

»» Integrating Renewables in Centralised Electricity Systems

Marrakech (COP22) – 15 November 2016
GIZ Side Event on Renewables Integration

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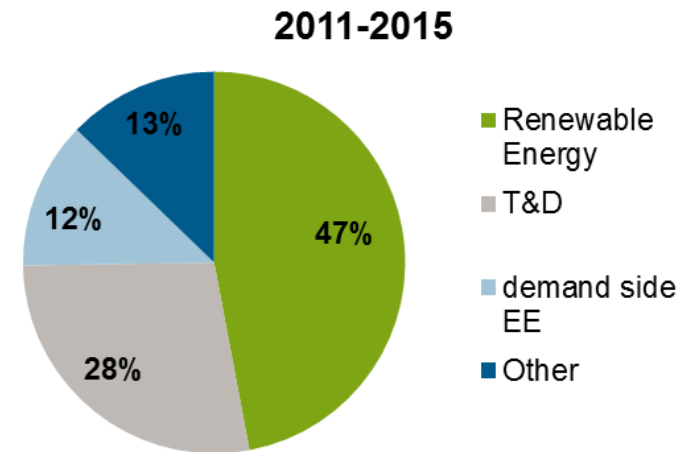
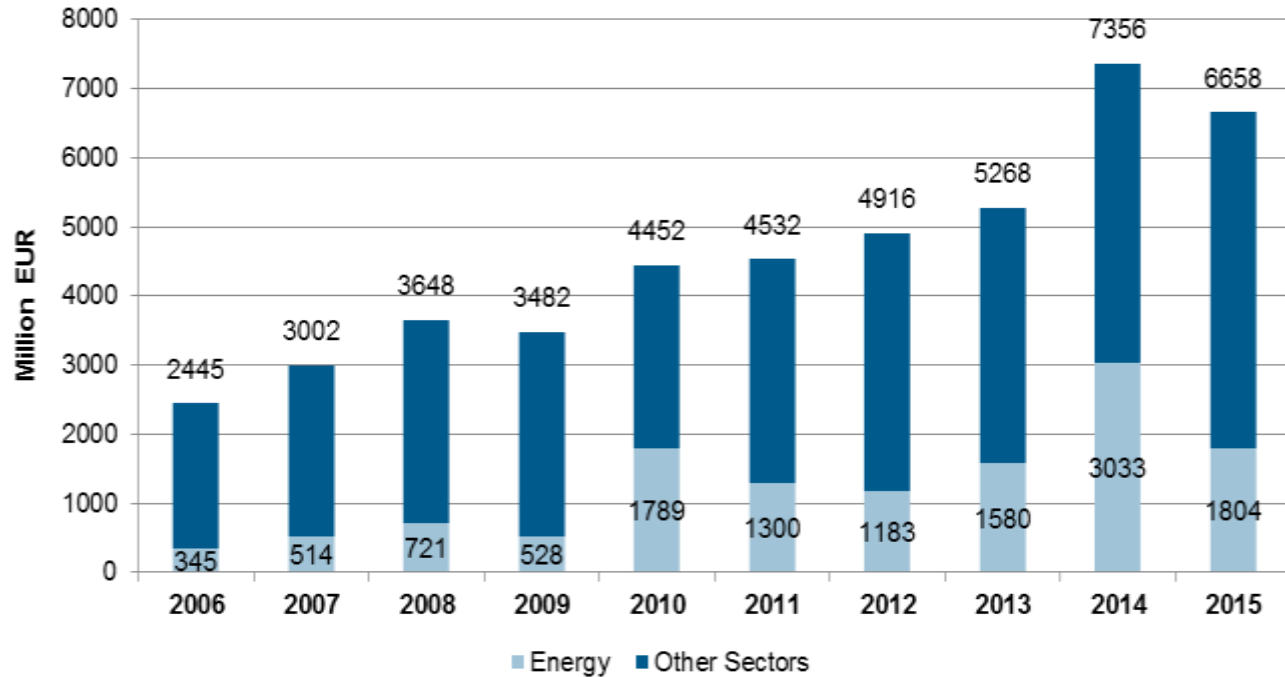
KfW, Climate and Energy Policy Unit, Frankfurt (Germany)

Bank aus Verantwortung

The logo for KfW, consisting of the letters 'KFW' in a bold, blue, sans-serif font.

