Energy Efficiency and Renewables - in search of viable projects and financial mechanisms to mitigate Climate Change

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Common Goal

Investments in Renewables and Energy Efficiency have a common goal – reduction of Green House Gases emissions

Renewables

Generation of energy with zero net GHG emissions

Hydro, Wind, Solar, Geothermal, Biofuels, Tidal, Wave

Energy Efficiency

Reduction of use of energy and thus emissions of GHG

Efficient lighting, Efficient household appliances, Efficient industrial technologies etc.

Different Approach

Renewables

Displace the use of fossil fuels

Energy Efficiency

Reduce the use of fossil fuels

Different Project Size and Structure

Renewables

usually a single self standing project

Hydro Power Plant, Geothermal Power Plant, Wind Farm

Exceptions: Rural use of biomass, Small scale solar

Energy Efficiency

usually a number of measures and actions in combination

Energy Efficiency in Buildings: lighting, heating, air conditioning and ventilation, insulation, windows

Exceptions: new, more efficient industrial technology, like continuos casting

Different Aims

Renewables

to generate and supply energy

Energy Efficiency

to reduce and conserve energy

Different Markets

Renewables

- large and likely to expand
- long term
- renewable energy potential of Russia - as high as 30% of total primary energy supply or 270 million tons of coal equivalent (MtCe)/year,
- currently R only 3% (2% hydro and 1% all others)

Energy Efficiency

- initially large but saturating and ultimately will be diminishing
- short to medium term economic potential in Central Europe - 20% of the total current final consumption
- Southeastern Europe and the CIS – 30 to 50%.

Different Sponsors and Financial Requirements

Renewables

- energy companies, developers, community energy supply project
- to be cost efficient mostly require larger projects – hydro, wind, geothermal
- such projects require project finance, large corporate credit, or sizeable equity participation

Energy Efficiency

- from individuals to municipalities and companies
- measures, actions and EE equipment can start cheap,
- no minimum size investment to save energy
- from micro credits, government or municipal guaranteed loans to third party finance

Differences from Investors Perspective

Renewables

- usually capital intensive – relatively high value single project
- generate energy – i.e. produce cash when energy is sold
- defined ownership and management of assets and benefits, established energy market
- usually have offtake contract – guaranteed future income
- easy to meter, monitor and account
- can be financed as a self standing project on a non recourse or limited recourse financing structure,
- the future revenues, the project assets and offtake contract can be used as collateral

Differences from Investors Perspective

Energy Efficiency

- usually relatively small individual investments, aggregated in a project
- saves energy – i.e. saves payments, but does not produce cash
- the assets and the benefits may be with different owners – municipal projects
- often level of savings depends on individual behaviour and/or corporate culture
- savings can be forecasted, but there is no guarantee that will be realised
- often not easy to monitor and account
- difficult to finance as a project, require a strong corporate balance sheet to ensure debt service
- often require third party guarantee or a service contract with performance guarantee to attract finance
- ESCo – performance service contract solution

Examples

Renewable projects

Mutnovsky Geothermal Power Plant – Kamchatka, Russia

- Generation of 50MW electricity, offtake contract by the electricity company, high local electricity tariffs > 10 ¢/kWh, Kamchatka not connected to the Russian grid
- Finance – 100 million USD - EBRD, 50 million - Russian sources (RAO UES etc.), CO_2 reduction = 200,000 t/year

Solar Power Plant Brindisi (Italy)

- Generation of 20MW peak, offtake contract rejected, New law for specialised tariffs from solar installations drafted, not yet signed
- Finance – 86 million Euro
- If tariffs like in Germany or Spain, IRR = 14%

Examples

Energy Efficiency project

- Karelsky Okatysh - production of iron pellets, Karelia region, Russia,
- balance sheet restructuring
- investment in energy and operational efficiency improvement, including:
    - •integrated Power Distribution Control System;
    - •automated Energy Management System;
    - •rehabilitation of the compressed air system;
    - •optimisation/rehabilitation of the grinding and crushing processes;
    - •overhaul of all three roasting furnaces;
    - •purchase of new fuel-saving mine trucks.
- Total cost: US$ 147 million, 60 million loan
- Result = 8% reduction in energy consumption
- GHG reduction = 90,000 tonnes CO2/year.

Conclusions

Renewables

- capital intensive
- relatively low IRR
- given the low cost of fossil fuels, require:
  - relatively long term finance
  - if connected to the grid, often supported by compulsory purchase agreements and/or preferential tariffs

Energy Efficiency

- often not capital intensive
- high returns,
- but require:
  - strong corporate balance sheet
  - or external guarantees
  - or third party finance

Conclusions

Different from investors point of view and require different financial instruments

But can be combined in one fund to balance the long and short term money and debt – equity portfolio

R = EE in case when the renewable energy is used for self consumption (rural electrification)

UNECE and sustainable energy in Europe

- To facilitate the investments in Renewables and Energy Efficiency and thus reduce GHG
- To assist the establishment of financial mechanisms incorporating instruments enabling investments in energy efficiency and renewable projects, taking into account the differences and synergies of such projects
- To assist in overcoming the biggest problem - lack of sufficient number of bankable energy efficiency and renewable projects ready for investment

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