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Biogas potential in Brazil and the US: evaluation of condominial production of energy from livestock wastes and biomethane for urban mobility

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The predictions for increasing population and industrialization are boosting the demand for water, energy, and food, especially in developing countries. In this context, the analysis of these three elements has gained increasing attention globally in research, business and policy spheres. This article will provide an analysis of this nexus for Brazil and the United States, using current and predicted scenario for 2050, and present the biogas potential for these countries, including best practices and case studies implemented in this area. Both countries have similar scenarios regarding the opportunities for use of this energy source: are among the five countries with the largest population and territorial extent, leaders in food production, large energy consumers and are among the countries with greater availability of water in the world. The article will also present a case study in the Ajuricaba Agroenergy Condominium for Family Agriculture, located in South Brazil, which aims to adequately address the waste generated in 25 farms, transforming them into economic assets. The biogas is used as thermal energy for heating boilers at a local cooperative that processes poultry and the remaining biogas is used by the farmers in their biogas' stove for cooking, replacing the LPG (Liquefied Petroleum Gas), and for heating water for cleaning dairy utensils. Additionally, the biogas system produces biofertilizer, important to increase the productivity in the field, contributing to the reduction of greenhouse gas (GHG) emissions. Biogas can still be used as electric energy and can be purified and transformed into biomethane, used as vehicular energy for urban mobility. It will be concluded that biogas can provide multiple economic, environmental and social benefits.

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