

Viewpoint

Renewable energy—traditional biomass vs. modern biomass

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Abstract

Renewable energy is basic to reduce poverty and to allow sustainable development. However, the concept of renewable energy must be carefully established, particularly in the case of biomass. This paper analyses the sustainability of biomass, comparing the so-called “traditional” and “modern” biomass, and discusses the need for statistical information, which will allow the elaboration of scenarios relevant to renewable energy targets in the world.

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1. Introduction

Renewable energy is a basic ingredient for sustainable development. Such sources can supply the energy we need for indefinite periods of time polluting far less overall than fossil or nuclear fuels.

The advantages of renewables are well known, as far as they enhance diversity in energy supply markets; secure long-term sustainable energy supplies; reduce local and global atmospheric emissions; create new employment opportunities offering possibilities for local manufacturing and enhance security of supply since they do not require imports that characterize the supply of fossil fuels.

According to Fig. 1, renewable energy¹ represented, in 2000, 13.33% of total world consumption.

These shares, though, are quite different for developed and developing countries, as shown in Figs. 2 and 3:

In developing countries, renewables (and waste) share is much higher than in developed countries. In a superficial analysis, it would seem that developing countries were in a better situation than OECD ones regarding renewable energy supply.

However, it must be observed that the concept of “renewables” in all figures include large shares of biomass and we can only include biomass if it is the so-called “modern biomass”.

2. Traditional biomass vs. modern biomass

Biomass produced in a sustainable way—the so-called modern biomass—excludes traditional uses of biomass as fuelwood and includes electricity generation and heat production, as well as transportation fuels, from agricultural and forest residues and solid waste. On the other hand, “traditional biomass” is produced in an unsustainable way and it is used as a non-commercial source—usually with very low efficiencies for cooking in many countries.

In the above IEA figures (and many other statistics), renewables include biomass used either in a sustainable or unsustainable way, despite the fact that in many countries the widespread use of trees as fuelwood is not sustainable.

Fig. 4 shows the world consumption of primary energy using the mentioned characterization.

Therefore biomass, the most important energy source in several developing countries, is only sustainable under certain conditions. It is only renewable if realistically replaced. Much biomass use in developing countries is leading to deforestation both for either domestic small scale or large scale for industrial purposes. Moreover, biomass use for cooking and heating in developing

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¹Renewable energy according to IEA includes: hydropower, biomass, wind, solar (thermal, photovoltaics), geothermal, marine energy (wave and tidal)

World shares of total primary energy supply (2000)
414.6 EJ

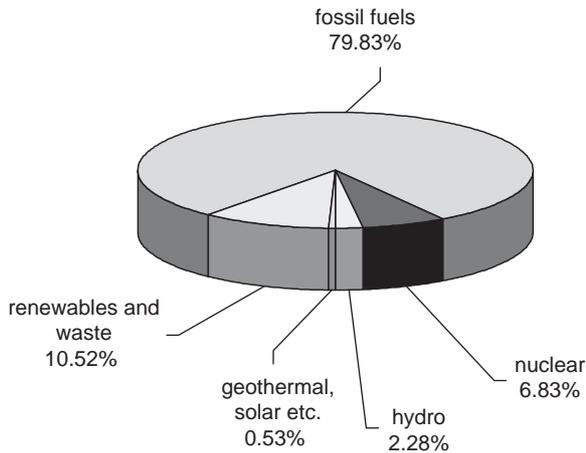


Fig. 1. World shares of TPES—total primary energy supply (IEA, 2001a, b).

World Energy 1998 (WEA 2000) from 402 EJ TPES

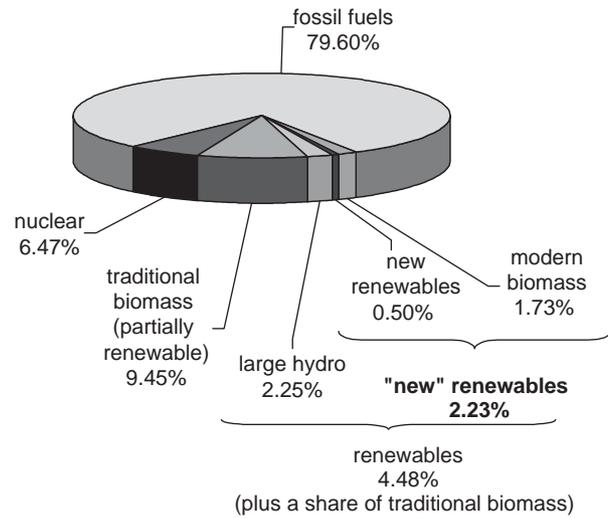


Fig. 4. World energy consumption in 1998 (TPES) (WEA, 2000).

