



# The Conflict between Economy and Ecology of Productive Energy Sources

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## Short Communication

In the field of energy, there is a strong circular flow in renewable energy, which circulates in nature and returns to the production cycle. An environmentally friendly way of production of electricity is based on the use of renewable energy sources available in the local environment (water, solar, wind, wood biomass, biogas, and the like). The transmission of electricity ends with the energy consumption of end users. The cycle of primary production sources is rounded off in nature and returns in the cycle from production sources, via transmission lines (transport) to the user who has energy needs. In the power industry, it is characteristic that electricity cannot be stored, which means that production and consumption must be equalized with losses in the grid. Supplies can be stored in the form of water, for example in an accumulation hydropower power plant or in a pumped hydropower power plant, and behind larger dams of flow-through hydropower power plants with a very short, limited time. Recently, temporary reserves represent batteries and large energy storage tanks. In the case of wood biomass, biogas, and fossil fuels (coal), reserve energy is accumulated as a raw material to be used if necessary. I understand the integrated nature of the economic-material process of the circular economy as a concept of a cycle of primary sources - raw materials that are directed towards re-use. In the case of reproductive residues - waste in biogas plants after anaerobic fermentation, creates a productive - economic - environmental opportunity to produce a new by-product such as humus, compost, fertilizers and the like. Hydropower power plants are a typical energy cycle from the source to the exploitation of water potential in hydropower power plants, evaporation of water and re-entry the water into natural circulation through precipitation. Since hydropower power plants have a long lifespan, they have reliable economic effects at the

appropriate purchase price of electricity and average water hydrology. In extreme conditions, the targets are not achieved with low rainfall and water flows, and with centuries-old waters, the production facilities are damaged and not operated due to the flood remediation of damaged installations. There is also ecological damage, erosion of the banks of the river bed, river silt in facilities, changes in in water life, destruction of habitats, and the like. In general, when planning the construction of hydropower power plants, there is a natural conflict between economy and ecology, which is why nature conservationists in Slovenia prevent the construction of hydropower power plants on the Mura River. On the other hand, the construction of a chain of hydropower power plants on the lower Sava River showed that their construction regulated the municipal and road infrastructure, strengthened river banks, regulated rivers, introduced control and improved flood safety. In extreme waters, there is a threat of accumulated water for dams, which can cause major flooding if not acted upon in a timely manner (the case of the Drava River). The large expansion of the construction of solar power plants in the last decade in Slovenia is the result of excessive subsidies for purchased electricity, for which all electricity consumers contribute when they charge us a contribution for renewable energy sources. However, when calculating economic viability, providers to potential private investors too often ignore the cost of recycling photovoltaic panels at the end of the power plant's lifetime. In the calculations of taxpayers' cash flow by taking into account benefits of the reduction of CO<sub>2</sub> emissions, it should also take into account the environmental impact of the production of cutting slices that make up solar panels. In the case of biogas plants, the economic effects in Slovenia have diminished with changes in the guaranteed purchase prices of electricity.

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Fermented manure is returned from the biogas plant to fields with a lower content of heavy metal content, which then put less strain on the environment. Due to the environmental impacts from fermentation, degradation, and decay of substrates, the impact of the smell in the surroundings, and the proximity of residential settlements, some biogas plants have been closed. The biggest conflict between economy and ecology is in the field of biogas plants. The situation is better with wood biomass power plants, the benefits are in burning wood residues. The problem is pollution with pm 10 particulate matter in the air. In principle, biogas and wood biomass power plants are cogeneration facilities for the cogeneration of heat and electricity. The use of heat means an improvement in economic indicators and a faster return period of investment. Useful heat can be used to heat buildings, greenhouses, swimming pools, production processes such as wood drying, fruit. An ambitious investor has the potential to increase economic effects.

We are under-exploiting the potential of wind for electricity generation in Slovenia, as only two large wind turbines are built in Senožeče and in Razdrto. The economic results of these two wind turbines are good with minimal impacts on birds. Unfortunately, the lobbies have prevented the construction of other planned wind farms.

The facts show that to ensure a stable electricity supply, we need to have reliable sources of production or get more expensive electricity from imports. In the case of lower hydrology and consequently lower electricity production in hydropower power plants, nuclear energy, and thermal energy are important sources to ensure the security of supply. Fossil fuels are the biggest conflict between economy and ecology.