

# **Sources of Financing for Renewable Energy**

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## SOURCES OF FINANCING FOR RENEWABLE ENERGY

### 1. Introduction:

Renewable energy project developers can obtain their initial investment by borrowing it from a bank or other financial institutions (Debt) or by equity investments (Equity) or a combination of both. There can be several ways by which the debt and equity financing is done for any projects, these are discussed after the discussion of the ways investors look at providing finance for a project.

The investment into a renewable energy projects and firms are viewed and analysed by the investors and lenders in a very different way as compared to other projects.

**Equity investors** view a renewable energy projects success to have a potential for unbounded returns and therefore are interested in taking high-risk investments and investing in the form of funds, take an equity position - in companies, projects or a portfolio of projects, and expect a greater return for the level of risk they take. For instance, Venture Capital, or VC funds, investing in new technology companies might expect 25% of their investments will fail, and therefore look for a very high return. The project investments are analysed from a risk-return trade off with an emphasis on expected investment return.

**Lenders** are far more risk averse and therefore the debt contract is fixed obligation and lenders do not profit beyond a certain limit from project success, in other words the lenders will lend money to projects and will focus on getting that debt repaid, earning a relatively small return on the transaction. Lenders analyse a renewable energy project from a worst case perspective.

In addition, **certain investors and companies** such as utilities can finance projects base on their 'balance sheet', i.e. from their own corporate funds as part of their corporate strategy on Renewable Energy. The funds for such projects come from the company by cash reserves and surplus of the company stored in the bank or which are available with the company, or by sale of assets and holdings of the company and its business. The choice whether to finance the project by the company itself or by other means will depend on which offers a cheaper source of funding the project. The companies or utilities with low borrowings costs have typically financed their balance sheets.

### 2. Types of funding:

#### BANKS AND FINANCIAL INSTITUTIONS

##### a) Corporate Lending:

Banks provide finance to companies to support everyday operations. The creditworthiness of the company is assessed based on the company's financial strength and stability and the interest rates of the

debt are priced accordingly. In this form of lending, the bank may place a few restrictions on how the company can use the funds, provided certain conditions are met.

**b) Project Finance or Limited Recourse Finance:**

In project finance, debt is borrowed for a specific project only, the amount of debt made available from the borrower will be linked to the revenue the project will generate over a period of time; this will be the means of paying back the debt. This amount is adjusted in such a way to reflect inherent risks of the project, In case of a problem over loan repayments the banks will establish first charge or claim over the assets of a business.

**c) Mezzanine finance:**

As its name implies, this type of lending sits between the top level of senior bank debt and the equity ownership of a project or company. Mezzanine loans are of more risk than senior debt repayments of the mezzanine loan are made after those for senior debt, however, the risk is less than equity ownership in the company. These loans are of a shorter period and are more expensive for borrowers, but pay a greater return to the lender. For a renewable energy project, mezzanine finance is sought for if the amount of bank debt it can access is insufficient: the mezzanine loan may be a cheaper way of replacing some of the additional equity that would be needed in that situation, and therefore can improve the cost of overall finance.

**d) Refinancing:**

Refinancing is where a project or a business has already borrowed money but decides, or needs, to replace existing debt arrangements with new ones, i.e. debt is restructured. The reasons for refinancing include more attractive terms becoming available in the market because lenders are becoming more familiar with the technology, meaning more money can be borrowed against the asset; or the duration of the loan facility, e.g. loans are often structured to become more expensive over time because of the increasing risk of changes to regulation or market conditions. One of the results of the financial crisis was that banks became extremely reluctant to lend for more than six or seven years, which forced projects that required longer-term loans, to refinance in the future, and take the risk of the terms available at that time.

**VENTURE CAPITAL, PRIVATE EQUITY AND FUNDS**

Renewable energy equity investments taking an ownership stake in a project, or company, involve investments by a range of financial investors including Private Equity Funds, Infrastructure Funds and Pension Funds, into companies or directly into projects or portfolios of assets.

