

предпочтительный тип реакции организации, исходя из характеристик управления и изменений внешней среды.

В общем виде, для успешного принятия стратегического решения по адаптивной устойчивости предприятия необходимо:

- наладить мониторинг внешней и внутренней среды, а также постоянно осуществлять диагностику системы менеджмента;
- наладить эффективный процесс управления сопротивлением изменениям;
- внедрение современных информационных технологий, поддерживающих планируемые системы управления;
- разработать и регулярно использовать методики осуществления системы управления на промышленных предприятиях;
- внедрение стратегического менеджмента.

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RENEWABLE ENERGY AND SUSTAINABLE DEVELOPMENT: A REVIEW FOR THE MOLDOVAN FOOD INDUSTRY

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An indispensable part of the harmonious development of any national economy is the energy industry that provides the necessary heat and power required by the other sectors of economy. In last decade the energy industry faced a dramatic decrease of energy resources and the most appropriate step to address this situation is to increase security in this area. This is achieved by providing the necessary energy resources from national production and lower dependence on imported energy. A special attention in this paper is paid to renewable energy resources. In this context an important place is given to European funds and different projects designed to promote the use of renewable sources in food industry.

Introduction. An indispensable part of the harmonious development of any national economy is the energy industry. In 1970 at international level *green energy* was considered a «dream» but this situation has changed over the years and has become a topic for debate. For industrialized countries, *renewable energy* sources such as biomass, solar, wind, hydro, etc., have become their national targets for energy production structure. For the first time this issue was mentioned in 1972 by the Club of Rome in their report «*The Limits to Growth*»; followed by oil crisis and the energy crisis from 1973 and 1974. In this context, renewable energy was firstly seen as a possible alternative to the oil. The later discussion of these problems worldwide came through *conferences in Rio de Janeiro* in 1992 and *Kyoto* in 1997. Since 1992 when the UN Conference in Rio de Janeiro was adopted and assumed an overall strategy to protect the environment, global warming, environmental degradation etc., has become increasingly pressing this issue and the world accelerated the search for renewable forms of energy: solar, wind, biomass, etc.

According to the FAO's study, global community is becoming increasingly concerned about the high dependence of the global food sector on fossil fuels. These projections indicate that by 2050 a 70% increase in current food production will be necessary to meet the expanding demand for food. Energy from fossil fuels has increased farm mechanization, boosted fertilizer production and improved food processing and transportation. However, if an inexpensive supply of fossil fuels becomes

unavailable in the future, options for increasing food productivity may become severely limited [1].

Consumption trends of alternative energy resources in the food enterprises. It is to be considered that food sector currently is around 30% of the world's total energy consumption. According to the investigations, high GDP countries use more energy for processing and transport spheres, compared to low GDP countries where cooking sphere have the highest share (Figure 1).

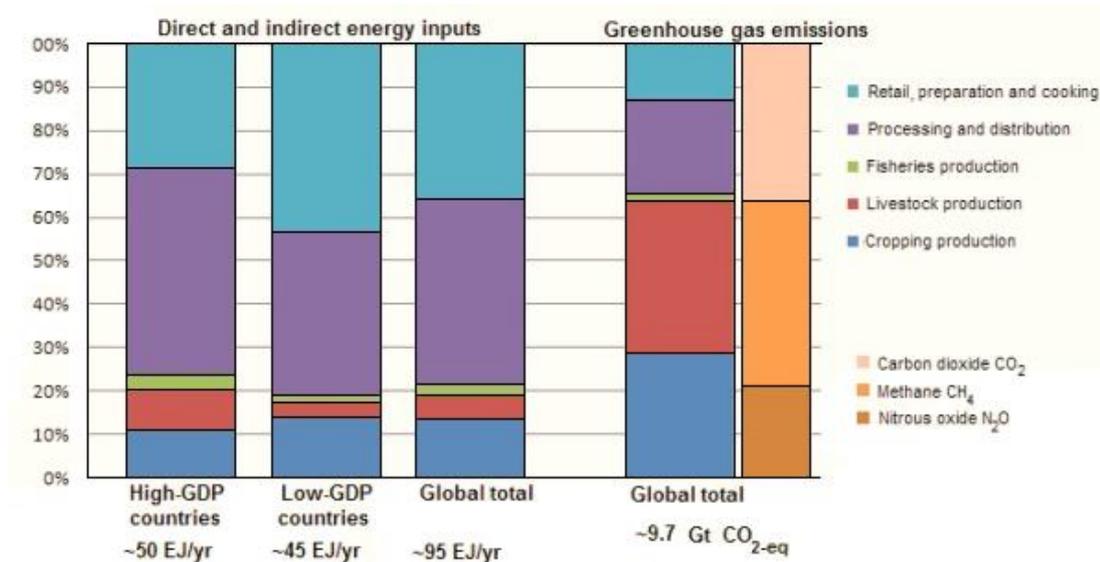


Fig. 1. The shares of final energy consumption for high and low GDP countries
Source: [1, p.3]

We consider that low GDP countries try to maximize their efforts to achieve high productivity similar to those countries with high GDP, but during this period may occur high energy costs. The conventional oil and gas flows will reach a peak in the future. So, there are opportunities for the community from the food sector to combine food production with renewable energy: existing food enterprises can benefit from renewable energy installations receiving rental income and lower cost energy; can access land and lower cost energy, etc. The rising cost of energy is a major barrier to the success of food enterprises, but in the same time the use of renewable energy could be one way to overcome such barrier[1].

