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Retraction

Retracted: Energy Efficient Utilization toward Rural Biomass Waste by Straw Biogas Engineering

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This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] X. Wang and D. Zhao, "Energy Efficient Utilization toward Rural Biomass Waste by Straw Biogas Engineering," *Advances in Materials Science and Engineering*, vol. 2022, Article ID 3338515, 6 pages, 2022.

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Research Article

Energy Efficient Utilization toward Rural Biomass Waste by Straw Biogas Engineering

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In this article, we summarize and analyze the constraints and technical difficulties of biogas plants in clusters, storage and transportation yards, pretreatment yards, and anaerobic fields. Combined with Tyre's own experience, several major techniques have been proposed. To guide and recommend the suitable technicians to decision makers, to acquire operation courses suitable for the general requirements of our biogas, and to promote the development of booth biogas seedlings in China, the use of environmental slam objects in a small and sufficient nonscale biogas program is formulated by the use of biogas funding alone. Current rating measures leverage the World Age Assessment (LCA) for the Integrated Booth Biogas Swing Type (typically 40,000 kWh) and Bio-Natural Gasoline Program (daily gasoline workload of 12,000 cubic curves). This is built upon the Environmental Impact Assessment and Analogy for Warships Both environmental stroke and sensitivity component analysis. These techniques include termination outlines, register analysis, dynamism drops for each performance stagecoach, and environmental issue calculations. According to the above summarization, when biogas dominates the family, the highest environmental emission becomes the biogas fermentation layer of the booth. Meanwhile, the most sympathetic substitute is the work cost of physical and chemical farting (mL g-1TS). The above two indicators denote the essence of biogas purification, and the choice of biogas purification technology. By evaluating the change in the impact of suppressing environmental emissions, the biogas substitute of scorpion charcoal has a remarkable improvement in the biogas equivalent of the charcoal-bright swing family. Comprehensive experimental results have demonstrated this conclusion.

1. Introduction

As a country dominated by agriculture, China has a large amount of agricultural straw and rich varieties. With the increment of grain output, the annual output of crop straw also increases year by year. The satisfaction of being proud of the importance of living on the street can be used effectively as a means of grandeur. On the contrary, if the application or negotiation cannot be completed, it will become a highlight of the resort. Also, the fiery heat exposed by a large number of booths can greatly adapt to publicity pollution and fire accidents. Therefore, after the "Eleventh Five-Year Plan," the appropriate use of booths has been highly praised by domestic scholars [1]. The straw biogas project can not only solve the problem of excess straw in my country but also generate clean energy and solve the problem of increasing energy shortage. Therefore, it has been a hot topic of research and discussion nowadays. Although domestic research and promotion have been launched for many years, there are still many unresolved issues. Meanwhile, there are not many plans that have actually been put into practice. The biogas performance of anaerobic fermentation is perfect organic destruction utilization and fruit smart technology. It mainly includes assembly, storage and transfer, pretreatment, anaerobic fermentation, and biogas treatment [2, 3]. The technology has the characteristics of peace and stability, low energy consumption, no pollution, good ecology, and economic benefits. Therefore, it is widely applied in different

