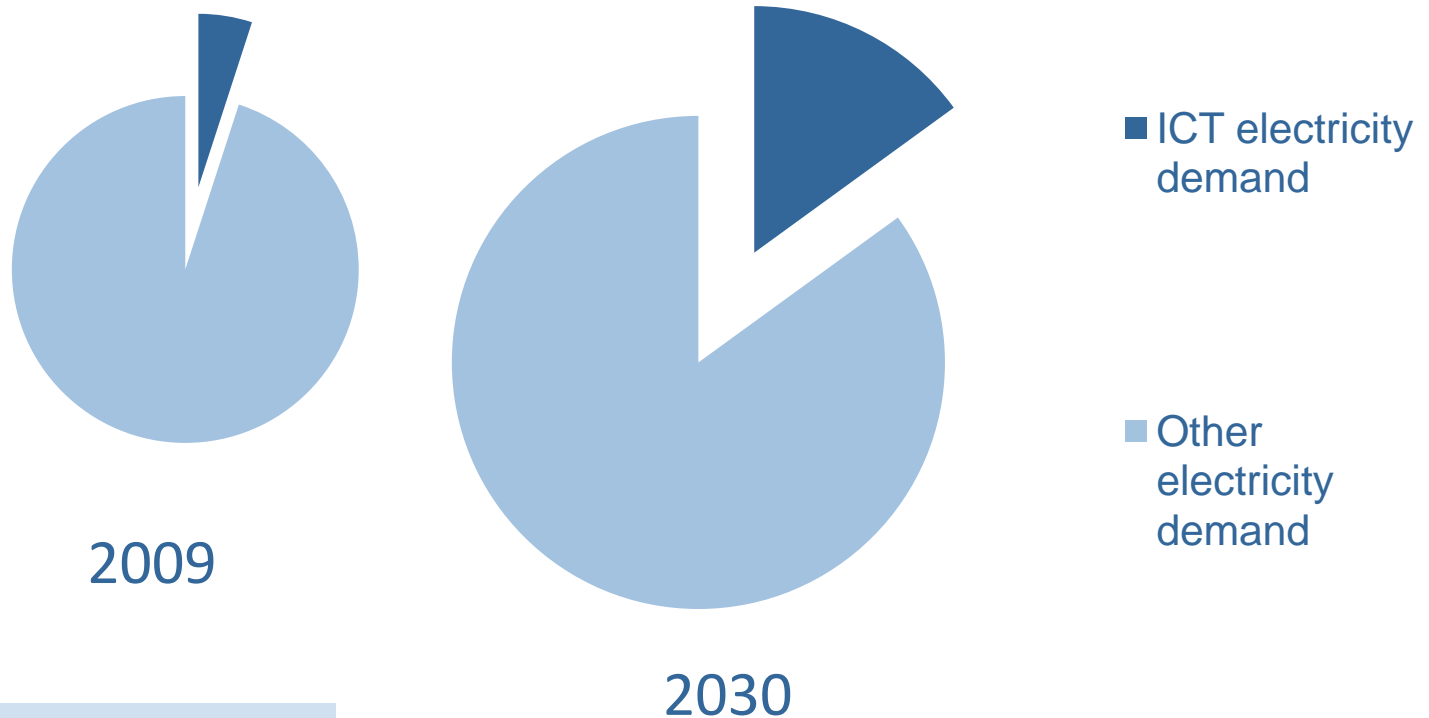3.5% of total final electricity consumption

Savings potential
Required

Savings potential ~ 550 TWh (2020)

Source: Bio Intelligence Service, 2011 *residential/commercial network connected products

