Asia-Pacific
Economic Cooperation

APEC 21ST CENTURY RENEWABLE ENERGY DEVELOPMENT INITIATIVE (COLLABORATIVE VIII)

FINANCIAL ROADMAP FOR THE APEC REGION

FINAL REPORT

Prepared by

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APEC 21st Century Renewable Energy Development Initiative (Collaborative VIII): Financial Roadmap for the APEC Region **[EWG 02/2003]**

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1. Introduction

1.1 GROWING ROLE OF RENEWABLE ENERGY

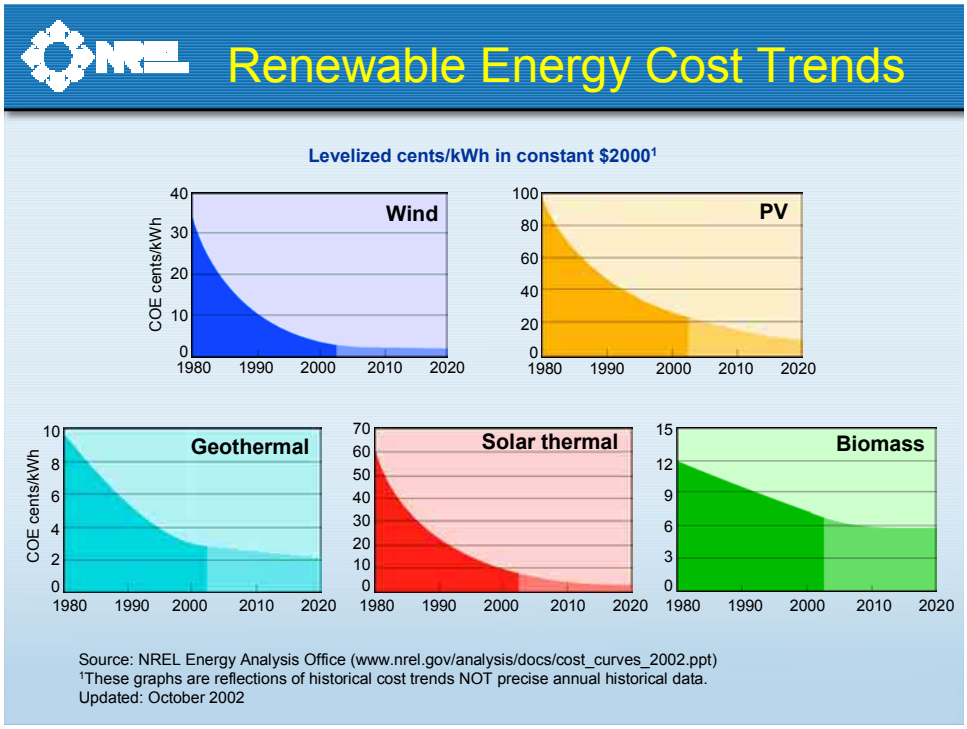
Fossil fuels and nuclear energy provide over 80% of the energy required today, with more than 70% of the energy being consumed by developed countries. The world population has doubled since 1960, reaching 6 billion in October 1999 with the current world population growth of 78 million per year. It is estimated that one third of the world's population today (about 2 billion people) have no electricity from national grid supplies. It is also generally accepted that electricity can change peoples' lives and improve living standards by providing access to essential facilities such as light, communication, water pumping and refrigeration. As world population growth continues and developing countries improve their living standards, demands for energy will also rise. It has been suggested that the world's demand for energy will more than double within this century.

The high reliance on the use of fossil fuels by developing countries contributes directly to polluting of the environment and increasing levels of greenhouse gases in the atmosphere. Even though developing countries account for only approximately 25-30% of current fossil fuel consumption, an increasing amount of forests is being cut down to produce wood as a major fuel source. Apart from the serious loss of wildlife habitats and bio-diversity, deforestation reduces the carbon dioxide removal process through photosynthesis, allowing further accumulation of greenhouse gases in the atmosphere. Consequently, both developed and developing countries are contributing to the pollution of the environment causing health problems, global warming, climate instability and acid rain.

Even if fossil fuels were totally environmentally friendly, there is insufficient supply for their continued use to meet the increasing demands for energy. Although fossil fuels will continue to be used to supply energy in the future, it is essential to introduce alternative sources of energy. The renewable energy sector has been growing rapidly in recent times due to growing public awareness about greenhouse gas emissions and other environmental impacts, as well as the costs of fossil fuels in remote areas.

In many instances, renewable energy can provide a cheap, clean and reliable source of electricity and in most cases have limited environmental impacts. The most promising of these energies are wind energy, small hydro, biomass energy and solar energy from photovoltaic cells. One of the major hurdles preventing the extensive use of renewable energy has been the high capital costs; however, recent technological advances in the renewable energy sector have caused significant increases in performance, which make these energies more competitive and consequently, more economically viable. In addition, the developing use of carbon finance has the potential to increase the rates of return of clean technology projects, enhance the bankability of investments in renewable energy, promoting projects to reduce greenhouse gas emissions and contribute to the sustainable development of developing countries. As the graph on the next table shows, the costs of renewable energies are constantly decreasing, thus increasing their competitiveness with traditional fossil fuels.

The challenge remains how to finance projects, how to access the necessary capital, and how to spur investment in renewable energy markets.



1.2 GOALS OF APEC

Asia-Pacific Economic Cooperation, or APEC, is the premier forum for facilitating economic growth, cooperation, trade and investment in the Asia-Pacific region. APEC's 21 Member economies are Australia; Brunei Darussalam; Canada; Chile; People's Republic of China; Hong Kong; Indonesia; Japan; Republic of Korea; Malaysia; Mexico; New Zealand; Papua New Guinea; Peru; The Republic of the Philippines; The Russian Federation; Singapore; Chinese Taipei; Thailand; United States of America; Vietnam.

APEC was established in 1989 to further enhance economic growth and prosperity for the region and to strengthen the Asia-Pacific community. Since its inception, APEC has worked to reduce tariffs and other trade barriers across the Asia-Pacific region, creating efficient domestic economies and dramatically increasing exports. APEC also works to create an environment for the safe and efficient movement of goods, services and people across borders in the region through policy alignment and economic and technical cooperation.

1.3 APEC ENERGY WORKING GROUP

The Energy Working Group (EWG) is a voluntary consensus-based regional forum, established in recognition that energy is an essential input into economic activity and consequently economic prosperity of the APEC region. The EWG members also recognise that energy goods and services are a major component of international trade. Therefore, trade and investment liberalisation and facilitation are high on the agenda of this working group.

Renewable energy is becoming an increasingly significant energy source in the APEC region, helping member economies diversify their energy mix, strengthen the security and reliability of affordable energy, and further sustainable development. The Expert Group on New and Renewable Energy Technologies (EGNRET) was formed by the EWG with the mission of facilitating the increased use of new and renewable energy technologies in the APEC region. A major EGNRET activity is the APEC 21st Century Renewable Energy Development Initiative (REDI). REDI is a series of collaborative efforts to foster a

common understanding of regional renewable-energy issues, facilitate trade and investment in renewable-energy technologies and services, and reduce the environmental impact of the energy sector through the applications of renewable-energy technologies.

1.4 OBJECTIVES OF STUDY

The purpose of this study is to list and describe the potential sources of funding for commercial installation of renewable and clean energy technologies in APEC economies. The report covers lending and grant entities and programs that could fund implementation of international energy and environmental projects. Major potential sources of equity funds are also included in the report.

Achievement of the above objectives will improve APEC's renewable energy project developers' understanding of financial options in the region, thereby easing access to financial resources and increasing the number of renewable energy projects implemented in the area. This will assist achievement of APEC goals of economic growth, energy security and environmental protection.

2. Methodology

2.1 QUESTIONNAIRES

The initial phase of the study was principally undertaken using desktop research to identify financial institutions, organisations or government entities that were potential sources of funding for commercial installation of renewable and clean energy technologies in APEC economies. Once relevant financial institutions, organisations and government entities were identified, they were contacted and invited to complete a questionnaire.

Two questionnaires were developed for the study: one for Government Renewable Energy Agencies and one for other financing institutions and organisations. Copies of the blank questionnaires are included in Appendix 6.1 and 6.2.

Responses to the questionnaires were received from 32 organisations within 11 individual APEC member economies, plus 11 international organisations catering to APEC member economies. Follow-up interviews were conducted with 20 institutions.

2.2 TARGETED INSTITUTIONS

The following is a listing by country of organisations that responded to the questionnaire. A complete listing of targeted institutions that received questionnaires is included in Appendix 6.3.

2.2.1 Australia

- Office of the Renewable Energy Regulator (ORER)
- The Australian Greenhouse Office (AGO)
- Sustainable Energy Development Authority (SEDA), New South Wales
- Sustainable Energy Development Office (SEDO), Western Australia
- National Australia Bank

2.2.2 Canada

- McCarthy Tetrault LLP
- The Probyn Group

2.2.3 Chile

- Refer to international organisations.

2.2.4 People's Republic of China

- China Environment Fund

2.2.5 Indonesia

- Department of Energy & Mineral, Department for Renewable Energy & Energy Conservation
- State Minister for Research & Technology, Deputy of Technology and Knowledge Research

2.2.6 Republic of Korea

- Korea Energy Management Corporation, Ministry of Science and Technology

2.2.7 Malaysia

- Malaysian Energy Centre – PTM (Pusat Tengan Malaysia)

2.2.8 Mexico

- Refer to international organisations.

2.2.9 Papua New Guinea

- Department of Petroleum and Energy, Energy Division, Energy Planning and Policy Branch
- ANZ, Papua New Guinea
- BSP, Bank of South Pacific, Papua New Guinea

2.2.10 Peru

- Refer to international organisations.

2.2.11 Philippines

- Philippine Council for Industry and Energy Research & Development

2.2.12 Singapore

- Singaporean National Environment Agency (NEA)

2.2.13 Chinese Taipei

- Ministry of Economic Affairs (MOEA)
- Industrial Technology Research Institute

2.2.14 United States

- Solar Development Group
- US Trade and Development Agency
- United States Agency for International Development

2.2.15 International Organisations

- The Corporación Andina de Fomento (CAF) (includes Chile, Mexico and Peru)
- The Industrialization Fund for Developing Countries (IFU), Denmark
- Triodos Bank NV, Netherlands
- ABN Amro Bank
- COFACE, France
- DEG -Deutsche Investitions - und Entwicklungsgesellschaft mbH, Germany

- Finnish Fund for Industrial Cooperation Ltd. (FINNFUND), Finland
- Hermes Kreditversicherung, Germany
- United Nations Environment Programme, France
- Gesellschaft fuer Technische Zusammenarbeit, Germany

2.3 FOLLOW-UP INTERVIEWS

Below is a list of entities that were interviewed as follow-up to the questionnaires. Also listed are certain entities that were contacted directly without having received a completed questionnaire.

- Gesellschaft fuer Technische Zusammenarbeit, Germany
- EBRD
- EIB
- Oxford Institute of Energy
- World Bank Energy Department
- Prototype Carbon Fund (World Bank)
- GEF (World Bank, IFC, UN)
- ENEA, Italy
- SACE, Italy
- IFC
- IDB
- UNEP
- UNESCO
- REEEP
- Natural Resources Canada
- McCarthy Tetrault LLP
- The Probyn Group
- G-8 Task Force for Renewables
- US Trade and Development Agency

2.4 OTHER RESEARCH

Below is a listing of articles, speeches, reports, white papers, and other relevant publications that were used in analysing the availability of financing for renewable energy projects.

Electricity Reform in APEC Economies – The Way Ahead, November 2003

Cary Bloyd Ph.D, New and Renewable Energy: An APEC Perspective for Sustainable Development, APERC mid-Year Workshop, October 29-30 2003

Draft addendum to the UNCITRAL Legislative Guide on Privately Financed Infrastructure Projects, Unite Nations Commission on International Trade Law, 19 December 2002

Technical Assistance for Public-Private Infrastructure Advisory Facility, Asian Development Bank TAR: OTH 36249, December 2002

APEC 21st Century Renewable Energy Initiative – Training and Accreditation Needs and Capabilities Study (EWG 04/2002), Final Report

Synthesis of the Survey of APEC Member Economies' Renewable Energy Based Priority Needs and Issues Relating to Sustainable Development, March 2002

Wide-Spread Implementation of Renewable Energy Projects in APEC Member Economies: Road Maps for Success, November 2000

APEC Guidebook for Financing New and Renewable Energy Projects, August 1998

Renewable Energy: A Guide to Successful Implementation, South Asia Renewable Energy Programme (SAREP), February 2003

Marianne Haug, Director Energy Efficiency, Technology and R&D, International Energy Agency (IEA), *The Role of Renewables in Future Energy Directions*, ETI Conference, Lisbon, 16 October 2002

Rural Energy and Development for Two Billion People, World Bank Publication

Financing of Private Hydropower Projects, World Bank Discussion Paper No. 420, July 2000

Best Practices Guide: Economic & Financial Evaluation of Renewable Energy Projects, USAID, June 2002.

Wohlgemuth, Norbert and Reinhard Madlener, "Financial Support for Renewable Energy Systems: Investment vs Operating Subsidies," *Proceedings of the Norwegian Association for Energy Economics (NAEE) Conference „Towards an Integrated European Energy Market", Bergen/Norway, 31 Aug – 2 Sep 2000.*

Financing Sustainable Energy Directory: A Listing of Lenders and Investors, United Nations Environment Programme, September 2002.

Financing Wind Beyond 2010: Survey Results, Issued to BWEA Members, September 24, 2003

Financing Wind Beyond 2010: Possible Solutions, Issued to BWEA Members, September 24, 2003.

Electricity Sector Report for the World Summit on Sustainable Development, United Nations Environment Programme, January 2002.

Eric Martinot, "Grid-Based Energy in Developing Countries: Policies, Strategies, and Lessons from the GEF," *World Renewable Energy Policy and Strategy Forum, June 13-15, 2002, Berlin Germany.*

Energy Sector Strategy, Inter-American Development Bank, May 2000.

European Bank for Reconstruction and Development, *Energy Operations Policy*, 2002.

European Bank for Reconstruction and Development, *Municipal and Environmental Infrastructure*, January 1999.

European Commission, *Energy for the Future: Renewable Sources of Energy*, White Paper for a Community Strategy and Action Plan, November 1997.

Alejandro Jadresic, "Promoting Private Investment in Rural Electrification – The Case of Chile," *Viewpoint*, World Bank Group, Private Sector and Infrastructure Network, June 2000.

Anil Cabraal and Kevin Fitzgerald, "PV for Rural Electrification within Restructured Power Sectors in Developing Countries," March 2002.

Eric Martinot, Anil Cabraal, and Subodh Mathur, "World Bank/GEF Solar Home System Projects: Experiences and Lessons Learned 1993-2000," April 2000.

Netherlands Certified Emissions Reduction Unit Procurement Tender, *Project Design Document: Brazil: Catanduva Sugarcane Mill, Biomass Power Plant Expansion*, July 2002.

Alan S. Miller and Eric Martinot, "The Global Environment Facility: Financing and Regulatory Support for Clean Energy," *Natural Resources & Environment* 15(3): 164-167; 206 (2001).

Douglas Barnes et al., "Financing Decentralized Renewable Energy: New Approaches," *Energy Issues*, 1998.

3. Description of Renewable Energy Programs

The ability and willingness of the financial sector to provide financing for renewable energy (RE) projects grew substantially during the 1990s, but has recently encountered some obstacles with the global economic downturn and the disruption of international energy markets. Despite larger government support for RE and the first attempts at carbon trading, financing remains a critical impediment to the growth of RE projects. The following section will provide a list of potential sources of financing for such projects. The list is broken down by type of funding agency: Multilateral Institutions, Export Credit Agencies and other governmental entities, private equity funds and commercial banks. Much of the information provided here has been obtained from the *Financing Sustainable Energy Directory: A Listing of Lenders and Investors*, published by the United Nations Environment Programme. Additional research was undertaken to identify other possible funding sources. Many of the entities listed in this section invest in stand-alone RE projects and in companies that develop renewable energy technologies. It was decided to keep the list as comprehensive as possible. Some of the organizations listed place the focus of their investment activities in promoting RE technologies, but they may also be interested in stand-alone projects under the right conditions. Since the contact information of the individuals listed in this section constantly changes, some of the information contained might be outdated, but we believe that the listing provided herein offers a comprehensive overview of sources of funding for RE projects.

3.1 MULTILATERAL INSTITUTIONS

Multilateral Institutions such as the World Bank, the International Finance Corporation, and the United Nations are important funding mechanisms for RE projects. Many of these institutions have introduced programs and initiatives that provide various forms of financing, especially in the seed stage, for RE projects. They can also offer invaluable technical assistance. Furthermore, they have positioned themselves at the cutting edge of the many carbon trading and reduced emissions certificates trading projects that promise to raise significant amounts of investment capital for RE projects in the years to come.

Lending organizations such as IFC, ADB and IDB have traditionally been an important source of capital for large-scale hydro projects, the single-most important form of RE today. Amidst growing concerns over the environmental impact of large dams, they are now paying more attention to small-scale hydro plants and other forms of RE. Because the involvement of multilateral lenders makes the participation of commercial lenders and other private investors more likely, they perform a crucial function in leveraging their funds to raise more capital for RE projects.

Name of Institution	World Bank Asia Alternative Energy Programme (ASTAE)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The Asia Alternative Energy Program (ASTAE) was established in 1992 to mainstream alternative energy (renewable energy and energy efficiency) in the World Bank's power sector lending operations in Asia. ASTAE has supported the development of alternative energy investments in the Asia regions. The ASTAE-supported alternative energy lending portfolio for FY 93-03 consists of 38 operations in 11 countries with a total alternative energy cost of $3.5 billion and total Bank/GEF commitments of $1.1-1.3 billion. The 17 projects under implementation will displace more than 1 gigawatt (GW) of fossil fuel based generation capacity and will provide electricity to an estimated 530,000-630,000 rural households in remote areas that would otherwise lack access. Increasingly, alternative energy is being mainstreamed into Bank/GEF lending to the Power Sector in Asia. For the period FY97-FY99, 12% of Total (cumulative) Bank Power Sector lending in Asia was for alternative energy projects or project components.
Contact Information	Mr. Mohammad Farhandi, Program Manager Mfarhandi@worldbank.org +1 (202) 458-2880 Mr. Noureddine Berrah, Deputy Program Manager Nberrah@worldbank.org +1 (202) 473-1132 Asia Alternative Energy Program (ASTAE) 1818 H Street, N.W. Washington, DC 20433 USA Tel: +1 (202) 458-1405 Fax: +1 (202) 522-1648

Name of Institution	World Bank - Energy Sector Management Assistance Programme (ESMAP)
Focus of Activity	All Renewable Energy Projects
Description of Activity	ESMAP is a global technical assistance program sponsored by the World Bank and the United Nations Development Programme (UNDP) and managed by the World Bank. ESMAP focuses on the role of energy in economic development with the objective of contributing to poverty alleviation and economic development, improving living conditions, and preserving the environment in developing countries and economies in transition. ESMAP channels free policy advice and other technical assistance to governments. ESMAP focuses on three priority areas: - market-oriented energy sector reform and restructuring, - access to efficient and affordable energy, - environmentally sustainable energy production, transportation, distribution and use. ESMAP works along six main themes: - assisting with energy sector policy and restructuring, - promoting energy access in rural and urban areas, and underserved households and businesses, - analyzing local, regional and global energy-environment linkages, - mainstreaming renewable energy technologies, - encouraging more efficient energy practices, - facilitating international energy trade.
Contact Information	Dominique Lallement (Manager of ESMAP) Tel: +1 (202) 458-2321 Fax: +1 (202) 522-3018 E-mail: esmap@worldbank.org World Bank, 1818 H. Street N.W., Washington, DC. 20433 USA

Name of Institution	Global Environmental Facility
Focus of Activity	All Renewable Energy Projects
Description of Activity	The GEF is an entity that provides grants and concessional funds to recipient countries for projects to protect the global environment. It was established to forge international cooperation and finance actions to address four critical threats to the global environment: biodiversity loss, climate change, degradation of international water, and ozone depletion. The GEF is managed by the World Bank, but projects are approved by the World Bank along with the UNDP and UNEP. Approved by GEF's Council in 1995, the Operational Strategy lays the foundation for GEF's efforts in the aforementioned four focal areas discussed above and 10 operational programs. The strategy incorporates guidance from two conventions for which GEF serves as the financial mechanism: the Convention on Biological Diversity and the UN Framework Convention on Climate Change.
Contact Information	GEF Secretariat 1818 H Street, NW Washington, DC 20433 USA Call or send a fax to the Secretariat at: Tel: +1 (202) 473-0508 Fax: +1 (202) 522-3240/3245 E-mail: secretariat@TheGEF.org

Name of Institution	Prototype Carbon Fund (PCF)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The PCF, with the operational objective of mitigating climate change, aspires to promote the Bank's tenet of sustainable development, to demonstrate the possibilities of public-private partnerships and to offer a learning-by-doing opportunity to its stakeholders. The PCF will invest contributions made by companies and governments in projects designed to produce emission reductions fully consistent with the Kyoto Protocol and the emerging framework for JI and the CDM. Contributors or participants in the PCF will receive a pro rata share of the emission reductions, verified and certified in accordance with agreements reached with the respective countries hosting the projects. Greenhouse gases targeted should be those covered under the Kyoto Protocol (CO2, CH4, N2O, HFCs, PFCs, and SF6).
Contact Information	Ken Newcombe Prototype Carbon Fund The World Bank 1818 H Street, N.W Washington, DC 20433 USA HelpDesk@prototypecarbonfund.org www.prototypecarbonfund.org

Name of Institution	International Finance Corporation (IFC), Environmental Projects Unit and Power Department
Focus of Activity	All Renewable Energy Projects
Description of Activity	IFC's Environment and Social Development Department assists IFC to develop successful and sustainable projects with low environmental and social impacts. Within this department, the Environmental Projects Unit (EPU) contributes to IFC's mission by accelerating market acceptance of technologies, products, and operating practices that benefit the environment. It supports sustainable energy projects and in recent years, has been actively seeking to finance a greater number of energy efficiency projects and to develop special initiatives to accelerate the market penetration of these technologies. The EPU welcomes proposals seeking IFC financing for private-sector projects with specific environmental benefits. In reviewing such proposals, IFC works closely with the relevant IFC Investment Departments. The Power Department of the IFC is a team of professionals which provides a wide range of advisory and financial services to IFC's clients. IFC works with investors to refine and improve project structures, alleviate risk, and assure syndication of commercial debt on the best terms. The Power Department structures financial instruments to meet the needs of individual transactions. Beyond IFC's equity, A loan, B loan, mezzanine financing and risk management facilities, IFC and the World Bank collaborate on the deployment of the Bank's partial risk guarantee to underpin additional financing as circumstances require. IFC is also designing new credit enhancement mechanisms, intended to extend loan maturities and reduce costs.
Contact Information	2121 Pennsylvania Avenue, NW, Washington, DC, 20433, USA. Louis Boorstin, Manager Environmental Projects Unit: E-mail: ifcepu@ifc.org Francisco Tourreilles, Director Power Department: Tel: +1 (202) 473-0814 Fax: +1 (202) 974-4309 www.ifc.org/enviro/EPU www.ifc.org/about/contacts/sectors/power/power.html

Name of Institution	IFC Photovoltaic Market Transformation Initiative
Focus of Activity	Solar Power
Description of Activity	The IFC/GEF Photovoltaic Market Transformation Initiative (PVMTI) is a strategic intervention to accelerate the penetration of photovoltaics (PV) as a renewable and emission-free source of electric power in developing countries, especially for offgrid applications. The Global Environment Facility (GEF) has approved $30 million for the project, of which $25 million is intended for concessional investments in PV market development projects in India, Kenya, and Morocco. The remaining $5 million is reserved for implementation costs. PVMTI is expected to have a significant impact in increasing sales of PV in-country, but its main impact is expected to be in facilitating the success of several 'beacon companies' that will provide examples of viable PV businesses. The successful investments will demonstrate financial structures and business approaches that work, thus forming the basis for long-term sustainability and replicability of projects.
Contact Information	Daniel Edmonds Broughton House 6-8 Sackville Street London W1X 1DD United Kingdom Tel: +44 207 434 1122 Fax: +44 20 7437 1245 d.edmonds@impax.co.uk www.impax.co.uk

