

The Sustainability of Wind and Solar Energy

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The use of non-renewable sources of energy is associated with the global problems of climate change, energy insecurity, and global warming. While other alternative sources of energy such as wind and solar are intermittent, they can best be used in meeting all the global energy needs without emitting greenhouse gases. While worldwide energy needs in areas such as transportation, industrial activity, and domestic heating are increasing, wind and solar energy can be tapped to meet all needs sustainably and reliably in the foreseeable future. These sources of energy can sufficiently address energy needs when the demand for electricity is regulated, and technologies are developed and designed to foster the storage of wind and solar energy and ensure that the power generated meets the demand.

The short-term variability of wind and solar energy can be addressed using modern technologies. According to Delucchi & Jacobson (2011), geographically dispersed and naturally variable sources of energy can be interconnected to develop one large electrical grid. Separate buildings and facilities will be far apart in the network, making it improbable for wind and the sun not to exist on all its parts. Also, complimentary energy sources can be combined using technology. For example, daytime solar power can be paired with wind power at night. With these approaches, sufficient and reliable energy can be generated to fill all the temporary gaps, and meet all societal energy needs.

Also, wind and solar energy can be stored for future use when their generation is higher than the demand. A significant reason why wind and solar power are unsustainable is because of the wasteful use of available renewable energy. Electricity from renewable sources can be stored at the point of generation by compressing air in underground caverns using excess energy, and at the locations of end use, and at hydrogen refueling facilities

(Delucchi & Jacobson, 2011). Storage can also be facilitated through the installation and maintenance of solar panels and wind turbines (Delucchi & Jacobson, 2013). Importantly, better weather forecasting technologies can be developed to help in understanding some of the potential short-term fluctuations in the supply and demand for wind and solar energy.

Governments and policymakers around should focus on the management of energy demand. Arguably, the demand for energy is increasing rapidly around the world due to inadequate government policies. If regulators check the demand and use of energy, wind and solar energy can reliably and economically meet all the electricity needs. Some of the methods that government agencies can use in promoting energy efficiency in industrial activities, domestic appliances, and buildings include incentives, municipal financing, and rebates. Regulators need to focus on encouraging the use of demand-response grid management in utilities as a way of reducing the demand for interim energy backup on grids (Delucchi & Jacobson, 2013). Energy sector players need to implement sustainable measures, such as virtual net-metering for small-scale electricity systems to promote sustainability.

In a nutshell, even though wind and solar energy are intermittent due to their reliance on weather conditions, interventions such as regulation of energy demand and storage can be used in ensuring that they meet the energy needs. The challenges of meeting all the worldwide energy needs using wind and solar energy are associated with increased energy demand. Government interventions are critical in ensuring energy sustainability. Society needs to focus on implementing sensible and broad-based policies to address global energy needs and other environmental problems using clean and renewable sources of energy.

References

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