The energy transition: from now to next

Mechthild Wörsdörfer, Director, Sustainability, Technology and Outlooks
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Global energy demand grew by 2.3% in 2018, the fastest pace this decade, driven by a robust global economy, unseasonal weather, and moderate energy prices.
Energy-related CO₂ emissions hit a record high…

Higher demand for fossil fuels drove up global CO₂ emissions for a second year after a brief hiatus. Increases in efficiency, renewables, coal-to-gas switching and nuclear avoided 640 Mt of CO₂ emissions.
Achieving sustainability requires many solutions

Global CO₂ emissions in the New Policies and Sustainable Development Scenarios

Energy efficiency and renewables contribute the most to realising the emissions pathway of the Sustainable Development Scenario, also assisting air quality & energy access goals.
Digitalization is impacting all energy demand and supply sectors...

Digital technologies can help improve safety, productivity, and efficiency of energy systems
Pre-digital energy systems are defined by unidirectional flows and distinct roles.
Pre-digital energy systems are defined by unidirectional flows and distinct roles; digital technologies enable a multi-directional and highly integrated energy system.
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.

1 billion households and 11 billion smart appliances could actively participate in interconnected electricity systems.
EVs smart charging would provide further flexibility to the grid, saving between USD 100-280 billion investment in new electricity infrastructure.
Digitalization can help integrate variable renewables by enabling grids to better match energy demand to times when the sun is shining and the wind is blowing.
Digitalization can facilitate the deployment of residential solar PV and storage, making it easier to store and sell surplus electricity to the grid or locally.

Blockchain could help to facilitate peer-to-peer electricity trade within local energy communities.
Digitalisation ‘modernizes’ energy efficiency

Digitalisation can help energy efficiency play a more active role in electricity grids, by improving the ability to accurately measure energy savings and understand where and when efficiency is delivered.
Power system security remains a priority

Cybersecurity in a digital power system

- Reinforce grid resilience through technical standards
- Improve monitoring and control systems to detect intrusions
- Improving the system's capability of response and recovery
- Ensuring operational security in grid connected assets
- Improving resilience of IoT devices

Digitalisation has to come hand in hand with cybersecurity to maintain system reliability
Cybersecurity will be a focus area of the IEA's upcoming Electricity Security report