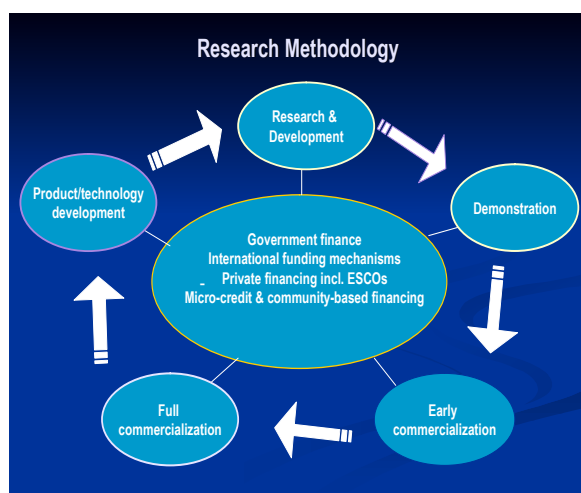


## 2.2. Details of Sub-Themes

### 2.2.1 Innovative Financing for Renewable Energy Development

#### Outline

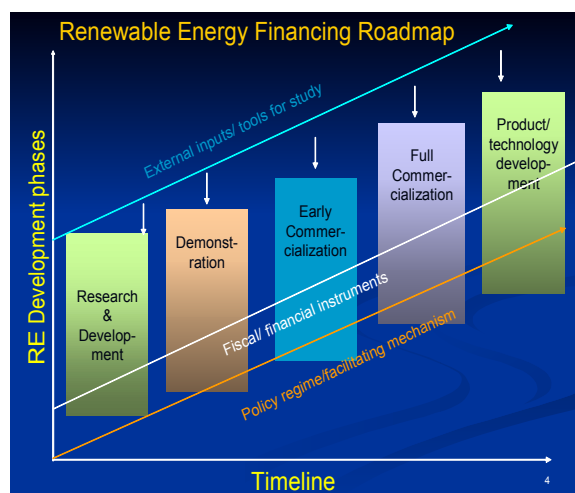
This research explores four areas that are likely to be the primary sources of finance for the development and commercialisation of wind and solar technologies and products in the mid to long term: government finance; international funding mechanisms (including the Clean Development Mechanism); private sector finance (including financing through energy service companies); and micro-credit and community-based financing.



The aim is to identify in these four areas innovative financing mechanisms that: 1) break down the high initial costs of renewable energy products and technologies; 2) increase competitiveness against traditional fossil fuels; 3) reduce the transaction costs of renewable energy products and technologies; and 4) ensure sustainability without public aid and subsidy.

The research is developing strategic policy options aimed at an innovative financing mix through a life-cycle approach, which include financing mechanisms for the stages of research and development; demonstration; early commercialization; full commercialization; and product and technology development. These policy options would provide an indication of how financing for the supply side (R&D, manufacturing) and demand side (consumer

financing) could be optimized through an innovative mix of the four categories of financing considered.



#### Examples of Good Practice

- Public sector financing (Indian Renewable Energy Development Agency Ltd.: IREDA) for wind power development – Tamil Nadu, India
- Solar photovoltaic minigrids – a combination of government and community financing – Sunderbans, West Bengal, India
- Developing a market-oriented institutional and financial model for decentralized solar systems – Rajasthan, Uttaranchal, India
- Wind-power development by the private sector – a combination of the Clean Development Mechanism CDM and public sector financing (IREDA) – Karnataka, India
- Promoting household PV system application in remote areas through international funding – Inner Mongolia, Qinghai, Gansu, Xinjiang, Tibet, and western Sichuan, China
- Scaling-up of renewable village power through governmental finance and bidding based on market regulation – Inner Mongolia, Qinghai, Gansu, Xinjiang, Tibet, Shanxi and Sichuan, China
- Economic incentive policy–stimulated growth of the market for a small wind turbine – Inner Mongolia, China
- Renewable energy finance: the experience of the first CDM project in China.