Total Primary Energy Supply (2000) in OECD countries (222.6 EJ)

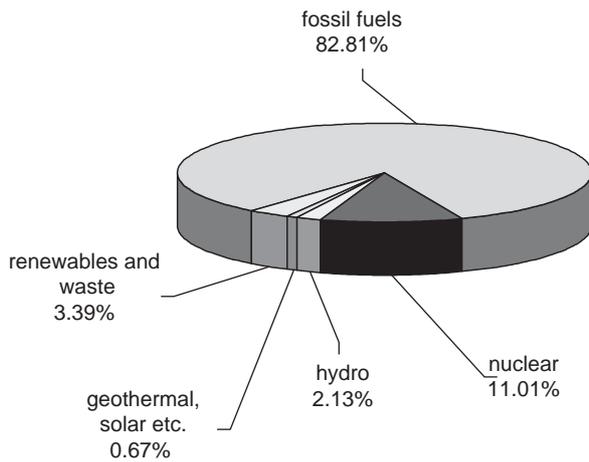


Fig. 2. Shares of TPES in developed countries as of 1998 (IEA, 2001b).

Non-OECD countries (192.0 EJ)

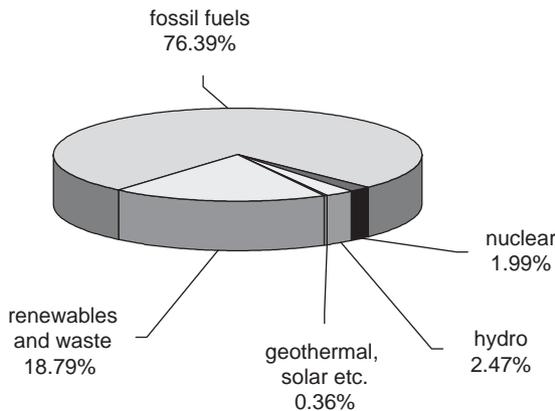


Fig. 3. Shares of TPES in developing countries 1998 (IEA, 2001a).

countries is a major cause of serious indoor pollution, particularly to women, small children and the elderly. On the other hand, in OECD countries (Fig. 2) most biomass used is modern biomass, from wood plantation, wood, urban or rural residues.

For developing countries the situation may be more complex. As seen in Fig. 3 they use a lot of “renewable and waste” energy (18.79%), a good part of which is not strictly sustainable. However, the huge difficulty is to obtain the desegregated figures in order to allow the effective evaluation of the current situation in each country. In many of them, however, “modern or sustainable biomass” is already significant and could be easily increased. Examples are Brazil (20.4%, Fig. 5) and India (4.7%) among others.

Economic development will at first encourage developing countries to reduce their use of biomass either through efficiency improvements and fuel switch, which may reduce deforestation but will not lead necessarily to sustainability. Economic development will also inevitably lead to some increase in the use of fossil fuels.

Fig. 6 shows growth rates for the different types of renewable energy and an extrapolation to 2003 and 2008 assuming these growth rates will be the same as they were in the period 1993–1998, with the adequate differentiation between traditional and modern biomass.

