

# **Energy Efficiency and Renewables**

## **Same Goal by Different Financial Means**



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# Common Goal

## 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 continuous 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 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 project

- **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<sub>2</sub> reduction = 200,000 t/year**

# 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 CO<sub>2</sub>/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)***

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