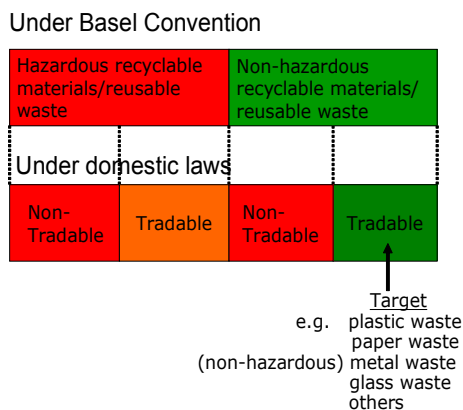
## 2.2.2 Creation of Inter-boundary Market for Recyclable Materials

### Outline

The UN Economic and Social Commission for Asia and the Pacific (ESCAP) reported in its *State of the Environment in Asia and the Pacific 2000* that the amount of industrial solid waste generated in the Asia-Pacific region is expected to increase substantially and will double in less than 20 years at the current rate of growth of industrial solid waste generation. Promotion of recycling is one solution to reduce industrial waste. In addition, for the countries with relatively cheap labor costs of waste separation and limited access to expensive virgin materials, the use of recyclable materials is sometimes more attractive in terms of production cost than is the use of virgin materials. Promotion of the recycling of industrial waste could reduce the production cost as well as the volume of industrial waste.

This research aims to propose strategic policy options to create an effective inter-boundary market of recyclable materials and promote their use in order to achieve a win-win situation.

Recyclable materials targeted in this research can be seen in the following diagram.



The research activities have three components. First, to determine the current and potential supply and demand of recyclable materials in the region, the following survey is being conducted in countries of Thailand, the Philippines, the Republic of Korea and Japan:

#### <Supply side>

- What quantity of tradable non-hazardous recyclable materials is produced domestically?
- How many of these materials are domestically

recycled and disposed of, and how many are exported overseas?

- Where are they exported to?

#### <Demand side>

- What types of tradable non-hazardous recyclable materials are in demand domestically?
- What types are domestically obtained and what types are imported from overseas?
- Where are they imported from?

Secondly, to determine the factors that are important for creating an effective inter-boundary market of recyclable materials, information on good practice in inter-boundary trading of recyclable materials and in domestic material exchange systems is being collected from Thailand, the Philippines, the Republic of Korea and Japan.

Lastly, strategic policy options to create an effective inter-boundary market of recyclable materials and promote their use will be developed from analyses of the above-mentioned survey and good practices.



HMR Envirocycle (Manila, Philippines)

### Examples of Good Practice

One example of good practice is the waste recycling business of Wongpanit Co. Ltd. in Thailand, which purchases and sells waste domestically and to and from abroad. Its main trading partners are those in the Lao PDR, Cambodia, Vietnam, Myanmar, the People's Republic of China, Taiwan, the Philippines and Malaysia.

### Pilot Project

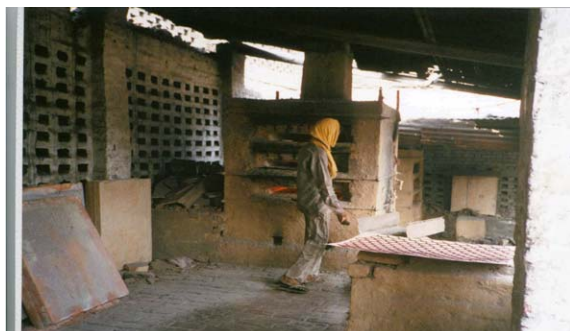
To evaluate the strategic policy options, a pilot project that will experiment in the inter-boundary trade of recyclable materials among four countries (Thailand, the Philippines, the Republic of Korea and Japan) is planned.

### 2.2.3 Improving Environmental Performance of Small and Medium-sized Enterprises

#### Outline

It is widely recognized that SMEs are important vehicles in the economy and are substantial suppliers of employment opportunities in Asia and the Pacific. At the same time, the environmental impacts that SMEs cause have reached a level that can no longer be ignored.