Name of Institution	IFC Renewable Energy and Energy Efficiency Fund (REEF)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The $65 million Renewable Energy and Energy Efficiency Fund (REEF) is an investment fund targeting renewable energy and energy efficiency projects in developing countries. REEF targets investments below 50 Megawatts (MW) and small-scale PV operations. REEF's investments may take a variety of forms including common and preferred stock, partnership and limited liability company interests, and convertible or subordinated debt with equity warrants/options. REEF may also make loans to projects or project sponsors on a bridge or permanent basis. Equity transactions are typically structured so that the entrepreneur retains the majority of shares and/or management of the company.
Contact Information	Projects over 7MW: Attn: K.R. Locklin EIF Group 727 15th St., NW – 11th floor, Washington, DC 20005 USA Tel: +1 (202) 783-4419 Fax: +1 (202) 371-5116 klocklin@eifgroup.com Commercial Projects < 7MW: Attn: Brooks Browne Environmental Enterprises Assistance Fund 1655 N. Fort Myer Drive, Suite 520, Arlington, VA 22209 USA Tel: +1 (703) 522-5928 Fax: +1 (703) 522-6450 brooks@eeaf.org Off-Grid Projects and Development Projects < 7MW: Attn: Phil LaRocco Energy House Capital Corp. (see E+Co) 383 Franklin Street, Bloomfield, NJ 07003 Tel: +1 (973) 680-9100 Fax: +1 (973) 680-8066 phil@energyhouse.com www.ifc.org/enviro/EPU/Renewable/REEF/reef.htm

Name of Institution	IFC Small and Medium Enterprise Program
Focus of Activity	All Renewable Energy Projects
Description of Activity	The objective of the SME Program is to stimulate greater involvement of private sector SMEs in addressing two specific objectives of the Global Environment Facility (GEF) – the conservation and sustainable use of biological diversity and the reduction of greenhouse gases. (SMEs are defined as viable businesses with less than $5 million in assets). Viable institutions experienced in working with SMEs in GEF eligible countries are eligible to act as SME Program Intermediaries. SME Program Intermediaries receive a long-term low interest rate loan of from US$500,000 to US$1 million (for up to 10 years at an interest rate as low as 2.5% p.a.). Intermediaries use the loan proceeds to finance, with debt or equity, SMEs or SME projects which address the biodiversity or climate change objectives of the GEF. The maximum amount of SME Program funding an Intermediary may advance to any one SME or SME project is US$250,000. To date 18 Intermediaries operating in more than 20 countries have been approved and between them they will finance in excess of 120 different SME projects. The EPU is currently designing a follow-on SME Program. This initiative, if successfully capitalized, with also support the GEF climate change and biodiversity objectives but on a more commercial and sustainable basis.
Contact Information	International Finance Corporation, Environmental Projects Unit, 2121 Pennsylvania Avenue NW, Washington, DC, 20433, USA. ifcepu@ifc.org

Name of Institution	Asian Development Bank
Focus of Activity	All Renewable Energy Projects
Description of Activity	ADB is a multilateral development finance institution dedicated to reducing poverty in Asia and the Pacific. ADB is a non-profit, multilateral development financial institution that engages in mostly public sector lending, and some limited private sector lending for development purposes in its developing member countries. ADB's clients are its member governments, who are also its shareholders. ADB's principal tools are loans, equity investments and technical assistance. ADB provides investment loans to public and private sector projects. Public sector borrowers are also eligible for technical assistance and may, when among the poorer countries, also be eligible for concessional loans
Contact Information	Headquarters: 6 ADB Avenue, Mandaluyong City 0401 Metro Manila, Philippines information@adb.org Tel: + 632 632 4444 Fax: + 632 636 2444 www.adb.org

Name of Institution	Central American Bank for Economic Integration (CABEI)
Focus of Activity	All Renewable Energy Projects
Description of Activity	CABEI is a regional development bank. The five funding nations are Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica. In the area of energy CABEI focuses on production and rational use of energy in the public and private sector, providing technical and financial support to cover the investment needs and requirements. The bank estimates that 59% of its energy portfolio is composed of renewable energy projects, and it is currently working with UNDP on a project to accelerate investments in renewable energy in Central America through CABEI. Its overall objective is to promote renewable energy investments, thereby reducing the CO2 emissions of the energy sector and contributing to rural economic development in Central America.
Contact Information	Gracia M. Barahona 16 Calle 7-44, Zona 9 Ciudad de Guatemala, Guatemala Gbarahon@bcie.hn Tel: +(502) 331 1260 Fax: +(502) 331 1457 www.bcie.org

Name of Institution	Corporación Andina de Fomento (CAF)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The CAF is a multilateral financial institution that promotes the sustainable development of its shareholder countries (Bolivia, Colombia, Ecuador, Peru, Venezuela, Argentina, Brazil, Chile, Jamaica, Mexico, Panama, Jamaica, Paraguay, Trinidad, and Tobago, Uruguay) and regional integration. It serves the public and private sectors, providing multiple financial services to a broad customer base composed of the governments of shareholder countries, public and private companies, and financial institutions. CAF has been developing a series of environmental programs, activities, and products, which include the Latin American Carbon Program (LACP). In May of 1999, CAF established LACP with the support of the Center for the Sustainable Development in the Americas (CSDA). Its objective is to support the participation of the shareholder countries in the development of the emerging carbon market, based on the principles of the United Nations Framework Convention on Climate Change (UNFCCC).
Contact Information	Pablo Cardinale Venezuela Ave. Luis Roche, Torre CAF, Altamira, Caracas P.O. Box Carmelitas 5086 Venezuela. Tel: (+58212) 209-2111 Fax: (+58212) 284-5754 pcardinale@caf.com www.caf.com

Name of Institution	European Bank for Reconstruction and Development (EBRD)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The EBRD exists to foster in the countries of Central and Eastern Europe and the Commonwealth of Independent States (CIS), the transition towards open market oriented economies and to promote private and entrepreneurial initiatives. It is committed to applying the principles of multiparty democracy, pluralism, and market economics. EBRD is becoming more and more active in renewables, and is looking at projects throughout the region - mainly small hydro, wind, and biomass. EBRD has already invested in a large geothermal plant in Russia. EBRD is a founding investor in the Dexia-FE Clean Energy Efficiency Fund (See Dexia-FE Clean Energy, Energy Efficiency and Emissions Reduction Fund under Private Equity), which invests in ESCOs.
Contact Information	Karen McClellan One Exchange Square London EC2A 2JN, UK mcclellk@ebrd.com Tel: +44 20 7338 7177 www.ebrd.org

Name of Institution	European Investment Bank
Focus of Activity	All Renewable Energy Projects
Description of Activity	The Bank will fund projects that offer a satisfactory rate of return. Loans, both individual and global, can be up to € 25 Million, and up to 50% of investment cost. Projects by SME or local authorities are also considered. The task of the EIB, the European Union's financing institution, is to contribute towards the integration, balanced development, and economic and social cohesion of the EU Member Countries. To this end, it raises on the markets substantial volumes of funds that it directs on the most favourable terms towards financing capital projects meeting the objectives of the Union. Outside the Union, the EIB implements the financial components of agreements concluded under European development aid and cooperation policies. EIB has helped finance a number of renewable energy and energy efficiency projects.
Contact Information	Various country officers Peter Carter, Environment Officer 100 blvd. Konrad Adenauer L-2950 Tel: +35 2 43791 Fax: +35 2 437704 www.eib.org

Name of Institution	Inter American Development Bank (IDB)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The IDB was established to help accelerate economic and social development in Latin America and the Caribbean. The bank supports electric energy generation, transmission and distribution projects and/or programs, as well as the development of hydrocarbon resources. The Bank will actively promote energy development in the region by means of loans and technical cooperation for technically, socio-economically, and financially feasible projects aimed at: • developing alternative sources of energy, especially from renewable resources; • reducing and/or replacing the utilization of hydrocarbons in the production of energy; • promoting the efficient use of energy; • creating and/or strengthening the institutional and technological base of the energy sector; • mobilizing additional resources, either of internal or external origin, required for the implementation of energy projects and/or programs.
Contact Information	Daniel Sheppard, Project Specialist 1300 New York Avenue, NW Washington, DC 20577 USA Tel: +1 (202) 623-2708 Daniels@iadb.org www.iadb.org

Name of Institution	Inter-American Investment Corporation (IIC)
Focus of Activity	All Renewable Energy Projects
Description of Activity	As part of the IDB, the IIC consists of 42 shareholders that promote the economic development of its regional borrowing member countries by stimulating the establishment, expansion, and modernization of private enterprises, particularly those that are small and medium in size. The IIC seeks to provide financing to companies that do not have access to medium- or long-term financing from the capital and financial markets. Also, the IIC may serve as an advisor to companies in attracting other resources to the projects it finances: additional financing, technology transfer, and technical and managerial know how. These resources are mobilized through co-financing and syndication, support for security underwriting, and identification of joint-venture partners. The IIC seeks out investment funds structured to embrace the smaller projects, which are often not acceptable to the market's bigger players. For example, the IIC subscribed $5 million of the $100 million target capitalization of the EIF Caribbean Basin Power Fund, Ltd, an equity fund that will finance small power plants, mainly in Central America and the Caribbean.
Contact Information	Steven Reed 1300 New York Avenue, NW Washington DC, 20577, USA Tel: +1 (202) 623-3981 Fax: +1 (202) 623-3802 www.iadb.org/iic

Name of Institution	Multilateral Investment Fund (MIF) of the Inter American Development Bank (IDB)
Focus of Activity	All Renewable Energy
Description of Activity	The Multilateral Investment Fund of the Inter-American Development Bank (IDB) was established to finance private sector development projects in Latin America and the Caribbean. The MIF supports specific investment funds that can invest in companies that employ renewable energy technologies or energy efficiency. In addition, MIF is supporting a variety of initiatives in the region to promote the use of cleaner production and other instruments to reduce the use of energy, water and other materials and help make companies more competitive.
Contact Information	Daniel Shepherd, MIF Project Specialist 1300 New York Avenue, NW Washington, DC 20577 USA Daniels@iadb.org Tel: +1 (202) 623-2708 Fax: +1 (202) 942-8100 www.iadb.org/mif

Name of Institution	Nordic Environment Finance Corporation (NEFCO)
Focus of Activity	All Renewable Energy Projects
Description of Activity	NEFCO is an international financial institution, established in 1990 by the five Nordic countries (Denmark, Finland, Sweden, Norway and Iceland) to participate with risk capital (equity, mezzanine financing and loans) in environmental projects in Central and Eastern Europe. The purpose is to promote financially viable environmental projects, i.e. projects that are able to generate sufficient revenues to cover their costs, while at the same time contributing to environmental improvement. The main types of investments comprise enterprises set up to provide environmental services (such as wastewater treatment or waste handling) or to produce environmental equipment, or pollution abatement measures in production plants and energy utilities. NEFCO regularly co-finances projects with bilateral and multilateral partners (including the programs of the European Commission) and also administers external funds. NEFCO has so far approved close to 100 projects, the majority of which are partnerships with private companies or municipal entities. Recent projects funded by NEFCO include a renewable energy facility in Russia and an energy-efficiency project in Apatity, Russia.
Contact Information	Harro Pitkanen, Managing Director Fabianinkatu 34, PO Box 249 Fin-00171 Helsinki Finland Tel: +358 918 001 Fax: +358 963 0976 Harro.Pitkanen@nefco.fi www.nefco.fi

Name of Institution	UNEP: CREED – China Rural Energy Enterprise Development
Focus of Activity	All Renewable Energy Projects
Description of Activity	The China Rural Energy Enterprise Development Initiative (CREED) project seeks to create a sustainable energy development path for rural people in the Northwest part of Yunnan province and neighbouring areas in Western China. CREED will invest in new small entrepreneurs to offer energy services to rural customers based on energy technologies and practices that are environmentally more sustainable than current approaches. Adopting a method developed by project partner E+Co of coupling enterprise development services with closely targeted financing, the CREED initiative will help start and support new businesses that supply improved energy to the rural poor. CREED will also work with local partners toward rural energy services by providing support for consumer credit and income generation activities so that poor families will have the means - and incentive - to purchase and use better alternatives. These two main thrusts of the project will be carried out in a way that helps a variety of Chinese partners to continue the approach and that anchors it in Chinese Government policies and programmes that are themselves strengthened through the project.
Contact Information	Tang Letian ltang@public.km.yn.cn Xia Zuzhang xiazh@public.km.yn.cn

Description based on website and TDJ research

Name of Institution	UNEP: RE/EE Investment Advisory Facility (IAF)
Focus of Activity	All Renewable Energy Projects
Description of Activity	Since mid 1999, UNEP has invested more than $450,000 to promote renewable energy (RE) and energy efficiency (EE) investments in developing and transition economies through the RE/EE Investment Advisory Facility (IAF). The IAF provides banks and financiers with targeted expertise and support to evaluate proposals in the sustainable energy sector and to help these institutions develop the skills to evaluate such projects independently. Funded by the Global Environment Facility and Sustainable Alternatives.net, the IAF is part of UNEP's broad efforts to shift flows of finance towards systems that align with sustainable development. The IAF is managed jointly by UNEP and the UNEP Risoe Centre on Energy and Environment. The IAF has assisted a variety of development and commercial banks, and private investors to assess prospective debt and equity investments in the sustainable energy sector. These include projects or investment funds involving wind, biomass, biogas, geothermal, small hydro and district heating technologies, as well as energy service companies (ESCOs).
Contact Information	Energy Unit Division of Technology, Industry and Economics United Nations Environment Programme 39-43 quai André Citroen, 75739 Paris, France Tel: +33 144377614 Fax: +33 144371474 Email: eric.usher@unep.fr

Description based on website and TDJ research

3.2 GOVERNMENT ENTITIES AND EXPORT CREDIT AGENCIES

Many of the developed countries of North America and Europe have formed Export Credit Agencies (ECA) whose designated role is the promotion of the exports of the respective countries through credits and political risk insurance to the buyers of the goods. In project finance, the participation of ECAs such as the US Export-Import Bank is often crucial in allowing commercial lenders to loan money to energy and other projects in countries with a high degree of economic and political instability. However, RE projects have not utilized this funding mechanism extensively in the past. The lower investment volume of many RE projects made such an approach infeasible. But the growing commercialization of wind power in particular, indicates that more and more of the producers of wind turbines and other equipment used in RE projects might consider ECA financing to promote the exports of their machinery. Our contacts with ECAs in the United States and Europe have shown that they are interested in the promotion of RE projects. They will consider export credit requests from equipment manufacturers under the same conditions as other energy projects.

Name of Institution	Danish Export Finance Corporation
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	La Cours Vej DK-2000 Frederiksberg Denmark www.efs.dk

Name of Institution	Export Credits Guarantee Department (UK)
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	Mr. David Allwood PO Box 2200 2 Exchange Tower Harbour Exchangew tower London E14 9GS Tel: +44 (0) 20 75127323 Fax: +44 (0) 20 75127649 Dallwood@ecgd.gov.uk www.ecgd.gov.uk

Name of Institution	Export Development Corporation, Canada
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	151 O'Connor Street, Ottawa, Canada K1A 1k3 Fax: +1 613 598 6615 export@edc-see.ca

Name of Institution	Export Finance and Insurance Corporation, Australia
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	Export Finance and Insurance Corporation 22 Pitt Street Sydney NSW 2000 Tel: + 61 (0) 2 9201 2111 Fax: + 61 (0) 2 9201 5222 info@efic.gov.au www.efic.gov.au

Name of Institution	United States Export-Import Bank
Focus of Activity	All Renewable Energy Projects
Description of Activity	Ex-Im Bank is an independent US government agency that finances export sales of US goods and services (in contract to OPIC, which supports investment). It is the official export credit agency of the U.S. It supplements and encourages, and does not compete with, commercial financing. The Ex-Im Bank enables US exporters to compete internationally on the basis of product quality, service, and price by neutralizing the effect of export credit subsidies from other governments and by absorbing risks that the private sector will not accept. The Ex-Im Bank provides financing to creditworthy private and sovereign foreign buyers. Application to Ex-Im Bank may be initiated by any interested party to a specific export transaction: the manufacturer, the exporter, the intermediary lender, the foreign buyer, the buyer's guarantor. Loans and guarantees are available to support sales of U.S. capital equipment, projects, and services. If a US export item contains foreign-made components incorporated in the US, the Ex-Im Bank will finance up to 100% of the US content provided the total amount financed does not exceed 85% of the total contract price and the total US content is not less than 50%. Limited recourse (project) and structured financing are two options that offer maximum flexibility for project sponsors and help U.S. exporters compete globally in natural resource and infrastructure sectors. Ex-Im Bank can consider limited recourse project financing in most countries and has no country or project dollar limits. In either project or structured finance, Ex-Im Bank has two primary goals: ▪ To maximize U.S. company participation in the transaction in order to support U.S. jobs; and ▪ To lend responsibly into creditworthy projects in order to protect the interests of our "shareholders," the U.S. taxpayers. Although Ex-Im Bank's Project Finance Division was created less than ten years ago, we were doing "structured" deals for many years. Now these two functions are being handled jointly by the Structured Finance Division under Vice President Barbara O`Boyle.
Contact Information	Export-Import Bank of the U.S. Washington, DC Office

	811 Vermont Ave., NW Washington, DC 20571 USA Tel: +1 (800) 565 3946 Fax: +1 (202) 565-3380 www.exim.gov

Description based on website and TDJ research

Name of Institution	US Agency for International Development
Focus of Activity	All Renewable Energy Projects
Description of Activity	US AID has a number of programs in place than can be used to finance RE projects: *Development Credit Authority:* Agency-wide loan guarantee program that enables USAID to leverage its capital by providing loan guarantees in lieu of grants for a variety of projects, including energy. *Environment Program:* The program seeks to overcome market and institutional barriers to encourage widespread adoption and use of renewable energy systems to meet development needs. The program seeks to: • foster implementation of policy or regulatory changes that clarify or establish rights and incentives for the cost-effective utilization of renewable energy resources and technologies; • mobilize business entities to pursue renewable energy projects; • leverage financial commitments to renewables; and • catalyze the establishment or strengthening of host-country, non-profit institutions for the explicit purpose of promoting renewables to meet development needs. *US-Asia Environmental Partnership:* The United States-Asia Environmental Partnership (US-AEP) is a public-private initiative that promotes environmentally sustainable development in Asia. US-AEP is jointly implemented by several U.S. government agencies, under the leadership of the U.S. Agency for International Development (USAID). In creating US-AEP, the White House recognized Asia's growing commitment to sustainable development and America's increasing eagerness to share its experience, technology, and management practices. Consequently, US-AEP embodies a new model of cooperative development, one that encourages U.S.-Asian partnerships. With the participation of wide range of partners--governments, NGOs, academia, and the private sector--US-AEP has become a flexible, responsive vehicle for delivering timely answers to environmental questions.
Contact Information	U.S. Agency for International Development Ronald Reagan Building Washington, D.C. 20523-1000 Tel: +1 (202) 712-4810 Fax: +1 (202) 216-3524 www.usaid.gov

Description based on website and TDJ research

Name of Institution	Japan Bank for International Cooperation (JBIC)
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic (Japanese) companies. The purpose of Japan Bank for International Cooperation shall be to contribute to the sound development of Japan and the international economy and community through undertaking lending and other financial operations: for the promotion of Japanese exports, imports or Japanese economic activities overseas; for the stability of international financial order; and for economic and social development or economic stability in developing areas; in accordance with the principle that it shall not compete with commercial financial institutions.
Contact Information	4-1 Otemachi 1-Chome Chiyodu-Ku Tokyo 100 Japan Tel: +81 3 3287 9101 Fax: +81 3 3287 9539 www.jbic.go.jp/english

Name of Institution	Gesellschaft fuer Technische Zusammenarbeit (GTZ)
Focus of Activity	All Renewable Energy Projects
Description of Activity	The GTZ is a German private cooperation that handles the technical assistance part of the official development work of the Federal Ministry for Economic Cooperation. GTZ is actively involved in the support of RE in all regions of the world. GTZ focuses its activities in the following areas: • Development of market for RE. • Government consulting on legal framework and institutional reforms. • Pilot projects for off-grid and on-grid RE energy projects. • Rural electrification with RE. • Solar home systems and biomass projects. • Development of financing modalities for RE.
Contact Information	Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH Dag-Hammarskjöld-Weg 1-5 65760 Eschborn Tel: (06196) 79-0 Fax: (06196) 79-1115

Description based on website and TDJ research

Name of Institution	Hermes Kreditversicherung
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	Head Office 22763 Hamburg Friedensallee 254 Postanschrift 22746 Hamburg Tel: +49 (0) 40 88 34 0 Fax: +49 (0) 40 88 34 77 44 www.hermes-kredit.com

Name of Institution	Kreditanstalt fur Wiederaufbau (KfW)
Focus of Activity	All Renewable Energy Projects
Description of Activity	KfW promotes the German economy by extending long-term loans at favourable interest rates. The focus is on financing: · Business investment and investment in environmental protection by small and medium-sized enterprises in Germany. · Business investment by small and medium-sized enterprises outside Germany. · Technology, innovation, and equity participation. · The creation and modernization of housing. · Communal infrastructure investment. KfW has begun promoting climate protection via renewable energies on a global scale and will continue to support the use of renewables in Germany, Europe and elsewhere in the world. KfW, as a bank supporting environmental and climate protection, has over the last five years provided € 0.34 (DEM 0.66) billion in investments, advisory services and further training measures to promote renewable sources of energy.
Contact Information	Energy and Environmental Technology Financing Unit Palmengartenstrasse 5-9 60325 Frankfurt am Main Germany Tel: +49 69 74310 Fax +49 69 7431 3344 www.kfw.com

Name of Institution	Overseas Private Investment Corporation (OPIC)
Focus of Activity	All Renewable Energy Projects
Description of Activity	OPIC supports US business investment in developing countries through direct loans and guarantees. OPIC provides support for investment, in contrast to Ex-Im Bank, which provides support for the export of US goods and services. OPIC support provides confidence to both project sponsors and other investors to invest in developing countries. OPIC's eligibility criteria are the same whether it makes a direct loan or issues a loan guarantee. The project must be environmentally and financially sound and be sponsored by an investor having a proven record of success in a closely related business. Financing is available for both new projects and expansion of existing businesses. The proposed project must not have a negative effect on the economy or employment in the US and be consistent with the social and economic interests of both the developing country and the US. Projects can be owned wholly by US companies or be joint ventures with local companies. The US investor is expected to own 25% of the equity. More than 50% of the voting shares of an overseas venture should be held by private companies or individuals.
Contact Information	Overseas Private Investment Corporation 1100 New York Avenue, N.W. Washington, DC 20527 USA Tel: +1 (202) 336-8400 Fax: +1 (202) 336-8420 info@opic.gov www.opic.gov

Description based on website and TDJ research

Name of Institution	Svensk Exportkredit, Sweden
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	Swedish Export Credit Corporation P.O. Box 16368, Västra Trädgårdsgatan 11 B, SE-103 27 Stockholm, SWEDEN Tel: +46 8 61 38 300 Fax: +46 8 20 38 94 info@sek.se www.sek.se/en/index.htm

Name of Institution	Finanzierungs-Garantiegesellschaft
Focus of Activity	All Renewable Energy Projects
Description of Activity	Provides export credits to domestic companies.
Contact Information	Mr. Herge-Gehart Hobensinn Prinz-Eugen Str. 8, A-1041 Vienna, Austria Tel: +43 (0) 1 50 175318 www.fgg.at

3.3 PRIVATE EQUITY FUNDS

Over the last ten years, a number of private equity funds - often founded in cooperation with a Multilateral Institution - have emerged that focus on the development and promotion of RE. These funds have invested hundreds of millions of US dollars in RE projects and companies, and form an ever more important source of funding for RE. Many of the funds listed primarily invest in companies that are engaged in the development of new technologies, but they can also be interested in stand-alone projects that meet their respective investment criteria. While many of the funds are driven by a genuine concern to further RE and to combat global warming, their investors require a return on their investment that not all RE projects can match. Only commercially-sound projects can hope to obtain financing from private equity funds. But the accelerating commercialization of wind power, particularly in Europe, has shown that RE projects can be profitable. As capital costs for RE projects continue to decline, and as the price of RE becomes more competitive with energy produced by fossil fuels, investment flows in RE from private sources will increase and provide an ever larger share of the overall investment volume.