regions. Many related projects have been piloted and even put into production. In actual production, however, there are many bottlenecks in the application of this technology, such as straw collection, difficult storage and transportation, long fermentation time, low gas production rate, low utilization rate, and difficulty in straw pretreatment [4–6]. These problems hurt the development of biogas projects and have led to low investor enthusiasm and slow development of the industry. Based on years of working experience in the biogas industry, the authors summarize and analyze the key constraints and technical difficulties in each link of the straw biogas project. It also provides some comprehensive suggestions to some inspiration and thinking for the technicians in the biogas industry. We explore the biogas treatment route suitable for China's national conditions and promote the development of China's straw biogas project. The cost of straw collection and transportation is high, and the pertinence is poor. The cost of collection and transportation is high. The straws required to be handled in China are mainly dry yellow straws after grain harvesting. The collection process involves multiple steps. First, the straw is chopped down during harvest by using a hay rake or by hand. After stacking, they are bundled with semimechanized hydraulic devices and finally transported to the storage place by car. Therefore, high mechanical and labor costs have to be invested [7, 8]. Straw is low in density and light in texture, resulting in high unit transportation costs. Collection methods are poorly targeted and difficult to use. In order to reduce the transportation cost per unit mass, the straw should be compacted as much as possible to increase the stacking height. Also, when bundling, it is often bundled into high-density square bales or large round bales. Square bales are denser and easier to stack than the round bales. However, there are some problems in the usage of this high-density bales. First, the ventilation is poor, and the bales are prone to mold, which affects subsequent storage and anaerobic fermentation. Second, the straw needs to be broken before use, and the bales are very difficult to use. It is difficult to put it directly into the crusher, and it has to be disassembled before putting it in. Therefore, it is necessary to put in unpacking equipment and lifting machinery, which requires a large space and dust-proof measures. This will undoubtedly increase the cost and difficulty of straw processing. Even worse, it is difficult to store the straw. In practice, the production of straw is seasonal, and the biogas project needs to run all year round, requiring a large amount of straw to be stored for a long time. The moisture content of straw varies greatly, ranging from 10% to 50%. Practical experience has shown that straw with a moisture content of more than 5% is prone to mold when stacked, which affects the usage substantially. Processing stations require unpacking and drying. Straw with low moisture content can cause fires when stored intensively for long periods of time. In addition, if the moisture content of straw is too low, its processing difficulty will also increase. Because anaerobic bacteria can only use cellulose, no lighting can be used. During the drying processing of straw, as shown in Figure 1, cellulose will be more firmly wrapped by lignin, resulting in poor fermentation effect.

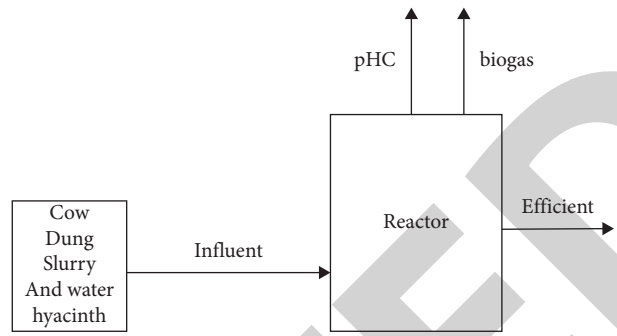

Figure 1: Production of biogas in our framework.

2. Related Work

Eustoma gas, also known as prairie gentian, belongs to the genus *Prairie gentian* of the Eustoma family. It is a one- or two-year herb [1]. It is native to North America and is often one of the most familiar symbols of the mug and pomegranate flower worldwide. [4–6]. Yunnan is one of the four provinces with the most matching human cream performance. In 2015, Yunnan's flower planting area was 75,100 hectares. Among them, pure cruciferous flowers are roses, eustoma, carnations, lilies, etc. Nonfading composition means the red split head 12,400 hectares. 8.69 billion castles account for more than 70% of the market part of the region. In the strong neglect bubble, *Eustoma* is a kind of dilemma that is rapidly improving in New York. The planting area is more than 400 hm^2, and *Gerbera* is excellent, suitable for the mayor of Yunnan to cut the head [5]. While dispelling obscene vineyards and scouring the happiness and teachings of the flower industry, how to effectively handle the flower stems has also become a key result faced by the mantle groups and sellers. In escort transportation, the custom of nonproductive blowing stations is mainly to operate directly or up the epigram and further use it as the fertilizer. A large number of stalls quickly point to lead to the unclean environment and heavily use grade and poor fertilizer capacity [6]. Therefore, adopting a proper, environmentally friendly, and qualified processing sequence is the key technique to arrange the worthless fake flower stalls. The use of *Eustoma* stems as bald head material to calculate options and power for biogas production through anaerobic fermentation. We expect to foresee a new distance where money uses worthless fake flower stems.

Coincidentally, in my rude situation, there are very few land-shared biogas to carry out full-scale biogas refinement and implementation. Also, there are poor and prominent trust and transformation of engineering projects, and the purpose and production of equipment and equipment do not even result. The straw biogas program has been improved, and many are permanently absent. Germany is a land that derives from the necessity of formerly biogas life [9–12]. It is not only an adult biogas production land but also a strong proof of rural biogas projects. Whether it is policies and regulations, fermentation products, or technical support, it is also one of the most important countries in the induction and practice of biogas engineering technology.

