Importance of Financing & Public Private Partnerships for Securing Energy Services in Rural Areas of ESCWA Region

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1- Introduction
2- Characteristics of Energy Sector in ESCWA MCs
3- Energy poverty & insecurity: Barrier to achieving the MDGs
4- Public-Private Partnerships (PPPs): a viable financing mechanism
5- Case studies in PPREPs: Egypt, Saudi Arabia, Tunisia & Morocco
6- Concluding remarks
1- Introduction

Pollution Emission & Climate Change

- Source of
- Storage of
- Availability of
- Access to
- Security of Supply of

ENERGY

- Conversion & use
- Feasibility
- Efficiency
- Cost

For Social & Economic Development

Why Public – Private Partnership is needed for Renewable Energy Projects in Rural Areas in the ESCWA Region?
Members:
Bahrain       Oman
Egypt          Qatar
Iraq             Saudi Arabia
Jordan         Sudan
Kuwait        Syrian Arab Republic
Lebanon      Tunisia
Libya           United Arab Emirates
Morocco     Yemen
Palestine

Map no. 3978 Rev.12  UNITED NATIONS
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Note: The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.
2- Characteristics of Energy Sector in ESCWA MCs

Sources of Energy Supply

ESCWA

Sources of Energy Supply

World

- Coal and Peat: 0.7%
- Oil: 52.9%
- Natural Gas: 42.6%
- Nuclear: 0.0%
- Hydro: 0.4%
- Renewable Energy (other than hydro): 2.9%
- Electricity: 0.2%
- Coal and Peat: 0.7%

- Oil & Gas Exports Represent more than 65 % (to 90%) from total exports for GCC Countries & Yemen, Iraq & Sudan.
- Population growth with average annual growth rate 3.0% (world average = 2.73%) further pressure on E resources.
- Electricity Tariffs and Oil & Gas Products are subsidized.
- Main primary Energy Consumer: Electricity Sector (96% from Oil & Gas evenly distributed) # 40%.
- Emissions: 40% from Electricity Sector.

<table>
<thead>
<tr>
<th>Proven Reserves from Total World (%)</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>2006</td>
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<tr>
<td>-------</td>
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<tr>
<td>Gas</td>
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<tr>
<td>Total Arab Countries</td>
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<tr>
<td>Total ESCWA MCs</td>
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</tbody>
</table>
Most of ESCWA MC’s are oil and gas producers, Lebanon, Morocco, Jordan and Palestine are importers

Primary E consumption: 2585 koe/capita, (Sudan 219, Yemen 330, Saudi Arabia 5244, Kuwait 6940, UAE 8977, Qatar 19342) (2010)

Average electricity consumption (2011): 4081KWh/capita, (Yemen 216, Sudan 274, Saudi Arabia 8770, UAE 9740, Kuwait 15540, Qatar 16696)

CO₂ emissions: top countries in the world in Tons of CO₂ emitted/ capita in 2008: Qatar (5.4), Kuwait (26.3), the UAE (35) & Bahrain (29). Other ESCWA countries emitted lower than world average. The Average in ESCWA region is 4.5 T/Capita/year the same average per capita for the world, compared with USA average per capita which is >20 T/Capita/year.

E consumption is disproportionate across the region & positively correlated to GDP (2 LDCs Yemen and Sudan)

Largest electrical E consumer in 2011: residential sector (44.8%)
Electricity consumption (%) in ESCWA Region by economic sector (2011)

- Industrial: 45%
- Residential: 18%
- Commercial: 16%
- Other: 22%

Heavy reliance on fossil fuels & focus on centralised power generation & grid extension

- Challenge for oil-exporting & -importing countries alike: Diversification & security of E resources/ Dwindling reserves / Dependence on imported fuel / Sensitivity to E prices volatility

- Key solution: E mix.

High oil subsidies mask the real cost of fossil fuels → market distortions, restrain E sector reform & generate economic losses in public budgets

- Urgent need to integrate sustainable E strategies within national development policies.

