



PARTNERSHIP TO ADVANCE CLEAN ENERGY-DEPLOYMENT (PACE-D) TECHNICAL ASSISTANCE PROGRAM

International Conference on Decarbonization of Indian Railways- Mission Electrification

New Green Financing Options

3/11/2016

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Decarbonization Strategy

Electrification

Indian Railway is the second largest Railway Network in the world

38% routes electrified carrying 63% of freight and 50% of traffic.

---→ Electrification will reduce diesel consumption (basic decarbonization)

Railway's demand set to increase from 18 TWh to 49 TWh by 2030

1/17/2016

Energy Efficiency

Efficiency of energy use

- Existing infrastructure: replacement and modernization, specially in non-traction demand
- New infrastructure: built in energy efficiency

Energy efficient infrastructure (lighting, air-conditioning, pumping etc) coupled with on-site generation can further boost energy efficiency

FOOTER GOES HERE

Energy Mix

The energy mix shifted towards green: solar, wind

49 TWh = ~30 GW
green capacity

1st phase- India Railway can target 10% green energy

Modes- captive generation, PPA (procurement of energy)

Non Traction (15% of demand) easier to shift.

2

Railway - Green infrastructure

Investment in Railway Infrastructure is considered Green

- It is more energy efficient/TKm or /pKm compared to road transportation
 - Hence any investments in tracks or supporting infrastructure is considered green except in tracks and rolling stock which carries fossil fuel
- Electrification – replaces diesel and reduces GHG emissions
- Energy Efficiency and Green Energy – also considered Green.
- 66.8% of Bonds Issued for climate aligned investments, relate to Transportation Sector. Energy Accounts for 18,8%*

Large investors shifting to Green Investments as priority

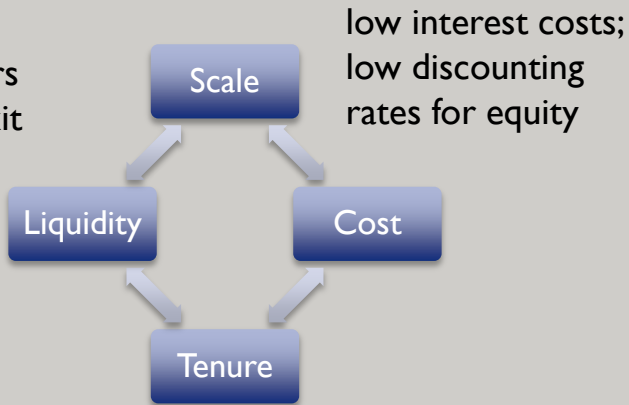
- Institutional Investors with Assets Under Management (AUM) of \$11.2 tn pledged to support green investment sin Cop21 (2015, Paris)
- Insurance companies plan 10 fold increase in green investments by 2020.
- Investors who have subscribed to PRI (principles of responsible investing) and manage \$60 tn assets increasing their commitment to Green Instruments.

*2016 State of the Market Report by Climate Bonds Initiative

Green Investing Needs a New Class of Instruments

\$93 tn+ New Climate Economy estimate for Green Investments by 2030

Investors need exit options

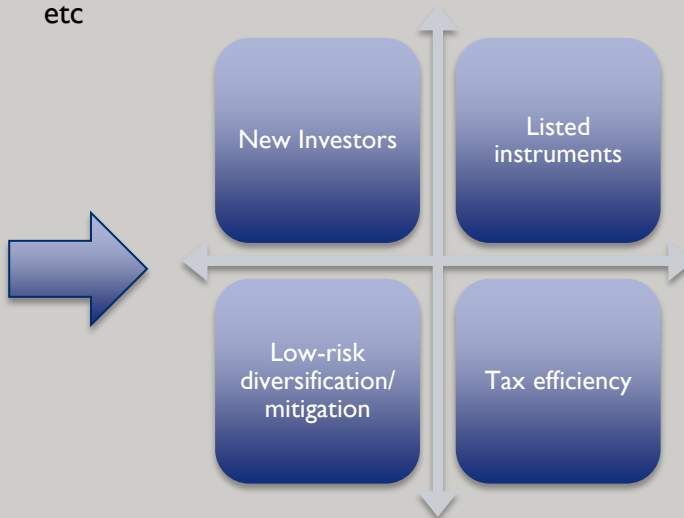


Long term investors (15 yr+)

