Renewables in the clean energy transition

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Key messages

• The future of energy systems will be flexibility
• Flexibility solutions will be widespread by combining innovations
• Long-term scenarios can better support decision making
Ongoing Energy Transformation: Drivers

• **Policy imperatives**
  • Sustainable Development and Economic Growth (SDGs)
  • Climate and Environmental agenda (Paris Agreement)

94% of needed emission reductions from RE and EE

• **RE Strong Business case**
  • Policy frameworks, business and technology innovation
  • Dramatic cost reduction

Source: IRENA (2018), Global Energy Transformation: Roadmap to 2050
Increasing role of power sector in the decarbonized world

The share of electricity in the final energy demand reaches to 45% by 2050

Solar PV + wind 60% in 2050
Flexibility needs to be harnessed in all sectors

Source: Power System Flexibility for the Energy Transition, IRENA, 2018
Flexibility needs to be harnessed in all sectors

Source: Power System Flexibility for the Energy Transition, IRENA, 2018
Example of a new opportunity: Re-electrification

Source: IRENA and SGCC (2019), Electrification with Renewables
Changes surrounding the energy sector

Source: IRENA (2019), Innovation landscape for a renewable-powered future: Solutions to integrate variable renewables
Systemic innovation approach for the energy transition

- Value spatial complementarities - interconnections
- Encourage Flexibility
- Decentralized system
- Electrification of other sectors
- Value complementarities in VRE
- System Operation
- Enabling Infrastructure
- Market regulation
- Business Models
- RE Tech.
- Electric Vehicles
- Storage
- Blockchain
- Digitalization - IoT
- Aggregators- VPP
- Platform business model
Long-term Energy Scenarios (LTES) for the Clean Energy Transition campaign was launched in 2018 May

LTES Campaign is to be supplemented by IRENA’s global platform - Energy Transition Scenarios Network (ETS-Net) to be launched in April 2019 at the LTES International Forum in Berlin
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• The future of energy systems will be **flexibility**
• Flexibility solutions will be widespread by **combining innovations**
• **Long-term scenarios** can better support decision making