Depending on the type of business, the stage of development of the technology, and degree of risk associated, different types of equity investors will engage. **Venture Capital** will be focused on 'early

stage' or 'growth stage' (depending on how far from the laboratory and commercial roll out) technology companies; **Private Equity Firms**, which focus on later stage and more mature technology or projects, and generally expect to 'exit' their investment and make their returns in a 3 to 5 year timeframe; **Infrastructure Funds**, traditionally interested in lower risk infrastructure such as roads, rail, grid, waste facilities etc, which have a longer term investment horizon and so expect lower returns over this period; **Institutional Investors** such as Pension Funds have an even longer time horizon and larger amounts of money to invest, with lower risk appetite.

Such funds use Internal Rate of Return (IRR, or 'rate of return') of each potential project as a key tool in reaching investment decisions. It is used to measure and compare the profitability of investments. Funds will generally have an expectation of what IRR they need to achieve, known as a hurdle rate. The IRR can be said to be the earnings from an investment, in the form of an annual rate of interest.

In the United States, '**tax equity**' is also used to finance renewable energy projects: firms with a sizeable tax liability income can use these investments to offset future tax obligations.

## **KEY FEATURES OF FUNDS PROVIDING EQUITY**

### **a) Venture Capital Funds**

- Money is raised from a wide range of sources with high risk appetite to include insurance companies, pension funds, mutual funds, and high net worth individuals
- Target new technology and new markets
- Interested in early-stage companies
- High risk of failure in every venture
- Investment horizon of around 4-7 years
- Return requirement is of many multiples of original investment (50 – 500% IRR)

### **b) Private Equity Funds**

- Money is raised from a wide range of sources with medium risk appetite to include institutional investors and high net worth individuals
- Target opportunities with possibility for enhanced returns (or 'upside')
- Interested in companies and projects with more mature technology, including those preparing to raise capital on public stock exchanges ('pre IPO'), demonstrator companies, or under-performing public companies.
- Shorter investment horizon, 3-5 years
- Higher return requirement, 25% IRR

### **c) Infrastructure Funds**

- Funds drawn from a range of institutional investors and pension funds
- Target 'infrastructure' i.e. an essential asset, long duration, steady low risk cash flow
- Interested in roads, railways, power generating facilities

- Medium term investment 7-10 years
- Low risk and return, 15 % IRR

#### **d) Pension Funds**

- Typical investments include:
  - Public equity (via stock markets)
  - Corporate and government bonds
  - Real estate
  - Inflation-linked assets (such as commodities, inflation linked bonds, infrastructure and energy, forest land)
  - Private equity
  - Cash and cash equivalents
- Investing directly they seek ‘cash yielding’ investments, i.e. those that generate a stream of cash year on year, as opposed to an investment in which all cash is realised at the end of the investment period through an ‘exit’ (by either sale or IPO). These investments are required to support their long term liabilities;
- For these investments they display a low risk appetite, reflected in expectations of stable returns at around the 15% level;
- In Renewable Energy they make very low risk investments e.g. a portfolio of operational onshore wind assets;
- As they have very large funds to invest, they do not commonly get involved in individual projects. They may allocate money to specialised Private Equity or Venture Capital funds (including infrastructure or renewable energy funds) that manage the investments and provide the pension funds with a return;
- A handful of specialised Renewable Energy bonds have been issued which have been of interest to pension funds. Risks are described in the project bond issue documents.

