



Modernising energy efficiency through digitalisation

Brian Motherway, Head of Energy Efficiency

 *#energyefficientworld*

Digitalization trends are truly astounding

KB kilobyte 10^3 bytes
MB megabyte 10^6 bytes
GB gigabyte 10^9 bytes
TB terabyte 10^{12} bytes
PB petabyte 10^{15} bytes
EB exabyte 10^{18} bytes
ZB zettabyte 10^{21} bytes
YB yottabyte 10^{24} bytes

1987
2 TB

1997
60 PB

2007
54 EB

2017
1.1 ZB

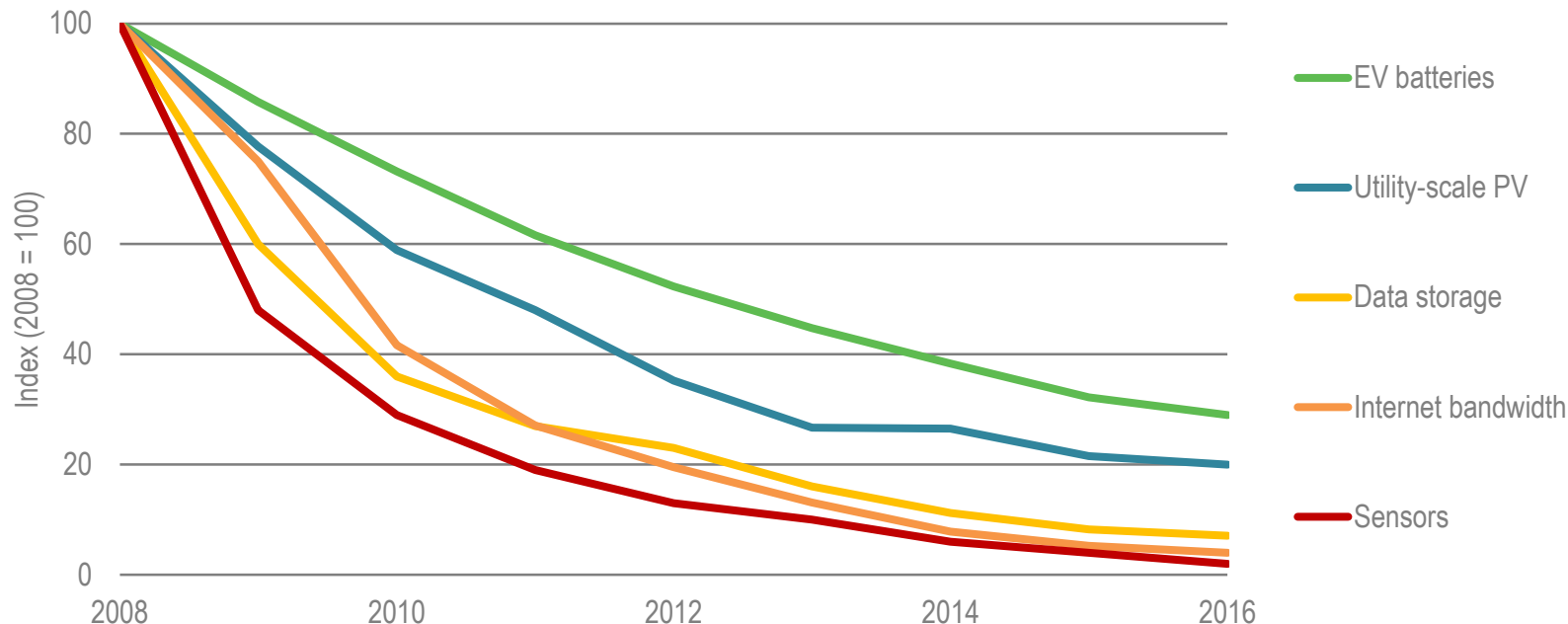
Annual internet data traffic

Sources: Cisco (2017). *The Zettabyte Era: Trends and Analysis* June 2017; Cisco (2015). *The History and Future of Internet Traffic*.

