Deep-dive Session 6
Advancing the frontiers of reliability and quality

IRENA INNOVATION WEEK

The Age of Renewable Power

11 – 13 MAY 2016 • BONN, GERMANY
The case for quality control

Doubling RE share by 2030 will need annual investments to rise from USD 360 billion in 2015 to **USD 1.3 trillion** by 2030.
Nurturing rapidly growing RE markets

Which instruments do we have to mitigate technical risk, attract investment and public acceptance, and meet expectations by all stakeholders in a USD trillion market?

International standards and conformity assessment scheme

- Consumer protection
- Build trust with financial services
- Enable promotion of RET

- Nurture emerging markets
- Enable technology promotion
- Reduce trade barriers
- Attract new businesses

- Improve product design
- Improve manufacturing

IRENA “Quality Infrastructure for Small Scale RET”
IRENA activities in Standards and Quality for RET

Available
- Policy guidelines to implement quality infrastructure
- Analysis on quality control for Solar thermal in residential sector and Small wind turbines
- Advisory services to the Latin American Region on solar thermal and China on small wind
- Launch INSPIRE platform

2016-2017
- Grid connection codes
- Quality control guidelines for PV systems
- Standardisation for smart grids
- Continue regional and country support to implement quality control for renewables – China offshore wind, LAC solar thermal, Africa PV systems (VCs needed)
- Strengthen partnership with: ISO, IEC, PTB, UNIDO, WWEA and industry
Standards and Technical Regulations for Integration of VRE in Electricity Grids

New IRENA report released today

- Collects good practices and lessons learnt from different countries in developing grid codes
- Provides clear guidelines for countries, with ambitious targets for VRE, on how to design and implement a grid connection code considering local conditions and policy targets
Challenges of VRE grid integration

- Time-dependent availability
- Generation geographically and voltage level non-centralized but distributed (DG)
- New technology features, non-synchronous generators and power electronic converters
Implementation of grid connection codes

Technical requirement

- Protection
- Power quality
- Power reduction at overfrequency

Low VRE shares

- Communication
- Adjustable reactive power
- Constraining active power

Higher VRE shares

- LVRT - current contribution
- Simulation models

Very high VRE shares

- Active power gradient limitation
- Reduced output operation mode
- Synthetic inertia

Prioritisation of technical requirements according to VRE share

Country cases

IRELAND

- High share of wind power and limited interconnections → focus on frequency control requirements

GERMANY

- Significant penetration of PV systems in low-voltage networks → reactive power capabilities in distribution systems

AUSTRALIA

- National sub-systems → different requirements within the country
Key messages

- Grid codes collect and enforce appropriate solutions to the challenges of integrating VRE in grids
- Grid codes interlink technology, operation and policy
- Grid codes bring all stakeholders of power systems together, creating a power sector play field
- Consideration of local conditions is crucial

Download the report for free at: www.irena.org/Publications
Thank you

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