Under such circumstance, globalization of the economy and pressure from the international community have virtually forced SMEs to widen their narrow focus of profit-seeking to one of sustainable economic operations. However, technical and financial constraints as well as insufficient information hamper them from doing so.



Conventional coal-based furnace (Firozabad, India)

The research work of this theme sets its objective as: To examine and identify practical means of improving the environmental performance of SMEs.

To conduct a thorough analysis and develop strategic policy options (SPOs), the research work has started by delineating the overall role of SMEs in the socio-economy in relation to the environment. Background information has been collected on productivity figures, existing government policies, and programs supported by non-public sectors through literature reviews and sometimes face-to-face interviews. Further, some good practices under the theme have been examined to derive the critical essence of possible SPOs. (See below.)

Some ideas for SPOs include gearing up the operations of industry associations for the environment; setting up ISO-type environmental management systems applicable to SMEs at a cluster level; and engaging SMEs in environmental improvements by a business-oriented

approach. Further research will be focused on exploring how the identified SPOs will be practically implemented – in other words, what should be done to make the SPOs actually happen.

#### Examples of Good Practice

In the course of the research work, the following examples of good practice have been determined to improve the environmental performance of SMEs:

- Implementation of an environmental management system in a medium-scale manufacturing industry (Thailand)
- Energy conservation in a medium-scale autopart manufacturer (Thailand)
- Demonstration and dissemination of cleaner technologies in a small-scale glass industry (India – see photos)
- Adaptation of vertical shaft brick kiln (VSBK) technology for the brick industry (India).



Natural-gas-fired furnace (Firozabad, India)

#### Capacity-building

The Preliminary field studies and interviews have shown that some sort of capacity-building to increase the understanding of sustainability must be carried out at all levels (local government, business owners, and employees). The target groups and methods have to be carefully identified in accordance with the objective of the capacity-building. It would be appropriate to invite local NGOs to help design capacity-building programs, so that their cooperation will be ensured on a long-term basis. Moreover, funding aspects should be incorporated into the planning.

## 2.2.4 Development of Environmentally Sustainable Transport Systems in Urban Areas

### Outline

This research aims to develop systems for environmentally sustainable transport (EST) for the cities in the Asia-Pacific region as strategic policy options.

*Strategic policy options* for EST will be developed on the basis of scenario analysis, which offers a means of exploring a variety of long-range alternatives.

The procedure for this research is as follows:

#### *Categorization of future city types*

'Good cities' of the future are categorized according to the degree of demand for transportation and the types of measures needed to accommodate transportation needs. These city types are: (i) High-Tech Dependent/ Growing City; (ii) Automobile Dependent/ Growing city; (iii) Community Independent/ Sustainable City; (iv) Public Transport Dependent/ Sustainable City; and (v) Public Transport Dependent/ Growing City.

#### *Collection of good practices*

Good practices are being collected and compiled in *Good Practices Inventory*.

#### *Development of scenarios*

Field-based studies will be carried out for selected cities (Beijing and Taiyuan in China, and Bangkok in Thailand), and qualitative city-specific scenarios will be developed on the assumption that the city will develop into one of the categories of a 'good city'.

#### *Development of draft Strategic Policy Options*

On the basis of the scenario analysis and the application of good practices from the inventory to the city, draft Strategic Policy Options will be developed.

#### *Calculation of an index for measuring innovation*

The effect of draft *Strategic Policy Options* will be estimated by quantitative model simulations in collaboration with the IEA.

### Examples of Good Practice

Examples of good practice have been collected in Beijing, Shanghai (China), Kathmandu (Nepal), Singapore

(Singapore), Curitiba (Brazil). Bangkok (Thailand), Seoul (Korea), Bogota (Colombia), and Quito (Ecuador). It is planned to collect examples from Cairo (Egypt), Sapporo and Fukuoka (Japan), and other South East Asian countries.