Market Needs

Large investors with *long tenor, low risk, low cost* capital – pension funds, sovereign wealth funds, insurance co etc

Liquidity of instruments, helps attract large scale investors.

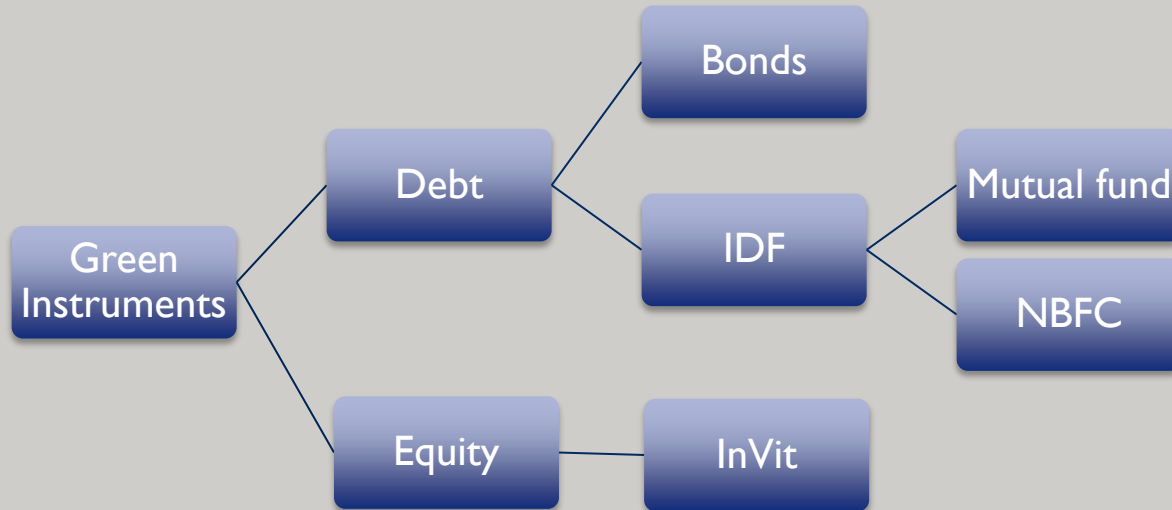


Low interest rates and low discounting rates are possible with risk mitigated, diversified ring fenced, project portfolios

High level of tax efficiency helps reduce the cost of debt/ equity

New Approach

New Instruments: Green Bonds, Infrastructure Debt Funds (IDF), Investment Trusts (InVits)



Re, \$
On-shore, Off Shore
Labelled, Unlabelled
Externally Verified, Self reported.

