

exports balance of system components [13, 28–30]. In this case, money provided by the government is seen as an instrument to promote local development. Over 2500 rural communities have been electrified in Mexico with photovoltaics following this model, and it is interesting to note that in many of them people have instrumented a variety of cost-recovery and money-making mechanisms, which allows for system maintenance and additional communal projects.

A number of governments from developing countries are considering the social route to deliver PV-based electricity to rural areas. Policy setting and definition of financing mechanisms are usually the first steps in this direction. Examples can be found in several Latin American countries [31]. Some examples are discussed below.

In Bolivia, Article 61 of the Electrical Law establishes that the State is responsible for the electrification process in smaller localities and in rural areas that cannot be served by private interests. Resources to finance such projects must be provided by the State, through the National Development Fund. The Executive must also propose energy policies and strategies to foster the use of alternative energy sources.

A similar mandate can be observed in Colombia, where Law 143 urges the State to provide basic electrical services to lower-income families in rural areas and to make funds available to cover necessary subsidies in this respect. The Energy and Gas Regulatory Commission is obliged to protect the rights of the lowest-income people, while the Colombian Institute for Electrical Energy has been mandated to prepare the National Energy Plan for regions not served by the grid, including the use of alternative energy systems in substitution of fossil fuelled generating systems.

In Ecuador, the Law of Regime for the Electrical Sector, addresses rural electrification and financing issues for the rural sector. It also assigns priorities for the application of renewable energy in rural electrification projects and describes the structure for project identification, approval, execution and operation. The National Fund for Rural and Urban Marginal Electrification (FERUM) is the body responsible for the administration of financial resources, and is directly regulated by the office of the president.

Similarly, in Nicaragua, the Law for the Electrical Industry holds the State responsible for developing rural electrification in remote areas in lieu of interest from other economic agents. For this, the State must provide the necessary resources through the Fund for Development of the National Electrical Industry. The State is also required by the law to implement policies and strategies for the use of alternative energy sources for electricity generation.

As a last example, in Panama, Article 9 of Executive Decree 22 makes the State responsible for promoting rural electrification and for assigning an annual budget to carry out this task. Consequently, the Office for Rural Electrification was created within the office of the president, and is in charge of promoting the use of renewable energy for rural electrification projects.

23.3.5 Trained Human Resources

Adequate financing and institutional frameworks are necessary but not sufficient conditions to remove the main barriers for PV rural electrification. Properly trained human