Name of Institution	Al Tayyar Energy
Focus of Activity	Biogas, Biomass, Small hydropower, Solar, Wind
Description of Activity	Provides project development assistance funds as well as equity investments.
Contact Information	Dr. Granville (Pete) Smith PO Box 757 Abu Dhabi United Arab Emirates gpetesmith@cs.com Tel: +971-2-681-4004 Fax: +971-2-681-4005 www.altayyarenergy.com

Name of Institution	Private Energy Market Fund LP (PEMF)
Focus of Activity	All Renewable Energy
Description of Activity	Private Energy Market Fund L.P. is a private equity fund that was formed in November 1999 with $50 million in capital. The principal strategy is to take advantage of opportunities being created by the deregulation and restructuring taking place in the energy industry worldwide. The fund aims to identify the investment concepts that will benefit from the structural changes in the energy markets. The fund's role is typically one of a minority equity provider. In this role, it aims to add value to transactions by providing energy-industry and financial expertise. The fund acts as a neutral, but active private equity investor. The fund is managed by Emerging Power Partners Ltd., which is one of a small number of specialised fund managers targeting new opportunities in the energy sector. It combines access to a broad spectrum of resources with a proven ability in energy-related business development and finance.
Contact Information	Juhani Iloven Telekante 40 PO Box 92 02151 Espoo Finland Juhani.ilvonen@pemfund.com Tel: +358 94691209 Fax: +358 9469 1207 www.pemfund.com

Name of Institution	Asia West Environment Funds
Focus of Activity	Service companies in the environment sector and some off grid renewables.
Description of Activity	The Asia West Environment Funds, which includes the China Environment Fund and the Asia West Environment Fund, are strategic private equity funds whose mission is to generate venture-like financial returns by making active investments in companies working to sustain, restore and improve the global environment. The China Fund will invest in a core group of Chinese environmental service companies, around which a roll-up strategy can be implemented to take advantage of China's highly fragmented, yet enormous environmental protection market. The International Fund will invest in selected non-Chinese companies with technologies, products and/or services that are especially well-suited and competitive for the Chinese market.
Contact Information	Don Ye, President and CEO Tsinghua Venture Capital Co., Ltd. RM 2608, Huaye Building Tsinghua University Beijing 100084, Peoples Republic of China donye@tsinghuavc.com Tel: +86 (10) 6279 1197 Fax: +86 (10) 6278 0287

Name of Institution	Black Emerald Leasing Partners
Focus of Activity	All Renewable Energy
Description of Activity	Black Emerald Leasing Partners., L.P., is a leveraged equipment leasing fund. The fund invests in operating well-performing renewable energy power plants. Assets are purchased by the fund and leased back to the developer / SPV.
Contact Information	Eric Urbani 445 Park Avenue, 10th Floor New York, NY 10022 USA eric.urbani@blackemerald.com Tel: +1 (212) 675 3105 Fax: +1 (212) 675 5890 www.blackemerald.com

Name of Institution	Caribbean Basin Power Fund
Focus of Activity	All Renewable Energy
Description of Activity	EIF Group was founded in 1987 as the first specialized U.S. private equity fund manager dedicated exclusively to the independent power (IPP) and electric utility industry. EIF Group manages over $740 million of capital in portfolios containing more than 54 diversified investments, with a combined underlying asset value exceeding $4.5 billion. In December 2000, Dresdner Kleinwort Capital (DrKC) acquired EIF Group, which today comprises 31 investment, engineering, analytical, financial, and legal professionals with extensive experience in the development, evaluation and financing of global energy and utility investments. EIF manages a series of funds that provide equity capital to the global power and utilities sector. The Caribbean Basin Power Fund is an equity fund that finances small power plants, mainly in Central America and the Caribbean. The average generating capacity of these plants will be 28 megawatts. This fund will help finance approximately twelve power generation projects.
Contact Information	Terry Darby Managing Partner EIF Group Tel: +1 (212) 429 2200

Name of Institution	CDC Capital Partners
Focus of Activity	All Renewable Energy
Description of Activity	CDC Capital Partners provide equity capital to businesses in emerging markets. Their aim is to generate fully commercial returns on investments. By seeking to identify and invest in commercially viable, sustainable and socially responsible businesses, CDC Capital Partners aims to promote the enlargement of the business base in these countries; improve the competitiveness of their economies; and increase the wellbeing of their people. Electricity has always been one of the largest sectors in their power portfolio. Responding to the growing global trend towards private-sector power business by targeting investments in independent power producers, CDC Capital Partners is looking to participate in greenfield initiatives, privatisation and the restructuring of power businesses, either as part of a consortium or as lead developer.
Contact Information	Andrew Aldridge 1 Bessborough Gardens London SW1V 2JQ Aaldridge@cdcgroup.com Tel: +44 (20) 7828 6505 www.cdcgroup.com

Name of Institution	Clean Technology Fund
Focus of Activity	All Renewable Energy
Description of Activity	The fund has a target size of US$35 million for equity investments, US$20 million in debt facilities, and US$3-5 million in grants. The Clean Technology Fund includes a package of grant, equity, and debt funding that was conceived by the Multilateral Investment Fund (MIF) and is well adapted to the needs of SMEs, Energy Services Companies (ESCOS), and regional conditions. CleanTech focuses on the Southern Cone Region of the continent (Brazil, Argentina and Chile) and Mexico. It does not exclude investments in other Latin American countries, but the idea is to concentrate in the more industrialized regions, where the cleanup needs are more evident. The CleanTech Fund was scheduled to close its first round of investment in the fourth quarter of 2001 and begin investing in 2002.
Contact Information	André L. Guimarães Director Clean Technologies, Sao Paulo Tel +55 11 30 39 58 88, andre.guimaraes@a2r.com www.a2r.com.br Econergy International EIC Boulder Headquarters 3825 Iris Avenue, Suite 350, Boulder, CO 80301 Tel: +1 (303) 473-9007 Fax: +1 (303) 473-9060

Name of Institution	Clean Power Income Fund
Focus of Activity	Small Hydro, Biomass, Wind
Description of Activity	Clean Power Income Fund is an unincorporated open-ended trust established under the laws of Ontario. The Fund invests in 'environmentally preferred' power generating facilities. These investments currently consist of four hydro-electric facilities, one biomass facility (waste wood from forest industry operations), as well as loans for three wind power facilities. The Fund strategy is to enhance the stability of its financial performance by making investments in electricity-generating facilities that are diversified based on the geographic market they serve and the sources of energy they use to generate electricity. The Facilities serve the provincial power grids in Ontario, Alberta, and British Columbia, a municipality in northern British Columbia, and markets in the Pacific Northwest and Colorado in the United States.
Contact Information	Suite 1600, 67 Yonge Street, Toronto, Ontario, M5E 1J8 Canada www.probyngroup.com

Name of Institution	Corporación Financiera Ambiental (CFA)
Focus of Activity	All Renewable Energy
Description of Activity	CFA is the first environmental venture capital fund to invest in environmental projects in Central America. CFA invests at the stage of project execution. Investments can be made for new projects or the expansion of existing businesses. Investments range from US $100,000 to US $800,000 per project, and have an average size of $500,000. In exceptional cases, larger capital requests can be syndicated with other established regional funds that CFA coordinates with. Investments are made in the form of debt, equity, or a combination of the two, according to the financial structure that is most appropriate for small and medium-sized private enterprises.
Contact Information	Adriana Madrigal Empresas Ambientales de Centroamerica Apdo. 1581-2050 San Pedro Montes de Oca San José, Costa Rica Tel: +1 (506) 257-4717 Fax: +1 (506) 256-1357 amadrigal@cfa-fund.com www.cfa-fund.com

Name of Institution	Darby Latin American Mezzanine Fund
Focus of Activity	All Renewable Energy
Description of Activity	The Darby Latin American Mezzanine Fund, L.P. (DLAMF), launched in 1999, is Darby's first mezzanine finance fund and the first fund dedicated to mezzanine finance in Latin America. Darby conceived a unique structure with DLAMF: an investment vehicle that is rated and supported by long-term debt. This approach ensures diversification, allowed DLAMF to source long-term debt from prestigious lenders in the bilateral and multilateral banking community, and maximizes returns to the equity investors in the Fund. The Fund has investment capacity of $195 million, representing over $100 million in subscribed equity and the balance in commitments from lenders. DLAMF's investment activities are concentrated primarily, but not exclusively, on the traditional infrastructure sectors, including power, transportation, telecommunications, and water. The Fund has focused on funding the expansion, acquisition and refinancing activities of existing companies, rather than on financing green-field projects. Demand for DLAMF's capital is expected to remain very strong due to the substantial investment needs for continued privatization and development of the region's installed infrastructure, combined with an acute shortage of available capital.
Contact Information	Scott Beatty Chief Operating Officer 1133 Connecticut Avenue, NW Suite 400 Washington, DC 20036 Tel: +1 (202) 872-0500 Fax: +1 (202) 872-1816 contact@doil.com

Description based on website and TDJ research

Name of Institution	Asian Infrastructure Mezzanine Capital Fund
Focus of Activity	All Renewable Energy
Description of Activity	In March 2002, Darby acquired Prudential Asia Infrastructure Investors Limited (PAII), the management company that advises and manages the $246 million Asia Infrastructure Mezzanine Capital Fund (AIMCF), from Prudential Financial and renamed it Darby Asia Investors Limited (DAI). Launched in 1998, AIMCF is the leading specialist provider of mezzanine capital for the infrastructure industry in the emerging market countries of Asia. AIMCF provides mezzanine capital for privately led entities involved in the development, construction, ownership or operation of infrastructure and infrastructure-related businesses located in the emerging economies of Asia. AIMCF provides capital for new projects, restructuring, expansion, recapitalization and bridge financing. The investment objective is to generate both a current yield and capital appreciation and achieve an attractive risk-adjusted return. AIMCF invests primarily in the traditional infrastructure sectors including power, telecommunications, transportation and water treatment services as well as in Internet network facilities and services companies. AIMCF has made nine investments aggregating more than $195 million in various forms of mezzanine and equity securities issued by private and publicly-listed companies operating in South Korea, China, India, Indonesia, Thailand, Malaysia and the Philippines. The scale of financing required for essential infrastructure development and for corporate restructuring and related refinancing in many industries throughout the Asia region is substantial given the expected resumption of high economic growth in the coming years. Mezzanine capital is an innovative form of financing in Asia that can help fund these requirements which must be met more and more from the private sector. DAI aims to become a significant partner for "infrapreneurs", corporate management teams and with other private equity/mezzanine investors, in providing mezzanine capital to them while mitigating dilution of their equity interests.

Contact Information	Scott Beatty Chief Operating Officer 1133 Connecticut Avenue, NW Suite 400 Washington, DC 20036 Tel: +1 (202) 872-0500 Fax: +1 (202) 872-1816 contact@doil.com

Name of Institution	E+Co
Focus of Activity	All Renewable Energy
Description of Activity	Provide early stage risk capital. Will only work with projects that have a clear social and environmental benefit. Must also be commercially viable (i.e. competitive with conventional alternatives). Must have potential to be self sufficient in order to attract private investment in the next stages of the development cycle. E+Co is a US based group focused on the provision of business development services and seed capital. Their interest is in supporting indigenous enterprises that are working to provide those in developing countries with a reliable and affordable source of clean energy. To date E+Co has provided such support to over 60 enterprises in Africa, Asia and Latin America. Typically, investment (debt or equity) is limited to US$250,000, but the company is different from other sources of funding because it is willing to take a higher (but measured) investment risk by providing a combination of business services and seed capital during the earliest stages of an enterprise's growth. E+Co believes that the combination of business services, seed capital and commitment to local entrepreneurs is the key to success. E+Co co-manages UNEP's Rural Energy Environment and Development programmes (see www.areed.com) in Africa, Brazil, and China.
Contact Information	Phil Larocco 383 Franklin Street Bloomfield, New Jersey USA Tel: +1 (973) 680 9100 Fax: +1 (973) 680 8066 eco@energyhouse.com www.energyhouse.com

Name of Institution	Energy Ventures Group (EVG)
Focus of Activity	All Renewable Energy
Description of Activity	EVG is looking for innovative well-defined business models that originate from outside the traditional realm and offer the potential to become industry-leading companies. Shifts in traditional service delivery models have resulted in new value added paradigms for the energy customer. Viewing current or future energy models, EVG is looking for technology that will impact those models and a superior management team. Energy Ventures Group is an energy investment firm with a focus on emerging technologies in the energy sector. EVG specializes in venture capital, advisory services and valuation through its multi-faceted approach. Understanding the valuation of companies throughout their life cycle, from start-up to maturity, is the common thread connecting EVG's business units. The firm looks to partner with outstanding management teams and with innovative entrepreneurs to build world-class energy services companies.
Contact Information	Laura Marland Energy Ventures Group, Washington Office 1101 30th Street, NW Suite 500 Washington, DC 20007 USA Tel: +1 (202) 625 4395 Fax: +1 (202) 625-4363 www.energyvg.com

Name of Institution	Environmental Enterprises Assistance Fund (EEAF)
Focus of Activity	All Renewable Energy
Description of Activity	Environmental Enterprises Assistance Fund (EEAF) was founded in 1990 to bridge the gap between investment capital and small environmental businesses in developing countries. EEAF's core program focuses on managing private equity funds. However, its broader mission is to build capacity in the countries where it works. Based in Arlington, VA, EEAF has a fully owned subsidiary in Costa Rica, Empresas Ambientales de CentroAmerica and also partners with financial institutions in several other countries. Since 1996, EEAF has raised some of the first environmental emerging-market private equity funds. EEAF's Objectives are to finance environmentally beneficial companies that become models for replication by other entrepreneurs and investors; foster the creation of investment funds that generate financial, environmental and social returns; collaborate with regional and local institutions that promote sustainable development; and leverage additional financing from other investors and provide management support for portfolio companies. In addition to its own investment capital, EEAF manages private, for-profit investment funds.
Contact Information	Environmental Enterprises Assistance Fund 1655 N. Fort Myer Drive, Suite 520, Arlington, VA 22209 USA Tel: +1 (703) 522-5928 Fax: +1 (703) 522-6450 eeaf@igc.org

Name of Institution	FE Clean Energy Latin American Clean Energy Services Fund
Focus of Activity	All Renewable Energy
Description of Activity	The Fund will make equity or quasi equity investments in small innovative companies that offer energy services to other companies, providing access to financing and technical expertise to help them use energy efficient measures or renewable energy for generating power. The Fund will target potential investments in countries that have shown advances in energy efficiency and renewable energy technology projects, such as Brazil and Mexico. Initially, the fund will pursue direct investments in energy service companies (ESCOs) that bundle together small- and medium-sized projects focused on improving the efficiency of production, distribution, and consumption of electricity or thermal energy. Subsequently, through performance contracts and other financial instruments, the ESCOs will help assist other businesses to reduce their energy consumption.
Contact Information	Francisco A. Hoyos fhoyos@fecleanenergy.com

Name of Institution	Global Environment Fund
Focus of Activity	All Renewable Energy
Description of Activity	Global Environment Fund is currently managing a group of private equity investment funds, including: two funds dedicated to basic environmental infrastructure in emerging markets and a U.S. fund focusing on technologies that promote improved efficiency in industrial processes, energy generation and telecommunications fields. In addition, through its own capital investment vehicle, Global Environment Capital Company, LLC, GEF develops, finances, and takes controlling interests in principal investments for its own account. The capital available for investment through GEF's equity investment programs exceeds $300 million.
Contact Information	Benjamin Sessions Global Environment Fund 1225 Eye Street NW, Suite 900 Washington, DC 20005 USA info@globalenvironmentfund.com Tel: +1 (202) 789-4500 Fax: +1 (202) 789-4508 www.globalenvironmentfund.com

Name of Institution	Hydro-Québec CapiTech Inc.
Focus of Activity	All Renewable Energy
Description of Activity	Hydro-Québec CapiTech is the wholly owned venture capital arm of Hydro-Québec. It was formed in 1997 as a way to ensure access to energy related products and services and to capitalize on the opportunities created by the deregulation of the energy industry. CapiTech invests with strategic intent in companies that can create demand for and increase the performance of Hydro-Québec's business units. The delivery of superior financial returns is an important part of Hydro Quebec's investment criteria.
Contact Information	Mr. Richard Morrison Hydro-Québec CapiTech Inc. 75 René-Lévesque Blvd. West, 22nd floor Montréal (Québec) H2Z 1A4 Canada Tel: +1 (514) 289 3189 Fax: +1 (514) 289 4166 Hqcapitech@hydro.qc.ca www.hqcapitech.com

Name of Institution	Microgen Tech Fund
Focus of Activity	Solar, Wind, Biomass, Fuel Cells
Description of Activity	Early stage investments that have high growth potential as a result of a unique technology, system or service in the microgeneration field and offer potentially substantial terms. Investments are in the range of US$500,000 – US$3,000,000
Contact Information	Bob Shaw Arete Corporation PO Box 1299 Center Harbour, NH 03226, USA +1 (603) 253 9797 aretecorp@cyberportal.net www.arete-microgen.com

Name of Institution	New Energies Invest AG (Bank Sarasin & Cie)
Focus of Activity	Hydro, Fuel Cells, Wind, Biomass, Solar, Energy Efficiency
Description of Activity	New Energies Invest Ltd. is a private equity company founded by Bank Sarasin & Cie and managed by Remaco Merger AG. As of first quarter 2002, New Energies Invest Ltd had a net asset value of CHF 46 million. The investment policy of New Energies Invest Ltd. is based on the principles of sustainability. The main objective is to enhance the company's value over the long term by investing its assets in a globally diversified but well-focused portfolio. Investments are made in companies that finance, produce, distribute, sell and subsequently trade in renewable forms of energy, as well as in companies that act as consultants in this field, or develop, manufacture, assemble or use the components and equipment required for this purpose.
Contact Information	Arthur Hoffman c/o Bank Sarasin & Cie Elisabethenstrasse 62 CH-4002 Basel, Switzerland Tel. +41 (0) 61 277 7477 arthur.hoffman@sarasin.ch www.sarasin.ch

Name of Institution	NIB Capital
Focus of Activity	All Renewable Energy
Description of Activity	The Energy and Environment Group is internationally active in arranging, structuring, and syndicating tailor-made financial solutions, including senior debt, mezzanine and tax driven / off balance sheet structures for sponsors involved in the Energy and Environmental sectors. Activities are driven by the in-depth sector knowledge of the team and covers Power (IPP, Renewables, Cogeneration, and waste to energy), Offshore Services, Water and Waste and Oil and Gas. Energy and Environment is involved in over 90 projects and is currently undertaking various mandates in the UK, Continental Europe, and the US. The team operates from offices in The Hague and London. Transaction size ranges from € 50-400 million.
Contact Information	Dennis van Alphen dennis.van.alphen@nibcapital.com Tel: +31 (0)70 342 52 54 Fax +31 (0)70 360 74 23

Name of Institution	North American Environment Fund
Focus of Activity	All Renewable Energy
Description of Activity	Since 1974, Ventana, an asset management and equity investor, has established eight international private growth funds. The firm has in excess of $230 million under management. Ventana's 79 portfolio companies have received in the aggregate over $3 billion in additional financing, including direct investments from many of Ventana's multinational Global Working Partners. The purpose of the fund is to support the development of small Mexican firms, particularly new businesses, in the environmental sector. The specific objective is to expand the financial capacity of the Risk Capital Fund of the North American Environmental Fund that was established in 1993 to finance companies in the environmental market.
Contact Information	Carlos de Rivas Bosques de Duraznos 75, Suite 202 Bosques de las Lomas 05610 Mexico, DF Mexico cderivas@ventanaglobal.com Tel: +52-5-596-9795 Fax: +52-5-251-4797 www.ventanalatinamerica.com

Name of Institution	Rabo Sustainability Fund
Focus of Activity	All Renewable Energy
Description of Activity	The Rabo Sustainability Fund is a 'fund-of-funds' established in 2000 for the risk-bearing participation in funds that in turn participate in sustainable development projects. The Rabo Sustainability Fund has been placed with Gilde Investment Management. Gilde Investment Management is the venture capital provider within the Rabobank Group. The Rabo Sustainability Fund has participations in Solar Development Capital and in the Prototype Carbon Fund.
Contact Information	Investor Relations P.O. Box 17100 3500 HG Utrecht Tel: +31 30 216 9500 Fax: +31 30 216 3640 email: IR@rabobank.com www.rabobank.com

Name of Institution	Renewable Energy Equity Fund, Australia
Focus of Activity	All Renewable Energy
Description of Activity	The CVC Renewable Energy Equity Fund is an Au$30 million (approx.) venture capital fund established to increase investment in renewable energy technologies through the provision of equity finance. It is funded to $20 million (approx.) under the Australian Government's REEF program and $10 million (approx.) from private sources. The Fund will invest in high growth emerging Australian companies with domestic and global market potential in the renewable energy industry.
Contact Information	Sydney Office Level 40 AMP Centre 50 Bridge Street Sydney NSW 2000 Australia Tel: +61 2 92238800 Fax: +61 2 92239808 www.cvcreef.com.au

Name of Institution	Scudder Latin Power II Fund
Focus of Activity	All Renewable Energy
Description of Activity	A private equity fund launched in 1998 with investments from IFC, IIC and CAF to invest in power projects in Latin America. Investment takes the form of equity or quasi-equity. The goal of the fund is to support medium-scale energy generation enterprises in the region and to complement the lending efforts of multilateral institutions such as the IDB in the area.
Contact Information	N/A

Description based on website and TDJ research

Name of Institution	Solar Development Group – IFC (comprising Solar Development Capital and Solar Development Foundation)
Focus of Activity	Solar Power
Description of Activity	The objective of SDG is to increase the delivery of solar home systems (SHS) and thus bring environmentally clean electricity to rural households in developing countries. Specifically, it aims to overcome the key barriers to accelerated growth of PV in the off-grid segment including lack of medium-term funding to enable customers to repay the relatively high initial cost of PV systems over time, a lack of understanding of PV by conventional financial intermediaries (FIs), and weak capitalization of many indigenous PV companies. SDG will address these constraints by providing both financing and business-development services. SDG has a target capitalization of US$50 million, with approximately $30 million of investment capital devoted to an Investment Fund (Solar Development Capital) and $20 million of grant funds devoted to a Foundation (Solar Development Foundation). SDG will invest in private sector companies involved in rural, commercially sustainable PV activities, including the distribution, sale, lease-hire, or financing of PV solar home systems and other productive use PV systems for electricity generation, and provide financing to local FIs who will service such companies. The combination of finance and business development components is needed in order to overcome persistent market barriers and accelerate the growth of the market.
Contact Information	Hans Schut, Triodos Bank NV Utrechtseweg 60, 3700 AB Zeist The Netherlands Tel: +31 (0) 30 2868880 Fax: +31 (0) 30 281 5638 hansschut@triodos.com www.solardevelopmentgroup.com

Name of Institution	Sustainable Asset Management (SAM) Private Equity Energy Fund LP Fund Manager: SAM Equity Partners Ltd
Focus of Activity	All Renewable Energy
Description of Activity	The SAM Private Equity Energy Fund LP (Energy Fund) has closed as of December 31, 2001 at EUR 48.6 million. Both funds are managed by SAM Equity Partners Ltd, a wholly owned subsidiary of SAM Sustainable Asset Management AG, an independent asset management company based in Zurich/Switzerland.
Contact Information	Triodos Bank NV Utrechtseweg 60 3700 AB Zeist The Netherlands Tel: +31 30 693 65 00 Fax: +31 30 693 65 55

Name of Institution	Triodos International Fund Management BV
Focus of Activity	All Renewable Energy
Description of Activity	Triodos International Fund Management BV manages funds (equity and debt) with a focus on funding renewable energy businesses in both Europe and developing countries.
Contact Information	Triodos International Fund Management BV Utrechtseweg 60, PO Box 55 3700 AB ZEIST The Netherlands sdg@triodos.nl Tel: +31 30 6936590 Fax: +31 30 6936566 www.triodos.com www.solardevelopment.org

Name of Institution	Triodos Renewable Energy Fund plc
Focus of Activity	All Renewable Energy
Description of Activity	Triodos Bank is a social bank lending only to organisations and businesses with social and environmental objectives. The Wind Fund is an investment fund in the UK investing in single wind turbines and larger windfarms.
Contact Information	Triodos Renewable Energy Fund plc Brunel House 11 The Promenade Clifton Bristol BS8 3NN United Kingdom renewablesfund@triodos.co.uk Tel: +44 (0) 117 973 9339 Fax : +44 (0) 117 973 9303 www.windfund.co.uk

Name of Institution	UBS (Lux) Equity Fund Future Energy
Focus of Activity	All Renewable Energy
Description of Activity	The fund invests mainly in small- and medium-sized companies in the renewable energy and energy-services sectors, as well as in energy-saving applications and components. Companies including those from the solar and wind energy sectors are considered, as well as other growth areas in the energy sector, which enable the provision of more sustainable forms of energy. The Socially Responsible Investment Team at UBS Global Asset Management selects potential companies together with its external partner, ecos.ch. The fund seeks to achieve its investment objective via active security selection and a sound portfolio structure.
Contact Information	Dr. Gerhard Wagner, UBS Global Asset Management Gessnerallee 3 8098 Zurich, Switzerland gerhard.wagner@ubs.com Tel: +41-1-235 55 52 Fax: +41-1-235 55 30 www.ubs.com/swedenfunds.com

3.4 COMMERCIAL LENDERS

Previously, commercial lenders have not played a large role in financing RE projects. Many of these projects had a risk profile that was unacceptable to commercial banks. But over the last decade, some specialized banks, like Triodos, have emerged that specialize in the financing of RE projects, often in the area of wind power. They have acquired sufficient expertise in the area to discern and mitigate the specific risk factors common to RE projects. As other forms of RE become more commercially feasible, it can be expected that they will also increasingly be able to attract bank funding. A recent $380 million bond issue by Florida Power & Light, the largest producer of wind energy in the United States, has also demonstrated a larger appetite for RE by the capital markets.