Can only be Re, listed in India
Can be used for any asset

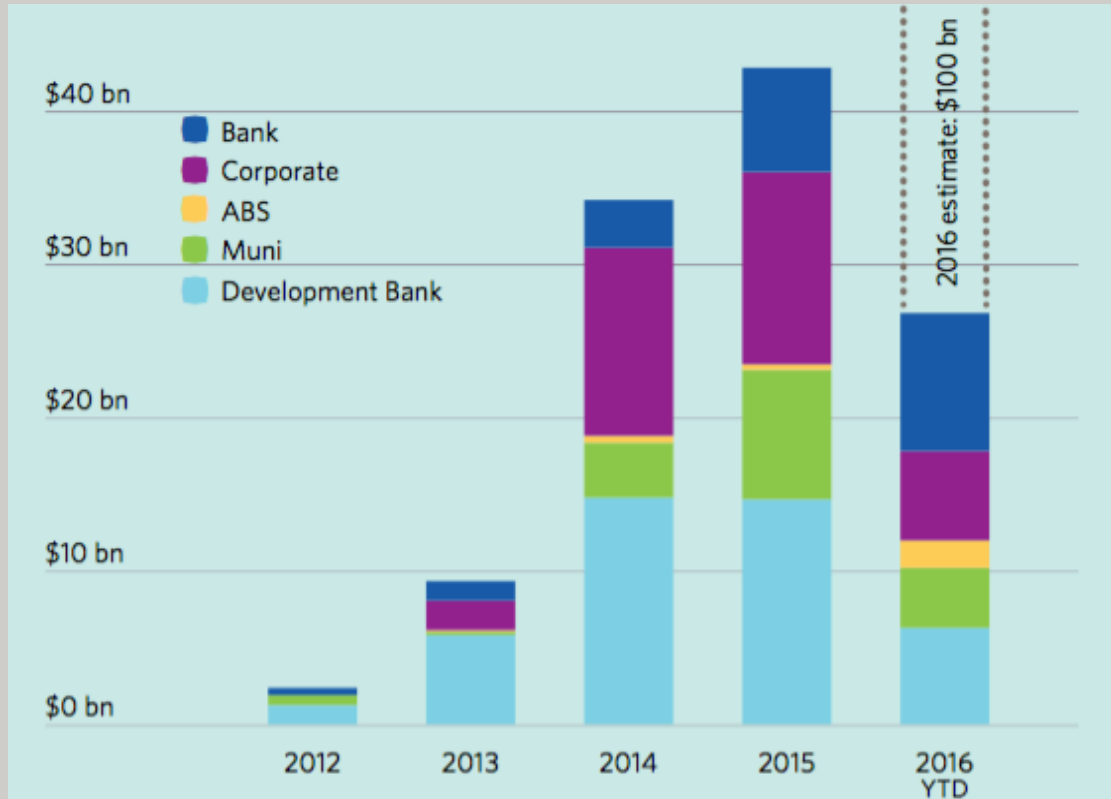
Can be Rs or \$; used only for re-financing