#### *Good Practice Examples Collected in Year 1*

City	Title	Examples of Critical Instruments
Beijing	Emission Control	High-quality fuel standard, emission checking system
	Public Transport System	International bidding, public participation in price-setting
	Alternative Fuel Vehicles	Establishment of compressed natural gas (CNG) and liquefied petroleum gas (LPG) stations
	Integrated Road Transport System	Financial innovation
Shanghai	Emission Control	Vehicle license auction, elimination of motorbike
	Rail-based mass rapid transit system	Financial innovation, competitive operation
	Alternative Fuel Vehicles	Investment and loans, establishment of supervision system
Kathmandu	Electric Three-wheelers	Role of NGOs and civic society, favorable electricity tariff
Singapore	Environmentally Sound Transportation Planning	Fiscal measure to restrain car ownership, public transport, electric road pricing, vehicle quota system
Curitiba	Integration of Land Use and Bus System	Single fare for public transport, tube-shaped bus stations, all-bus network transit system



Compressed natural gas bus (Beijing)

### Pilot Project

One proposal for a pilot project could be the introduction of clean fuel buses in a small to medium-sized city in China.



## 2.2.5 Promotion of Biomass Energy

### Outline

The objective of this research is to determine the preferred mix of energy supply in the Asia-Pacific countries, mainly by focusing on a Biomass Energy Promotion Strategy (BiEPS) as part of *Strategic Policy Options*.

Strategic policy options for BiEPS are being developed through the following process:

#### *Investigation of available biomass energy resources*

In the first year, the use of biomass energy in India, Thailand and Japan was reviewed. This is needed as a basis on which to review the literature on other Asia-Pacific countries.

#### *Categorization of targeting of biomass energy resources*

There are many kinds of biomass energy resources. Bagasse, rice husk, animal waste, wood and solid waste (e.g. palm oil shell, municipal waste, wood residues) were selected as the target biomass energy resources for consideration in the review of the Asia-Pacific countries.

#### *Collection of good practice examples and development of technology list for comparison studies*

Good practices are being collected by focusing on the above and targeting biomass energy resources. They will be added to *Good Practices Inventory*. Each team will compile a summary list of biomass energy conversion technologies. These lists will become important inputs into comparison studies of each target biomass energy resource.

#### *Development of story lines to promote biomass energy use*

On the basis of comparative studies, story lines to promote biomass energy use will be developed. They will take into account economic instruments, technology components, organizational arrangement, and policy and regulatory instruments. Quantitative impacts will be simulated in collaboration with the IEA sub-project.

#### *Proposal of Strategic Policy Options*

Draft *Strategic Policy Options* at a local, country, and regional level will be proposed on the basis of this process. These proposals will be improved by effective interaction between the research team and stakeholders.

### Examples of Good Practice

In the first year, the following examples of good practice were identified and compiled in *Good Practices Inventory*.

#### India

- Satisfying heating needs in rural cottage industries through a cluster- and application-based approach to biomass gasification
- Use of rice husks as fuel in process steam boilers
- Biogas plants based on night soil

#### Thailand

- Biogas technology for pig farm wastes
- Biogas technology for carbohydrate-based wastewater from a starch factory
- Fluidized bed combustion of biomass



Circulation tank and biogas domes at pig farm  
(Pak Tho District, Thailand)

## 2.2.6 Facilitating Community-based Tourism in Protected Areas

### Outline

The objectives of this strategic research are a) to compile good practices of community-based tourism (CBT) in the protected areas of four countries in Asia (India, Indonesia, Japan and Thailand) into *Good Practices Inventory*; and b) to propose innovative strategic policy options on ways to actively involve those communities living in and around protected areas in tourism and thus facilitate effective integrated protected area management.

For the purposes of this research, 'community-based tourism' has been defined by its objectives, namely: gain local economic development; obtain a certain level of participation; provide a socially and environmentally responsible experience for visitors; and have a positive impact on the conservation of natural and/or cultural resources.