Internet data traffic is growing exponentially, tripling over the past five years

Cost declines are driving digital trends

Cost declines in new energy systems and digital technologies, 2008-16

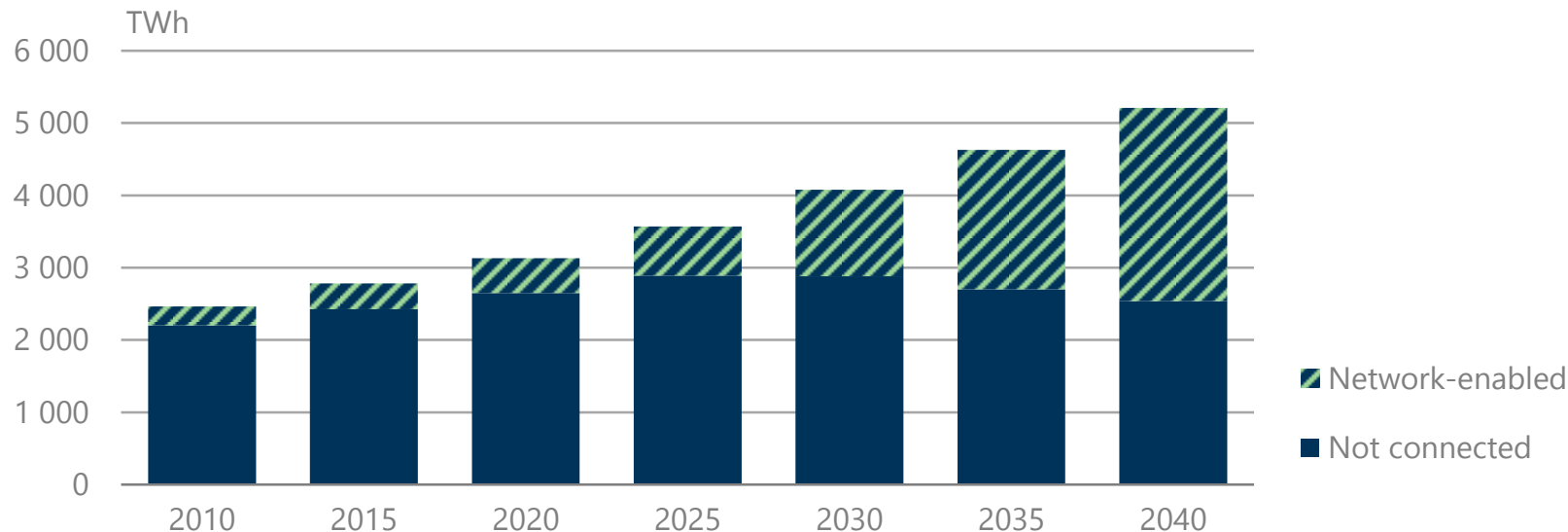


Sources: Based on BNEF (2017), Utilities, Smart Thermostats and the Connected Home Opportunity; Holdowsky et al. (2015), Inside the Internet of Things; IEA (2017), Renewables; Tracking Clean Energy Progress; World Energy Investment; Navigant Research (2017), Market data: Demand Response. Global Capacity, Sites, Spending and Revenue Forecasts.

Since 2008, data collection, storage, and transmission costs have declined by over 90%

Growing number of appliances connected to a network

Global household electricity consumption of appliances and other small plug loads