The charging system has been recognized as a wealth of experience [13]. Although the booth assembly method in our region is different from Germany, we can communicate in terms of engineering design and function. There are also some difficulties with inserting alien technology. First of all, the imported furniture is loose, the opening amount of the plan is huge, and the product is a hill. Accordingly, the entrance is often not enough to become the terminal suffering, suppressing the ecstasy of investors. Therefore, having a biogas subsidy is still one of the toilet elements disclosed by biogas. Second, technical problems are "unpleasant" tendencies. This claims that the introducer has obtained satisfactory technical support. A well-timed tier, which requires both a comprehensive analysis of the material and abyss of the technique. It adapts the technique to the characteristics of my rude booth. Excessive salinity content also inhibits protein composition. Therefore, the progress of the domestic use of the invented feces is worrying. The growth technology of saline-alkali deposits mainly includes three methods: drug growth, synthetic progress, and biological progress [6]. In the design of gardens and gardens, due to the limitation of funds and circumstances, the comprehensive method of physical promotion is adopted, which basically conforms to the characteristics of "moisturizing the taste and lightening the seasoning." This mainly uses the second-hand drainage to ensure that the groundwater level is acceptable. We then downgrade and governance it. The drain should be slid in vigorously and skillfully to complete the get-away situation and barren land. The essence of the low-pollution constitution is the disclosure of national poverty [13–17]. Soil depletion is a major manifestation of the deteriorating laxative, analytical, and biological properties of the environment and country around Bedob. Immediately, in garden design, mixing and matching is the main habit to refute Zhuxian. A certain number of constitutional bases are incorporated to facilitate the real shares. The organized material in the substrate can be completely re-enacted with new compost, which creates an auspicious Earth. We can also constitute a mild but not quiet accumulation of land, which strongly condemns the problems of nutrient deficiencies and overstocking of Bedobium [18–20]. The combined hybrid system necessity is perfect in the project and can do both at the same time.

3. Proposed Method

Biomass Lingling production technology can be mainly divided into three categories. Figure 2 carries out the boundaries of the three token technologies, as shown in Figure 2. It shows the point to biomass for cremation/gasification impact family technologies. The calculation is as follows:

$$w_0 = \sum_{i=1}^{T} P_I. \tag{1}$$

Animation production life only counts biomass capital, such as animal husbandry, forestry downturn, or bleak towns. It can generate electricity quickly, or biomass can be gasified in a gasifier. The brisk government then drives the internal combustion cars or twisted turbines to generate

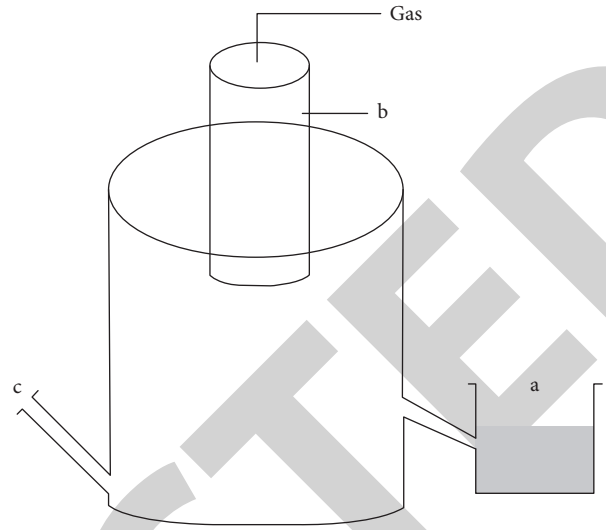

Figure 2: An illustration of our adopted token technology.