This figure was the basis for the *Brazilian Energy Initiative*, presented at the WSSD, in Johannesburg, proposing an increase of “the use of new renewable sources to 10% as a share of world energy matrix by 2010”. In this proposal, “new renewable sources” include modern biomass, small hydropower, geothermal

Brazilian Total Primary Energy Supply, by Energy Type, 2000

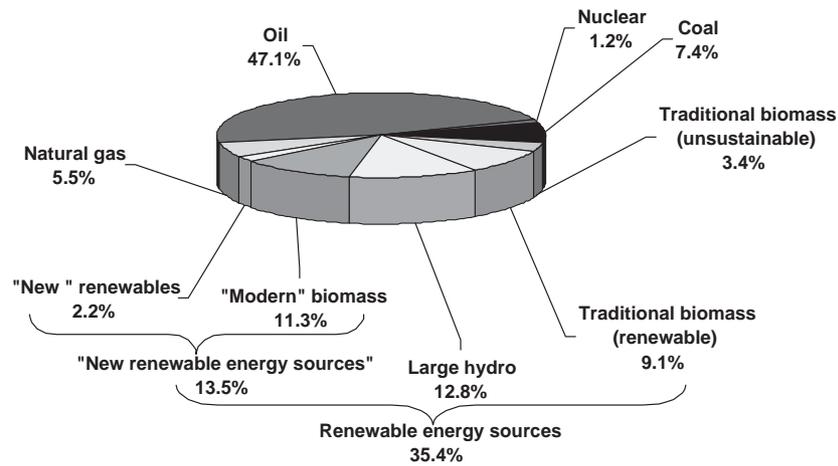


Fig. 5. Brazilian energy shares (adapted from WEA, 2000 and CENBIO, 2001).

World Renewables - TPES and shares

source: WEA 2000. Projections upon yearly rate of increase by source (2.89% for renewables and 3.73% for new renewables)

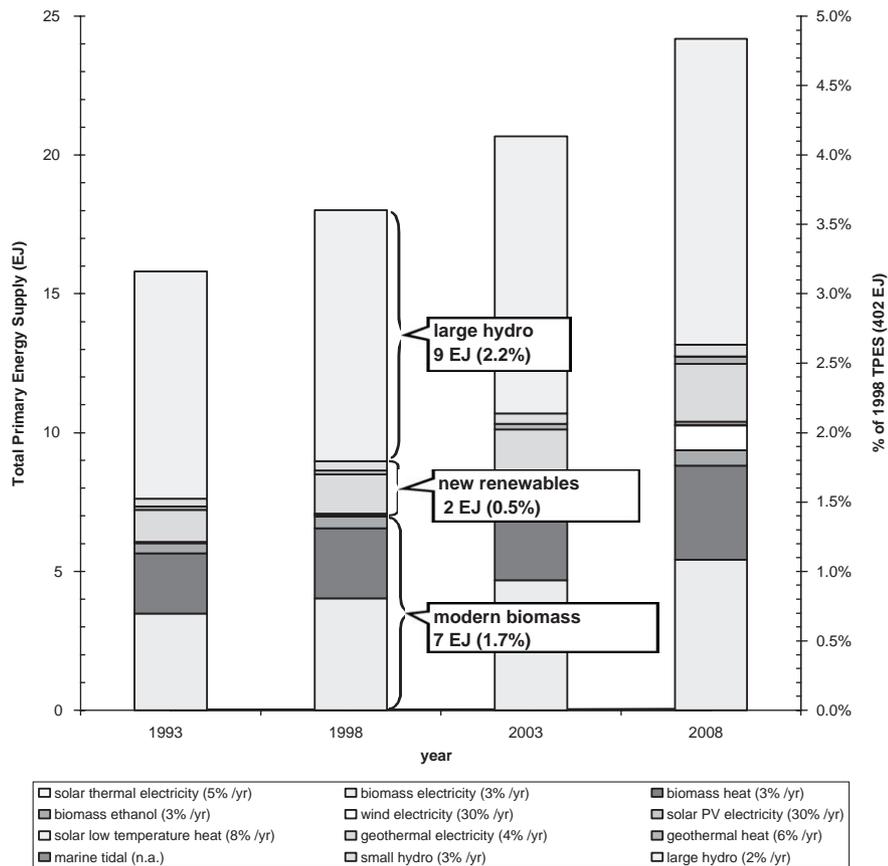


Fig. 6. World renewables—TPES and shares (adapted from WEA, 2000).

energy, wind energy, solar energy (including photovoltaics) and marine energy. As already mentioned, “modern biomass” excludes traditional uses of biomass as fuelwood and includes electricity generation and heat

production from agricultural and forest residues and solid waste. With such caveats “new renewable energy sources” could be labeled as “sustainable renewable energy sources”.

References

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