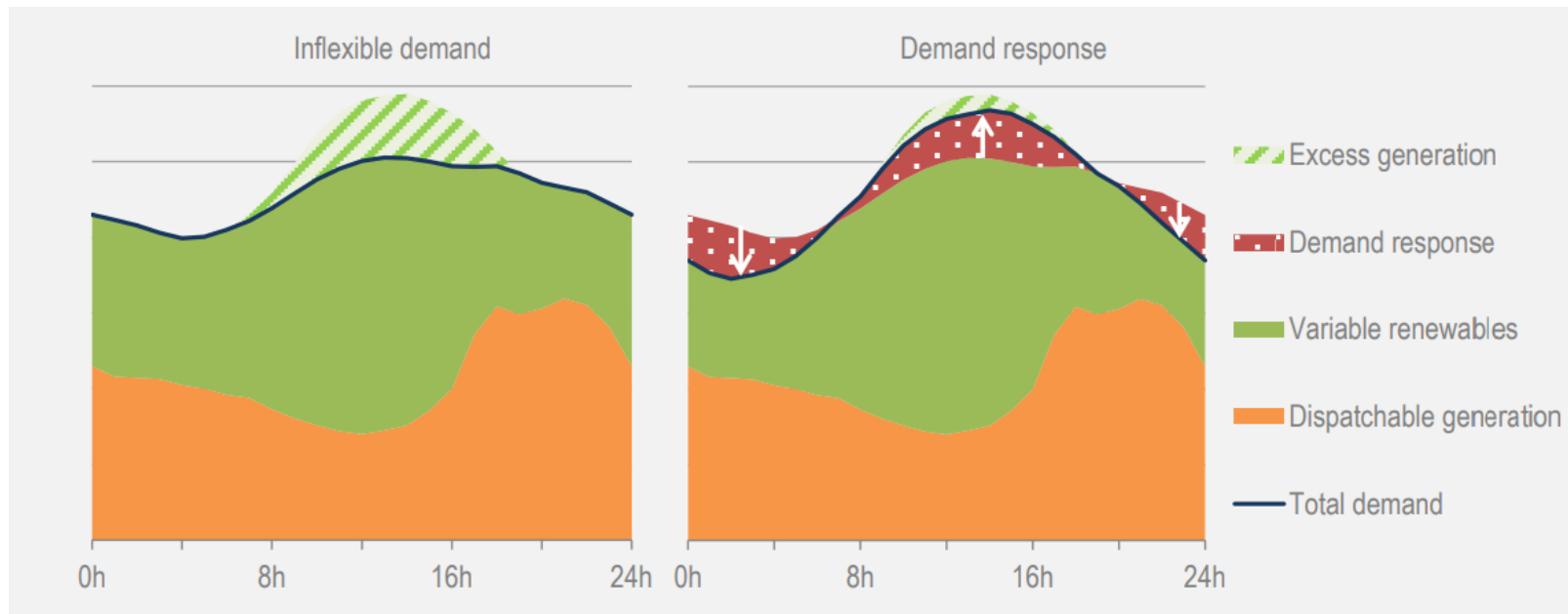


The growth in network-enabled devices presents opportunities for smart demand response but also increases needs for standby power

- Enhancing end-use efficiency
 - Greater control and optimisation
 - New business models
 - Enabling behaviour change
- Enhancing system efficiency
 - Optimal use of infrastructure
 - Integrating variable renewables
 - More precise valuation of efficiency resources

