Enhancing IEA Efforts on Digitalization

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5 April 2017 – IEA Digitalization and Energy Workshop

Context

- **What do we mean by "digitalization and energy"?**
  - Convergence of ICT and energy; blurring the digital / physical divide

- **Growing pervasiveness of digitalization** across the energy sector
  - **Utilities** – investment in digital grid of US $500b over the next 5-7 years
    [EY (2016). Digital grid: powering the future of utilities]
  - **Oil & Gas** – by 2050, digital technologies could help to increase production by 4% and reduce costs by 13%
    [BP (2015). Technology Outlook]

- **Digital companies' increasing interest in energy**
  - Cumulative **renewable energy purchases** to date exceeds 5 GW
    [cumulative corporate renewable energy purchasing to Nov 2016 for Google, Amazon, Microsoft, Facebook, and Apple in the US, Europe, and Mexico; BNEF data]

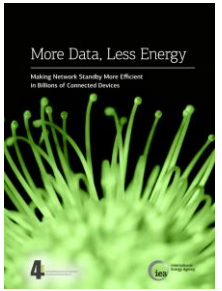
- **Energy use increasingly shaped by digital enablers**
  - **Data centers** alone account for about 2% of global electricity use [IEA (2014). More Data, Less Energy; Van Heddeghem et al. (2014)]
  - **Stand-by consumption** of IoT devices expected to grow to 46 TWh by 2025 [IEA 4E TCP (2016). Energy Efficiency and the Internet of Things]
  - Emergent use of smart devices **to better match supply and demand**

General consensus that digitalization could disrupt significant parts of the energy sector

Past IEA Efforts on Digitalization and Energy

- **Digitalization focus across IEA work streams for many years**
  - Efficiency, system integration, outlooks, sustainability, transportation, industry, buildings, investment, data and statistics, electricity, oil and gas, renewables, technology
  - Growing interest for IEA Secretariat to focus more on digitalization by IEA Members, company partners, etc.

- **Past efforts** include:
  - *Impact of Smart Grid Technologies on Peak Load to 2050* (2011)
  - *More Data, Less Energy* (2014)
  - *Technology Roadmap: How2Guide for Smart Grids in Distribution Networks* (2015)



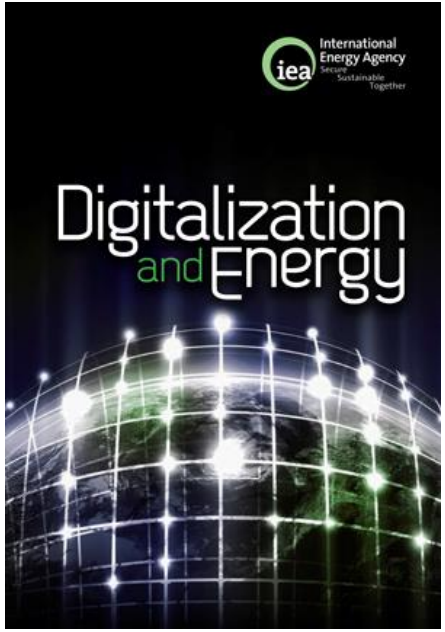
- While interest on digitalization is wide, **current understanding** of the scale and scope of potential impacts **is limited**, particularly *quantitative and analytically-rigorous assessments*

- **Cross-IEA Digitalization & Energy Working Group** consisting of multiple IEA divisions; several new and enhanced streams of work

2017 IEA Digitalization and Energy Report

An assessment of the implications of digitalization on the energy sector, bringing together new quantitative assessments, qualitative insights, and analysis of policy implications

- **The current state of interlinkage between energy and digital**
  - Investment flows: digital investment in the energy sector and investment by digital companies in energy
  - Assessment of digital readiness across the energy sector
- **Impact of digital economy on energy demand**
  - Past trends and outlook for electricity demand by digitalization
  - Assessment of digitally-enabled impact of energy demand in industry, transport, and buildings
- **Impact on energy supply – primary focus on the power sector**
  - Asset performance improvement and related avoided investment in physical infrastructure
  - Smart energy systems, flexibility, and demand response
  - Digital optimization in upstream oil and gas operation
- **New business models and markets**
  - Facilitating emerging business models to capture value and opportunities
- **Challenges and opportunities for policy-makers**
  - Data ownership, privacy, regulatory frameworks, digital resilience, economic disruption
  - No-regrets policy recommendations



Key Milestones

IEA Working Group

[2016]

Expert consultations

- Brussels; Silicon Valley,
- Energy Advisors
-EBC, RIAB, Development workshop, annual stats meeting
- CEM8 Beijing (6-8 Jun)

5 April Workshop

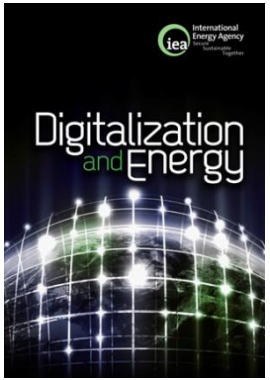
+ 6 April deep-dive sessions

Publication

[Mid-October]

IEA Ministerial

[7-8 November]



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