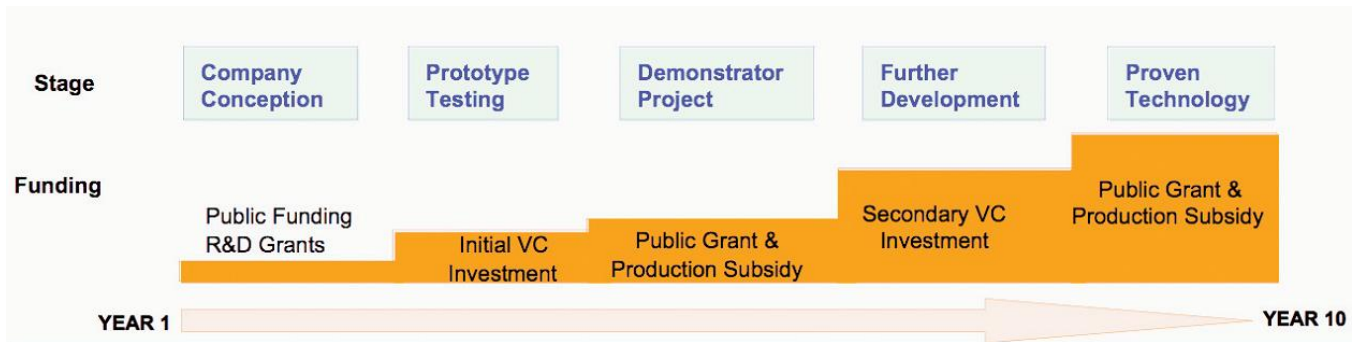
Project risks will be extensively mitigated in order for the project to attract “an investment grade rating” making it attractive to investors. A higher rating suggests less risk that the project will default on its bond obligations leaving bond investors at risk of not being repaid.

The table below illustrates the different sources of finance for renewable energy projects, the type of risk taken and an idea of level of return or expected margin.

Venture Capital	Private Equity	Infrastructure Funds	Pension Funds	Bank Mezzanine Debt	Bank Senior Debt
Start ups, new technology, prototypes	pre IPO companies, demonstrator technology	Proven technology, Private companies,	Proven technology	Demonstrator / Proven technology, New Companies	Proven technology, established companies
>50% IRR	35% IRR	15% IRR	15% IRR	LIBOR + 700 bps	LIBOR + 300bps

\*\*This diagram is reflective of current market conditions and is valid as at June 2009

### 3. BUILDING THE SUPPLY CHAIN: FINANCE FOR EARLY STAGE TECHNOLOGY INVESTMENT E.G. WAVE POWER



This example demonstrates the phases of investment from public grants, VC funding and production subsidies required to develop a new Renewable Energy technology through to the point it can begin to demonstrate a track record and attract second stage funding. This might be through an Initial Public Offering (IPO) on a stock exchange to raise equity from external investors, as well as project finance debt from banks, to enable further project build out. The term, the ‘valley of death’ is often used during the phase illustrated above which describes the difficulties of accessing commercial finance between the initial VC investment and demonstration; or from demonstration to commercial roll-out with secondary VC investment. The diagram shows where public grants or specific subsidies can be essential.

In its final stages of development where a technology steps into ‘Proven Technology’, it is then assumed to be fully commercial and to compete with other forms of Renewable Energy, when standard grants, support or incentive mechanisms or other subsidies will become available. Investors such as private equity firms are likely to be attracted at this point, although there are overlaps between stages and financial institutions.

### 4. Innovative Financing Mechanisms

**Clean Development Mechanism (CDM)** is one of the flexible mechanisms following the Kyoto Protocol, which offers industrialized countries the possibility to engage in economically and environmentally competitive emission reduction projects in developing countries. The income stream from selling the creditable emission reductions from emission reduction projects have beneficial effect on the project's financial structure.

**Dealer-Credit Model** involves an arrangement wherein the dealer is provided support through access to business financing and sells the Renewable Energy systems to the end user, which can be some times on credit.

In a **Consumer Credit Model** local finance institutions provide loans to users to buy the Renewable Energy system. The Renewable Energy enterprise in this case transacts on commercial basis with the users.

**Supplier Credit Model** is similar to equipment lease financing, insofar as it involves financing provided by suppliers of goods and services to the project.

In an **Energy Service Company Model** (or Fee-for-Service model) the customers pay for the energy service that is provided to them by an energy service company (ESCO). It makes the energy affordable and minimizes the long-term risks for the customers as the ownership and maintenance of the equipment lies with the energy service company.