For most of the larger commercial banks, the small size of most RE projects make them unattractive. Given the costs involved in originating a loan, transactions below a certain threshold are too expensive in relation to the loan size for the commercial banks. The responses to our questionnaire showed that banks such as ABN Amro will only consider projects with a loan volume in excess of $25 million. It seems possible, however, than one can overcome some of these obstacles by bundling projects together to reach a size of interest to commercial lenders. But even then, these institutions will require a security package and a project structure that will protect their loan from default.

Name of Institution	ABN Amro
Focus of Activity	Wind, Solar, Sustainable Building
Description of Activity	ABN Groenfonds lends to government-approved green projects. Examples include wind and solar energy, and sustainable construction. Loans are offered at preferential interest rates. This loan offers companies lower interest costs and other fiscal opportunities.
Contact Information	Tel: +31 20 383 2500 fund.services@nl.abnamro.com www.asset.abnamro.nl

Name of Institution	Deutsche Structured Finance
Focus of Activity	Wind
Description of Activity	Wind
Contact Information	Manfred Kittelmann Westendstrasse 24 D-60325 Frankfurt/Main Tel: +49 69 97 14 970 Fax: +49 69 97 14 9715 dsf@dsf-fra.de

	m.kittelmann@dsf-fra.de www.dsf-fra.com

Name of Institution	FMO
Focus of Activity	All Renewable Energy
Description of Activity	FMO promotes sustainable development of the private sector in developing countries. Realizing sufficient returns on its risk capital is a prerequisite. Only then can FMO continue to act as an effective risk partner and ensure the continuity of the organization. These two aims – sustainable development and financial returns – are therefore inextricably linked. FMO has an investment portfolio of € 1.79 billion, making it one of the largest bilateral development banks. FMO has excellent access to capital markets, in part attributable to the Triple A status that was conferred in 2000. FMO's core activity is to provide local businesses and financial institutions in developing countries with long-term financing, ranging from loans to equity investments in enterprises. FMO does this on market terms and only when financing by commercial financiers is either unavailable or inadequate. Its present portfolio covers 78 countries
Contact Information	Mrs. B. Hamelynck Postbus 93060, 2509 AB Den Haag, NL Tel: +31 (0) 70 314 96 96 Fax: +31 (0) 70 314 97 64 b.hamelynck@fmo.nl www.fmo.nl

Name of Institution	Fortis Bank
Focus of Activity	Wind, Biomass, Biogas/Landfill
Description of Activity	The applicant must have credit-worthy sponsors and adequate contractual arrangements. Fortis most recently arranged and has underwritten a GBP15 million, 32MW Wind Power project for Westbury Windfarms Ltd.
Contact Information	Energy Finance Unit Charlie Wilson, Analyst Fortis Bank, London UK

	Tel: +44 (0) 2074448739 Fax: +44 (0) 2074448792 Charlie.wilson@fortisbank.com

Name of Institution	Triodos Bank
Focus of Activity	All Renewable Energy
Description of Activity	Triodos Bank is a social bank lending only to organizations and businesses with social and environmental objectives.
Contact Information	Triodos Bank NV Utrechtseweg 60 3700 AB Zeist The Netherlands Tel: +31 (0) 30 286 8880 Fax: +31 (0) 30 281 5638

Name of Institution	West LB
Focus of Activity	All Renewable Energy
Description of Activity	The Global Structured Finance Group of WestLB was formed in 1998 from the international project, export, and other structured finance activities within WestLB, drawing upon a long-standing and successful history of the various units.
Contact Information	Juergen Finke Westdeutsche Landesbank Girozentrale Herzogstraße 15 40217 Düsseldorf Tel.: +49 211 826-01 Fax: +49 211 826-6119 Dr_juergen_finke@westlb.de www.westlb.de

Name of Institution	National Australia Bank (NAB)
Focus of Activity	Financing of Hydro, Geothermal and Wind Power Plants. Focus is Australian based, although they will follow major Australian clients in Asia.
Description of Activity	The NAB's Corporate and Institutional Banking division manages its top tier relationships with large companies and financial institutions globally. The needs of these clients are complex. With operations in Australia, the United Kingdom, United States, Asia and New Zealand, NAB's expertise covers markets, transactional banking, specialised finance, loan syndications, securitisation and corporate lending. Their large scale lending experience is across a breadth of industries including energy and utilities.
Contact Information	Stuart King Director Project Finance 25 / 255 George St Sydney NSW 2000 Australia Tel.: +61 2 9237-9357 Fax: +61 2 9237-1877 Email: stuart_king@national.com.au

Description based on website and APW research

Name of Institution	Bank of South Pacific (BSP), Papua New Guinea
Focus of Activity	Financing of Hydro Power Plants. Will only lend within Papua New Guinea.
Contact Information	Virginia Elmslie, Robin Fleming Tel.: +675 321 1999 Email: VElmslie@bsp.com.pg Website: http://www.bsp.com.pg/

Description based on questionnaire response

If not otherwise noted, the descriptions of the various funding agencies have been taken from the *Financing Sustainable Energy Directory: A Listing of Lenders and Investors*, published by the United Nations Environment Programme**. The directory is a continuously updated directory of potential sources of financing of RE projects. Given that the entities are constantly reviewing their business operations and focus of activities, no guarantee can be given that the information is always accurate.**

4. Summary of Findings of Questionnaires and Follow-Up Interviews

4.1 INTRODUCTORY REMARKS

In the following section of the report, general conclusions and observations have been made on Renewable Energy (RE) financing based on questionnaires received, follow-up interviews and an analysis of the international debate on alternative energy sources. The general definition of renewables used for the purposes of this study has been taken from the G8's Task Force's definition:

> "Renewable energy technologies include solar, biomass, and geothermal energy for electricity and heat, wind energy for electricity and mechanical services, and small hydro up to 50 MW."

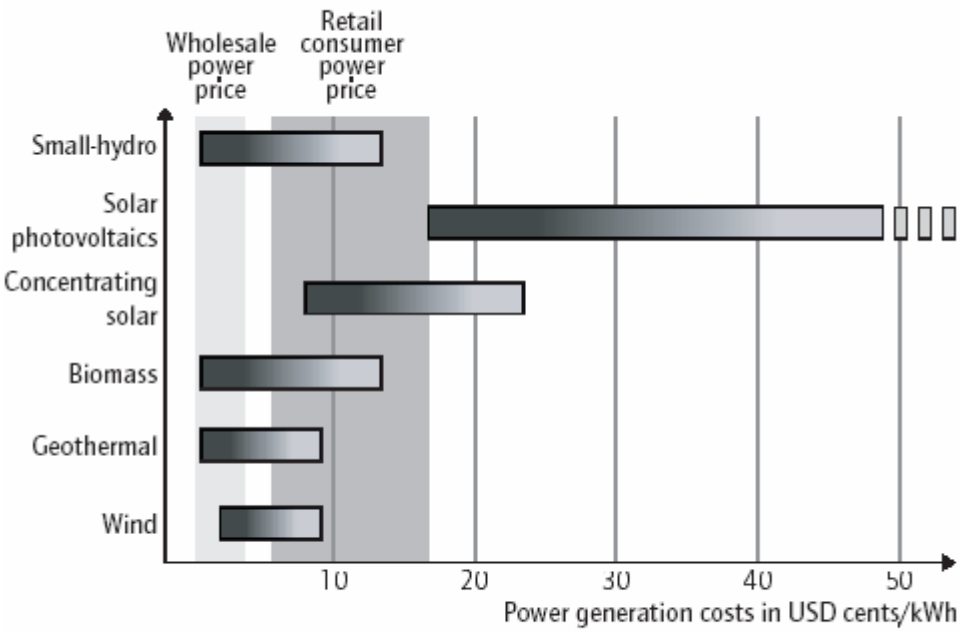
Though wave and current generated energy fall within the recognised definition of renewables, they are still in their infancy stage making them extremely difficult to finance at present. As the technology improves, the associated project costs will drop making them important additional resources.

The aim of this section is to identify the financing mechanisms that have been applied to renewables, highlight any differences that may distinguish the different project types and expand on new developments and financing modalities. For the purposes of this analysis, renewables are defined, not only according to type of power plant, but more appropriately, according to size (micro, small, medium or large) and location (off-grid, on-grid and embedded). Therefore, for the purposes of sections 4 and 5, we highlight this "financial division" rather than a technology one. The task at hand is further complicated by the diversity of the countries which, together, form APEC. On the one hand, we have countries such as Canada and the United States, that are highly developed economies with substantial energy sectors, a strong financial sector, vocal public opinion groups, as well as the legal, regulatory and institutional frameworks necessary to encourage renewable energy. APEC also includes China, Russia and several lesser developed countries, where the electricity sector, financial sectors and public awareness of renewables are generally less developed. Russia and China offer further complications because of their size and the diverse nature of decentralization process they are undergoing.

4.2 ECONOMIC VIABILITY OF RENEWABLES ENERGIES

Renewable energy projects have generally been more costly than the more established traditional fossil fuel power plants. The high costs associated with the individual RE technologies, particularly those still faced with steep learning curves, create significant up-front costs and therefore severely limit their competitiveness. Of the RE technologies being considered in this report, the technologies best established are hydro, wind and biomass, which have become more cost efficient because of both improved engineering as well as increased competition among manufacturers. As international financial institutions become more comfortable with the technologies and their providers, interest will continue to grow. With specific respect to hydro-power, financial institutions are familiar with large scale hydropower, which in countries such as Canada, are considered mature sectors, while micro-hydros, because of their technology and insecure customer base, continue to have an uphill struggle for financing. As the following graphs show, there are substantial cost differences between the various types of RE, with significant implications for the type and amount of financing a project can mobilize.

Cost Competitiveness of Selected Renewable Power Technologies.



Note: Cost calculation is based on system investment needed (capital cost is based on discount rate of 6% and amortisation period of 15 - 25 years) and power output. Lowest cost range refers to optimum conditions (proven technology, optimised plant size and design, and high availability of system and resources).

Source: NET Ltd. Switzerland.

From a purely financial perspective, it is generally agreed that renewables are becoming more economically viable, but will have difficulty in reaching a point where they can fully substitute the traditional fossil fuel based power plants. Therefore, despite the fact that renewable energy is becoming more price competitive, the technology more wide spread, and that new financing mechanisms are being created, the path to a fully developed market is still difficult and complex. Nonetheless, the important role renewables have to play in future energy supplies is not disputed. If we look at them from a broader standpoint, they can provide important social benefits, take pressure off developing economies and improve the quality of service when used in conjunction with more traditional energy resources. Renewables have an important role to play in:

- Inaccessible regions – connecting some of the more rural regions can prove cost prohibitive because of distance, as is the case of parts of China and Russia, or because of the difficult grid building conditions in regions such as the Andes in Peru.
- Fossil fuel poor countries and/or regions – for those countries such as Peru and some of the Asian countries, the acquisition of oil and gas accounts for a substantial part of their balance of payments and can consume much of those countries' hard currency reserves.
- Flexibility in energy planning and investment – Renewable energy is particularly flexible because it can be easily "modularised", allowing the energy players greater choice in how much to develop and at what speed adapting to fit financing available.
- Reduction in the need for new grid generating capacity – this follows the previous point in that traditional power plants must generally be of a certain minimum size in order to be financially viable. Recent events in North America and the UK have highlighted the fragile demand-supply balance that needs to be maintained.
- Localized employment and generation.
- Short construction times.

- Improved quality of service – with embedded production to meet peak demands, renewables offer an important back-up to existing systems, though the physical limitations of the individual technologies can restrict when and where they can be utilised.

When faced with promoting renewables, governments, municipalities, and private sector promoters continue to encounter substantial barriers affecting projects, in varying degrees. These barriers depend on the type of plant, location, customer base and structure, as well as its intended role within the domestic electricity market (off- or on-grid). The responses to the questionnaires, the opinion of experts interviewed and general international experience and published research all agree on the main issues that continue to act as brakes on the development of a renewables' market. The main issues identified were:

- Access to financing
- Long amortization periods for the individual technologies
- High up-front development costs
- Uneven playing fields
- Lack of appropriate policy reforms

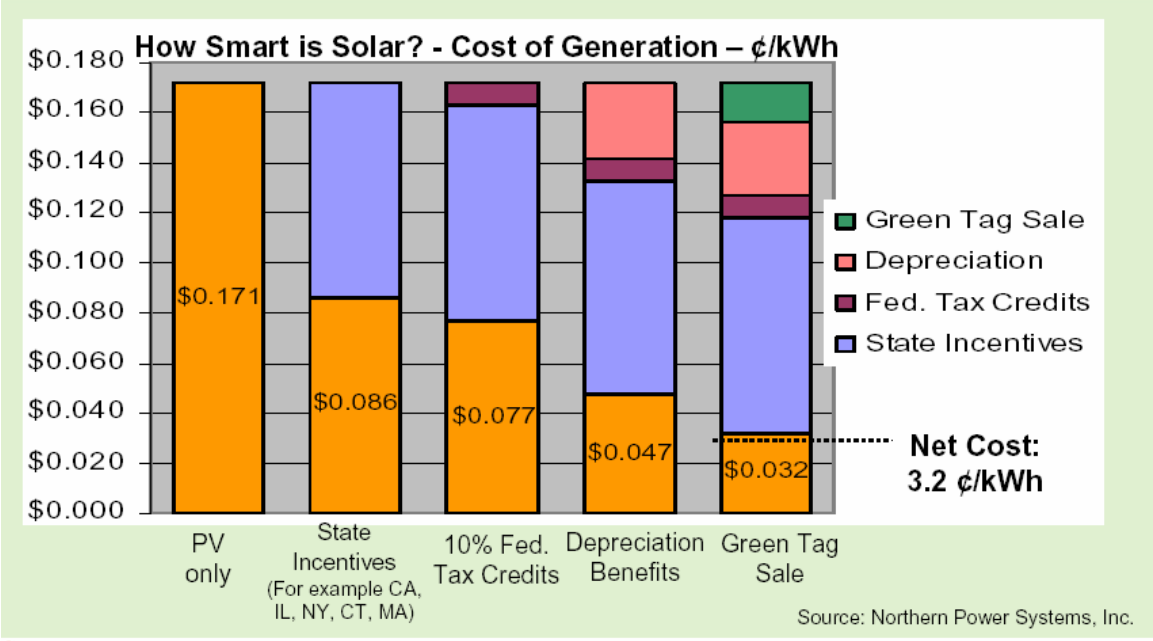
When evaluating the benefits of developing renewable energy projects, governments are more aware of the indirect benefits to be gained from renewables and take them into consideration when comparing them against least cost alternatives.

Many governments have introduced subsidies to promote the development of RE. Some of the mechanisms to make RE economically competitive are:

- *Investment subsidies.* Investment incentives are often used to reduce project developers' capital costs and thus provide incentives to developers to invest in renewable energy.
- *Fixed higher payments upon delivery.* These can be established through regulation or voluntary agreements.
- *Competition.* There exist several examples of competitive systems. The non-fossil fuel obligation (NFFO) in England and Wales, for example, requires bidders to compete for contract awards within technology bands.
- *Green pricing/marketing.* Green electricity is a direct consequence of the introduction of competition between electric utilities and the possibility for consumers to select their supplier according to environmental quality criteria. With green electricity, consumers can choose to pay a premium to support the production of totally or partially produced renewable electricity.
- *Carbon tax.* A tax on the carbon contents of fossil fuels is an attempt to mitigate climate change. Carbon taxes help to level the economic playing field by compensating (at least partially) existing subsidies for coal, oil and, to a lesser degree, natural gas.
- *Green certificates.* The idea of green certificates is to create two different markets with respect to renewable electricity – one for physical (renewable) electricity and the other for renewable certificates. With such a system, renewable electricity is fed into the electricity grid and sold at market prices, but the renewable electricity producer also receives a certificate that is sold on a separate market and improves the competitiveness of the renewable production, because it has the effect of a subsidy.

In sum, many of the promotion mechanisms available can essentially be reduced to the basic instances of investment and operating cost subsidies. Investment subsidies can help to lower the up-front costs of building a RE facility, while operating subsidies reduce the cost of producing electricity from RE. The following graph illustrates how subsidies in the United States have lowered the price of solar energy.

Operating incentives can be superior to investment incentives by eliminating the temptation to inflate initial project costs and by encouraging developers to build reliable facilities which maximize energy production. Any financing plan for a RE project must carefully examine the subsidies available in the host country to take maximum advantage of existing opportunities.



4.3 FINANCING CRITERIA AND RISK FACTORS OF RE PROJECTS

The analysis carried out under the APEC project has demonstrated that there is no specific, clear cut and simple solution to the funding of RE. Further, according to the responses to our enquiries, RE projects are handled in **exactly** the same manner as any energy project by commercial lenders and Export Credit Agencies. **The financial viability of projects is the key to their financing.** As the institutions willing to consider the funding of renewable energy power plants (REPPs) projects generally are the same as those funding non-renewable power plants, it is not surprising that the same criteria for assessing the viability of the project are used and that these institutions continue to respect their rules of financing, mandates and areas of activity regardless of the energy source. This conclusion has been recently reinforced in the IEA's newly published study of renewable energy technologies.

Traditionally, because the various forms of REs were considered to be new, untested with associated steep learning curves still to be overcome, it was felt that substantial subsidies were needed. The jury is still out on how effective general subsidies can be, since they can undermine the development of an independent and strong RE sector, rather than level the playing fields against traditional energy sources. If the subsidies are well defined and specifically targeted - so called "smart subsidies" - then they can play an important role in creating the necessary first push some REPPs need. Recent events in California have also shown that when using subsidies or incentives, it is equally important to develop a subsidy exit strategy to maintain long-term confidence in the sector.

Therefore, without some form of institutional support, renewables are faced with the difficult task of capital mobilization, a task made more difficult following the failure of conventional power plants (such as the HUB project in Pakistan and Argentine projects) and the recent scandals of Enron. The experiences that many developers, investors and lenders have had with independent power projects, particularly in emerging markets in the 1990s, continue to have a negative impact on their willingness to participate in

such projects in the current international environment. Currency depreciation, the impact of macroeconomic developments on power demand, and erratic regulatory and legal responses all contributed to the current wariness that has caused some developers to retrench and lenders and investors to be more selective. However, this does not mean the modalities accepted in the past are no longer feasible. It means that participants have become more discriminating and that many of the more traditional financing modalities will need to be creatively adapted or enhanced. In the following sections, we will outline the principal obstacles to financing that RE projects face and the various sources of financing that projects can try to access.

4.3.1 Criteria for Financing

Given the significant capital investments required to build renewable energy power plants, access to funding and the choice of funding sources are among the most critical elements for success.

Due to the deterioration in the worldwide **energy investment environment,** new REPP projects have and will continue to have considerable difficulty in attracting capital in the present distressed state of the market and bank credit committee's general aversion to risk. Only projects whose risk profile is low enough, due to stable and predictable cash flows, will have a chance to access bank financing. This places RE projects at a considerable disadvantage, since they are generally competing with the more traditional energy forms under the same financing criteria:

- Cost of the project
- Country risk
- Sector stability
- Stability of cash flow/customer base
- Existence of any take or pay contracts
- Project structure including any construction contracts
- Project construction time

4.3.2 Hurdles to Obtaining Financing for RE Projects

Several hurdles exist that make it more difficult for RE projects to attract private debt or equity financing. They key issues are:

- *High capital to O&M cost ratio*: Renewable energy systems tend to have little or no fuel, operation and maintenance (O&M) costs, but their initial unit capital costs tend to be much higher than fossil generation systems. The higher ratios of capital cost to O&M cost are significant, because they indicate that renewable energy projects carry a disproportionately heavy initial burden that must be financed and amortized over the life of the project. Additionally, the initial high capital cost of renewable energy projects is a barrier to project financing.
- *High Project Development to Investment Cost Ratio*: The ratio of project development costs to project investment is also higher for renewable energy projects. This is due to the nature of renewable energy projects, which are often dispersed, small in scale and lack established infrastructure to assist in project development. Legal, regulatory and engineering transaction costs are also generally higher, more complex and do not benefit from the economies of scale common to large conventional projects.
- *Small Total Investment Requirements*: Renewable energy projects are generally smaller in scale and therefore require smaller total investments. As a consequence, many commercial banks,

utilities and established independent power producers (IPPs) are not interested in pursuing these smaller investments. The time and resources they must spend to undertake due diligence are high, as are the perceived risks measured against their expected return. This situation of "high risk – low return" has consistently lessened investor and lender interest in RE.

