

RENEWABLE ENERGY SOURCES AS A FACTOR IN REGIONAL ECONOMIC GROWTH

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Hydrogen and fusion energy show promise, as solutions to the energy crisis. They are not all encompassing remedies. Hydrogen can be used as a clean energy source because its combustion does not release carbon dioxide, but most hydrogen today is produced by heating coal and natural gas with steam, which releases a lot of carbon dioxide, negating hydrogen's environmental certifications. One of the possible solutions would be to generate hydrogen at the site of other renewables, such as wind farms and solar arrays when they are generating enough energy.

Besides giving hydrogen the green stamp of approval, this would provide a convenient back-up source of energy when there is not any wind, or the sun does not shine. Additionally there are challenges associated with storing and transporting hydrogen. Currently, hydrogen is distributed through three methods: Pipeline, High-Pressure Tube Trailers, Liquefied Hydrogen Tankers. Because hydrogen contains less energy per unit volume than all other fuels, transporting, storing, and delivering it to the point of end-use is more expensive on a per gasoline gallon equivalent basis.

Fusion is among the most environmentally friendly sources of energy and holds potential for generating amounts of power. There are no CO₂ or other harmful atmospheric emissions from the fusion process, which means that fusion does not contribute to greenhouse gas emissions or global warming. Nevertheless, for deuterium and tritium to fuse on Earth, there must be pressures surpassing 100 million atmospheres per square centimeter, temperatures above 100 million degrees Celsius, and enough confinement to contain the plasma and sustain the fusion reaction for an extended period of time to result in a net power gain. Establishing and maintaining a fusion reactor present safety hurdles and we currently lack commercially operational fusion power plants.

Renewables like solar and wind continue to see increases in both their capacity and their competitiveness. Solar and wind generated a record-setting 700 terawatt-hours (TWh) in 2022 which was around 67 percent (460 TWh) of total renewable electricity generation last year. These two renewable energy juggernauts are on track to become the largest source of global electricity by 2025. Solar is expected to be the largest single source of power capacity by 2027. Despite droughts, global hydropower output was also up in 2022 compared to 2021, contributing over one-fifth of the growth in renewable power. However

nowadays they still represent a portion of the global energy mix. Dependency on carbon-based sources will persist until renewable energy sources become widely accessible and economically competitive.

The growth of the local economy can be significantly impacted by renewable energy sources. Renewable energy sources such as solar and wind energy are clean and do not emit harmful greenhouse gas emissions. The use of such sources helps reduce air and water pollution, improve the quality of the environment and public health, which can lead to a reduction in healthcare costs associated with pollution-related diseases.

By utilizing renewable energy sources, areas may lessen their reliance on importing oil, gas, and other types of energy. This can lower import expenses, improve economic security, and boost the region's self-sufficiency.

In summary, by creating jobs, lowering reliance on energy imports, enhancing the environment, fostering innovation, and luring visitors and investors, the development of renewable energy sources may support regional economic growth. It remains crucial to invest in research and development, across energy sources and technologies in order to effectively address the energy crisis.

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