Low electrification rate in some parts (Sudan & Yemen) → delays the provision of social & public services → obstructs the economic & social development

- Urgent need to enhance E access in rural & remote areas
## 2- Characteristics of Energy Sector in ESCWA MCs (Cont’d)

### Electrification rate (%) in ESCWA Region

<table>
<thead>
<tr>
<th>Country</th>
<th>Electrification rate at the rural level</th>
<th>Electrification rate at the National level</th>
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<tbody>
<tr>
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<td>98%</td>
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<td>Egypt</td>
<td>86%</td>
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<td>73%</td>
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<td>Kuwait</td>
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<td>KSA</td>
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<td>100%</td>
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<tr>
<td>Sudan</td>
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<tr>
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<td>Tunisia</td>
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<td>UAE</td>
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<tr>
<td>Yemen</td>
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<td>100%</td>
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</tbody>
</table>

**Source:** IEA, *World Energy Outlook 2011*
2- Characteristics of Energy Sector in ESCWA MCs (Cont’d)

Total Electricity Generation 2011-2020

Total Energy Generated 2011 (thousand Gegawatt hour)
Total Energy Generated 2020 (thousand Gegawatt hour)
Impacts of Climate Change on Energy sector

1. Increased need for Air Conditioning

2. Decreased Capacity & Efficiency of Electricity Generation Equipment

3. Increase need for cooling & decreased current in cables

4. Sea Level Rise (SLR) : Cooling Systems ; Oil & gas extraction Platforms

5. Increase Need for Energy to produce water
Energy for water

- Already Water Stressed region

- CC aggravate water shortages and therefore:

1. Desalination
2. Water Treatment

Pressure on Water Resources

Energy Needs Increase
Impacts of Climate Change on Energy sector

Where do we go??

Climate change

More CO₂ Emissions

More Energy Consumption (fossil fuel?)

Energy Consumption (fossil fuel)

CO₂ Emissions Change

Climate for

Needs

AC Refrigeration

Desalination +

Less Efficiency
2- Characteristics of Energy Sector in ESCWA MCs (Cont’d)

**Electricity Sector**

- Import by ESCWA Region from Europe (Spain of Turkey) and Iran: around 2400 GWh
- Deficit in generation in Iraq, Lebanon, Jordan…
- Previsions 2011 – 2020
  - 115% increase in Electrical Energy
  - 91% increase Peak Electricity Demand
- Investment for the period until 2020
  - 45 GW for Electricity Generation from RE
    ➔ around **150 billions** US$
  - 155 GW Conventional Electricity Generation (new power plants) with grid expansion.
    ➔ around **300 billions** US$
  - Replacement of 33% of the existing power plants (55 GW)
    ➔ around **50 billions** US$

**500 billions** US$ More than **50 billions** US$/year

Sources of Financing
- Governments
- International & Regional Funds
- Private Sector
- …. 
- CDM
- **Public Private Partnerships**
Specific Energy Problems in ESCWA Countries

- **Energy Accessibility** about 36 million people (mainly in Sudan and Yemen) in the ESCWA countries (12%), mostly in rural areas, have no access to appropriate energy services especially electricity; a further of 45 million (mainly in Iraq, Lebanon) (15 percent) are severely undersupplied.

- **Poverty** is a serious problem in several Arab countries and there is an urgent need for increasing energy accessibility to the poor to mitigate energy and human poverty.

- **The Subsidized** electricity tariffs and oil-gas prices is the main constraint which is facing the deployment of EE and RE applications.

- **The impacts of Climate change in Energy Sector**

- **There are needs for**: - Awareness raising & Capacity Building
  - Institutional Framework
  - Technology transfer
  - Investment for Electricity Sector/gas and oil sectors
  - Promoting Public Private Partnership
3. Energy poverty & insecurity: Barrier to achieving the MDGs

- None of the MDGs tackles Energy. YET their achievement needs accessible, affordable & reliable E provision. E at the heart of social development:
  - Enhances education by allowing for study beyond daylight hours
  - Improves healthcare by providing safe drinking water, lighting & storage of vaccines and medications
  - Contributes to improvement of information & telecommunications
  - Fosters increased productivity → creates jobs & generates income
  - E poverty engenders social disorder → jeopardises national security

- Population in developing countries is more rural than urban → 55% of total population & 4/5 households in rural areas work the farm. YET, a large rural population is moving away from agricultural opportunities
  - Challenges:
    Makes farming more productive, more commercially viable & better marketable (climate change & resource scarcity & degradation)
    Creates new opportunities in rural areas (multi-sectoral approach)
3. Energy Poverty & Insecurity: Barrier to Achieving the MDGs Contd.

Environmental performance index of Arab Countries (0-100)
3. Energy Poverty & Insecurity: Barrier to Achieving the MDGs (Cont’d)

<table>
<thead>
<tr>
<th>Country</th>
<th>Environmental performance index (0-100)</th>
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<td>Palestine</td>
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<td>Syria</td>
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<td>Egypt</td>
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<td>Tunisia</td>
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<td>Lebanon</td>
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<td>Jordan</td>
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<td>Saudi Arabia</td>
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<td>Yemen</td>
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<td>Oman</td>
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<tr>
<td>Bahrain</td>
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<td>Iraq</td>
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<tr>
<td>UAE</td>
<td>40.7</td>
</tr>
</tbody>
</table>

Source: Human Development Report 2011
Can Renewable Energy bridge the gap in Energy access & reduce GHG emissions?