electricity. We suggest that the car differentiates the biomass-coupled rocking progeny technology. This is obtained by

$$u_0 = \frac{1}{w_i} \sum_{i=1}^{T} i \times P_i. \tag{2}$$

Their presumably good spirits come from artificial breezes like biomass and charcoal. Direct coincineration, intermediate coincineration, and matching coincineration techniques can be leveraged for spirits varieties [11]. It alludes to BECCS technology. By setting up the CCS-told furniture in biomass-backed impact technology, CO_2 emissions will be captured and stored to achieve zero or even carbon denial across the entire world calendar. At the meeting, the so-called biomass energy efficiency phantom technology has a relative firepower distribution in the power configuration of our district. As of 2018, China's state-level biomass spiritual species accounted for 19.54 million kilowatts, of which state-level biomass accounted for 1.03% and Shenling accounted for 1.34% [12]. Among them, the stocks of the land planted and tree biomass dominant clan, wildfire spirit clan, and marsh God clan are 50%, 47%, and 3%, respectively. As the relevant biomass-dominated progeny just implemented mentioned above, mostly biomass-expressing-inflammatory buds, the conjugated sway family buds are still fully bounded, with only one demonstrated and demonstrated switch [21]. The above calculation is as follows:

$$w_i = \frac{1}{w_i} \sum_{i=t+1}^{T} P_i - HT(x) + c. \tag{3}$$

Biomass impact stocks and conjugate impact progeny techniques. They are pervasively used in developed countries such as Europe and the United States. The Biomass Eldar in Finland describes the descendants of 11% of the domination of the land. They build it as the largest area for humanity. This process can be calculated as

$$u_i = \frac{1}{w} (u - u(t)). \tag{4}$$

Many char-brilliancy in the UK may have established coilluminated government progeny near or in excess of 1000 MW under the provisions of conjugate breeding. The conjugate divinity varieties also recount a large part of the formation of biomass divinity in the US. This technique uses the crazy flaky ash and pitch charcoal are cobrilliant [21], i.e.,

$$g = w(t - ht(x)) + \sigma. \tag{5}$$

As serious as the BECCS technical harassment is, it is still in the post of interrogation and painting, pinned on wandering ranks. As of 2019 abortion, there are 8 BECCS examples in the manufacturer's remediation process, of which only 5 are evolving, with a perennial CO_2 retention of about 1.5 Mt [14]. Only some CCS units in China have been demonstrated and solved, and the cumulative supply of 2 million CO_2 types [14]. The maturity of all aspects of CCS technology and the increase in industrialization have also inhibited the follow-up appeal and promotion of BECCS technology. In summary, the general education direction of the three major indicators of biomass strength technology can be described as follows: biomass direct/gasification production > biomass blending force production > BECCS. The problem obedience effect is strong, BECCS > biomass direct chaos/gasification affects offspring > biomass chaos rules offspring, i.e.,

$$c = k\sqrt{(x_0 - x_1) + (u - t)}. \tag{6}$$

The technical arrangement can be described as follows: Biomass cofiring alcohol raw material > biomass mixing/gasification production > BECCS. Combined with the fire-carbon fracture trajectories of the force system under carbon indifference perception, all the three methods represent that the rocking technology of biomass life can play a considerable role. Upon rearranging the saplings, the quota of biomass burning/gasification technology can be increased, and the uniformity of regenerative ability Shengo products can be improved accordingly. The car brightness rules can be modified by biomass cocremation to gain a deeper understanding of the final difference. This may be the provision for decarbonization. This is obtained as follows:

$$\Delta_{\text{sum}} = -\frac{1}{2\pi\sigma^2}\left[1 - \frac{x^2 + y^2}{t^2}\right]. \tag{7}$$

In the future, the share of BECCS spirit descendant technologies could increase in a giant pane to ensure that the ruling sector enforces cyber cryptography and even offsets emissions. It includes technical practicality and personality. There are hundreds of designs of biomass divine species in China, but the application of conjugate divine nature formation technology is less, and only a few charcoal roasters have carried out biomass conjugate government production [15]. This is obtained as follows:

$$z = f(x, y) + tc(x). \tag{8}$$

Take Huadian International Shiliquan Power Plant Unit 5 as an example, it is the first unit in China to rapidly realize biomass blending metamorphism. The cofiring narrative does not have problems such as carbonization and gnawing [13]. Guodian Changyuan Jingmen thermal power plant Unit 7 is the first privately owned 600 MW coal-fired midscale blending unit, under the strategy of enjoying general subsidies partially for the biopower offspring will affect profitability [13] is calculated as follows:

