

Energy Resilience in the Sustainable Built Environment: the Use of Biogas to Reduce Vulnerabilities and Risks

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Abstract : The built environment is considered as a key element in transitioning to clean energy, needed to create resilient buildings and cities, enhance their adaptability to changes, and pursue energy saving. For such energy transition, this paper presents biogas as one of the sustainable sources of energy, as it is produced from organic materials often available in both urban and rural areas and can be converted into electrical and thermal energy, or into vehicular energies fuel. The resilience benefits of this fuel is being a localized alternative energy, and also provides tangible benefits for water, air, and soil quality. Through bibliographic and empirical research, this study analyzed the biogas potential and applications in Brazil and in the U.S. The results indicated that biogas emits 85% less CO₂ to the atmosphere compared to diesel and could supply 40% of domestic electricity demand and 70% of diesel consumption in Brazil, with a similar scenario for the U.S.

Keywords : resilience, sustainability, built environment, energy transition, biogas.

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