Can only be Re, listed in India

Green Label – up to 20 bps potential difference in costs

Indian Railway -> issues can have 200 bps+ lower costs v/s IPPs

Green Instruments such as Green Bonds Taking Off



Labeled Green Bonds Issued

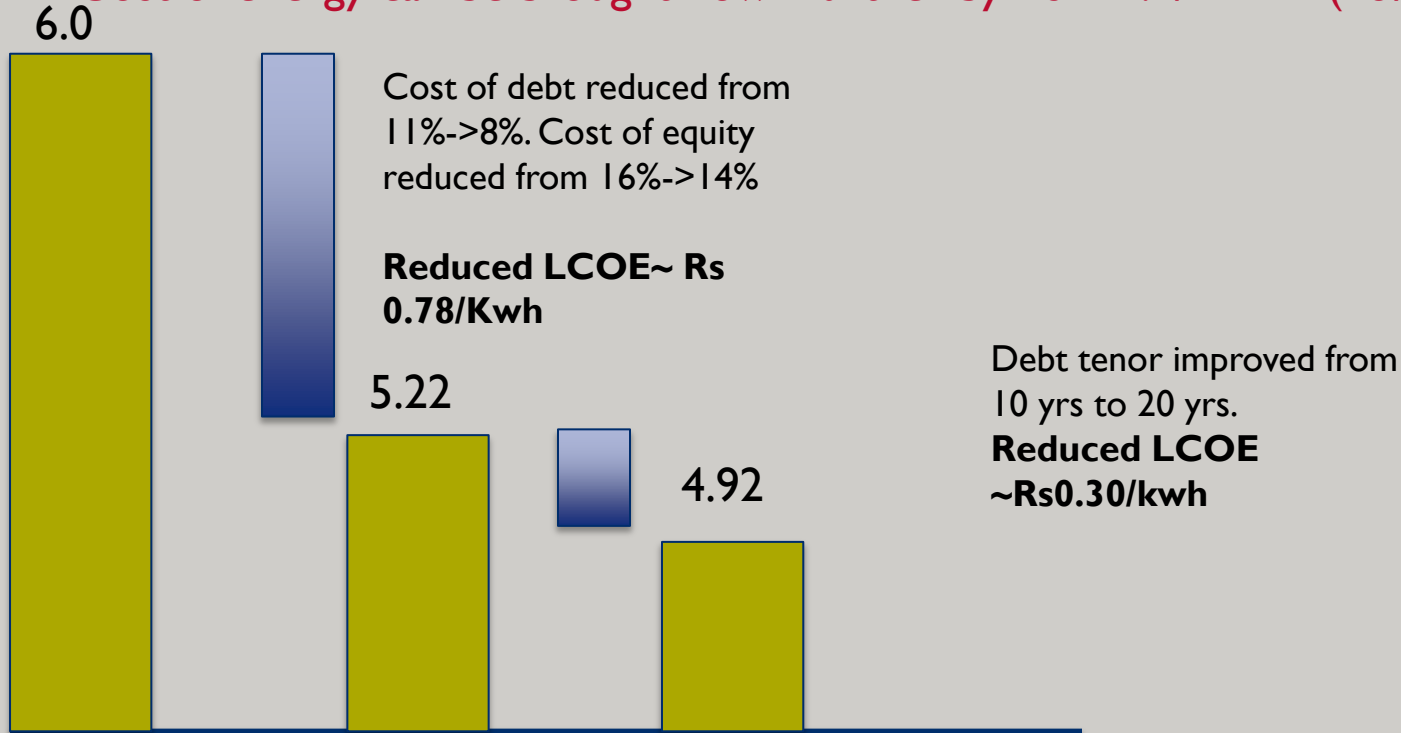
China Railway Corporation is the largest issuer (\$194 bn, including unlabelled)