»» KfW Development Bank and the Energy Sector

Energy is our most important business sector with renewables and grids at the core



»» Promoting Renewable Energy (I)

Integration of variable renewable energy (vRE)

- › **Decreasing RE technology costs** provides opportunity for rapid and massive scaling-up
- › **Challenge: System integration** - ensuring reliable & affordable/competitive energy systems
- › Examples for work of KfW Development Bank:
 - › Green Energy Corridors in India: 6,500 km **new power lines to evacuation vRE** and 80 substations will be built or renewed
 - › Integration of Albania (highly dependent on hydro power) into the power network of SEE: **Cross-border transmission lines** with three neighbor countries
 - › Morocco - **technological diversification** and thermal **storage**
 - › KfW supports the GoM to reach its target to increase the installed solar / hydro / wind capacity to 2,000 MW each in 2020
 - › CSP with thermal storage provides electricity during the evening peak

»» Promoting Renewable Energy (II)

Selected Innovative Programmatic Approaches

› **Policy based lending (PBL)**

- › Output based instrument using concessional loans at scale to target multiple targets
- › KfW experience: the “Sustainable and Inclusive Energy Program” (SIEP) with Indonesia in cooperation with ADB, WB and AFD; PBL with Vietnam under preparation

› **GET FiT (Global Energy Transfer Feed-in Tariffs)**

- › Compensation of incremental costs for innovate climate friendly RE technologies
- › Also crucial: development of standardized PPA and access to finance
- › Successful in Uganda, programs under preparation in Zambia, Namibia und Mozambique

› **Risk Mitigation**

- › Insufficient capital markets might hamper RE investment even in case of economic viability
- › Example: the finance vehicle **FIRST** will provide first loss loans for small RE projects in South Africa to mobilize capital from local banks and to create a new market segment
- › More examples: **GRMF / GDF**

»» Energy Supply Uruguay (I)

Modern Gas and Steam Power Plant

Context

- › Rising demand for electricity
- › Further expansion of hydropower not possible
- › Strong expansion of wind energy planned
- › At the same time, reliable energy supply needed (Back-up for RE)

Approach

- › Support for the construction of a modern gas and steam power plant (510 MW)
- › Higher effectiveness than other thermal power plants



KfW-Bildarchiv

»» Energy Supply Uruguay (II)

Modern Gas and Steam Power Plant

Impacts

- › Compensation of volatile RE, less expensive electricity imports
- › Higher energy efficiency on demand side
- › Thermal energy generation lower in CO₂-intensity
- › Sustainable economic growth through secure energy supply

Contribution of KfW Development Bank

- › Total costs: USD 540 million
KfW funds: USD 70 mil. promotional loan



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»» Green Energy Corridor India (I)

New Pathways for Renewable Energy

Context

- › Increasing electricity demand
- › Third biggest CO₂-emitter
- › 25% of the population without access to electricity
- › Until 2020: Share RE from 12% to 15%

Approach

- › Construction of new substations, power lines and transmission lines
- › Transmission of RE – so called „Green Corridors“
- › Geographic Concentration of RE-generation: 80 % in seven of 29 federal states



KfW / Walter Klotz

»» Green Energy Corridor India (II)

New Pathways for Renewable Energy

Impact

- › Support of RE extension in India
- › Climate protection
- › More than 6,500 kilometer new power lines
- › More than 80 substations built or renewed
- › Covers annual consumption of 11 million Indians

Contribution of KfW Development Bank

- › KfW-funds: 988 million EUR
- › With Indian power company „Powergrid“ and regional suppliers



KfW / Walter Klotz

»» Personal Outlook

Stop Telling Stories - Get Serious About Renewables

- If countries are serious about renewables – international support needs to be serious
- Affordability and reliability: integrated modern economies continue to need grid infrastructure
- Make full use of available technology options including:
 - Large scale renewables (solar, wind, hydro, geothermal and biomass)
 - Combined cycle gas power plants
 - Pumped storage
 - Grid expansion, modernization and interconnectors
- Compliance with international environmental and social standards essential
- In need: good policies, sound engineering and robust business models