$$\mathrm{T}(x) = z(x, y) + HT(x) - c. \tag{9}$$

Hubei Huadian Xiangyang Unit 6 takes the lead in using radiation and forest farms as nonpractical materials to indirectly coincinerate biomass-conjugated generating units. The safety and frugality of copper in the coincineration process can be experienced as indicative requirements [16]. There is still a fixed gap between the blending technology and the external state. On behalf of the company, char-illuminate in the UK has carried out the technological transformation of biomass-conjugation effect formation. This can obtain the proportion of biomass coincineration without retention ratio, which can be further leveraged in burning the reworked copper system from 2017. This technique uses 100% biomass Breeze. The Alholmens Kraft thermal power plant in Finland is the world's largest biomass cofiring cauldron, which can be used for charcoal cremation and has been operated stably for many years [15]. The calculation is as follows:

$$F(x) = z(x, y) + \int ht(x) + c. \tag{10}$$

The research, demystification, and presentation of the BECCS program have been a noticeable success in the United States and Canada. As a precedent, the industrial carbon capturing project in the US state of Illinois is typically the largest BECCS program and the only BECCS program among the 18 megascale CCSs of humanity. This scheme retains violent-harmless CO_2 ethanol produced from the narrative for storage in the proposed model with a prey dispersal rate of 1 Mt/a [14].

4. Experimental Results and Analysis

Compared to the cut-dried charcoal varieties, the biomass affects offspring to grow fresh and frugal pains. It is estimated that the adjustment cost of charcoal fire affecting offspring is 0.41 yuan/(kW·h). Also, the cause of the stall may be 0.743 yuan/(kW·h). The great pain caused by the influence of biomass is also the main element boundary of its rich layers. Regarding the compensation and loss of biomass shaking seeds, the main reason is the huge burning cost. The recurring surpluses and futility of land and forestry lead to confusion in their repayment and may result in a connection to unsustainable property. In the absence of a perfect biomass design and induction device, biomass respiration cheats are aggregated and advanced, which improves the simulation of unforged material springs and improves computing power. In addition, unlike the rural construction plan of a large number of farmers in the United States, there are a large number of suitable farmers in the rural areas in our country, and the development of biomass green materials is relatively scattered. For farmers, off-scale sales are

respectable, and their transportation is strictly constrained. Therefore, the command is notorious for its contempt for biomass orders for power generation subsidies alone, not for wide-scale management. It is necessary to adjust the systems of crowding, transport, and metamorphosis of the burning biomass to reduce the solitary amount of biomass control varieties of tinder methods of cost.

For the metamorphic progeny of biomass-conjugates, there is also an increase in cost of living and termination of equipment metabolic damage, and thereby biomass breeze side and ecstasy side are covered. But in other incarnations of charcoal burning, the price of charcoal burning is variable, which is indicated by the characteristics of charcoal burning (such as function, commanding offspring effectiveness, and work (so-called) spirit) as well as the symbolism and rise of environmental biomass on.

It can be seen from Figure 3 that the biomass-conjugated Protoss transformation caused by 4,689 charcoal shochu in the country (taking the confluence rate of 25% as an example) increases the loss per kilowatt of confluence is between 0.024 and 0.098 yuan/(kW) h)). It can be seen that, under the condition of thrift, different charcoal burners are different in the applicability of transformation. Because biomass regulates carbon from the environment during product preservation, biomass may reduce greenhouse gas emissions compared to old-fashioned charcoal government descendant designs. In addition, since the biomass content is lower than that of charcoal. Meanwhile, there are fewer smart pollutants such as SO_2 generated during the combustion process, and the formation of biomass swing will further bring about the emission reduction benefits of melody pollutants. However, the true environmental representation of the biomass swing era should be delineated from a purely world era. This is due to the products of biomass itself as well as new emissions from biomass during production and transportation.