- RE applications: wind, hydro, solar, geothermal (lesser degree, biomass):
  - Generate much lower concentrations of GHG throughout life cycle
  - Create jobs in manufacturing, sales, installation, O&M mechanism for poverty alleviation & minimisation of internal migration
  - Give countries autonomy (quasi-independent from oil prices fluctuations)
  - Strong link between global T increase & potential negative impacts on food supply, water, ecosystems & extreme events

- ESCWA region lies in the “solar belt”: high potential for RE
  - Solar radiation = 1,460-3,000 kWh/m²/year across the region (ESCWA, 2011)
  - Potential for solar energy in Egypt, Jordan, Syria & Yemen exceeds electricity demand by several orders of magnitude
  - Hydropower: Very limited/ water scarcity in most of ESCWA MCs
4- Public-Private Partnerships (PPPs): a viable financing mechanism

- It is argued that RE services are capital intensive. Public versus private divide?
  - State services: cater for the poor but often times are bad/inadequate
  - Privatisation: profit accumulation, may mean ignoring the poor & remote segments but provides high capital

- Partnership/ contractual agreement between public & private entities: **PPPs**
  - Acknowledge that both public & private sectors have advantages
  - Overcome state budgetary constraints & make expertise available
  - Government ensures frameworks are in place, provides social responsibility & local knowledge & mobilises political support
  - Private sector provides cash & expertise & asks for financial rewards proportionate with outputs
  - Serviced community gets jobs & transfer of skills + competitive bidding offers best available option to increase service efficiency
4- Public-Private Partnerships (PPPs): a viable financing mechanism

- **Demand market**: potential “consumers” /market segments of PPREPs
  - Residents of remote rural areas lacking access to E (decentralised)
  - Residential areas already electrified but witness power cuts (Lebanon)
  - People aware of climate change, link consumption practices to environmental degradation → would not mind paying more
  - Growing populations wherever there is potential for RE (Atlases)
  - Commercial market (hotels, SMEs) → “green” involvement & Corporate social responsibility (CSR)
  - Desalination: MENA accounts for more than half of the world's desalination capacity, expected to grow from 21M in 2007 to ~ 110M m³ of water/day by 2030 (climate change will increase the need for water)
  - European countries on the Mediterranean (MSP)
4- Public-Private Partnerships (PPPs): a viable financing mechanism

- **Supply market:**
  - Private businesses in the region & globally willing to invest in RE projects to improve their image among consumers: create local jobs & increase poor people’s access to E
  - Many local companies (Egypt, Jordan, Morocco, Tunisia & Syria) are importing, installing, manufacturing, assembling or producing parts or whole systems & already supplying to end-users
  - Independent power producers

- RE businesses should be proactive to create a favourable market for RE:
  - Prepare the market to better accept their products
  - Develop business models that show technical & economic performance under local conditions
  - Lobby for legislation in favour of RE technologies
4- Public-Private Partnerships (PPPs): a viable financing mechanism

- Good governance is a pre-requisite of a successful PPP:

  - PPREP: Establishment of competent, transparent & efficient institutions/procedures & building-up of expertise to negotiate agreements, manage contracts & manage risk organizational & institutional challenges to the public sector

- Benefits of good governance:
  - Private party selected through fair & transparent bidding
  - Fair incentives for private entity to achieve commercial success & financial returns while minimising risk
  - Public services improved & personnel trained
  - Better service provided to end-users (political support)
  - Governments access services of higher quality at lower prices
4- Public-Private Partnerships (PPPs): a viable financing mechanism

The point estimates of indicators of Governance in ESCWA countries (2011)

### 4- Public-Private Partnerships (PPPs): a viable financing mechanism

<table>
<thead>
<tr>
<th>Country</th>
<th>Voice and Accountability</th>
<th>Political Stability</th>
<th>Government Effectiveness</th>
<th>Regulatory Quality</th>
<th>Rule of Law</th>
<th>Control of Corruption</th>
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<td>0.65</td>
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</table>
4- Public-Private Partnerships (PPPs): a viable financing mechanism

*Improved governance = Foundation for an investment climate conducive to private sector development & economic growth*