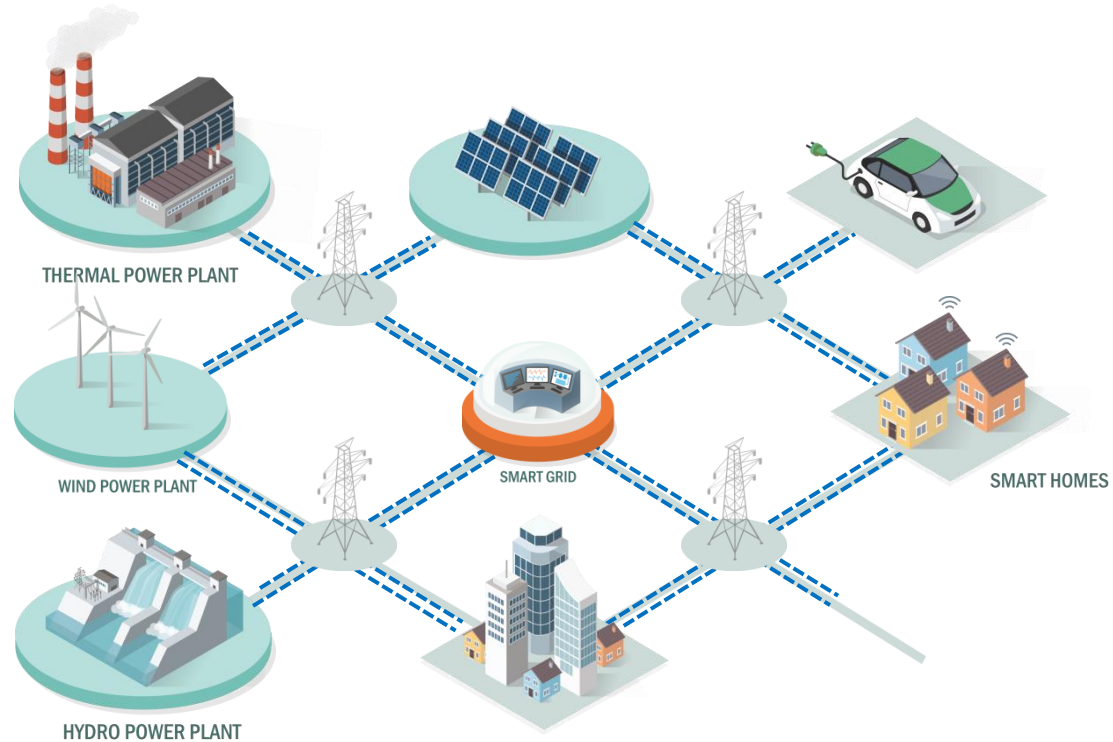


Providing system flexibility from the demand side

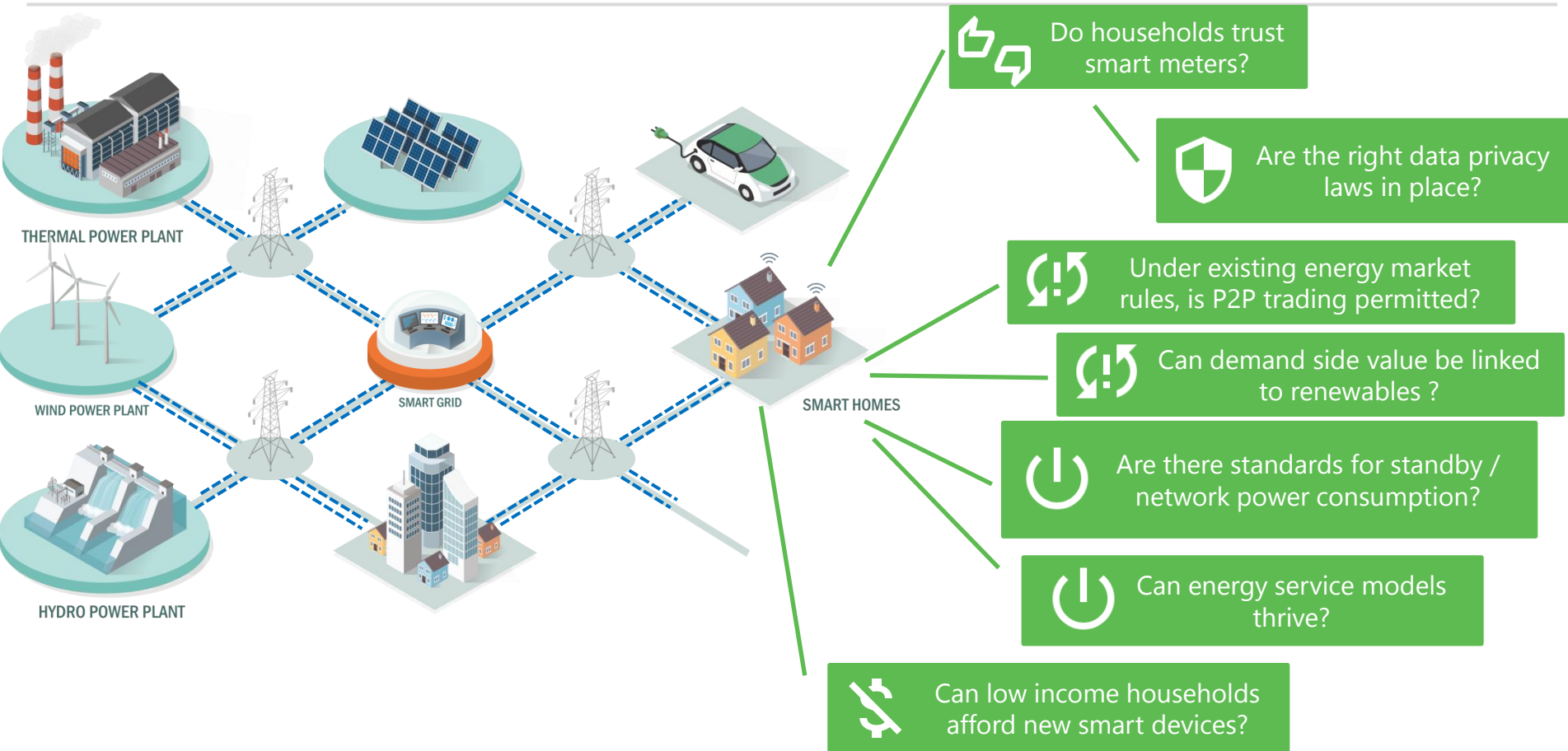


Demand response programs – in buildings, industry and transport - could provide 185 GW of flexibility, and avoid USD 270 billion of investment in new electricity infrastructure.

Smart and interconnected users and systems



Case study: Policies to support smart homes



Skills and
expertise

Access to
data

Innovation

Trust and
social equity

Experiment

Market
openness

Infrastructure

Cross-govt
collaboration

- **Engagement activities**

- Webinars (Quarterly)
- Today's workshop

- **Resource library**

- New online knowledge resource to be launched in June as part of our Global Exchange Platform www.iea.org/topics/energyefficiency/

- **Analysis**

- Quantifying efficiency opportunities through digitalization
- Developing the concept of policy readiness

- Two day event that will bring together Ministers, CEOs, the heads of international organisations and other leaders
- Opened by Irish Prime Minister Mr Leo Varadkar



- Focus on the impact of digitalisation on energy efficiency and opportunities for policy making
- Confirmed speakers include Energy Ministers from Ireland and Luxembourg and the CEOs of Enel X, Saint-Gobain, Siemens and BP Alternative Energy



www.iea.org



#energyefficientworld