

17 kWh low-carbon economy

2022, 2023, 2024, ...

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This study is structured into six (06) sections. Section "Solid waste classifications" presented the existing literature on the many types of solid waste, as well as their generation, administration, and disposal techniques is briefly summarized in "Solid waste production, management and utilization". Section "Materials and methods" covers the research method and data analysis for LEAP model. Section "Results and discussion" provides in-depth analysis of empirical results and finally conclusion is given in "Conclusion and policy implications".

The majority of solid waste is generated by industries like agriculture, construction, residential housing, and commercial business²⁴. The four main categories of solid waste are hazardous waste, industrial waste, municipal solid waste, and agricultural waste. Below, each waste category is covered in more detail.

The purpose of this article is to discuss the usage of solid waste to generate electricity. To that goal, a number of solid waste power generating systems were assessed using techno-economic criteria as compared to the other methods stated in Table 2. The gasification strategy for power age is appropriate. The gasification technique takes a wide range of junk for power age and delivers less debris. It likewise has a more powerful efficiency⁷⁶. Gasification, with its hybrid system, opens the door to yet another new development in the country, as hybrid technologies based on other resources such as coal, combined with biomass and solid waste resources, provide community with energy advantages⁷⁷.

Accordingly, this study develops energy transition pathways for Pakistan between 2023 and 2053 that use solid waste as a fuel source. Figure 1 displays a flowchart for an operation.

Methodological flow diagram.

Aspects in the social, technical, and demographic spheres affect CO₂ emissions, capital cost and production⁸⁷. Table 3 demonstrates important input variables for the LEAP energy generation module however, the past consumption of electricity (1970-2020) is given in Fig. 288. The LEAP module includes exogenous characteristics for the lifespan of energy technologies, the development of electricity consumers, fuel prices, and GDP growth. In the LEAP module, endogenous features include sectorial energy demand, solid waste generation capacity, and electricity intensity⁸⁹. New versions of LEAP (2020.1.32) are used in

this research⁸⁸.

Past electricity consumption data from 1970 to 2020 in terawatt hours⁸⁸.

Figure 3 indicates the kind of waste content and its percentage. To determine the chemical composition of solid waste products, physiochemical characteristics are used. The selectivity and acceptability of solid waste as a fuel source could be determined using these parameters⁷³. Figure 4 shows how solid waste is physiochemically. To ascertain the physicochemical properties, proximate analysis test measures fixed carbon, ash, moisture, and volatile matter in total solid waste and the ultimate analysis test measures the proportion of oxygen, nitrogen, sulphur, carbon, and hydrogen in total solid waste⁹⁰.

Composition type of solid waste in Pakistan⁷³.

Composition contents of solid waste in Pakistan⁹⁰.

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