- Some reforms in the region to improve the business climate:
  - Removing taxes, allowing free repatriation of capital (Bahrain)
  - Establishing a one-stop shop for investment (Bahrain, Oman)
  - Creating investment authorities (IDAL in Lebanon, the Abu Dhabi Investment Council & the Emirates Investment Authority in the UAE)
  - Finalising land use policy for wind power developers; approving zero customs duty & foreign currency denominated power purchase agreements & allowing investors to sell certificates of emission reduction (Egypt)
  - Improving credit information system & setting up a regulatory framework to establish a private credit bureau (Jordan)
  - Establishing new financing mechanisms to encourage projects in RE & EE through a subsidized loan with 0% interest rate & a repayment period of 5 years (Lebanon)
4- Public-Private Partnerships (PPPs): a viable financing mechanism

Performance of ESCWA countries in 10 regulations for doing business (2012)
### 4- Public-Private Partnerships (PPPs): a viable financing mechanism

<table>
<thead>
<tr>
<th></th>
<th>Ease of Doing Business Rank</th>
<th>Starting a Business</th>
<th>Dealing with Construction Permits</th>
<th>Getting Electricity</th>
<th>Registering Property</th>
<th>Getting Credit</th>
<th>Protecting Investors</th>
<th>Paying Taxes</th>
<th>Trading Across Borders</th>
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Impact of reforms on the business climate

- 6 months after Egypt had reformed its property registry, title registrations increased & revenue rose by 39%;

- Commercial registrations in Oman leaped by 93% during the year after Oman implemented a one-stop shop for business start-ups;

- In Saudi Arabia, reducing the minimum capital requirements for doing business led to 81% increase in new company registrations.
4- Public-Private Partnerships (PPPs): a viable financing mechanism

- Global recession & financial market instability + volatility of commodities’ prices + the consequences of climate change → negative implications on fiscal balances

- Foreign Direct Investments (FDI) inflows impeded by: high inflation rates; weak legislation & enforcement; bureaucracy; corruption & domination of government sector

- Decline in remittances flows → consumption & investment levels → cash flow

- Military struggles → infrastructure destruction, brain drain, displacement → pressure on resources

- Capital requirements: Catalyse public sector funding & leverage private sector investments through financial support mechanisms & international finance:
  - International Financing Institutions (IFIs) call for structural reform of business environment through mitigation of risk, support for demonstration projects & private sector incentives
  - Clean Development Mechanisms (CDMs) allow countries to reduce GHG emissions by implementing emission-reduction projects in developing countries (Egypt & the UAE)
  - Emissions Trading mechanism (ETM) created a new commodity – carbon – & allows countries to sell excess carbon units to countries that are over their targets
5- Case studies in PPREPs: Egypt, Saudi Arabia, Tunisia & Morocco

1- Egypt: Al Kuraymat Hybrid Solar Thermal Power plant (STP)
   - Overall capacity: 140MW (Out of which 20 MW is the solar component);
   - Private sector: Orascom Construction Industries(Egypt), Flagsol GmbH & Iberdrola;
   - This consortium was chosen by an international process tendering;
   - Project’s commercial operation: Oct 2011;
   - PPREP model: Orascom operates and maintains the solar component under a 2 year contract, then hand over to the NREA (New & Renewable Energy Authority).

2- Egypt: 200 MW Wind Farm in Gulf of Suez
   - PPREP model : PPP;
   - Financed by Masdar and NREA and African Development Bank (ADB);
   - The project is in the conducting phase of the relevant studies;
   - It is planned to operate the project by end of 2014;
   - Expected Energy Production: 894 GWh annually.
   - The operator and the owner of the this project: Masdar (50%) and Government of Egypt (50%)
3- Egypt: 120 MW wind farm in Gulf of Suez by Italgen (Private Sector)
- IPP model
- Objective: to power the cement factories owned by Suez Cement Company
- The relevant studies were performed (environmental, Feasibility Study, wind, measurements, verification)
- The land usufruct agreement has been completed between GOE and Italgen in July 2011 and signed in June 2012. Consequently, Italgen took over the project site.

4- Egypt: 1250 MW wind farms in the Suez Gulf (private sector)
- BOO System;
- 250 MW as the 1st competitive bid. The project is currently in the technical studies phase;
- The prequalification documents for the 2nd competitive bid for 1000 MW wind farm, in 4 phases; (4x250 MW), is under preparation and the developers can apply for more than 1 phase;
- Master plan was carried out by the Egyptian Ministry of Electricity: 7200 MW of Electricity from Wind Energy (2/3 by private sector and 1/3 by public sector).
5- Saudi Arabia: Pilot Solar Power Station

- Forecasted increase in power generation between 2010 & 2020 is 56.2%. Government pledged US$133M in 2011 budget for RE projects.

