

Chapter 1

Introduction

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CHAPTER 1

Introduction

Energy is known to be the prime mover for economic growth and social development of a country in general and regions in particular. However, most East Asian countries depend heavily on imported fossil fuel even if there is a high potential for renewable energy (RE) sources in this region. The utilisation of RE may reduce their dependence on imported fossil fuel. One great impact of the use of RE is the improvement in the socioeconomic and environmental conditions of communities by their expanded access to modern energy services, especially in rural areas where there are no grid electricity connections.

The availability of RE sources depends on the local conditions in various Asian countries and communities. Also, the RE initiatives in communities cannot be operated sustainably without being accepted by local people. In fact, some RE projects implemented in some Asian communities were halted due to their low socioeconomic benefits, contrary to expectations. This is mainly due to the decision-making process in which the initiatives are usually determined by the funders or project developers and not based on the readiness and needs of the recipients.

In this context, it should be important to identify some favourable figures to use not only RE in tandem with the available conventional energy sources in the Asian communities but also RE that will be sustainable and acceptable to the local people. In this two years of joint research, an expert working group (WG) was formed and conducted a feasibility study on the best sustainable energy system that uses RE sources suitable for various Asian communities based on environmental, economic, and social considerations.

To find the advantages and disadvantages of the RE initiatives from the perspective of environmental, economic, and social pillars of sustainability, the WG reviewed some community-based RE initiatives that were already being implemented in some Asian countries during the first phase (2013–2014) of the project. The review was made in terms of whether the initiative was a government project or privately owned. The review also took into account the types of initiative, for example, in an electrification of livelihood project, whether it has the following:(i) with or without subsidy,(ii) continuing or not,(iii) good

features of the initiative and what problems were encountered,(iv) benefits of the initiative to the community, and (v) lessons learned. Acknowledging that the driving factors for RE uptake vary from country to country, the RE initiatives were chosen for the several lessons that could be learned from their successes and failures, lessons that could help the WG in identifying the key factors in the RE initiatives implemented in East Asia Summit (EAS) countries.

Through the reviews, it has been proven that the use of modern energy¹ from RE significantly improved the living conditions of the local people and provided better opportunities for social and economic development. It is envisaged that the RE initiatives will not only supply energy but also offer other merits to the communities if they can obtain better acceptance from the people.

From the lessons learnt and from problems encountered with the initiatives reviewed, the following issues should be considered in making the RE initiatives sustainable:

- *Timing or when to initiate.* RE technologies are the cheapest options to improve access to modern energy, compared with grid extension or conventional energy. The costs of RE technologies are still relatively high at present but these costs are decreasing due to the progress in technology level and to the effect of mass production. The optimal timing to initiate the RE initiative should be decided after considering the balance between the needs of the people for modern energy and the cost of the target technologies.
- *Stakeholder participation.* All stakeholders who will receive benefits from the RE initiatives should play active roles in initiating and operating the initiatives so that their needs can be reflected.
- *Fee collecting system.* An acceptable and robust fee-collecting system is crucial for the long-term sustainability of the RE initiatives. Thus, both willingness and capability to pay of the stakeholders for the energy should be considered.
- *Capacity building.* Training for operation, maintenance, and setting up of local service networks are fundamental conditions to guarantee the long-term success and sustainable development of the initiatives.
- *Consequence of implementing the initiatives.* In some initiative sites, population growths were observed due to access to modern energy. As a result, energy demand increased. This indicates that the initiatives should be designed with due consideration given to the potential effect, such as increased energy demand and the need to meet this demand.

¹ Although there is no single definition accepted and adopted internationally, modern energy here can be described as such safe and clean kinds of energy as electricity and gas.

From these review results, the WG discussed in the second phase (2014–2015) of the project how to find the advantages and disadvantages of the RE initiatives from the point of view of environmental, economic, and social development pillars of sustainability, then come up with guidelines on how to select the best mix of renewable and conventional energy sources, which are sustainable for various Asian communities. The WG defined the term ‘best mix’ as follows:

Best mix represents the combination of energy resources available to a target community that achieves the maximum positive impacts for the three pillars of sustainability, namely, environmental, economic, and social[aspects].

The guidelines comprise the screening method, the sustainability criteria for selecting the best mix, and the operational requirements to make RE initiatives sustainable. This report summarises the WG’s guidelines and its academic background.