

Chapter 2

Use of Renewable Energy: World, European and National Perspectives

2.1 Recent Consumption of Primary Energy at World and at National Levels

2.1.1 World Consumption of Primary Energy in the World

Energy conversion, consumption and conservation: The Law of Conservation of Energy is one of fundamental laws of physics: in physical processes energy cannot be destroyed or decreased, it can be converted (transformed) from one form of energy to another [1]. Table 2.1 lists several processes of energy conversion from one form to another [2].

In this context some questions arise: What is primary energy? What is energy consumption? When energy is consumed the following things occur: the conversion of chemical energy stored in coal, oil, natural gas, wood or of the energy stored in the atomic kernel, or the conversion of water kinetic and gravity energy, or wind kinetic energy, or the conversion of solar radiation energy into heating and lighting of our houses, or into electrical energy to make machine-tools operate or into kinetic energy to move the vehicles. In other words, energy consumption is equivalent to energy conversion. Energy conservation means the production of more goods and services by converting a small quantity of primary energy into heating, electricity, lighting (electromagnetic energy), etc.

Primary energy is all energy contained in the original sources. Nowadays, the main original sources are fossil fuels (coal, oil and natural gas), biofuels – wood, wooden wastes, agricultural waste, manure, etc. Other sources can be added, like hydraulic and geothermal energy, and other sources of renewable energy such as solar and wind energy, and nuclear energy as well. Consumers are interested in the satisfaction of their energy needs: they need thermal energy for heating and cooking, electrical energy for lighting, transportation and production of goods, etc.

The quantity of supplied energy, the form of useful energy needed, the amount of energy losses and the price to pay for the used energy are important things for consumers. Figures 2.1 and 2.2 show the three notions of energy (primary, supplied