- *Difficulty Guaranteeing Project Cash Flow*: Securing a project's cash flow is an essential element needed to secure project financing. To guarantee costs usually requires long-term fuel supply contracts and possibly a plant-operating contract. For revenues, this suggests that a solid power (or energy services) purchase agreement is a necessary element. In the case of wind, solar and hydro REPPs, "fuel" supply can be intermittent and can undermine a project's cash flow. For wind plants, this can be minimized by including electricity storage facilities. In the case of rural regions and off-grid plants, REPPs have the added disadvantage of an unstable customer base.
- *Weak Basis for Non-Recourse Financing*: Small, independent and newly established renewable energy project developers often lack the institutional track record and financial inputs (wherewithal) necessary to secure non-recourse project financing.
- *Disproportionately high transaction costs*: Any investment requires feasibility studies and due diligence on the part of prospective lenders and investors. These costs do not vary substantially with project size. But since many RE projects are small, they are ill-equipped to absorb these transaction costs.
- *Inaccurate Perception of Risk*: Many renewable energy technologies are newly commercial and are, subsequently, not widely known among project financiers. Moreover, information about renewable energy systems is not readily available and accessible to potential investors, although this is changing rapidly with greater Internet access. However, as RE technologies continue to demonstrate their technical reliability and commercial viability, risk perceptions on the part of lenders and investors will become more accurate.
- *Inaccurate pricing of energy production costs*: The cost advantage of fossil fuels over most forms of RE stems from the fact that carbon emissions and other negative environmental externalities are not reflected in the production costs. Continued government subsidies have been required because only such subsidies have made RE commercially viable. As more and more governments introduce long-term RE targets, new mechanisms will be developed that include environmental costs in market pricing models.

These characteristics of RE projects form significant obstacles to accessing sources of financing and need to be overcome to promote the future development of RE.

4.3.3 Investment Risks of RE Projects

The specific characteristics of RE projects outlined above result in an elevated risk profile for most projects that needs to be addressed to satisfy lenders and investors. The key risk elements are:

- *Credit risk*: Lenders are interested in assessing the creditworthiness of all of the parties associated with the venture; they are likely to undertake several activities to determine the track record and management skills of the parties to determine their reliability, expertise and credit standing.
- *Construction and development risk* is the risk that the borrower and contractors may not complete the project on time, according to specifications, and may not be capable of delivering the expected output within the programmed budget.
- *Operating/Commercial risk* is the risk of the local or international market, likely competition, access to market both in terms of physical access (breakdowns in transport and communication) and commercial access (the ability of potential purchasers to buy the service without interference from the central government).

- *Political Risk*: Strictly speaking, political risk refers to confiscation, expropriation or nationalization of project assets. More broadly, such risk may involve changes in the existing political framework that can result in commercial and financial risk as a consequence of: imposition of new taxes, tariffs, and export restrictions; devaluation of the currency; foreign exchange transfer restrictions; imposition of more stringent environmental regulations; and taxes or prohibition of repatriation of profit and debt service. Power projects are considered to be especially vulnerable to political risk since they may be considered crucial to the country's infrastructure or security. The principal mitigation measure against political risk is insurance taken out on a commercial basis or with official agencies, such as export credit departments or multilateral development banks.
- *Financial Risk* involves, among other factors, fluctuations in exchange rates, increase in interest rates, increases in commodity prices that bear on the project, inflation, world commodity prices, protectionism and tariffs. These risks can be mitigated by including hedging facilities in the finance package against exchange rate and interest rate fluctuations, using currency and interest rate swaps, interest rate caps, floors and other financing techniques.
- *Force Majeure* refers to risk caused by natural disasters or accidents such as fires, flood, storms and earthquakes. These losses can generally be mitigated through commercial insurance. Often the lender will require the borrower to cover losses from *force majeure* during the construction and start-up phase to cover the debt service and fixed cost of initial loan proceeds.

4.3.4 The Impact of Project Size and Project Type

RE come in a variety of sizes, but it makes sense to distinguish primarily between on-grid and off-grid projects. The challenges to accessing financing and the types of financing available differ substantially.

Many on-grid RE projects have been developed by large energy companies or specialized project-development companies. Due to the financial strength of the sponsors, such projects have significantly better chances of accessing commercial bank debt of project financing. The sponsors can also finance a larger share of project costs on their own balance sheets. The vast majority of on-grid RE projects rely on wind power. The commercial viability of wind power has been proven and insurance companies exist that provide coverage for such projects.

Given the availability of financing for such projects, each individual project must demonstrate stable cash flows. For this, they require price support mechanisms that insulate them from potentially volatile power prices. The experiences of merchant power plants over the last few years have shown the disastrous effect price swings can have on power projects that are fully exposed to price risk. The development of wholesale spot power markets can be a benefit for consumers who have to pay less for their electricity, but they impose a much higher risk on project sponsors. Because RE projects have inherent difficulties showing stable cash flows, they require some kind of support mechanism that will lower their risk profile and make them acceptable to lenders. Different countries have experimented with a variety of mechanisms, such as feed-in laws in Germany and Spain or renewable obligation arrangements. While these laws may not encourage the most cost-effective production of power, they have led to a rapid expansion of installed RE capacity. For on-grid projects, the most important form of public intervention today centres on the creation of price support mechanisms. If they are in place, private investment capital can be found for commercially viable RE technologies.

Off-grid RE projects, which also tend to be smaller, face significantly bigger obstacles in accessing financing. Their small size and unpredictable cash flows make them uninteresting for lenders and very risky for investors. Because such projects tend to be located in the less developed regions of the world, they are much more dependent on development funds from bilateral and multilateral organizations and donors. Such help can take many forms:

- Seed capital to finance demonstration projects.

- Business developments grants to small and medium-sized enterprises.
- Lines of credit to local banks for on-lending to RE projects.
- Credit enhancements such as risk and credit guarantees that make banks more willing to extend credit to RE projects.
- Interest-rate subsidies.
- SME growth capital funds that provide equity or debt directly to projects. A number of such funds have been formed over the last 10-15 years, usually with a mixture of donor and commercial capital.

Donor organizations will have to continue to provide this form of development help to promote RE in such countries and regions where the conditions for the fully commercial financing of RE projects do not exist. In assessing the potential types of financing available, project sponsors must pay close attention to the size of the project and must seek out the financing mechanisms most suited for their particular project.

4.4 OPTIMAL SOURCES OF FUNDING

A great variety of funding sources and mechanisms exist that the developers of a RE energy project can try to access. In fact, the rising interest in RE has resulted in a proliferation of new funds and initiatives designed to promote the production of RE. Many of the projects already in operation have drawn on a mixture of government (or multilateral) and commercial funding sources. As more and more forms of RE become competitive, as is already the case with wind energy, private investors will be increasingly willing to invest in such projects. The sources and modalities listed here have been successfully used in the past to fund RE projects and will continue to act as the most important means to obtain the required investment capital. While private investment capital is playing an increasingly larger role, public intervention remains important to overcome the fact that environmental and social costs are not internalized in power prices.

4.4.1 Export Credit Agencies (ECA) and Multilateral Institutions (MLA)

For developing countries, ECAs and MLAs provide an important source of funds for power projects. Institutions such as the World Bank and the Inter-American Development Bank have made infrastructure investments one of their top priorities to raise standards of living and economic growth rates in developing countries. A large number of Private PPs in Latin America were financed with the help of international lending agencies. Most prominent were ECAs such as the US Ex-Im Bank and OPIC (which technically is not an ECA but a development bank). Because data was not available on a sufficient number of projects, it was impossible to determine the precise extent of ECA coverage for REPPs. However, funding is available with contributions taking the form of direct loans to the project or of credit guarantees to commercial lenders.

Given the higher risk profile of REPP projects in developing countries and their inability to achieve investment-grade ratings, the participation of ECAs is often crucial in lowering the risk for commercial lenders and increasing their willingness to invest. But the deterioration of the Asian and Latin American energy market has led to bankruptcies in the energy sector making banks and ECAs less willing participants.

Because of the experiences of ECAs with Latin American power projects, it is unlikely that they will be willing to invest in Asian REPPs, unless the market environment changes dramatically or MLAs provide support. Any REPP investment in Asia will require the participation of MLAs. The ADB and Asian ECAs such as JBIC will have to provide the bulk of the funds required.

MLAs can provide particularly useful assistance by targeting their support to the up-front and back-end costs of the project, as well as by providing the incentives for governments in the developing countries to create the necessary policy and legal framework needed to encourage renewable investments. In the case of up-front and back-end assistance, this is where some of the more innovative and important funds have been created.

4.4.2 Multilateral Organizations

As has already been highlighted, REPPs are faced with high up-front costs and instability of cash flow in the back end following the completion of construction. The MLAs have responded to the up-front costs by providing targeted grants, which often include technical assistance. These funds include programs such as GEF (WB, IFC, UN), which has a special set aside for Chinese RE development, the WB's successful Asian Alternative Energy Unit (ASTAE). The Kyoto Protocol has also stimulated a number of new initiatives designed to introduce various forms of carbon credit trading to obtain financing for RE. A number of MLAs such as the World Bank have invested a considerable amount of effort into finding mechanisms through which Carbon Credits can be monetised to support projects in their early stages. Through a form of Carbon off-take contract, used in parallel with electricity take-off contracts, international institutions are trying to promote REPPs. The IFC, in particular, is trying to anticipate the value of the carbon credits taking on some of the risks associated with the sale of the carbon credits once the plant is in production. Other more traditional funds such as GEF, with its China RE development fund and the successful Asian Alternative Energy Unit (ASTAE), have been managed for some time by organizations such as the UN, WB, IFC, both individually and in coordination with each other. These funds provide seed funds and technical assistance (these have been fully described in Section 3) that help to reduce the substantial up-front costs of REPPs.

4.4.3 Private Equity Funds

There are a number of private investment funds that have been developed to support renewables directly. They are primarily located and invest in the more developed APEC countries. The growing public interest in the environment has increased the pressure on governments to include a higher proportion of renewable energy in their energy portfolios and to provide incentives such as tax breaks for investments in renewables. This has resulted in a number of private funds that are being listed on different stock exchanges. One such fund is the Canadian "Clean Power Income Fund" which aims to provide stable, long-term cash flow to investors from environmentally preferred generation of electricity. The fund, which targets specifically water, wind, wood waste and landfill gas, is listed on the Toronto Stock Exchange (CLE.UN.) and benefits from government tax incentives. Many of the international oil companies have also joined the push for renewable energy and have put substantial funds into international organizations such as the World Bank and related funds. For example, some of the major stake holders in the World Bank's Prototype Carbon Fund include international oil companies.

4.4.4 Government / Bilateral Funds

A growing number of governments are taking concrete actions to promote more environmentally friendly forms of energy through tax breaks, grants and through the development of in-country mechanisms such as green certificates that can be traded between traditional power stations with high carbon emissions and REPPs. The Netherlands and Denmark are particularly noteworthy in developing renewable support mechanisms. The Dutch government has committed to the Kyoto Protocol, set aside funds and at the same time encourages its citizens through tax incentives to invest in the environment. Initially, activities were limited to promoting carbon reduction projects in-country, but now funds are being used to promote renewables across borders. The Dutch government not only uses the funds for bilateral projects, but also has become an important supporter of the different Carbon Funds being run by the IFC, World Bank, CAF

and by Rabobank, through its international affiliated institutions. The German government passed extremely effective legislation to promote wind power. This has not only increased the country's portfolio of renewable based energy, but also helped to create a very competitive wind turbine sector.

4.4.5 Bank Debt

The commercial bank debt market can be characterized as providing medium term debt. Many of the commercial banks that might lend to a RE project only offer loan tenors between 5 and 10 years, whereas many RE projects require longer repayment periods. Mismatches exist between the tenor of the debt and the operating characteristics of the PPs. This is of particular relevance to REPPs where the maturation of the projects can be considerably longer than other energy projects. The small size of many RE projects also makes them unattractive for commercial lenders even though the bundling of individual projects might be able to mitigate this problem. Commercial lenders also require security structures and project documentation that many smaller projects find hard to achieve. However, as the familiarity of commercial lenders with RE projects grows, one can expect a decline of transaction costs and a higher willingness to extend credit to such projects. In many transactions, the use of bank debt for PPs has been dependent on credit enhancements and risk guarantees provided by Export Credit Agencies and Multilateral Lending Institutions. They offered risk mitigation strategies that allowed commercial lenders to accept the higher risk level of projects located in emerging markets. The difficulties encountered by many PPs have made it much more difficult to access commercial bank debt at attractive rates.

4.4.6 Public Debt

The ability to use public financing is very dependent on the creditworthiness of the project and the country where the project is located. Most bondholders require investment grade debt. Some public debt has been raised for power plants in the form of bonds, although most of the bonds issued have been for projects with long-term tolling or vesting contracts. Bond financing has been most prevalent in the United States, where the bond market is highly liquid. Some Latin American IPP bonds were also placed with North American investors, but the low credit ratings of most projects rendered them unattractive for the insurance companies and pensions funds that provide much of the capital for bond issues. With international environmental awareness growing, the potential interest for bonds linked to international environmental projects will grow and could be placed on the more developed liquid bond markets of the world. The potential interest has already been shown in the Netherlands with its government fund, and in the growing number of pension and 401(K) type funds such as those found in the US, where strict conditions are set by clients on where money can be invested.

4.4.7 Private Placements

Private placement involves the sale of a bond or other security directly to a limited number of investors. An example would be the sale of stocks, bonds, or other investments directly to an institutional investor, like an insurance company, avoiding the need for the registration with the regulator if the securities are purchased for investment as opposed to resale. In the United States, Section 144a issues have far fewer requirements than public issues, yet still provides the ability to resell the securities, hence the liquidity that this type of lender requires. Private placements have played a significant role in the financing of IPPs in the United States where the market is most highly developed. There have been isolated instances where bonds for an IPP in Latin America have been privately placed in the United States. These cases remained the exception, however, because few IPPs have been able to achieve an investment grade rating. It seems unlikely that any RE projects except wind energy projects can obtain such a rating.

4.5 FINANCING MODALITIES FOR RE PROJECTS

When designing and structuring a RE project, the sponsors can choose between different financing modalities that have a substantial impact on the organization of the project and on the sources of funding that they can hope to access. Many power projects, both in the form of independent power projects and merchant power projects, have been project financed. In other instances, corporations have financed power plants on the strength of their own balance sheets. In selecting a project structure, the sponsors must keep in mind the specifics of the project and seek to maximize access to a wide variety of funding sources.

4.5.1 Project Financing

Project financing involves non or limited recourse debt financing for the development and construction of a particular project in which the lender looks principally to the revenues, expected to be generated by the project, for the repayment of its loan and to the assets of the project as collateral for its loan rather than to the general credit of the project sponsor. Project financing is commonly used as a financing method in capital-intensive industries for projects requiring large investments of funds, such as the construction of power plants, pipelines, transportation systems, mining facilities, industrial facilities and heavy manufacturing plants. The sponsors of such projects may not be sufficiently creditworthy to obtain traditional financing or are unwilling to take the certain project risks and assume the debt obligations associated with traditional financings. Project financing permits the risks associated with such projects to be allocated among a number of parties at levels acceptable to each party.

Project finance is a debt financing technique where a loan is made to a special purpose company created to construct and operate a specific project. The loan is generally made on a limited recourse basis or ”non-recourse" to the sponsor. This means that the sponsor has no obligation to make payments on the project loan if revenues generated by the project are insufficient to cover the principal and interest payments. In order to minimize the risks associated with a project finance loan, a lender typically will require indirect credit support in the form of guarantees, warranties and other covenants from the sponsor, its affiliates and other third parties involved with the project. A characteristic of project finance is that the costs of development and construction of the project are financed on a highly leveraged basis due to the stability and predictability of the expected cash flows. Projects can be financed using 60 to 80 percent debt. The combination of high leverage and limited recourse allows a sponsor to put less of its funds at risk, so it can finance the project without diluting its equity investment in the project. In certain circumstances, sponsors can reduce the cost of capital by substituting lower-cost, tax-deductible interest for higher-cost, taxable returns on equity.

The sum of all of the various contractual arrangements and key agreements, contracts and government undertakings that seek to reduce the lenders’ and investors’ risk through the establishment of legally binding obligations, financial structures, and operational procedures, is known as the Security Package. Lenders look to the Security Package to provide security for the loan. And in the event of breach of any of these agreements, they generally have the right to take over the company and install their own managers within the framework of the agreements.

A large proportion of IPPs and MPPs have used project finance, both in developed and emerging markets. However, the impact of the collapse of Enron and other energy companies, as well as the financial difficulties encountered by many MPPs, is that it has become much more difficult to finance power plants using project finance. Regardless, project finance may be still suitable for the larger REPP projects that are commercially viable, and have strong off-take contracts and a predictable regulatory regime that assures non-interference with the revenue stream.

Project finance is not a viable alternative for smaller on-grid projects because of the high up-front costs, unless some form of project bundling can lower the transactions costs and make them attractive to

commercial lenders. Project Finance is also cost prohibitive for very small and micro type projects, particularly those which have a very limited local and unstable customer base. These types of projects cannot obtain commercial financing and have to rely on official development assistance offered by MLAs or individual governments.

4.5.2 Balance Sheet Financing

Balance sheet financing means that the company financing the development of a power plant uses its own cash flow or the issuance of recourse debt and/or equity based on the creditworthiness of its entire operations. An example of balance sheet financing is if a company already owns generating assets and other assets and then purchases or develops a power project using cash flow generated from those other assets. One of the principal disadvantages of such an approach is that the parent company is liable for the debts incurred by the individual plant. In emerging markets, where the probability of failure can be fairly high, this may expose the project sponsor to significant credit risks. However, as banks have currently curtailed their lending activities for individual power projects, companies have to increasingly use the strength of their balance sheet to develop new projects.

With specific regard to REPPs, this form of financing can be considered. It is most likely to be selected as a financing option when it is part of a specific company strategy. Therefore, its use is limited given the risks associated with this form of energy project.

4.5.3 Portfolio versus Single Assets

Portfolios of assets are generally considered a benefit in the financing and development of PPs. The benefits associated with portfolio diversification can be significant. According to Moody's, "Financing structures which spread merchant risk across a number of markets or generating technologies will, from a ratings standpoint, be viewed favourably." One needs to look no further than Moody's high investment-grade ratings for generating companies active in competitive markets, including National Power and Powergen in the UK, and Endesa and Chilgener in Chile, to see the value of diversification. Many of the leading international power developers arrange their individual projects in portfolios to better spread the risk and mitigate the risk factors.

4.5.4 Lease Financing

Power project leases are not new, but the structures have been evolving. Leases have been used as the financing mechanism for a number of utility generating stations, as well as for independent power projects. Most of the utility leases were full recourse obligations of the utility, while most IPP leases were limited recourse obligations of a special purpose subsidiary of the project sponsor.

In the typical lease, a financial or industrial entity (the "owner participant") forms a grantor trust (or, more recently, a limited liability company or business trust) to serve as the lessor, which then purchases the power plant from the owner (soon to be the lessee) and leases the plant back to the lessee. The owner participant funds a portion of the purchase price with its equity contribution, and the lessor borrows the remainder of the purchase price from institutional lenders or through a capital markets or 144a financing. (Note that an investment grade rating is still a necessity under this structure). The lease is a "net lease" in that the lessee is responsible for all expenses in connection with the facility and fully indemnifies the lessor, owner participant and lender, for all liabilities associated with their participation in the transaction.

In effect, the purchase and lease are another form of financing for the sponsor, with the owner participant and lender essentially being passive investors in the transaction. Project sponsors must recognize, however, that rights to terminate a lease before the end of its term often are very limited and usually require large additional payments to the owner participant. Therefore, in entering a lease, the project sponsors should be prepared to live with the transaction over the entirety of the lease term.

Leasing provides a number of attractive features. First, for a project sponsor that is not currently taxable, the owner participant, which is fully taxable, can use the tax benefits of ownership (depreciation and interest deductions) and pass along those benefits in the form of lower rent. This is particularly attractive for generating assets that have a relatively short depreciation period for tax purposes. In addition, leasing effectively provides 100 percent financing because the lessor pays the full purchase price of the facility as opposed to only part of the cost being raised in a traditional debt financing.

Moreover, the financial accounting treatment of the lease can be quite attractive to both the owner participant and the lessee. Although the accounting rules are becoming more complex, the transaction typically is structured to be a "leveraged lease" for financial accounting purposes in the hands of the owner participant and an "operating lease" in the hands of the lessee. This normally results in the participant reporting significant book income in the early years of the lease term. The lessee also can enhance its book earnings in the early years if the lease term is long enough and the rents appropriately structured. The lessee's book expense in these early years can be lower than if it had owned the plant, directly incurred the associated debt, and recorded depreciation and amortization expense.

In the limited recourse project financings done in the 1980s and early 1990s, the true credit support usually was a long-term power purchase agreement (PPA) with a utility, whose cash flow stream provided the source of repayment of the debt and return of the owner participant's equity. Many leases done today do not follow this model but rather involve the project sponsor or its parent providing some form of guaranty of all or a portion of the rental payments as well as termination payments in the case of an early termination of the lease or a default by the lessee. Alternatively, the sponsor may have its own power marketing entity enter into a power purchase agreement with the project company, with the obligations of that entity guaranteed in whole or part by the parent. The power off-take arrangements can include utility or site host off-take agreements, portfolio power sales agreements or similar arrangements to mitigate merchant power risks to the financing parties. This hybrid approach allows the sponsor the benefits of leasing noted above while minimizing the traditional project finance-style covenants limiting the lessee's operating flexibility in dealing with the facility over time.

This is potentially a valuable tool for the encouragement of the smaller wind plants, some forms of biomass and solar energy.

4.5.5 Public-Private Partnership

A Public-Private Partnership (PPP) does not technically constitute a financing modality, but rather relates to the ownership structure of a project. It is important to list the various forms of PPP since they have been used to implement RE projects. A PPP is a sustained collaborative effort between the public sector (government agencies) and private enterprises to achieve a common objective (for example, the building of a power plant) while they pursue their own individual interests. In a PPP each partner:

- Shares in the design of the project.
- Contributes a portion of the financial, managerial and technical resources needed to execute and sometimes operate the project in accordance with each partner's comparative advantage.
- Partially shoulders the risks associated with the project and obtains the benefits – those expected by each partner – that the project creates.

Public-private partnerships span a spectrum of models that progressively engage the expertise and/or capital of the private sector. At one end, there is straight contracting out as an alternative to traditionally delivered public services. At the other end, there are arrangements that are publicly administered but within a framework that allows for private finance, design, building, operation and possibly temporary ownership of an asset.

In some regions of Latin America, the government created a concession system for regional REPPs providing their support in the form of indirect incentives such as tax concessions or guaranteed tariffs. Companies awarded the contracts were required to develop a region wide electricity supply network.

The optimal sources of funding are therefore traditional financing methods for energy projects. However, if these projects are to compete, considerable efforts must be made to **bring down surrounding project costs both up-front and back-end. This is true of all types of renewable energy and in all APEC countries, though for the smaller and micro projects, the main source of financing may continue to come from multilateral donors for the less developed countries of APEC.**

4.6 LESSONS FROM EXISTING RENEWABLE IPPS

Based on a thorough analysis of the information obtained and discussions with leaders in the renewable energy sector, it is clear that the bankabillity, and therefore the financing, of projects utilising alternative sources of energy is identical to the financing of more traditional energy projects. **If RE is to compete with other infrastructure projects for debt financing, it needs to demonstrate the same commercial viability that lenders expect from other energy projects.** Given the high demand for investment funds in the RE field, government and multilateral funds are clearly insufficient. But private capital can only be mobilized with viable and carefully structured projects that conform to the expectations of lenders and investors. The growth of wind energy has shown that RE can compete with fossil fuels, and one can expect similar trends for other RE technologies as well.

Though not part of the APEC region, it is worthwhile considering the financial structure of the recently financed 3.25 BEU Energías Eólicas Europeas S.A. (EEE) Wind Farm in Spain. It has set an important precedent on the use of project financing to support alternative energy. (Other case studies have been provided in the Appendix). In the case of the EEE project, the issues of project cost, risk, off-take contracts, project structure and project construction were successfully structured in such a manner that major international banking institutions were willing to participate in its financing. The project was further strengthened by a stable Spanish energy sector, sound and respected major energy players as managers (Iberdrola Diversificación and EHN) and a political and legal framework that was supportive. This demonstrates that with the correct combination of environment and financial structure, even large renewables projects can be financed. Financing in this form is more suitable for projects in the more developed APEC countries (Canada, USA, and some of the Asian countries). These countries are characterized by having a clear and stable energy market, a well developed grid system and a clear regulatory environment.