A good goal for strengthening food system enterprises is the minimization of fossil fuels and maximization of their renewable energy, energy efficiency and conservation opportunities. Food systems currently consume 30% of the world energy and produce over 20% of the world's greenhouse gas emissions; about 1/3 of the food produced is lost or wasted, and about 38% of energy consumed in food systems. It's expected that in the nearest future there will be significant increases in water, energy as result of a degraded natural resource base. The bioenergy has the potential to offer low GDP countries many advantages including investment in the agriculture sector, economic growth, increased energy security and access, rural development opportunities and reduced GHG emissions. However, to develop the full potential of the bioenergy sector, growth in bioenergy has to be managed in an economically, socially and environmentally sustainable way[2].

Improvement of energy management in food industry. In the near future the use of fossil fuels will continue to dominate the Moldovan food industry but it must be taken into account that use of renewable energy has started. Such energy as biomass, wind, solar resources are widely available and can be used as a substitute for fossil fuels. The Moldovan enterprises from food industry can use biomass by products for cogenerating heat and power.

As an example can be used the sugar mill that use bagasse residues for combined heat and power co-generation. Wet processing wastes, as tomato rejects and skins and pulp wastes from juice processing can be used as feed stocks in anaerobic digestion plants to produce biogas [4].

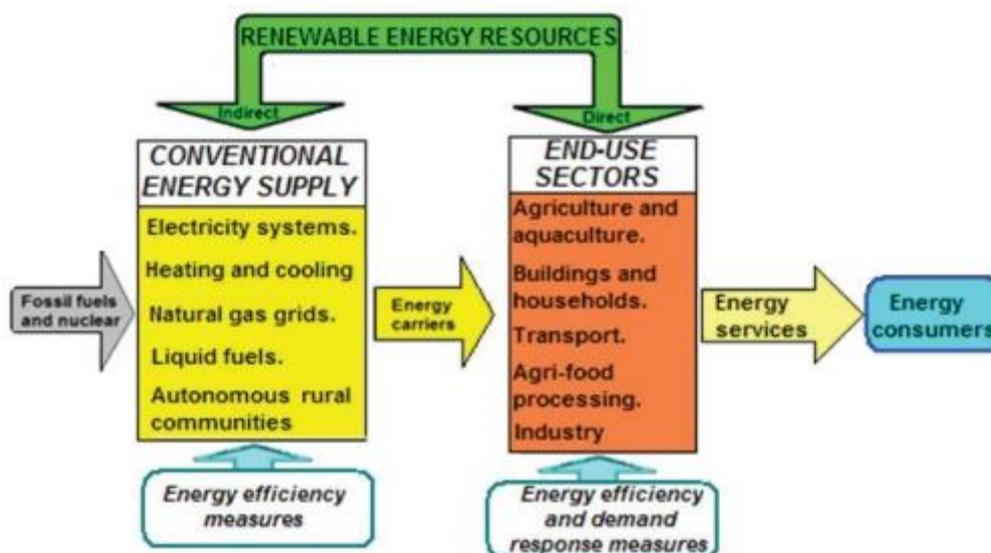


Fig. 2. The direct and indirect use of renewable energy

Source: [1, p.30]

Efficient measures in energy conservation can be achieved in several ways along the food chain. These measures bring direct savings through technological or behavioral changes or indirect savings by adoption of ecological practices. The prevention of food wastages can result in huge savings of energy for the Moldovan food enterprises. For large scale food systems there are a number of opportunities such as technological and capital intensive options, on another hand for small-scale systems the direct and indirect increase of energy inputs for improvement of productivity and water use.

The policies to manage the demand for energy and improve energy efficiency along food systems include: minimum energy performance standards for machinery that is used in food systems; energy performance labels on domestic appliances; vehicle speed restrictions; packaging recycling regulations; etc. In Republic of Moldova, for example, producers are likely to adopt energy savings measures only when there are significant financial benefits. But it must be mentioned also that Moldovan governments policies should stimulate investment for improvement of energy efficiency in the food chain and encourage the generation of renewable energy, in order to support all food chain.

Conclusions. We consider that biomass residues from primary production and food processing can also be used to generate energy. Awareness raising, capacity building and technical field support are essential if renewable energy projects are to be successfully established and operated. The key drivers of energy management of Moldovan enterprises may include improvement of legislation, economic, environmental and consumer issues.

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