ICT energy demand is increasing

2009

2030

ICT electricity demand

Other electricity demand
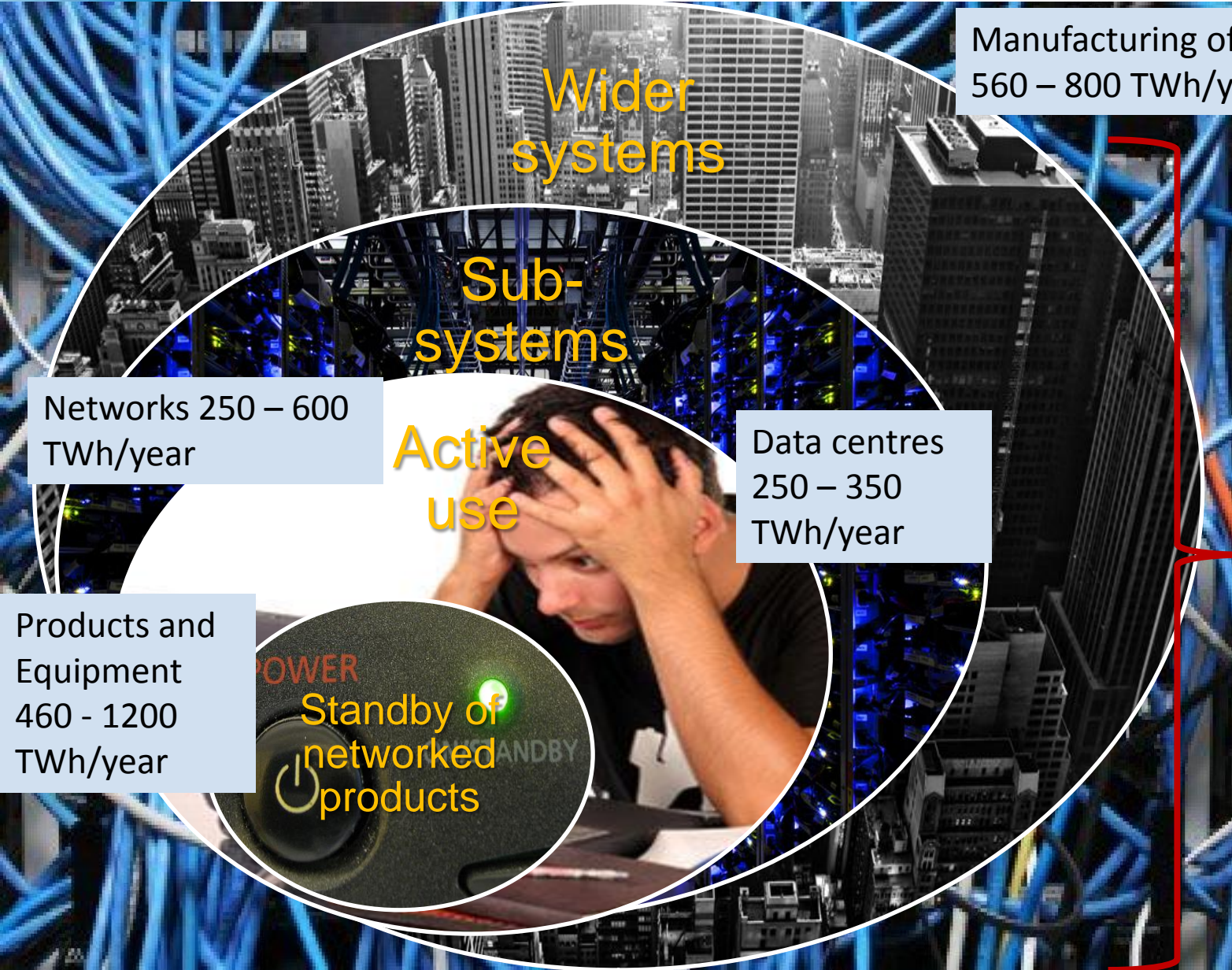
Globally nearing 10% today – could be 17% by 2020

Or could grow at an even faster rate….

Need for energy efficiency from standby to systems

Wider systems

Sub-systems

Active use

Standby of networked products

Manufacturing of ICT 560 – 800 TWh/year

Networks 250 – 600 TWh/year

Data centres 250 – 350 TWh/year

Products and Equipment 460 - 1200 TWh/year

More than 10% of global total final electricity consumption 1100 – 2800 TWh/year

More than 17% of global total final electricity consumption 2020 …

Recommendations

- **Develop and implement policies (building on existing initiatives/approaches or aligning where possible)**
  - Utilise and scale up existing fora for knowledge exchange
- **Ensure a robust technical foundation**
  - Data collection strategy
  - Support greening communication protocols
  - Support development of <u>international</u> test procedures
- **Work towards promoting energy efficiency throughout network connected systems**
- **Through vigilance and concerted positions – be in a position to utilise energy efficiency opportunities**