Smaller projects in the less developed countries of APEC will be forced to develop other mechanisms for financing their projects. Micro-hydros and small solar projects, where the IPP is often off-grid and where the stability of the market is suspect, may not be able to attract adequate commercial financing. In these cases, it is necessary to combine the various funding resources available with grants and seed funds to bring the project within more “competitive” parameters. Other possibilities lie in the bundling of “like” projects where the financial and technical costs can be shared across several smaller projects, either through a one-off financing for all the projects together or through a revolving financing structure. In Peru the approach has been to use revolving financing (see Case Study in Appendix), while in other parts of the world small regional concessionary systems have been used with special incentives for the investor, whether supplier or buyer/end user. In the latter case, the buyer/end user eventually owns the system once the financing has been repaid. These systems of financial structuring are dependent on the creation of a microfinance and SME type support system with all the implications both financially and organizationally. As with traditional small and micro enterprises, this is not a suitable financing mechanism in all countries and may be best utilised in those countries where a tradition of small enterprise financing already exists. For projects of this nature, multilateral donors such as the World Bank will continue to act as a primary source of financing.

Ranges of Investment and Generation Costs in 2002 and 2010

	Low investment costs USD/kW		High investment costs USD/kW		Low generation costs USD/kWh		High generation costs USD/kWh	
	2002	2010	2002	2010	2002	2010	2002	2010
Small hydro power	1000	950	5000	4500	2-3	2	9-15	8-13
Solar photovoltaic power	4500	3000	7000	4500	18-20	10-15	25-80	18-40
Concentrating solar power	3000	2000	6000	4000	10-15	6-8	20-25	10-12
Biopower	500	400	4000	3000	2-3	2	10-15	8-12
Geothermal power	1200	1000	5000	3500	2-5	2-3	6-12	5-10
Wind power	850	700	1700	1300	3-5	2-4	10-12	6-9

Note: Discount rate is 6% for all technologies; amortisation period is 15-25 years, and operation & maintenance costs are technology-specific.
Source: NET Ltd. Switzerland.

In all cases, the projects need to benefit from intelligent and targeted assistance, whether in the form of seed funds, subsidies, tax concessions (as have been used in California and Canada), or incentives for the replacement of traditional energy. Further, individual governments need to establish clear regulatory and legal frameworks as well as energy policies that set out the long term plan for renewables. But as RE becomes more cost-competitive (see graph above), the challenges to successfully financing RE projects will decline and more private sector lenders and investors will pursue investment opportunities in the RE sector.

4.7 FRAMEWORK OF SUCCESS FOR RE PROEJCTS

4.7.1 Legal and regulatory prerequisites for RE projects

The commercial viability of any RE project is dependent on a stable regulatory and legal framework that allows RE to compete effectively with fossil fuels. Many countries have engaged in substantial transformation of the power sectors, with mixed results. But it is clear that the trend toward the deregulation of the energy sector will continue and will present new challenges for the financing of RE projects. It has already been mentioned that governments support the development of RE in many ways and will have to continue to do so in the future to offer financial incentives to developers. Apart from the direct subsidies, governments need to pay close attention to the broader regulatory environment.

If RE is a true objective to be achieved, then the RE framework should aim not only to level the playing field between the various forms of energy, but should attempt, through targeted support and “smart subsidies”, to actually tip the field in favour of REPPs. Few APEC countries will see meaningful development of a sustainable renewable energy sector unless a clear committed path is established.

Here are some specific steps that governments can take to ensure a supportive regulatory framework:

- A stable and transparent framework for independent power producers is vital to attract private investment. For RE projects that are grid-connected, fair competition with utilities has to be possible, including power purchase agreements and a transparent tariff-setting regime. Because RE projects face greater challenges in demonstrating stable cash flows, they are dependent on stable tariffs to show their commercial viability.
- Minimise/remove market distortions: Many APEC countries have subsidies in place for fossil fuels either to reduce the impact of imported fuels or to safeguard employment, as has been the case in the UK coal industry. Such subsidies must be removed to allow RE projects to be cost-competitive.
- Open access to transmission is crucial for RE projects. Transmission services should not discriminate against certain types of generation or owners. The wheeling of power must be possible to enable RE projects to sell their output.
- Renewable Energy Portfolio (RPS) standards can play a vital role in promoting RE. An RPS requires that a minimum percentage of power sold in a region comes from RE. A number of countries and several states in the United States have introduced such mechanisms that expand the market for RE.
- Small/Micro REPPs (off-grid): Attention should be placed on ensuring that appropriate mechanisms are created to develop the market through SME and micro enterprise type institutions including SME oriented banking. This niche of the sector is faced with particularly difficult barriers and requires targeted support, which may well need to be permanent.
- Some countries have enacted mandatory purchases of RE based on a fixed price. In Germany, for example, so-called “feed-in” laws led to a rapid increase in installed capacity and development of commercial RE, particularly wind. While such laws run the danger of discouraging cost reductions in power generation, they also provide the kind of stable cash flows expected from lenders and investors.

5. Summary: Financial Roadmap for Renewable Energy Projects

As indicated previously in the report, REPPs are treated by financial institutions as any other energy project seeking financing. However, certain criteria for financing are becoming more critical when considering RE, specifically the high up-front costs, location of the project (by that we are referring to on- and off-grid and the insecure customer base), and size and type of plant. Successful financing therefore depends on a project's ability to minimise the front-end costs and secure the income at the back-end. Below we have set out a road map of financial sources according to type of REPP, a regional evaluation of funding available and a checklist of the steps needed to be taken when seeking financing for a project.

In the United States and Canada, though there are grants and funds available to support RE, most support comes in the nature of tax incentives and the creation of a favourable environment. For this reasons the following tables do not provide many institutions that will provide special financing for projects in the North American region.

5.1 FINANCIAL ROADMAP: FUNDING SOURCE MATRIX ACCORDING TO PROJECT CHARACTERISTICS

The following table identifies the funding resources available for REPPs according to size, type of institutions and project stage, as not all institutions are provide funding for all stages of a project.

	Size of Project		
Project Stage	**Micro**	**Small – Medium**	**Large**
	Funding Sources (Unless otherwise stated, the funds are available in all emerging markets)		
Project Front-end	**Multilateral Agencies**		
	WB –GEF, UNDP GEF, Micro financing, IFC REEF programs, IFC SME program, PCF, ASTAE[1], ESMAP, ADB[1], CABEI[2], CAF[3], CAF-Carbon Credit Fund, IDB, IIC through investment funds, UNEP CREED[4], UNEP RE/EE Investment advisory facility	ESMAP, GEF, PCF, IFC (environmental program), IFC – PVMTI, IFC REEF, IFC SME program, EBRD[5] (various clean energy funds including a new Carbon Fund), EIB, IDB, IIC through investment funds, UNEP-CREED, UNEP RE/EE Investment advisory facility	World Bank, IFC, EBRD, EBRD[5] (various clean energy funds including a new Carbon Fund), EIB, IDB, TDA, USAID, UNEP RE/EE Investment advisory facility
	Government Entities and ECAs		
	GTZ, TDA	GTZ, TDA	GTZ, TDA
	Private Equity		
	Al Tayyar, PEMF, E+CO, EVG, EEAF, GEF Private Equity Funds, New Energies Invest AG, NIB Capital	Al Tayyar, PEMF, E+CO, EVG, EEAF, GEF Private Equity Funds, New Energies Invest AG, NIB Capital	EVG, GEF Private Equity Funds, New Energies Invest AG, NIB Capital
Construction and Implementation of Project			
	Multilateral Agencies		
	NEFCO[6], IDB, WB, IFC, EBRD[6], EIB, UNEP, ADB	NEFCO, IDB, WB, IFC, EBRD, EIB, UNEP, ADB	NEFCO, IDB, WB, IFC, EBRD, EIB, UNEP, ADB
	Government Entities and ECAs		
	Danish Export Finance Corporation, ECGD (UK), Export Development Corporation, Export Development, and Insurance Corp (Australia), US Ex-Im Bank, JBIC, GTZ, Hermes, KfW, OPIC, Svensk Exportkredit (Sweden),	Danish Export Finance Corporation, ECGD (UK), Export Development Corporation, Export Development, and Insurance Corp (Australia), US Ex-Im Bank, JBIC, GTZ, Hermes, KfW, OPIC, Svensk Exportkredit (Sweden),	Danish Export Finance Corporation, ECGD (UK), Export Development Corporation, Export Development, and Insurance Corp (Australia), US Ex-Im Bank, JBIC, GTZ, Hermes, KfW, OPIC, Svensk Exportkredit (Sweden),
	Private Equity		
	PEMF, Asia West Environment Fund[7], Black Emerald Leasing Partners, Caribbean Basin Power Fund[8], CDC Capital partners[9], CFA[10], E+CO, E+CO[9], EEAF, FE Clean Energy Latin America, GEF Private Equity Funds, Microgen Tec Fund, North American Environment Fund[11], NIB Capital, Rabo Sustainability Fund, Renewable Energy Equity Fund (Australia), Solar Development Group – IFC[12], Triodos International Fund Management, Triodos Renewable Energy Fund,	PEMF, Asia West Environment Fund[7], Black Emerald Leasing Partners, Caribbean Basin Investment Fund[8], CDC Capital Partners[9], Clean Technology Fund[13], CFA[10], Darby Latin American and Asian Mezzanine Fund, E+CO[9], EEAF, FE Clean Energy Latin America, GEF private Equity Funds, Hydro-Québec, Microgen Tech Fund, North American Environment Fund, NIB Capital, Rabo Sustainability Fund, Renewable Energy Equity Fund (Australia), Scudder Latin Power II Fund, Solar Development Group – IFC[12], Triodos International Fund Management, Triodos Renewable Energy Fund, UBS Equity Fund Future Energy, FMO	PEMF, Asia West Environment Fund[7], Black Emerald Leasing Partners, CDC Capital Partners[9], Clean Technology Fund[13], CFA[10], Darby Latin American and Asian Mezzanine Fund, E+CO[9], GEF Private Equity Funds, Hydro-Québec, Microgen Tech Fund, North American Investment Fund, NIB Capital, Renewable Energy Equity Fund (Australia), Triodos International Fund Management, Triodos Renewable Energy Fund,

[1] Only applicable to countries in Asia
[2] Funds can only be utilized by member countries in Central America
[3] Funds are available for Mexico, Peru and Chile
[4] Only for rural projects in China
[5] The European bank for reconstruction and development only operates in the FSU and Eastern European Countries
[6] Operates programs in Russia
[7] Fund only targets non-Chinese firms interested suited to the Chinese market
[8] Invests in power plants in Central America and the Caribbean
[9] Invests in emerging markets
[10] Investments in Central America
[11] Particular interest in expanding risk capital funds to small firms in Mexico
[12] Only invests in Solar power projects
[13] Only invests in projects in the US and Canada in Wind predominantly, but also small hydro and biomass.

	Size of Project		
Project Stage	**Micro**	**Small – Medium**	**Large**
	Funding Sources (Unless otherwise stated, the funds are available in all emerging markets)		
	Commercial Lenders		
	Deutsche Structure Finance[15], FMO, Fortis Bank, Triodos Bank, West LB, Bank of South Pacific[14]	ABN Amro, Deutsche Structure Finance[15], FMO, Fortis Bank, Triodos Bank, West LB	ABN Amro, Deutsche Structure Finance[15], FMO, Fortis Bank, Triodes Bank, West LB, National Australia Bank[16]
Back-end Post Construction			
	Multilateral Agencies		
	WB, IFC, CAF and EBRD Carbon Funds	WB, IFC, CAF and EBRD Carbon Funds	WB, IFC, CAF and EBRD Carbon Funds
	Government Entities and ECAs		
	Government tariff subsidies	Government tariff subsidies	Government tariff subsidies
	Private Equity		
	New Energies Invest AG	New Energies Invest AG	New Energies Invest AG

[14] Hydro Power Plant in Papua New Guinea only.
[15] Only cover wind power projects
[16] Focus is Australian based, although will follow major Australian clients in Asia. Only covers hydro, geothermal and wind based Power Plants

5.2 REGIONAL BREAKDOWN OF FUNDING SOURCES

	Region										
Funding Source	**Worldwide**	**Asia**	**China**	**Latin America**	**Chile**	**Mexico**	**Peru**	**Russia**	**North America**	**US**	**Canada**
Multilateral Institutions	WB: GEF, ESMAP, PCF, SME Funds IFC: GEF, REEF, Carbon Fund, SME Funds, PVMTI UNEP: RE/EE Investment, IAF UNDP: GEF, ESMAP, SME Funds EIB	WB: ASTAE ADB	UNEP: CREED	IDB: MIF, SME Fund, IIC	CAF	CABEI Caribbean Basin Power Fund CFA	CAF	EBRD NEFCO			
ECAs and Governme nt Entities	All ECAs, USAID, USTDA, OPIC										
Private Equity Funds	Al Tayyar, PEMF, CDC Capital Partners, E+Co, EVG, EEAF, New Energies Invest, NIB Capital, Black Emerald Leasing, Global Environment Fund, Hydro-Quebec CapTech, Microgen Tech Fund, Rabo Sustainability Fund, UBS Lux Equity Fund, Solar Development Group, Triodos International Fund Management, Triodos Renewable Energy Fund	Asia West Environment Fund, Asian Infrastructure Mezzanine Capital Fund		FE Clean Energy Latin America Clean Energy, Scudder Latin Power II Fund, Darby Latin American Mezzanine Fund	Clean Technology Fund	N. America Environment Fund			Clean Power Income Fund		
Commerci al Lenders	ABN Amro, Deutsche Structured Finance, FMO, Fortis Bank, Triodos Bank, West LB	National Australia Bank, Bank of South PNG									

5.3 REQUIREMENTS FOR BANKABILITY OF AN RE PROJECT

An investment plan is an essential part of the loan application for any power project; without it, no bank will advance a loan. This plan demonstrates convincingly to the lender or investor the viability of the project. The objective of the investment plan is to maximize the probability of project success and minimize risk by closely examining all the financial aspects of the project. At a bare minimum, the plan should detail all capital and operating costs as well as all revenues. It should include monthly detail for projected cash flows. It should lay out, in clear detail, the legal, regulatory, commercial, and market demand assumptions of the project.

As part of the overall investment plan, any power project, even in the RE sector, is based on a carefully-prepared financial model that visibly demonstrates the commercial viability of the project to lenders and investors. Such a model and the associated project documents are prerequisites for accessing commercial sources of funding. The level of detail and sophistication will vary depending on the type and size of the project but must be sufficient to address the demands of lenders and project sponsors. The model will contain pro-forma financial statements for fully characterizing the financial viability of the project based on data and assumptions on electricity demand, operating costs, capital costs, financing structure, and taxes, among other elements. The model will have the capability to investigate the impacts of changes in key parameters, such as electricity demand, and financing options and terms.

The guiding premise in conducting this work is to develop a model with the detail and sophistication of financial models typically developed to support financing term sheet negotiations among banks. The model will incorporate key economic data on demand projections, project cost information and likely financing sources and terms.

A primary source of data for characterizing the project cost structure will be obtained from the results of the analysis of fuel costs and the plant specifications. The full range of fixed costs and operating costs estimated for the project annually will be included in the financial model. In particular, careful consideration will be given to identifying and estimating fixed and variable costs to determine operating leverage and, therefore, the resultant variations in projected revenues on cash flow. Asset service life and salvage values for buildings and equipment will be estimated to establish appropriate depreciation schedules.

A key issue related to projecting project revenues for purposes of assessing financial viability includes characterizing the potential volatility of revenues. Revenue projections under different demand, pricing, and production scenarios will be conducted based on the past history of similar projects and power market and price trends in the country where the investment will be situated.

The model will provide a range of critical information to prospective lenders and equity investors. Specifically, forecasts of debt service coverage ratios and related information will be generated to provide necessary information for lenders to assess credit risk and for equity investors to further assess the relationship between the project's business strategy and the financial plan.

The internal rate of return (IRR) will be computed to provide equity investors with likely target return estimates of the project. Additionally, the model will generate a range of financial ratios that characterize the financial condition of the project over time in four areas: profitability ratios (for example, profit margin), activity ratios that indicate how efficiently assets are being deployed, solvency ratios, and liquidity ratios.

A range of cases will be generated by the model to characterize the financial performance of the project as a result of changes in: (1) overall project configuration; (2) operating and capital costs; (3) technical performance of the project; (4) demand and tariffs; and (5) financing facilities (for example, terms of debt, mix of debt and equity). The model will produce a concise summary of the financial results to facilitate comparison across different sensitivity cases.

Sensitivity of the results to changes in configuration, capital costs, fuel cost, capacity factor, heat rate (four points from minimum to full load), discount rate, and various financial assumptions will be analyzed and compared. Any "special conditions" proposed by the project team can also analyzed. These results will be very useful in a bank review of the project to identify and quantify risks of the project.

5.3.1 Formulating a Financing Strategy

Before preparing financing documents, the developers/sponsors have to develop a financing strategy that would reflect the requirements of financing institutions that may participate in the project. The strategy would address the following issues, among others: composition of equity contributors and amount of equity, timing of equity investments, ownership structure of project, EPC contract and possible eligibility for ECA financing, procurement rules of lending organizations, and a timetable for financing activities.

5.3.2 Preparing Financing Documents

Two financing documents are typically prepared: (1) Project Briefing Book; and (2) Preliminary Information Memorandum (PIM).

A general project briefing book would be prepared for the purpose of introducing the project to prospective lenders, such as international commercial banks, IFC, IDB, ADB, US Ex-Im Bank, and possibly equity investors as necessary.

The PIM will present information on all key aspects of the project, including a description of the project; project economics under a base case and sensitivity cases; technical aspects of the project as they relate to commercial, technical, and financial risks; and financing requirements including amount of capital costs, development costs, interest during construction, working capital requirements, insurance, and financing fees. Because the PIM often serves as the key document that lenders use to decide whether to proceed further with the financing application process, it must be well organized, written clearly and concisely, provide relevant information for decision makers, and identify project risks and possible approaches for mitigating these risks. **Too often renewable energy projects have a tendency to emphasize the technology over the financial viability of the investment.** Focus is given to the environmental or social benefits that might accrue from the project with less attention given to its commercial potential. While such factors are commendable, the bankers' responsibility to shareholders requires that all investments be financially sound.

Generally, financing institutions encourage prospective borrowers to approach them at an early stage of a project in order to allow the banking staff to provide advice regarding the procedure and structuring options and to be kept informed of the relevant developments in the project cycle. For the initial stage, the bank will require a complete investment plan describing the project sponsors, the business and project rationale, and the type of investment the project sponsor requires.

Depending on the size and complexity of the proposed project, the project sponsor may retain the services of a financial advisor. The advisor will be familiar with the country where the project is located and can advise on structures and local conditions, as well as having the expertise and relationships to sell the project to the lending banks. In addition, technical experts might be retained to prepare, or at least validate, the project feasibility study. The technical expert will often have a continuing role in monitoring the progress of the project, and in providing assurance that performance covenants and tests stipulated in the financial documents are adhered to. Depending on the complexity of the documentation and international make-up of the parties, the retention of an experienced international law firm may be required. Project sponsors are advised to conduct a review of the legal, tax and regulatory systems in the host country as a part of their preliminary feasibility assessment.

5.3.3 Commercial Structure Outline

The following is an outline of the elements of the commercial structure that would be used as a guide for conducting activities in arranging a suitable financing structure. The extent to which certain elements are addressed will depend on their applicability to the project under consideration, status and composition of the developer team, details available on the proposed project, progress on commercial agreements, and the availability of information.

Describe Project Implementation Program and Prospects

A. Review of capabilities and experience of key parties

- Sponsor – foreign
- Sponsor – local
- Technology
- EPC firm
- Turbine suppliers
- Other equipment suppliers
- Local construction company
- Operator
- Electricity buyer
- Any common site sharers
- Availability of water, other utilities
- Other

B. Legal Structure of Project Company

C. Host Government Undertakings/Approvals/Support

Describe Commercial and Financing Program

A. Overview of project structure

- **Contractual Structure:**

  PPA – including tariff profile, minimum off-take commitments, force majeure events and continuation of capacity payment in event of force majeure, cost pass-throughs, currency of tariff, provisions for price adjustments for local currency devaluation, responsibility for availability of forex, timeliness of payments, relationship to prevailing tariff levels, change of law risk allocation, early completion bonus, dispatchability risk.

  Fuel Supply Agreement – assurance of supply, put-or-pay, pricing restraints, specifications, monetary damages for failure to deliver, backstop from credit enhancers.

  Transmission Right-of-Way

  Turnkey Construction – completion guarantee, performance tests and guarantees, capacity guarantee, schedule guarantee, liquidated damages, force majeure events and allocation of risk, cost overrun coverage, bonds/balance sheet to assure financial strength to meet obligations.

  Operations and Maintenance – performance assurance, liquidated damages; reputation and reliability of operator.

  Guarantees – as by Government, Ministry of Finance ((MOF)/Central Bank) that assure performance by State-owned firms.

Undertakings – assuring payment of debt in the event that significant changes of events or law occur that materially negatively affect the project's ability to operate economically and pay its debt service.

Provisions for Change-of-Law

Environmental standards and clearances – World Bank guidelines, environmental impact assessment, lender liability

Currency Remittability – required registration/approvals; holiday from withholding taxes; dividend restrictions; escrow accounts.

- **Financial Structure**

  Debt – sources, terms, rates, fees, duration, repayment profile, external, local, standby loan for completion, forex assurance **and** availability, timing.

  Equity – sources, terms, timing for infusion, standby funds for completion, working capital, repatriation profile, dividend schedule, IRRs, local vs. external, dividend restrictions, political risk insurance, shareholders' agreement.

- **Governmental Permits, Assurances, Approvals, Undertakings, Guarantees**
- **Overall Viability and Experience of Project Implementation Program**
  Developer - foreign and local

  Principal equipment suppliers

  Balance-of-plant supplier(s)

  Turnkey contractor

  Equity providers

  Debt providers

  Operator

  Other

B. Financial Analysis

- **Capital Costs**
  Completeness and reasonability of items

  Test/validate assumptions of cost

  Sensitivities

- **Operating Costs**
  Completeness and reasonability

  Test/validate assumptions

  Sensitivities

- **Fuel Costs**
  Test/validate assumptions

  Sensitivities

- **Financial and "Soft" Costs**
  Completeness and reasonability

  Test/validate assumptions

  Sensitivities

- **Cash Flow Model**
  Structure

  Formulae

  Completeness

  Sensitivities

- **Tariff Structure**
  Capacity payment elements
  - Capital cost recovery
- Debt principal and interest
- Equity - including dividend plan
  - Interest During Construction (IDC)
  - Fixed O&M
  - Fuel treatment
  - Minimum offtake
  - Force majeure events accountability

  Fuel/variable payment elements
  - Cost of fuel - pass-through
  - Variable O&M
  - Other marginal costs

  Ceilings/adjustments/reopeners

C. Basic Capital Structure of Transaction

- **Debt - Structure, Terms, Sources**
  Allocation of external/local costs

  Sources: external, local

  Terms: interest rate, fees, payment profile (mortgage-style vs. level principal)

  Duration: grace, IDC, average length, total length

  Completion/cost overrun financing - sources, terms, surety

  Political risk insurance fees

  Foreign exchange availability for external debt service

  Liens on project assets

  Assignability of all rights under all contracts

  Performance bonds

  Insurance proceeds

  Guarantees that run to the benefit of the project and its viability.