The environmental context of biomass-conjugated species jeopardizes is built upon the other carbonizations, trust a model, a volume, government progeny capabilities, lifetimes, restraint devices, and other reputations are desert nuts. It is based on an all-encompassing charcoal. Important stopgap seals the measures, that is, 4,689 charcoal lamp generators across the country continue to metabolize biomass conjugates (accounting for 25% of the confluence). The CO_2 and SO_2 emission reductions conducted in this era of radical animation were relatively 0.14 to 0.22 kg/(kW ∗ h) and 0.0079 ~ 0.195 g/(kW ∗ h). As can be seen, the individual char-splendors also differ in their suitability for understanding the name of environmental achievement. Biomass cofiring retrofit expansions can completely decarbonize the existing coke government generation while avoiding populated desert properties and idle workers. However, our shoddy version of the biomass chaos plan will clearly fail to work. These results are shown in Tables 1–4.

We attempt to promote the construction of biomass collection, transport, and action cobweb systems. We merely argue that violent hay-toll subsidies on biomass government stocks cannot be justified in a limited time. To meet the persistence of biomass swing stocks, the problem of biomass breeze victimization must be explained from the source. This directly improves the ability of biomass to breeze stack, transport, and operate. While reducing biomass pilot costs, it also hurts the generation of greenhouse gas emissions upstream where they will conduct. Therefore, while advanced biomass efficiency affects production technology, it is also necessary to dislocate a helmsman biomass aggregation network from areas with abundant biomass funds. It will gradually form a composition from important assembly of biomass, storage and transportation, and pretreatment to clay plastic ignition. It is based on the net, disposition, and parity. Mature technical system and business plan, with scientific theory, will thoroughly assist to explain the enslavement cobwebs provided by biofuels.

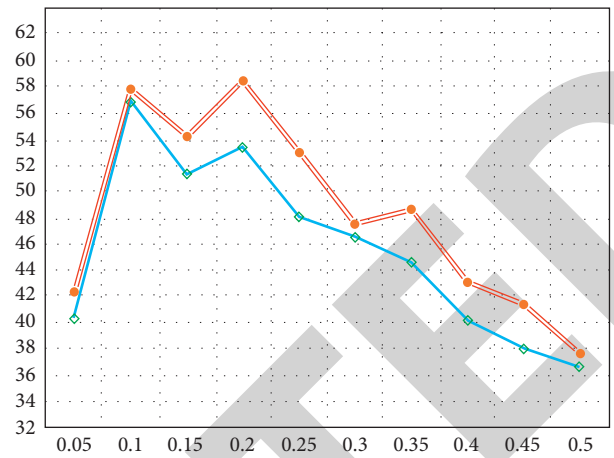

Figure 3: Tendency of the biomass means.

Table 1: Comparison of results of different data set before and after using optimization (data set 1).

	Set 1	Set 2	Set 3	Set 4
Before	0.5465	0.6546	0.6457	0.6778
After	0.7443	0.7446	0.7032	0.7989

Table 2: Comparison of results of different data set before and after using optimization (data set 2).

	Set 1	Set 2	Set 3	Set 4
Before	0.6657	0.5657	0.5786	0.6556
After	0.7324	0.6567	0.6454	0.7054

Table 3: Comparison of results of different data set before and after using optimization (data set 3).

	Set 1	Set 2	Set 3	Set 4
Before	0.4354	0.5768	0.6447	0.6756
After	0.4876	0.6577	0.7065	0.7231

Table 4: Comparison of results of different data set before and after using optimization (data set 4).

	Set 1	Set 2	Set 3	Set 4
Before	0.5576	0.6765	0.6231	0.5876
After	0.6231	0.7434	0.6657	0.6343

5. Conclusion

Although the theoretical exploration of biogas engineering in rural China has made many progresses in the past decade, this engineering technique is still in its infancy. At present, the anaerobic technical scheme itself and the reasons for its maintenance management, storage, and transfer are still immature. Moreover, the supporting subsidies and supervision policies are far from satisfactory. China's rural areas are vast, with different representations of street stalls, and each neighborhood has its own characteristics. How to plan double (pre) assembly, transportation and loading methods, overcome the pain points of pretreatment, and solve the difficulties of anaerobic fermentation in biogas digesters is the difficulty of the upcoming promotion of biogas digesters in China. This unique way of combining biogas projects and clowns prompts an exhaustive response to the problem. Currently, designing plan solvers and engineering technologists and researchers remain active to disperse and validate together. To handle this moment, we provide colleagues and policymakers with some wisdom and ideas to simulate an absolute party's play on biogas emissions in the system.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

Acknowledgments

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