- Capacity: 0.5 MW

  Pilot Solar Power Station: PV
  - Expected annual production: 864MWh;
  - Private sector company: Solar Frontier, a subsidiary of Showa Shell Sekiyu (Japanese energy company);
  - Farasan Island chosen because its inhabitants lacked connection to general electricity grid (according to the press).
6- Morocco: Wind Energy in Tetouan

- Capacity: 50.4 MW
- Model: IPP The plant was built as an IPP by a state company with soft loans
- Date of commissioning: 2000

7- Morocco: Wind Farm by Lafarge (Private Sector)

- Capacity: 10.2 MW
- Financed and Operated by Lafarge Cements
- Average annual production 38 GWh
- The objective of the project is to use wind resources to provide Lafarge Cements’ clients with wind electricity in the context of the “EnergiPro” program that aims at encouraging private industry to invest in renewable.
- Benefits from the Clean Development Mechanism (CDM).
- In times of excess production, Office National de L’Electricité (ONE) will purchase the surplus electricity.
MASDAR was founded in 2006, as a commercially driven enterprise that operates to reach the broad boundaries of RE and Sustainable Development technologies industry. MASDAR is owned by a public company “MUBADALA”

MASDAR invests in Renewable Energies as follows:

- Spain: 20 MW Ghema Solar, Solar Tower technology, officially commissioned in 2011
- Germany: shares in PV factory
- UK: Contribution to carry out 1000 MW off shore wind farm.
- Egypt: 200 MW wind farm in cooperation with the concerned governmental entity (NREA), which is currently in the phase of studies
- Abu Dhabi: 30 MW wind farm, 100 MW Shams1 CSP projects are in the phase of implementation.
9- Tunisia: PROSOL Program

- Launched in 2005; Aimed to transition households away from water heaters run on fossil fuels to solar water heaters (SWHs) by engaging local financial institutions to provide credit lines to consumers;

- Prosol is a joint effort of:
  - The Tunisian Ministry of Industry, Energy and Small and Middle Size Enterprises (MIEPME);
  - The National Agency for Energy Conservation of Tunisia (ANME);
  - The United Nations Environment Programme (UNEP);
  - With financial backing from the Italian-led Mediterranean Renewable Energy Program (MEDREP).

- The Program comprises two phases:

- Over Prosol phases I and II (2005-2010):
  - Total public and private investment in Prosol amounted to USD 134 million;
  - More than 119,000 SWH systems installed in Tunisia.
5- Case studies in PPREPs: Egypt, Saudi Arabia, Tunisia & Morocco (Cont’d)

PROSOL Program Phase II - Tunisia
5- Case studies in PPREPs: Egypt, Saudi Arabia, Tunisia & Morocco (Cont’d)

Review of case studies:

- Less sophisticated models, but a momentum is developing;
- Efforts from governments to employ PPREPs to provide E access to people in remote or rural areas (Farasan Island);
- Increasing interest from local (Orascom) & international (Shell) private companies in entering into PPREPs with governments;
- Governments restructuring their E sectors: policies & institutions, incentives targeting private sector & improving investment climate;
- Governments obliging bidding companies to include employment of local manufacturers & local labour force (Al Kuraymat);
- Clear appreciation of the importance of transfer of know-how & technology from private investors to local public entities (Egypt);
- Past experiences of the countries in PPPs in infrastructure & conventional power plants enhances private sector confidence.
E access best secured through locally-available RE resources;
Call for private sector to complement state efforts & budgets in deploying RE technologies, with public agencies serving a central role;
PPREPs bring great benefits to centralised & distributed RE projects in rural areas but there is no single formula on how to implement them;
Properly implemented PPREPs fill E access gap & mobilise funding for R&D;
General recommendations for governments:
- Use PPREP tool to assess institutions’ readiness & work on loopholes;
- Build on lessons learned from other countries;
- Establish a jurisdictional PPREP constitution: consistent & firm policy commitments to ensure transparency & develop reliable, predictable market conditions (political instability);
- Reduce subsidies on fossil fuels & subsidise RE projects instead;
- Target R&D in RE & introduce awareness raising programmes (RE + EE);
Role of regional & international agencies to improve technical assistance, enhance coordination & design a monitoring & evaluation system.
Thank you

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