- **Equity – Structure, Terms, Sources**
  Sources/soundness/strength of commitment

  Timing/schedule for investment

  Direct investment

  Standby reserves

  Working capital

  IRRs

Summarize Project Risk Mitigation and Next Steps

A. Risk Mitigation; Security Package

- PPA
- Transmission right-of-way or guaranteed access
- Fuel supply agreement
- EPC agreement
- O & M agreement
- Ministry approvals/undertakings
- MOF approvals/undertakings
  - Foreign investment registration/ repatriation
  - Foreign exchange availability
  - Capital equipment import licenses/duty treatment
  - Tax holiday
- Environmental permits
- Labor permits/taxes (social welfare)
- Local permitting
- Other governmental requirements to proceeding
- Other project implementation requirements and estimated timetable.
- Reliability of construction schedule
- Reality of support/connecting infrastructure required to make plant operate

B. Financing Requests

- Amounts
- Term
- Interest
- Fees
- Repayments profile

6. Appendices

6.1 SAMPLE QUESTIONNAIRE – RENEWABLE ENERGY AGENCIES

Questionnaire: Government Renewable Energy Agencies

1. Name of Institution/Agency: _____

2. What type of institution is your company?

† Government Institution:
†International †National †Regional †Provincial

† Donor Institution:
†International †National

† Non –profit
† Other: _____

3. Are there links between national level and provincial level?

† Yes
† No

4. a) Does government policy exist covering the development of renewable projects?

† Yes
† No

Do incentives exist to encourage Renewable development?
† Yes
† No

If yes want form do these incentives take?

† Import duty concessions (i.e. to cover turbines in the case hydropower)
† Tax holidays / concessions
† Production payment
† Trust funds
† Low-cost loans
† Subsidies
† Other: _____

b) Please describe briefly your institution's activities/role:

† Promoter of renewable energy public awareness
† Research **and** development
† Consulting
† Due Diligence
† Provide financial assistance

- Guarantees
- Owner of Renewable Energy Plants
- Manager of Renewable Energy Plants

5. What type of Energy plants does your institution support?

- Non-renewable power plants
- Renewable energy plants:
  - Hydro
  - Biomass
  - Solar
  - Geo-Thermal
  - Wind
  - Wave
  - Tidal
  - Ocean Current Thermal

6. Is your institution interested in any other new energy developments?

- Hydrogen Fuel Cells
- Other (please specify)

7. How much has been allocated to the energy sector and or development of renewable power plants over recent years? (Please state budget year and provide the value in US Dollars)
   Year _____ : _____(US$)
   Year _____ : _____(US$)
   Year _____ : _____(US$)
   Year _____ : _____(US$)
   Year _____ : _____(US$)

8. What Renewable development activity has taken place in the last five (5) years?

	Number of Projects in Last 5 years					
Power Plant	Total projects handled	Projects developed and producing power	Projects passing approval process	Projects in planning phase	Projects in feasibility/concept phase	Please provide a size range for each type of plant
Renewable						
Hydro						
Biomass						
Solar						
Geo-Thermal						
Wind						
Wave						
Tidal						
Ocean Current						
Ocean Thermal						

9. What are the other factors which define your institutions target market?

- Geographic (if yes please clarify)
  - Only domestically
  - Internationally:
    - Developing Market Countries
    - Other:_____
- Technology

Funding Policy:

10. Does your institution directly fund, contribute equity or facilitate state debt in renewable energy projects?

- Yes
- No
- Partially

11. If your answer to question 12 was either "yes" or "partially", what form of funding does support take?

- Research and development
- Bilateral
- Multilateral
- Export Credit
- Feasibility studies
- Environmental Impact Studies
- Guarantees
- Low-cost Loans
- Grants
- Subsidies
- Private Financing
- Export/Mixed Credit

12. Does your institution have upper and lower limits for project funding?

- Yes – if Yes what are these Limits (US Dollars):
  - Lower Limit
    - < Million; 1-10 Million; 10-100 Million; >100 Million
  - Upper Limit
    - < Million; 1-10 Million; 10-100 Million; >100 Million
- No

13. Please fill out the table below to describe your institution's/agency's renewable energy programs? (or please list programs and where we can obtain descriptions of the individual programs)

Funding Program			
Description			
	Program Target Definitions:	Decision Criteria (please tick one)	Comments Please specify any limitations and/or criteria.
Eligibility Criteria	Size of plant	Yes No	
	Geographic limitations	Yes No	
	Type of Plant	Yes No	
	Funding for specific phases of project	Yes No	e.g., Due Diligence, Environmental Impact,
	Other Financing required	Yes No	
	Average time for decision	N/A	
	Time limitations for application	Yes No	
	Are Government Guarantees required	Yes No	
	Is Program in collaboration with another institution?	Yes No	
	Number of Projects supported under this program in last 5 years	Yes No	

14. What are the criteria / decision factors which you take into consideration when evaluating projects for support?

	Vital	Highly Important	Moderately Important	Not Important	Not Considered
Maturity of legislative framework	†	†	†	†	†
Level of electricity sector liberalization	†	†	†	†	†
Availability of sovereign risk guarantee	†	†	†	†	†
Bankability of off-take organization	†	†	†	†	†
Political stability in host country	†	†	†	†	†
Other:	†	†	†	†	†
	†	†	†	†	†
	†	†	†	†	†

15. Who are the other institutions with which you traditionally cooperate in financing projects?

† Multilateral Finance Agencies
† Government Agencies
† Equity Funds
† Commercial Debt Funds
† Other: _____

16. Specific Projects:

What type of renewable energy projects has your institution supported in the last 5 years and in what fashion? (To facilitate your response we have set out a table with the information we need with regard to the projects)

Project name:								
Beneficiary:								
Name of Support Program:								
Plant Type:			Size: (MW)		Location:		Total Cost: (USD)	
Status of Plant:	Tick appro-priate box	Start date	Project Country:		Backing			
In production			Beneficiary	Project	Type of Support:	(e.g., due diligence, etc)		
Being assessed					Funds Provided	(value if applicable)		
Planning phase					Other institutions' support			
Feasibility/concept								
Project Description:								

6.2 SAMPLE QUESTIONNAIRE – FINANCIAL ORGANISATIONS

Questionnaire: Financing of Renewable Energy Projects

Please check all points which are applicable.

1. Name of Institution: _____

2. What type of institution is your company?

- † Lender
- † Government Institution
- † International Financial institutions
- † Private financial institution
- † Non-profit Foundation
- † Government agency responsible for energy or industry
- † Other: _____

3. Please describe briefly your institution's activities/role:

- † Promoter of Renewable energy public awareness
- † Research and Development
- † Consulting
- † Due Diligence
- † Financing of power plants
- † Provider of credit enhancement and guarantees
- † Owner of Renewable Energy Plants
- † Manager of Renewable Energy Plants

4. What type of Energy plants does your institution support?

- † Non-renewable power plants
- † Renewable energy plants:
  - † Hydro
  - † Biomass
  - † Solar
  - † Geo-Thermal
  - † Wind
  - † Wave
  - † Tidal
  - † Ocean †Current †Thermal
- † None of the above

5. Has your institution supported any other new energy developments?

- † Hydrogen Fuel Cells
- † Other (please specify)

Project Location:

6. Are there any specific regions and or countries where your institution is not prepared to lend?

   † Yes
   † No

   If yes please clarify: _____
   _____

Project Sponsors:

7. Some of the independent developers of alternative energy projects who apply for loans may be local utility companies, or locally owned companies that are **not** utility companies, or foreign energy companies, or joint ventures. Would you only lend to sponsors who are:

   † Local utility companies who are current clients
   † Corporations wholly owned by investors in your country
   † Joint Ventures with a large company
   † Equipment manufacturers
   † No particular preference
   † Other: _____

   a. Would you lend to sponsors that are foreign owned companies (e.g., UK utility companies)?
      † Yes
      † No

   b. Do the sponsors have to meet any certain financial criteria such as size, debt to capital, liquidity, operating experience, etc.?
      † Yes
      † No

   If yes, please explain:_____
   _____
   _____

Loan Type Preference (Construction or Permanent Loan)

8. Can your institution's loans cover both the construction period and the operation period of the project?
   † Yes
   † No

9. What form does a loan usually take?
   † Construction period plus operation period
   † Construction period only

   What tenor do you prefer for your operational period loans?
   † 3-5 years
   † 5-10 years
   † 10-14 years
   † > 14 years

10. Do you use the same credit criteria for renewable energy loans as you would on other energy projects (oil, gas, power plants)?
    - † Yes
    - † No

Documents and the Process for Borrowing Loans during Construction

11. Which of the following documents do you require to reach credit approval on transactions? (select all that apply or "m")

a.	Feasibility Study	†
b.	Plant Permits	†
c.	Power Purchase Agreement or Energy Conversion Agreement	†
d.	Financial Model	†
e.	Annual Report of Sponsor	†
f.	Environmental study	†
g.	Market demand study	†
h.	Tariff setting mechanism: legal and regulatory issues	†
i.	Complete financials of power purchaser	†
j.	Undertakings by Government, if Power purchaser is State owned entities	†
k.	Term sheet for loan	†
l.	Loan Agreement Document	†
m.	All of the above	†

12. What do you expect is the typical time requirement for approval of a loan, assuming the basic underwriting requirements such as purchase power agreements and financial projections are provided?
    - † 1-2 months
    - † 3-6 months
    - † 7-12 months
    - † More than 1 year

13. What are the major delaying factors?

14. When you make loans for more than $5 million, do you generally:
    - † Hold the entire loan until it is repaid
    - † Form a syndicate with other banks as the agent bank
    - † Form a syndicate with other banks as the participant bank
    - † Syndication depends on many factors, the loan could be either syndicated or held
    - † Act as guarantor, so syndication is responsibility of funding banks
    - † As Government Agency, hold all for own account

Loan Sizes and Structures:
Below we have provided a table, which separates construction and operational loans for projects in the renewable energy sector.

15. If you are interested in making loans to alternative energy projects, what currency would you prefer the loan to be denominated in:

Currency	Construction	Operational
Local Only		
US Dollar		
Euro Only		
Either local, USD, or Euro		

16. What is the approximate **smallest** size loan you deem commercially viable for a loan in the renewable energy sector?

Loan Size (USD)	Construction	Operational
< 1 million		
1-5 million		
6-10 million		
11-25 million		
> 25 million		

17. What is the approximate largest size loan you deem commercially viable for a loan in the renewable energy sector?

Loan Size (USD)	Construction	Operational
< 1 million		
1-5 million		
6-10 million		
11-25 million		
> 25 million		

18. What type of interest rate would you implement on a renewable energy project loan?

Interest rate Type	Construction	Operational
Fixed rate only		
Floating rate only		
Fixed or Floating		
Floating rate with interest rate swap		
Evaluated on a case by case basis		

19. What is the maximum grace period (the period in which no debt re-payments are required) that you would consider in establishing the re-payment schedule of a permanent loan?
    - No grace period
    - Six months grace period
    - 6 months – 1 year grace period
    - 1-2 year maximum grace period
    - a 3-5 year maximum grace period
    - Evaluated on a case by case basis

Project Financing:

20. What criteria would determine the size of a loan for project finance?

- † Project collateral
- † Debt service coverage ratio
- † Debt to capital ratio
- † All of the above
- † Evaluated on a case by case basis

21. What is the minimum debt service coverage ratio (DSCR) that would be considered in determining the size of the loan?

- † Minimum DSCR of 1.2-1.4
- † Minimum DSCR of 1.4-1.6
- † Minimum DSCR of 1.6 – 2.0
- † Evaluated on a case by case basis

22. What is the minimum debt to capital ratio that would be considered in determining the size of a loan?

- † Maximum Debt/Project Cost of 90%
- † Maximum Debt/Project Cost of 80%
- † Maximum Debt/Project Cost of 70%
- † Maximum Debt/Project Cost of 60%
- † Evaluated on a case by case basis

23. What arrangement do you use to cover contingencies during construction for possible construction over-runs, construction delays and plant performance?

- † Liquidated damages from contractor
- † Sponsor balance sheet support
- † Capped or uncapped
- † Sponsor Letter of credit
- † Other guarantee (please specify):_____

24. How important is the credit quality of the sponsor when you make loans (e.g., the ability of the sponsor to fund construction cost over-runs)?

Vital	Highly Important	Moderately Important	Not Important	Not Considered
†	†	†	†	†

Please comment: _____
_____
_____

Construction Contracts:

25. Do you require the developer to secure a fixed price "turnkey" Engineering Procurement and Construction (EPC) contract, in which the contractor accepts the risk of construction problems such as a delay or increased costs?

    † Yes
    † No

a. In making future loans, would you require that sponsors enter into EPC contracts with construction companies?

    † Yes
    † No

b. How would the presence of a turnkey or EPC contract affect your loan process?

    † Improve the conditions of the loan
    † Increase your institution's risk taking
    † Speed up the loan process
    † Other:_____

c. If there were a turnkey contract, do you require liquidated damages, bonding or other insurance to make sure the contractor could fulfil the contract obligations?

    † Yes
    † No

The Underwriting Process

Credit Risks

26. In analyzing credit, what are the most important risks evaluated?
    † Construction
    † operational/technical
    † Financial performance of sponsor(s)
    † Financial performance of off-taker
    † Commitment of Government to legal and regulatory framework
    † Economic (as contrasted with financial) soundness of project
    † Comparables in other places

27. Which of the following risks were most important to you in making the loan?
    a. Resource risk (wind speeds, river flows, etc.) Yes†No†

    b. Construction cost of plant (construction cost over-runs, construction delays, plant performance). Yes†No†

    c. Technological risk of plant not operating as planned (e.g. problems with wind turbine blades). Yes†No†

    d. Risks associated with PPA (e.g. credit problems of the utility company or regulatory out provisions). Yes†No†

e. Operations and maintenance expense risk.
Yes† No†

f. Tax risk (that tax holidays will expire).
Yes† No†

g. Currency risk from the denomination of the PPA (if the PPA is in USD and the tariffs are in local currency).
Yes† No†

h. How important was the guarantee or other credit support in the underwriting process?

_____
_____
_____

PPA Underwriting

28. Does the PPA have to be longer than the tenor of loan by a certain number of years?
Yes† No†
How many years?_____

29. How do you deal with a sub-investment grade taker that signs the PPA?

† Government guarantee
† Additional security
† Larger Escrow or reserve accounts
† Sponsor (seller) guarantees
† Denial of credit
† Other (please explain):_____

Independent Engineers and Consultants

30. Did you hire independent engineers to review the construction budget, feasibility study, or any other aspects of the project? Yes† No†

_____

a. Who paid for the independent engineer (e.g. the sponsor)?

_____
_____

b. Will an independent engineer or consultant continue to monitor the project in the operation phase? Yes† No†

_____
_____

31. Did you use internal staff at the bank to review the construction budget, feasibility study or any other aspects of the project?
Yes† No†

_____
_____

Loan Pricing

32. While interest rates would obviously be market based, could you give a range in credit spreads above LIBOR or another benchmark that developers could expect for the ***construction*** phase?

Credit spread range from _____ to _____ basis points, without guarantee
Credit spread range from _____ to _____ basis points, with guarantee

- Credit spreads are market driven and depend on a variety of factors making it impossible to provide a spread.

Comments:_____

33. Could you give a range in credit spreads above LIBOR or another benchmark that developers could expect for the permanent loan?

Credit spread range from _____ to _____ basis points, without guarantee
Credit spread range from _____ to _____ basis points, with guarantee

- Credit spreads are market driven and depend on a variety of factors making it impossible to provide a spread.

Comments:_____

34. How would the term of a purchase power contract affect the tenor of your loan?

- The PPA should extend for at least 5 years beyond the loan
- The PPA should extend for at least 7 years beyond the loan
- Evaluated on a case by case basis

35. In the following pages we have provided a table to provide specific information on projects financed by your institution. If it is more convenient to provide a print out of the projects, together with their financing structure, or a website where the information is available, either would be equally acceptable. In which case the table will provide an indication of the information we need. All information you provide will be kept in strictest confidence and shall be used only to provide an analysis of the sector.

Project name								
Beneficiary								
Plant:	Type:		Size:		Location:		Total Cost:	
	Start	Finish	Country Beneficiary	Country of Sponsor	Type of Funding:		Value USD	Other funds/support
Project Financing Description:	Loan Size: _____ to cover †Construction †Construction plus Operational Period of Grace: _____; Tenor of Loan: _____ Syndicated Loan: †Yes †No; Lead bank/financial institution: _____ Debt/Service Coverage: _____; Debt/Capital Ratio: _____ Contingencies: †Yes †No; Government or Other Guarantees: †Yes †No Whom: _____ Construction Lump Sum Turnkey: †Yes †No; PPA Underwriting: †Yes †No Interest Rate: †Fixed †Variable† Other: _____ Interest Rate: LIBOR + _____ Time for Loan Approval: _____							

6.3 COMPLETE LISTING OF TARGETED INSTITUTIONS

No	Agency / Organisation	Response (Yes / No)
Australia		
1	Office of the Renewable Energy Regulator (ORER)	**Yes**
2	The Australian Greenhouse Office (AGO)	**Yes**
3	The National Greenhouse Strategy (NGS)	No
4	Sustainable Energy Development Authority (SEDA), New South Wales	**Yes**
5	Sustainable Energy Authority Victoria (SEAV)	No
6	Sustainable Energy Development Office (SEDO), Western Australia	**Yes**
7	National Australia Bank	**Yes**
8	Westpac Banking Corporation	No
Brunei Darussalam		
9	Development Bank of Brunei Berhad	No
10	Islamic Bank of Brunei Berhad	No
Canada		
11	McCarthy Tetrault LLP	Yes
12	Canadian International Development Agency	No
13	Natural Resources Canada	No
Chile		
14	Consejo Nacional para el Desarollo Sostenible – Chile	No
15	Olade - Organisación de Energía en Latino America	No
16	Sustainable Chile Program	No
Peoples Republic of China		
17	China Environment Fund	**Yes**
18	U.S.-China Renewable Energy Cooperation - DOE's Office of Technology Access (OTA)	No
19	Division of Energy, Ecology & Environment, Center for Science & Technology Development, Ministry of Agriculture	No
Hong Kong, China		
20	Hong Kong Electric Company	No
21	Hopewell Holdings Limited	No

No	Agency / Organisation	Response (Yes / No)
Indonesia		
22	Yayasan Bina Usaha Lingkungan	No
23	Dept. of Energy & Mineral, Dept for Renewable Energy & Energy Conversation	**Yes**
24	State Minister for Research & Technology	**Yes**
25	Bank of Indonesia	No
26	Bank International Indonesia	No
Japan		
27	Agency for Natural Resources and Energy (ANRE) , Japan	No
28	Institute for Energy Economics, Japan	No
29	JBIC	No
Republic of Korea		
30	Ministry of Commerce, Industry and Energy	No
31	Korea Energy Management Corporation, Ministry of Science and Technology	**Yes**
32	Korea Council of Economic & Social Research	No
33	Centre for New & Renewable Energy Development and Dissemination	No
34	Korea First Bank	No
Malaysia		
35	Jabatan Alam Sekitar Malaysia, Department of Environment Malaysia	No
36	Malaysian Energy Centre - PTM (Pusat Tenaga Malaysia)	**Yes**
37	Ministry of Primary Industries, International Relations Division	No
38	Ministry of Energy, Communications and Multimedia	No
39	Bank Negara Malaysia	No
40	Maybank	No
41	Bank Mandiri	No
Mexico		
42	Mexico Renewable Energy Program	No
43	Mexico Secretaria de Energía	No
44	Consejo Nacional Consultivo para el Desarollo Sostenible – Mexico	No
New Zealand		
45	Energy Efficiency Conservation Authority (EECA)	No

No	Agency / Organisation	Response (Yes / No)
46	Environment Canterbury	No
47	National Bank of New Zealand	No
48	Bank of New Zealand	No
Papua New Guinea		
49	Dept. of Petroleum and Energy, Energy Division, Energy Policy and Planning Branch	**Yes**
50	ANZ - Papua New Guinea	**Yes**
51	Bank of South Pacific - Papua New Guinea	**Yes**
Peru		
52	Consejo Nacional del Ambiente – Peru	No
53	Ministerio de Energia y Minas Peru	No
54	ILZRO RAPS Peru	No
Philippines		
55	Philippines National Oil Company, Energy Research and Development Centre	No
56	Department of Energy	No
57	Centre for Renewable Energy Resources and Energy Efficiency	No
58	Philippine Council for Industry & Energy Research & Development	**Yes**
59	Energy Development and Utilisation Foundation, Inc (EDUFI)	No
60	Land Bank of the Philippines	No
61	Banco Filipino	No
62	Development Bank of the Philippines, Local Government Unit	No
Russia		
63	EU-Russia Energy Technology Centre	No
64	Russian Ministry of Energy Renewable Energy Sector	No
65	International Geothermal Workshop	No
Singapore		
66	Singaporean National Environment Agency (NEA)	**Yes**
67	OCBC Finance Ltd	No
68	DBS Bank Ltd	No
69	Monetary Bank of Singapore	No

No	Agency / Organisation	Response (Yes / No)
Chinese Taipei		
70	Centre for Sustainable Development	No
71	Ministry of Economic Affairs (MOEA)	**Yes**
72	Industrial Technology Research Institute (ITRI)	**Yes**
73	Bank of Taiwan	No
Thailand		
74	Electricity Generating Authority of Thailand (EGAT)	No
75	DEDP - Department of Energy Development and Promotion	No
76	Asia Energy Institute	No
77	Thailand Environment Institute	No
78	International Institute of Energy Conservation	No
79	Renewable Energy and Rural Industries Programme - NEPO - National Energy Policy Office	No
United States		
80	US Department of Energy	No
81	US Export-Import Bank	No
82	Solar Development Group	**Yes**
83	US Agency for International Development	**Yes**
84	US Trade and Development Authority	No
Vietnam		
85	Ministry of Industry, Institute of Energy	No
86	Research Centre for Energy and Environment (RCEE)	No
87	Vietnam Bank for Agricultural and Rural Development	No
88	Bank of Investment & Development of Vietnam	No
89	Vietnam Commercial Bank (Vietcombank)	No
90	Vietnam International JS Bank	No
International Organisations and Private Equity Funds		
91	The Corporación Andina de Fomento (CAF) (includes Chile, Mexico and Peru)	**Yes**
92	The Industrialization Fund for Developing Countries (IFU), Denmark	**Yes**
93	Triodos Bank NV, Netherlands	**Yes**

No	Agency / Organisation	Response (Yes / No)
94	ABN Amro Bank	**Yes**
95	COFACE, France	**Yes**
96	DEG -Deutsche Investitions - und Entwicklungsgesellschaft mbH, Germany	**Yes**
97	United Nations Environment Programme, France	**Yes**
98	Finnish Fund for Industrial Cooperation Ltd. (FINNFUND), Finland	**Yes**
99	Hermes Kreditversicherung, Germany	**Yes**
100	Gesellschaft fuer Technische Zusammenarbeit	**Yes**
101	Agence Francaise de Developpement	**No**
102	Agence Francaise de Developpement	**No**
103	Arclight	**No**
104	ASN Bank	**No**
105	Bank of Scotland	**No**
106	Bank Sarasin	**No**
107	Black Emerald	**No**
108	Caribbean Basin Power Fund	**No**
109	CDC Participations	**No**
110	Central American Bank for Economic Integration	**No**
111	Clean Power Income Fund	**No**
112	Danish International Investment Funds	**No**
113	Deutsche Structured Finance	**No**
114	DFID	**No**
115	E+Co	**No**
116	EBRD	**Yes**
117	EEAF	**No**
118	EIF	**No**
119	EIR Development Partners	**No**

No	Agency / Organisation	Response (Yes / No)
120	Energy Future Invest	**No**
121	Energy Ventures	**No**
122	Enertech	**No**
123	Environmental Enterprises	**No**
124	FE Clean Energy	**No**
125	FMO	**No**
126	Fortis Bank	**No**
127	GIMV NV	**No**
128	GRI Equity	**No**
129	Hydro-Quebec Capitech	**No**
130	IDB	**No**
131	IFC	**Yes**
132	Microgen	**No**
133	Netherlands Development Finance Company	**No**
134	New Energies Invest	**No**
135	New Energy Partners	**No**
136	NIB Capital	**No**
137	Norsk Hydro Technology Ventures	**No**
138	North American Environment Fund	**No**
139	Nth Power	**No**
140	OPIC	**No**
141	OPUS 4	**No**
142	Planet Capital	**No**
143	Private Energy Market Fund	**No**
144	Prototype Carbon Fund	**Yes**