A **Revolving Fund** is reserve money or fund, often used in developing countries, to lend to one or more borrowers. The idea for the revolving fund can be used both for an organization or an individual. The borrower on the other hand is expected to repay the original sum that restocks the fund over the given period of time. Usually, an additional sum is charged (interest) to the borrower that acts as a fee for providing the service (administrative costs) and helps to protect the fund from being depleted.

## **5. Financial institutions for Renewable Energy in India:**

### **1. Indian Renewable Energy Development Agency Limited (IREDA):**

- Indian Renewable Energy Development Agency Limited (IREDA) was established on 11th March, 1987 as a Public limited Government Company under the Companies Act, 1956 and it promotes, develops and extends financial assistance for Renewable Energy and Energy Efficiency/Conservation Projects.
- IREDA has been notified as a “Public Financial Institution” under section 4 ‘A’ of the Companies Act, 1956 and registered as Non-Banking Financial Company (NFBC) with Reserve Bank of India (RBI).
- IREDA's mission is “Be a pioneering, participant friendly and competitive institution for financing and promoting self-sustaining investment in energy generation from Renewable Sources, Energy Efficiency and Environmental Technologies for sustainable development.”
- IREDA's Motto is “Energy for Ever.”

The main objectives of IREDA are:

1. To give financial support to specific projects and schemes for generating electricity and / or energy through new and renewable sources and conserving energy through energy efficiency.
  2. To maintain its position as a leading organization to provide efficient and effective financing in renewable energy and energy efficiency / conservation projects.
  3. To increase IREDA`s share in the renewable energy sector by way of innovative financing.
  4. Improvement in the efficiency of services provided to customers through continual improvement of systems, processes and resources.
  5. To strive to be competitive institution through customer satisfaction.
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2. Infrastructure Development Finance Company Limited (IDFC)
  3. Industrial Finance Corporation of India (IFCI)
  4. Gujarat Industrial Investment Corp. Ltd.
  5. Infrastructure Leasing and Finance Services Ltd.
  6. National Bank for Agriculture and Rural Development (NABARD)
  7. Power Finance Corporation
  8. Rural Electrification Corporation
  9. Pradeshiya Industrial & Investment
  10. Tamil Nadu Power Finance and Infrastructure Development Corp. Ltd.
  11. Most of the Indian banks both private and public
    - o Small Industries Development Bank of India
    - o Industrial Development Bank of India (IDBI)
    - o Export - Import Bank of India (Exim Bank)
    - o ING Vysya Bank Ltd.
    - o UCO Bank
    - o Bank of Baroda
    - o Bank of Maharashtra
    - o UTI Bank now Axix Bank
    - o State Bank of India
    - o Laxmi Vilas Bank
    - o State Bank of Bikaner and Jaipur (SBBJ)
    - o Indian Overseas Bank (IOB)
    - o Canara Bank
    - o Corporation Bank
    - o ICICI
    - o Indian Bank
    - o Syndicate Bank
    - o Allahabad Bank
    - o Andhra Bank
    - o Bank of Punjab
    - o Bharat Overseas Bank
    - o DENA Bank
    - o Karnataka Bank
    - o State Bank of Mysore
    - o Oriental Bank of Commerce



- State Bank of Saurashtra

## 12. Indian Insurance Companies

- Bajaj Allianz General Insurance
- ICICI Lombard General Insurance
- IFFCO Tokio General Insurance
- National Insurance Company
- Oriental Insurance Company
- The New India Assurance Company
- Reliance General Insurance Company
- Royal Sundaram Alliance Insurance Company
- TATA AIG General Insurance Company
- United India Insurance Company

## 13. Major Global Institutions and banks

- United Nations Development Programme
- UNESCO
- World Bank
- Asian Development Bank
- UNIDO

### References:

- Private financing of Renewable Energy - a guide for policymakers – by Sophie Justice
- Financing Investments in Renewable Energy: The Role of Policy Design and Restructuring – by Ryan Wisser and Steven Pickle
- [www.ireda.gov.in](http://www.ireda.gov.in)
- [www.newenergyindia.org](http://www.newenergyindia.org)