### Examples of Good Practice

To select examples of good practice, the CBT team developed the following criteria:

Participation/ relationship	Have participation by local communities
	Have co-operation between protected area tourism authorities and communities working in community-based tourism
	Support a feeling of local community ownership of community-based tourism ideas, concepts and actions
Nature/ environmental conservation	Increase conservation of key resources in and around protected areas
	Build upon environmental awareness and others by local communities
	Lead to increased environmental awareness and improved attitudes by local communities and visitors
Socio-economic issues	Retain significant economic benefits in local communities
	Contribute to local social and community development in and around protected areas
Business	Be a profitable business for local communities
	Promote authentic products that build upon local natural and cultural assets

Other indicators of sustainability are to be developed when necessary by using participatory methods.



Local guide performing his duty  
(Doi Inthanon National Park, Thailand)

Good practice sites identified in FY 2002 were as follows:

#### India

- Multi-stakeholder tourism planning for the Corbett National Park Landscape

#### Indonesia

- Community-based tourism in Gunung Rinjani National Park
- Community-based tourism in Gunung Halimun National Park
- Community-based tourism in Gunung Gede Pangrango National Park
- Community-based tourism in Gunung Bromo-Tengger-Semeru National Park

#### Japan

- Nature tourism promoted by the Whale-watching Association, Ogasawara National Park

#### Thailand

- Community-based Tourism in Doi Inthanon National Park: case study of Ban Mae Klang Luang Tourism Alliance, Chiangmai
- Ecotourism of Ban Khao Lek at Chalerm Rattanakosin National Park
- Nature and Environmental Conservation Group of Ban Wang Lung at Khao Luang National Park

Awareness and capacity building, partnership, and self-regulatory instruments were important components in most of the good practices identified.

### Capacity Building

Building the capacities of policy makers is a vital component of the facilitation of CBT in protected areas. The development of programs targeting policy-makers will fill a gap in the capacity-building programs that are currently available.

## 2.2.7 Promoting Environmental Education by NGOs

### Outline

Environmental education (EE) by NGOs has been taken up as a sub-theme of RISPO for the following reasons. First, capacity-building is a key factor in helping countries to cope with the socio-political transitions (see *Networking Stakeholders for Action* in 2.1.). Secondly, as is seen from the UN's plan to launch the 'Decade of Education for Sustainability', there is an increased need for policy research to promote EE worldwide. Thirdly, the role of NGOs in promoting EE has become increasingly important in Asia owing to the growth of NGOs and the insufficient availability of resources within the formal education sector. Lastly, EE is one of the areas that can be effectively promoted by stakeholder networks. Therefore, this research tries to provide 'policy options' to promote EE by NGOs through *networking stakeholders*, as well as 'good practices' to be shared among related parties to improve their programs. This research is focused on Indonesian cases for the moment, because of limited time and resources, the abundance of good practices in Indonesia, and their applicability to other countries. Together with RMI-the Indonesian Institute for Forest and Environment (the partner institute in Indonesia) and other local experts, Institute for Global Environmental Strategies (IGES) has been conducting research activities such as literature reviews, interviews, observations, focus-groups and questionnaire surveys on this sub-theme.

From our analysis of good practice examples, four SPOs will be formulated on four key issues. 'Networking' is the key instrument in each SPO. These four issues are networking NGOs; networking NGOs with the local community; networking NGOs with primary and secondary education; and networking NGOs with higher education.

### Examples of Good Practice

A few good practices have already been identified. One of them is the 'NGO Environmental Education Network in Indonesia (*Jaringan Pendidikan Lingkungan: JPL*)'. It has resulted in *improved external relations* (e.g. an increase in resources such as funding and training opportunities) and *improved internal relations* (e.g. facilitation of communication and resource-sharing, leading to an

increase in the efficiency and effectiveness of member's EE activities). These benefits have attracted NGOs, and JPL's membership has increased from 27 in 1996 to 85 in 1999. Critical instruments in this successful case are *Awareness/capacity building*, *Partnerships*, and *Institutional Arrangements*.