No	Agency / Organisation	Response (Yes / No)
145	Rabo Bank	**No**
146	REEEP	**No**
147	Renewables Group	**No**
148	Robeco Milieu Technologie	**No**
149	SACE	**Yes**
150	Solar Energy Light Fund	**No**
151	Sustainable Energy Ventures	**No**
152	Swedish Export Credit Agency	**No**
153	UBS Lux Equity Fund	**No**
154	UNDP- SEED Program	**No**
155	Vattenfall	**No**
156	World Bank Asia Alternative Energy Program	**No**
157	West LB	**No**
158	Zero Stage	**No**

6.4 REFERENCE LIST OF FUNDING SOURCES

Name of Institution	Type of Institution	Page #
ABN Amro	Commercial Lender	62
Al Tayyar Energy	Private Equity Fund	39
Asia West Environment Funds	Private Equity Fund	41
Asian Development Bank	Multilateral Institution	18
Asia Infrastructure Mezzanine Capital Fund	Private Equity Fund	48
Bank of South Pacific (BSP), Papua New Guinea	Commercial Lender	65
Black Emerald Leasing Partners	Private Equity Fund	42
Caribbean Basin Power Fund	Private Equity Fund	42
CDC Capital Partners	Private Equity Fund	43
Central American Bank for Economic Integration	Multilateral Institution	19
Clean Power Income Fund	Private Equity Fund	45
Clean Technology Fund	Private Equity Fund	44
Corporación Andina de Fomento (CAF)	Multilateral Institution	20
Corporación Financiera Ambiental (CFA)	Private Equity Fund	46
Danish Export Finance Corporation	ECA or Government Agency	29
Darby Latin American Mezzanine Fund	Private Equity Fund	47
Deutsche Structured Finance	Commercial Lender	62
E+CO	Private Equity Fund	49
Energy Ventures Group	Private Equity Fund	50
Environmental Enterprises Assistance Fund	Private Equity Fund	51
European Bank for Reconstruction and Development (EBRD)	Multilateral Institution	21
European Investment Bank	Multilateral Institution	22
Export Credits Guarantee Department	ECA or Government Agency	29
Export Development Corporation	ECA or Government Agency	30
Export Finance and Insurance Corporation	ECA or Government Agency	30
FE Clean Energy Latin America	Private Equity Fund	52
Finanzierungs-Gesellschaft	ECA or Government Agency	38
FMO	Commercial Lender	63
Fortis Bank	Commercial Lender	63

Name of Institution	Type of Institution	Page #
Global Environment Facility	Multilateral Institution	12
Global Environment Fund	Private Equity Fund	53
Gesellschaft fuer Technische Zusammenarbeit (GTZ)	ECA or Government Agency	35
Hermes Kreditversicherung	ECA or Government Agency	36
Hydro-Quebec CapiTech Inc.	Private Equity Fund	54
IFC Photovoltaic Market Transformation Initiative	Multilateral Institution	15
IFC Renewable Energy and Energy Efficiency Fund (REEF)	Multilateral Institution	16
IFC Environmental Projects Unit and Power Department	Multilateral Institution	14
IFC Small and Medium Enterprise Program	Multilateral Institution	17
Inter-American Development Bank (IDB)	Multilateral Institution	23
Inter-American Investment Corporation	Multilateral Institution	24
Japan Bank for International Cooperation (JBIC)	ECA or Government Agency	34
Kreditanstalt fur Wiederaufbau (KfW)	ECA or Government Agency	36
Microgen Tech Fund	Private Equity Fund	54
Multilateral Investment Fund of the IDB	Multilateral Institution	25
National Australia Bank (NAB)	Commercial Lender	65
New Energies Invest	Private Equity Fund	55
NIB Capital	Private Equity Fund	56
Nordic Environment Finance Corporation	Multilateral Institution	26
North American Environment Fund	Private Equity Fund	57
Overseas Private Investment Corporation (OPIC)	ECA or Government Agency	37
Private Energy Market Fund (PEMF)	Private Equity Fund	40
Protype Carbon Fund (PCF)	Multilateral Institution	13
Rabo Sustainability Fund	Private Equity Fund	57
Renewable Energy Equity Fund	Private Equity Fund	58
Scudder Latin Power II Fund	Private Equity Fund	58
Solar Development Group	Private Equity Fund	59
Sustainable Asset Management	Private Equity Fund	60
Svensk Exportcredit	ECA or Government Agency	38
Triodos Bank	Commercial Lender	64
Triodos International Fund Management	Commercial Lender	60
Triodos Renewable Energy Fund	Private Equity Fund	61

6.5 CASE STUDIES OF RE PROJECT FINANCING

Project Summary

Project Title: Hidronihuil Power Plant
Country: Argentina
Amount: $35.7 MM
Sector: Power generation
Status: IIC loan approved May 1997

Sponsor(s)

Jose Cartellone Construcciones Civiles S.A. and Federación Eléctrica de Nuevo Cuyo S.A. (FENCSA), both of Argentina.

Offtaker(s)

The state utility of Mendoza province, Energía de Mendoza Sociedad del Estado (EMSE), under a 16-year power purchase agreement.

Financing Package

73/28 debt equity ratio.
Equity: $9.8 million; Debt: $25.9 million (IIC A-loan, $10.1 million; IIC B-loan, $10 million; suppliers credits, $3.9 million; Banco Regional Cuyo, $6 million).

Special Features

Build-Operate-Transfer (BOT) 30 MW hydro power plant. No domestic commercial sources for this refinancing existed, and foreign banks would not participate without the IIC's umbrella. The project was also too small to bring to the US capital markets.

Brief

In 1994 Mendoza authorities held a competitive bidding and awarded FENCSA a 16-year concession to construct, finance, operate, and maintain Nihuil IV, a small hydro power plant on the Atuel River. Construction began that year with a Citibank construction loan, which was refinanced with the help of the IIC in 1998, whose involvement was critical.

The project has several strengths, however, including a minimum debt service coverage ratio of 1.5. Since offtaker EMSE is a provincial government entity, it has agreed to deposit sufficient revenues to meet debt obligations into a trust account from which all obligations will be met. However, this is not expected to be a major issue, since EMSE is a profitable utility with high liquidity. It can cover its annual obligations to Hidronihuil with only 13 days of average receivables. It also has agreed to a take-or-pay clause that requires it to pay for all the energy generated by Hindronihuil.

In the event that it does not fulfil its contractual obligation established in the PPA to purchase a minimum level of electricity at a stated price, it will either make an indemnification payment that would be assigned to the IIC, or the sponsors of the project would assume responsibility for the outstanding debt. With those protections, the IIC approved an A-loan of 11 years at LIBOR plus 385 bp and an accompanying B-loan of 9 years at LIBOR plus 365bp.

Project Summary

Project Title: Ita Power Plant
Country: Brazil
Amount: $1.07 BN
Sector: Hydroelectric power generation
Status: IDB loan approved December 1997

Sponsor(s)

Itá Energética S.A. (Itasa), a consortium of four major Brazilian industrial companies (steel maker Companhia Siderúgica Nacional, petrochemical companies OPP Petroquímica SA and OPP Polietilenos SA, and cement company Companhia de Cimento Itambe) that holds a 35-year concession for the project.

Offtaker(s)

Itasa will purchase 61% of dam's 668 MW of guaranteed power output, with state-owned ELETROSUL purchasing the remaining 39%.

Financing Package

75/25 debt equity ratio; equity: $267.5 million; debt: $75 million IDB A-loan (15 years, with spreads over LIBOR increasing every five-years; $300 million IDB B-loan arranged through Citicorp and ABN-AMRO (10 years, with spreads also increasing every five years); and $427.5 million in parallel financing from Brazilian development bank BNDES.

Special Features

Itá is the largest hydro plant in the current 10-year plan of ELETROBRÁS, and its successful structuring and financing as a private sector project will create the necessary conditions for other new private hydro projects in Brazil.

Brief

In 1977, ELETROBRÁS subsidiary ELETROSUL first began conducting feasibility studies for a dam at Itá on the Rio Uruguaia, at the borders of Rio Grande do Sul and Santa Catarina states. In 1994, it held a competitive bidding and awarded a 35-year concession to the Itasa consortium. The concession called for the private consortium to build, finance and operate the dam, and ELETROSUL to be responsible for implementation of the social and environmental management plan, which by September 1997, had required it to spend $323 million and were projected to cost another $66 million in the future. Both parties were to share the guaranteed power output of the dam. The private sponsors will have the right to use the energy in their industrial plants and ELETROSUL can sell to its residential, industrial and commercial consumers.

Construction began in 1996 with sponsor equity contributions partly funded by BNDES bridge loans, and was completed in September 2001. The first unit began commercial operation in June 2000. The sponsors have agreed to make lease payments to Itasa sufficient to cover debt service obligations and other costs commencing with the start-up of the first unit at that time regardless of capacity or availability of energy. Lease payments will be collateralized by the sponsors through a lease collateral account to be created prior to project completion that will contain at least six months of lease payments and be funded

of the proceeds of the sales under the sponsors' related power purchase agreement for the sale of 61.2 MW of electricity to ELETROSUL. Part of the sponsors' own "self-generation" offtake risk is mitigated by a back-up PPA under which a payment default on the lease would trigger a purchase obligation by the remaining lessees of the defaulting lessee's energy.

The lease payments will be adjusted on an annual basis. A lease payment default would trigger a back-up power purchase obligation under which one or more of the sponsors would have to buy energy from the project and thus generate necessary cash flows to meet debt service obligations.

The IDB involvement was essential in attracting necessary long-term loans, which are generally not available in Brazil except from BNDES. To secure them, several project risks had to be addressed and mitigated. For example while 35% of the project cost is financed in dollar-denominated debt even though all the revenues are in local currency, lenders will be protected against exchange rate fluctuations and inflation by an indexing of payments to be made by the sponsors. BNDES also has agreed to provide Itasa with a standby facility to cover any shortfalls in the lease payments resulting from a sudden devaluation. It was also estimated that the long-term supply contracts would allow the Itá dam's power to be less costly than possible future imported Argentine or Bolivian electricity. ELETROSUL is also scheduled for privatization, with all the power generation assets sold in one piece in early 1998. Brazilian authorities have agreed to structure the privatization bidding documents so that the future owner will assume all of ELETROSUL's responsibilities that emerge from its concession to develop the Itá dam.

Project Summary

Project Title: Pehuenche
Country: Chile
Amount: $170 MM
Sector: Power Generation
Status: Successfully placed in April 1996

Sponsor(s)

Empresa Eléctrica Pehuenche S.A., which is 92.55% owned by Chile's largest electrical utility, Endesa, with JP Morgan as lead manager.

Offtaker(s)

87% of its output sold under long-term contracts into central Chile's distribution grid.

Financing Package

$110 million, seven-year maturity bonds priced at 7.30%, or 90 bp over U.S. Treasuries, carrying investment grade ratings from Moody's (Baa1), Standard & Poor's (BBB+) and Duff & Phelps (A-) financed by U.S. institutional investors. All of the proceeds were to be used to prepay an existing loan from the Inter-American Development Bank.

Special Features

Capital market refinancing of existing assets.

Brief

Pehuenche is the largest hydroelectric power producer in Chile. It was incorporated in 1986 under majority government ownership to build the 560 MW Pehuenche dam on the Maule and Melado Rivers, which became the country's largest power plant upon its completion in 1991. In 1990 Endesa bought the government's shares, making Pehuenche fully private. It has since developed the 64 MW Currilinque dam, and in October 1997 completed the $62 million, 38 MW Loma Ala dam.

The project's goal was to meet the growing demand for electricity and to provide expanded transmission capacity for the power generated in new power plants in the South to the load centers in Santiago and the North. The Pehuenche Hydroelectric Project, executed over a seven-year period, included (i) the construction of the 500 MW Pehuenche Hydroelectric Power Plant; (ii) a training program for the professional staff of Empresa Electrica Pehuenche S.A. (PEHUENCHE S.A.); and (iii) the execution of a national environmental program. In addition, the Government agreed to undertake executing studies and implementing recommendations on protection of the environment, design of medium size hydroelectric projects and reduction of illicit use of electricity.

There are few previous examples of privately-owned hydroelectric companies in developing countries obtaining capital markets financing. But with a location in an investment grade country and 87% of its output sold under long-term contracts into economically booming central Chile's distribution grid, Pehuenche was able to obtain an investment grade rating for this bond offering. It was used to refinance approximately $178.2 million of existing government-guaranteed IDB debt bearing interest at 7.91%

and dating to the company's early days as a state-owned enterprise. Investors' growing confidence in the Chilean power sector allowed the bonds to be priced 40bp tighter than a seven year, $110 million private placement that Pehuenche carried out through Banco Santander and Chase Manhattan Bank in 1995.

Project Summary

Project Title: Inner Mongolia Huitengxile Windfarm
Country: China
Amount: $21 MM
Sector: Power Generation
Status: 1/3 completed as of August 2002

Sponsor(s)

Project Sponsor/Project Company is the Inner Mongolia Windpower Corporation (IMWC), a state owned developer of wind power projects since 1989 with current projects at four sites in Inner Mongolia. Shareholders are: Inner Mongolia Power Corporation (The Offtaker) - 47%; the Huarong Investment Management Company (Industrial and Commercial Bank of China) - 39%; and the XinDa Investment Management Company (China Construction Bank) - 14%.

A "baseline study and monitoring plan" was completed in August 2002 by IT Power of Chineham, Hampshire, UK.

Offtaker(s)

A Power Purchase Agreement was signed with the Inner Mongolia Power Corporation guaranteeing purchase of the existing 10.4 MW of capacity from the windfarm. Price set at 0.609 Yuan/kWh (US$0.0737/kWh) for initial 10.4 MW. Price is yet to be decided for further 19.2 MW of capacity that is to be installed after 2002, for which a Letter of Approval, but not a PPA, has been signed.

Financing Package

The investment in 32 wind turbines (600 kW each) equating to 19.2 MW of new generating capacity is to be funded by a) equity investment from Inner Mongolia Windpower Corporation; b) a soft loan from the Dutch government; and c) a loan from the Chinese Construction Bank (shareholder in Inner Mongolia Windpower Corporation). No information is available about the amount of finance available from each source.

Brief

The project is located in Huitengliang within the Inner Mongolia Autonomous Region, People's Republic of China, 120km from Hohhot, capital of Inner Mongolia, and 26km from the nearest 220kV substation, to which it is linked via the Shuo-Ke 110kV transmission line.

The project involves the installation of 51 turbines, each with a capacity of 600 kW, providing a total output of 30.6 MW. The site has an excellent wind resource with 42 KW of generating capacity already installed. The site also benefits from a nearby strong transmission system forming one of the main power generation bases for the North China Power Grid. The proposed project is expected to generate 66.2 GWh per year that will be sold into the Inner Mongolia Western Grid (and onward to the North China Power Grid).

The project was only partially completed by August 2002, with nine turbines of 600 kW each installed in 2001 for total capacity 5.4 MW, and ten more turbines of 600 kW each installed in 2002 for additional capacity of 6.0 MW. Thirty two turbines remain to be installed between January 2003 and June 2004 for additional capacity of 19.2 MW.

China is the word's 2nd largest electricity consumer and is responsible for 25% of the world's annual coal consumption. Coal supplies over 60% of China's primary energy use, and can continue to do so beyond 2100. However, China's 10th Five Year Plan calls for structural adjustment that emphasizes a) the use of clean energy, b) technology upgrading in the energy sector, and c) greater energy efficiency. Clean energy priorities include the expansion of use of clean coal, natural gas, nuclear power and renewables

Project Summary

Project Title: Enersur
Country: Peru
Amount: $440 MM
Sector: Power Generation
Status: IDB loan approved December 1998

Sponsor(s)

Energía del Sur, S.A. (special purpose corporation set up by Tractebel of Belgium).

Offtaker(s)

Twenty year PPA with US-owned Southern Peru Copper Corporation (SPCC), one of the strongest corporate credits in Peru.

Financing Package

75/25 debt equity ratio.
Equity: $80 MM paid in by sponsor; $30 MM sponsor subordinated debt.
Debt: $75 MM 17 year IDB A-loan priced at LIBOR plus up to 275bps; $225 MM up to 17 year IDB B-loan priced at LIBOR plus up to 290bps. B-loan to be sold to US institutional investors in form of privately placed trust certificates guaranteed by project cash flows. ING to act as placement agent.

Special Features

This is the first independent power project in the southern interconnected system of Peru and the first IDB transaction to seek participation of institutional investors through a B-loan certification structure.

Brief

Southern Peru Limited (SPL) is an integrated producer of copper that operates mining, smelting and refining facilities and is the largest copper producer in Peru. For many years SPL generated its own electricity supply by means of a 140 MW industrial fuel oil fired plant. SPL recently initiated a $1.8 billion modernization and expansion program. This program includes substantial capital investments to introduce more efficient mining processes and environmental improvements. As part of this modernization and expansion program, SPC has decided to focus on its core business units and privately contract for ancillary goods and services. Consistent with this strategy, SPL recently sold its existing generating assets to Energía del Sur ("EnerSur") and entered into a 20-year power purchase agreement (PPA) for 180 MW of electricity. EnerSur is wholly-owned by Tractebel S.A. of Belgium.

SPL has transferred to EnerSur its existing generating assets which include a 140 MW industrial fuel oil fired unit and two 37 MW diesel fired units that are in the process of being installed. In addition to modernizing and operating these units, EnerSur is obligated to install an additional 125 MW coal fired unit. Under the terms of the PPA, SPL has the option of requiring an additional expansion of 250 MW of coal fired capacity (two 125 MW units) over the next 6 years. The generating units will be connected to the national grid in Peru through a transmission interconnection that will be owned by SPL but operated by EnerSur. Excess energy will be sold to the grid and to other third-party offtakers pursuant to long-term agreements. EnerSur will be responsible for the operation and maintenance of the project.

The project will use four different sources of fuel to generate electricity: waste steam, diesel #2, industrial fuel oil and coal. SPL is obligated to directly supply the waste steam to the project and to procure the industrial fuel oil and diesel #2. Waste steam is currently produced in four heat recovery steam generators installed on SPL's copper smelters and will be provided by SPL to EnerSur. Diesel #2 will be used to fire the two gas turbines and a diesel generator. Industrial fuel oil will be used to fire four existing boilers. The diesel and industrial fuel oil will be purchased by SPL both locally and internationally. Both fuels will be unloaded through a submarine pipe and stored in 80,000 barrel steel tanks. The coal required to operate the new coal fired units will be low sulphur coal imported by ship.

Tractebel has awarded the EPC contract to design and construct the new generating assets to Hitachi of Japan.

Project Summary

Project Title: Energías Eólicas Europeas S.A. (EEE)
Country: Spain
Amount: EU3.25 BN
Sector: Power Generation
Status: Financing closed 2001

Sponsor(s)

EEE is a 50/50 venture between Iberdrola Diversificación (a wholly owned subsidiary of Iberdrola) and leading international alternative energy producer, EHN.

Offtaker(s)

The power generated by each wind farm will be sold to the nearest electricity distribution company under a standard energy sale contract.

Financing Package

Debt splits into a EU814 million 15-year term loan and a EU99 million three-year credit line to finance VAT incurred during construction. Banco Bilbao Vizcaya Argentina (BBVA) was appointed financial adviser to the project in June 2000. In February 2001, Spanish banks Ahorro Corporación Financiera (AFC) and Banesto and foreign entrants Credit Agricole Indosuez and WestLB joined BBVA to act as lead arrangers.

A sub-underwriting phase saw debt fully underwritten prior to general syndication. Barclays Bank, Caja Madrid, Banco Popolare, Industrial Bank of Japan (part of the Mizuho Financial Group), Banca Nazionale del Lavoro, HypoVereinsbank and Instituto de Crédito Oficial (ICO) all signed up as co-arrangers on tickets of EU60 million.

In June, the retail phase offered tickets of EU20 million for senior lead managers, EU15 million for lead managers and EU10 million for managers. Final documentation signing involved a total of 53 institutions.

Special Features

World's biggest wind farm project.

Brief

EEE consists of 31 wind farms for a total of 1,173 MW of installed power. It is the first project financing of a portfolio of wind farms in Spain.

EEE's success reflects the fact that debt markets are becoming more comfortable with renewable projects.

The host country also played a significant role in wooing lenders. Driven by its poor background in renewables, the Spanish government has established considerable legislation to encourage development of environmentally-friendly power. Plants running from renewable resources can choose to opt out of selling into the variable pool in favour of a fixed price on a yearly basis. If they opt for the former, they are paid a set premium on top of the pool price. Recently implemented Spanish law also dictates that local electricity distributors are obliged to purchase power from renewable plants where they exist.

Project Summary

Project Title: Desert Sky
Country: USA
Amount: $178.3 MM
Sector: Power Generation
Status: Financing closed December 2002

Sponsor(s)

American Electric Power (AEP), one of the biggest wind energy operators in the US.

Offtaker(s)

Power purchase agreement (PPA) with City Public Service of San Antonio. PPA tenor is 20 years (84%) and 15 years (16%).

Financing Package

68/32 debt equity ratio.
The $178.3 million project is split into a $120.7 million 15-year term loan and $57.6 million in equity. Pricing on the 15-year debt started at 162.5bp over Libor for years 1 to 3, stepping up to 175bp for 4 to 7, 187.5bp for 8 to 10 and 200bp plus for 10 to 15. Fortis Bank was the lead arranger and underwriter and provided $19.6 million. Royal Bank of Canada, Dexia and Rabobank Ireland were the co-arrangers with $17.7 million a piece. Other participating banks were NIB Capital with $16.5 million, Landesbank Baden-Wurttemburg with $16.5 million, and ANZ with $15 million.
Milbank Tweed Hadley & McCloy were legal counsel for the lenders, with Jones Day acting for AEP. Garrad Hassan provided technical advisory.

Brief

Located near the far west Texas town of Iraan, the 160.5 MW wind farm consists of 107 1.5 MW turbines – the largest wind turbines manufactured in the US – spread over a 15 square mile area in Pecos County on Indian Mesa. The farm can produce power for up to 54,000 average US homes, using 69KV and 138KV lines to carry power into the Texas network.
Desert Sky was acquired by AEP from its former owner Enron. It was formerly called the Indian Mesa wind farm.

Project Summary

Project Title: Clean Power Income Fund
Country: Canada
Amount: C$360 MM under management
Sector: Renewable Energy
Status: launched in November 2001

Owner(s)

Clean Power Income Fund is the sole owner of Clean Power Operating Trust, which holds the Fund's operating assets and investments. Oversight and management are conducted by a group of seasoned professionals with extensive experience in independent power, project finance, electricity generation, law and business.

Investor(s)

Clean Power Income Fund is listed on the Toronto Stock Exchange under the symbol CLE.UN. All Canadians and non-residents of Canada are eligible to purchase units in the Fund.

Financing Structure

A key strategy of Clean Power Income Fund is to reduce operating risk so that investors' income is as stable as possible. The Fund does this by deliberately diversifies its electricity production assets by technology, fuel type and supply source, geographic location, power purchasers and regulatory jurisdictions.
The fund invests in equity and debt. The current debt equity ration is 54/46.
The fund ensures its investors dependable income by providing them the following items.

- *Long-term contracts* - Power purchasing agreements have remaining terms that average more than 17 years.
- *Creditworthy customers* - Production contracts are typically with well-capitalized, investment-grade customers such as major utilities and their agencies.
- *Little or no price volatility* - Prices for nearly all of Clean Power's production are contractually defined and do not fluctuate with spot market prices for electricity.
- *Little or no fuel costs* - Renewable energy sources such as water and wind eliminate volatility related to fuel prices.
- *Low operating costs* - The Fund's assets are proven, simple technologies with low operating costs and predictable maintenance schedules.

Special Features

Clean Power is the first income fund to be certified under Canada's Environmental Choice^{M} Program.

Brief

Clean Power Income Fund provides stable, long-term cash flow to investors from the environmentally preferred generation of electricity. The Fund invests only in power generating assets that use renewable energy sources such as water, wind, wood waste and landfill gas.