UK Network Rail (*\$40.3 bn), National Rail Company of France ((\$ 34 bn) are other large issuers

Most Issuances are over 10 yr maturity periods. Large utilities like Railways can issue **30+ yr** bonds. Or even **Perpetual Bonds**.

Railway's Financing Lever

Cost of energy can be brought down further by Rs 1-1.1/kWh~ (18%)



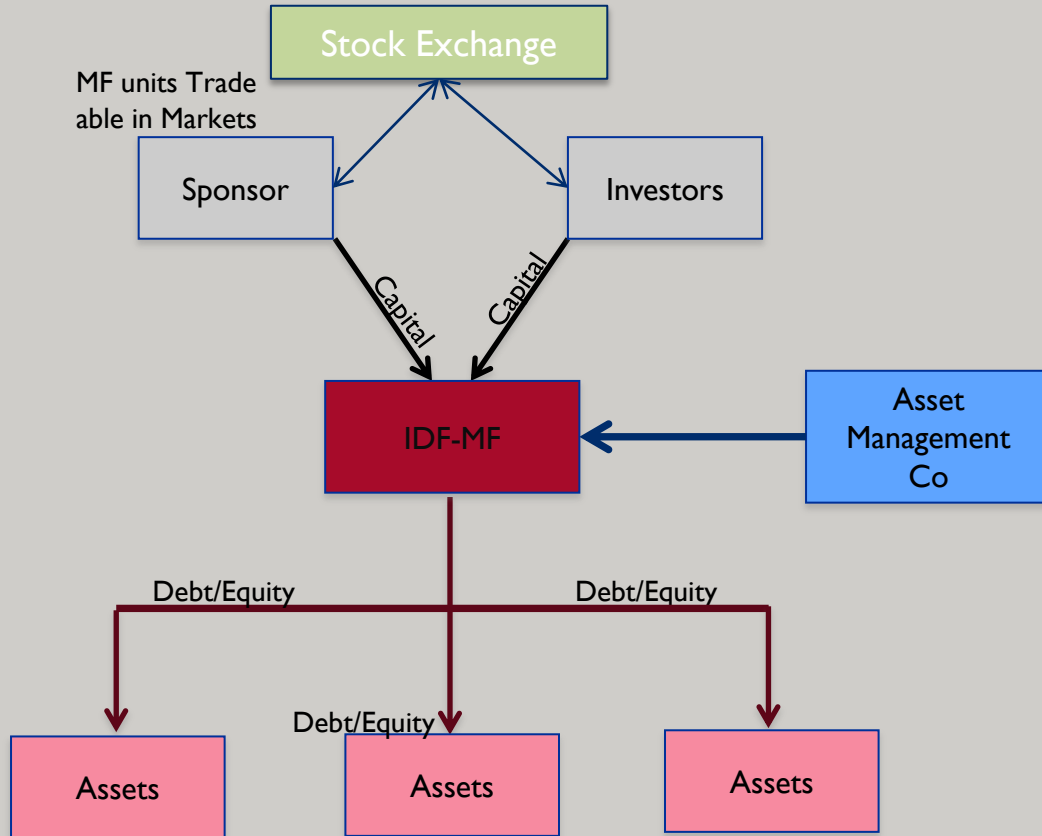
Railway has received excellent results in its procurement bids.