Another example is 'REPLING – an Environmental Education Route Program', which is a collaborative program conducted at Bogor Botanical Garden in Indonesia by an NGO and primary and secondary schools. It emphasises guiding interpretation as an education method, which is used in combination with other methods such as nature game activities, observation, and group discussion. The participants follow the REPLING trails in the Botanical Garden in groups (each group consists of 6 to 10 people) aided by facilitators. The program has brought about positive impacts on schools, participants, their parents, and facilitators. The case has shown that guiding interpretation is an effective method of EE, and that places such as botanical gardens can be a powerful EE tool that supports and complements the primary and secondary education sector. Critical instruments in this successful case are *Awareness/capacity building* and *Partnerships*.

Around 20 good practices will be collected within the next 2 years. See the *Technical Report* or *Good Practices Inventory* for further information.



JPL Annual Meeting in 1999  
(Seloliman, Indonesia)

## 2.2.8 Promoting Local/indigenous Knowledge-based Sustainable Resource Management

### Outline

The importance of local/indigenous knowledge (LINK) and its potential in the sustainable use of natural resources has been repeatedly emphasized in international discourses on sustainable development. In 1992, Agenda 21 of the Rio Declaration highlighted the importance of holistic traditional knowledge of lands, natural resources and the environment developed over many generations by local/indigenous people. The United Nations proclaimed 1993 as the 'International Year for the World's Indigenous People' and presented a unique opportunity to mobilize international cooperation to preserve and share local/indigenous knowledge for sustainable resource management. Recently, in 2002, the Johannesburg Plan of Implementation adopted at the World Summit on Sustainable Development again drew people's attention to the vulnerability of local, traditional, and/or indigenous knowledge.

It is worth noting that despite rising awareness of LINK, such knowledge and practices are rapidly vanishing in a number of Asian countries. LINK embedded in a given culture or society is likely to be lost irretrievably when the culture or society experiences drastic socio-economic changes. Once the unique and complex cultural norms that functioned as the basis for various local practices are lost, the knowledge can barely survive and cannot be passed on to future generations. The chances for learning lessons from such knowledge to realize sustainable development are gradually becoming slimmer.

This research aims to develop strategic policy options to promote LINK-based sustainable resource management, with two primary objectives:

- i) preservation and promotion of LINK, and
- ii) application and adaptation of LINK

The former aims to maintain the diversity of existing LINK-based sustainable resource management practices. The major focus here is to examine and propose a variety of approaches to encouraging local people to sustain such practices in the face of rapid socio-economic change. These approaches include awareness-raising, capacity-building, provision of economic incentives, the use of advocacy systems, and the provision of administrative support. The latter objective is to examine the applicability

of LINK-based practices. Although many LINK-based practices are site- and culture-specific, some aspects of these practices can be transferred to other settings. Likewise, the lessons learned from LINK, such as the roles of local/indigenous people and culture, the use of low-cost technologies, and the implementation of the necessary institutional arrangements, may be shared among policy-makers who aim to develop better planning for sustainable resource management.

### Examples of Good Practice

Currently, the RISPO-LINK research team is studying good practices in LINK-based sustainable resource management in the coastal and mountainous areas of Bangladesh, China, Thailand and Vietnam. For example, the gei wai at Mai Po and the Inner Deep Bay Ramsar Site, Hong Kong, China, is a traditional practice of shrimp cultivation in a sustainable manner. The gei wai (literally meaning a pond enclosed by a bund) is built in the coastal wetland, and its operation is carefully designed to minimize adverse impacts on the environment. Young shrimp flushed into the gei wai by tidal waves in autumn are fed only naturally, e.g. on the leaves of mangroves planted in the gei wai. The gei wai landscape provides precious habitats for water birds and other wildlife at the same time.



Gei wai ponds, Mai Po (Hong Kong, China)

Other LINK-based practices, such as indigenous strategies of coping with climatic extremes (floods and droughts) in Bangladesh, traditional systems of community-based water management in Thailand, and joint reforestation initiatives between local authorities and local people in Vietnam, are also being examined, with the close cooperation of researchers from both the social and natural sciences.