However the bidders have higher financing costs compared to what Railways can obtain.

A good structure for Railway assisted financing can reduce costs further by 18%-20%

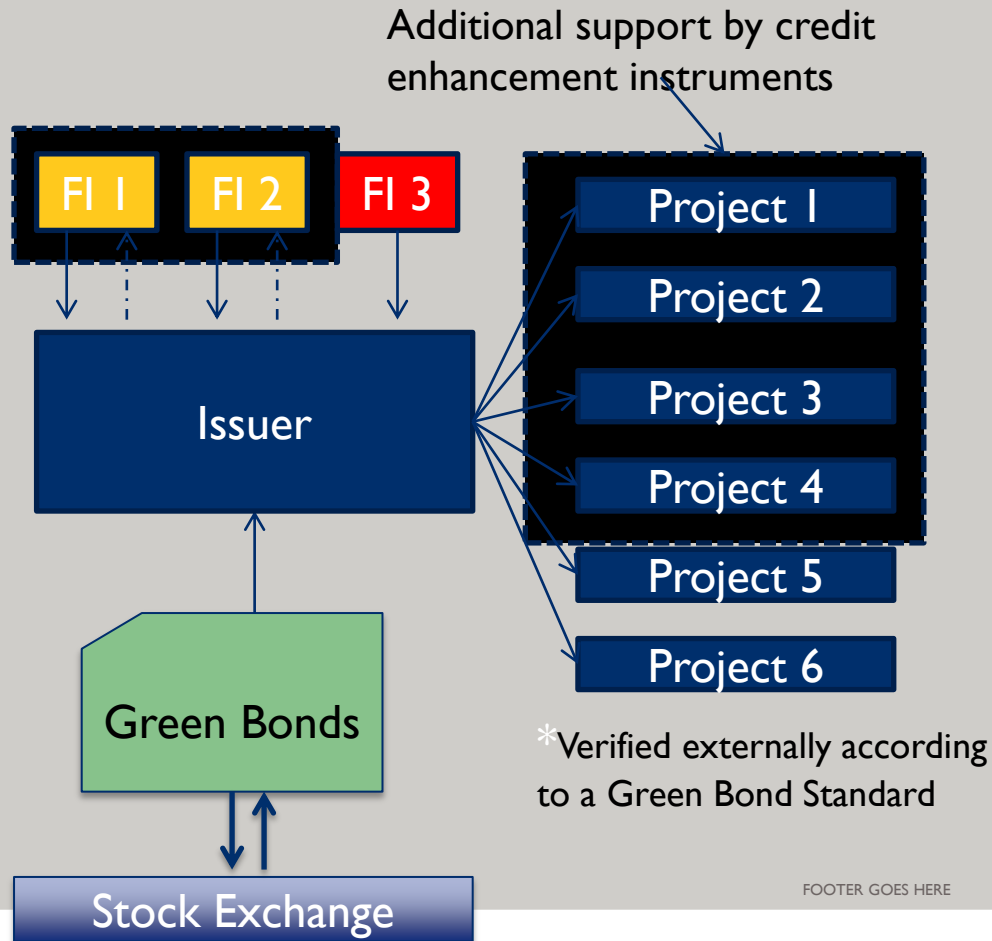
THANK YOU

IDF (MF) Operation



- Investments:
 - Min 90% in debt securities or securitized debt instrument; Balance in listed equity shares, convertibles, etc.
 - Investment maturity: 15 yrs+
- Returns:
 - Fixed 7-8% return
 - Tax Benefits: No income tax/5% withholding tax on foreign interest payment
- Risk: Credit risks associated with the underlying projects to be borne by the investors
- Further cost improvement and larger access to investors through Green Labeling.

Green Bonds



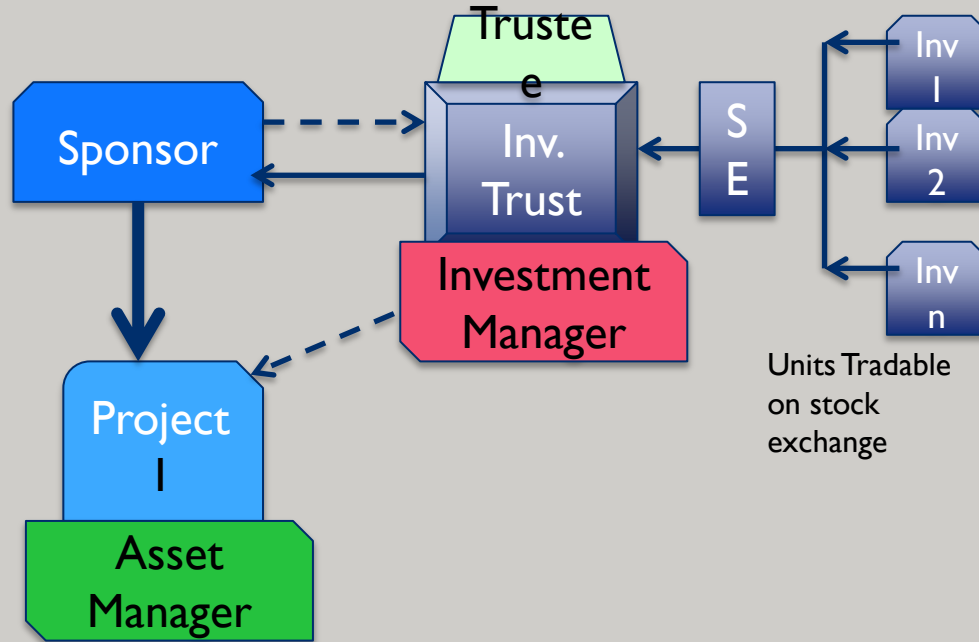
Corporate Bonds: 'Recourse' to the Issuer

Use of Proceeds Revenue Bonds: Non Recourse to issuer but recourse to pledged cash-flows. Proceeds can be used for any other green asset

Green Project Bond: Issued for specific projects. Non-recourse to issuer.

Asset Backed Securitized Bonds: Bond collateralized by one or more projects. Includes ABS.

Investment Trusts



SEBI Issued Guidelines

- The trust structure made tax pass through
- 80% investment in operating assets; 20% in green field
- Cash-flows apart from reserves for O&M and investments distributed to investors.
- Beneficial for investors seeking regular returns.