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Mini Review **Published Date:- 2023-12-27**

Research on the Connotation Development of Civil Engineering Materials Courses in Universities of Applied Sciences, a High Level in China

German universities of applied sciences have provided a large number of technical talents to society, and have made significant contributions to the enhancement of German education and industry. Drawing on the professional construction experience of German universities of applied sciences, this paper summarizes the path of civil engineering materials courses in China's high-level applied universities. The proposals for curriculum reform were discussed. Colleges and universities can cultivate professionals with strong hands-on abilities, strong exploration abilities, and a scientific research spirit. In addition, this paper puts forward that China needs to make changes from three levels: the country, universities, and teachers. Based on learning from the experience of collaborative education between teaching and scientific research in German universities, we have embarked on a road of education with China characteristics.

Research Article **Published Date:- 2023-12-21**

Current Situation of Municipal Solid Waste Management in the Urban and Peri-urban of Phnom Penh, Cambodia

Currently, the amount of solid waste is increasing in the world, especially in developing countries. Although Solid Waste Management (SWM) involves and collaborates with many stakeholders, management is still flawed. SWM in the urban and suburbs of Phnom Penh has encountered a number of obstacles and challenges. Seeing these problems, the government has decided to reform the solid waste management in Phnom Penh in 2019. After the reform, the provision of waste collection, transportation, and cleaning services in urban and peri-urban has changed significantly, while the urban and peri-urban receive collection services 95% and 80%, respectively. To be more precise one study on the current situation of SWM in urban and peri-urban Phnom Penh was conducted to understand the current situation and to identify challenges of SWM for the urban and the peri-urban in Phnom Penh. Two kinds of data were collected 1) preliminary data was collected from interviewing people in target areas by using structured questionnaires, and 2) secondary data was obtained from existing various sources. 330 respondents were selected with qualitative and quantitative analysis by using SPPS 28.0.1.1 and Microsoft Excel 2019. People use plastic bags instead of bins, triggers, and bags to store the waste.79.5% of the people are willing to pay the collection fee. It was found that the situation of SWM is better, however, the collection time is still blurred. SWM in Phnom Penh has faced four main challenges: financial, road infrastructure, landfill, and people's participation. SWM in urban and peri-urban, still have some problems such as the packaging and storage of the waste. and the problem of scavengers tearing the waste bags makes the garbage clutter.

Perspective **Published Date:- 2023-10-03**

Durability of Lumber Pretreatment Compared to Posttreatment Processes

Aim of study: In terms of treatment, it is essential to consider the correct use of preservatives and epoxy resin. Lumber pretreated with these substances can protect the wood from biodegradation or insect attack for exceeding three-year life expectation periods.
Methods: To further increase durability and structural integrity, Posttreatment like painting or lamination on wood surfaces helps keep moisture out and carries a higher yield compared to traditional methods. In addition, chemical treatments to make timber resistant to fungal infestations as well has been gaining traction recently which makes it possible for lumber to be used in even more applications safely than ever before.
Results: Thus, proper treatment plays a major role when considering the implications of using lumber as a resource both structurally and functionally over time.
Conclusion: Lumber remains one of the most sought-after resources due to its versatility; likewise finding ways how impart maximum longevity necessitates research into new treatments available so that we can optimally exploit such abundant supplies without compromising the durable nature of good quality timber source.

Literature Review **Published Date:- 2023-09-04**

Microbial Conversion and Utilization of CO2

Rising greenhouse gas emissions have contributed to unprecedented levels of climate change, while microbial conversion and utilization of CO2 is a practical way to reduce emissions and promote green manufacturing. This article mainly summarizes several natural CO2 pathways that have been discovered, including the Calvin cycle, the reduced tricarboxylic acid (rTCA) cycle, the Wood–Ljungdahl (WL) pathway, the 3-hydroxypropionate/4-hydroxybutyrate (HP/HB) cycle, the dicarboxylate/4-hydroxybutyrate (DC/HB) cycle, the 3-hydroxypropionate (3HP) cycle, the reductive glycine (rGly) pathway, and artificially designed carbon fixation pathways includes the CETCH cycle, the MOG pathway, the acetyl-CoA bicycle, and the POAP cycle. We also discussed applications of different carbon fixation enzymes, notably ribulose-1, 5-diphosphate carboxylase/oxygenase, pyruvate carboxylase, carbonic anhydrase, as well as formate dehydrogenase. This paper further addressed the development of photosynthetic autotrophs, chemergic autotrophs and model bacteria Escherichia coli or yeast produced main products for CO2 fixation through metabolic engineering, such as alcohols, organic acids, fatty acids and lipids, bioplastics, terpenoids, hydrocarbons, and biomass. Future studies on CO2 microbial conversion should focus on improving the efficiency of carbon fixation enzymes, metabolic modules of the carbon sequestration pathway, and intracellular energy utilization. Coupled microbial and electrochemical methods for CO2 fixation, in addition to biological fixation, show considerable promise.

Mini Review **Published Date:- 2023-07-21**

Sea Level Rise Impacts in Coastal Areas and Possible Mitigation Engineering Approaches

Coastal areas are subjected to both natural and man-made actions, leading to a deterioration of coastal structures. Climate change has had a heavy impact on these areas in recent years. An important consequence of these actions is sea level rise. This phenomenon is the most important cause of coastal erosion, a serious problem with ecological, economic, and human health consequences. The countermeasures to contrast this phenomenon and the degradation of the entire coastal system, are represented by engineering interventions. These basically consist of approaches for adaptation to sea level rise, namely protection, retreat, and accommodation. Variations and site adaptation of these actions can involve procedures of no intervention; advancement; protection; retreat; accommodation; and ecosystem-based adaptation. While these procedures have provided coastal benefits and protection, in the long run, they may cause further coastal disruption and further aggravate the situation. Such interventions, therefore, require an accurate assessment of the advantages and disadvantages. However, it is certainly necessary to proceed with actions aimed at mitigating climate change, respecting the rules in a sustainable way.

Research Article **Published Date:- 2023-06-09**

Design and construction of solar-powered smart garbage disposal unit

Cities with developing economies experience exhausted waste collection services, and inadequately managed and uncontrolled dumpsites; which is an ongoing challenge and many struggles due to weak institutions and rapid urbanization. The purpose of the research is to design and construct a smart garbage disposal system using a two-way power supply unit (that is, the electrical power supply unit and solar power supply unit) based on Arduino Nano that utilizes ATMEGA 328p microcontroller. Two pairs of ultrasonic sensors, the pair that faced upward detects the presence of garbage disposal agent at a close distance of (5 - 50) cm and then opens the lid while the other pair faced the inside of the container senses when the container is filled up and then closes the container until it is emptied are used.

Research Article **Published Date:- 2023-05-25**

Understanding RNG Gas Quality through Execution at Newtown Creek WRRF RNG

With each passing year a new record for global emissions is set (1) and policymakers and utility companies must embrace all avenues for decarbonization of energy. Universal adoption of electrification for every building and home by 2050 (2) is not practical, a balance must be struck between an equitable transition to cleaner energy supplies and ensuring uninterrupted, safe delivery of energy to utility customers. Renewable Natual Gas (RNG) is a molecule-for-molecule replacement of traditional geological natural gas with tangible life cycle emissions reductions. California continues to lead the way, initially starting with the low carbon fuel standard (LCFS) which aimed to reduce the carbon intensity of transportation fuel, and subsequently, Senate Bill 1440, which established RNG procurement goals including 12% RNG by 2030 (3). Other States are starting to adopt similar changes such as Oregon's Senate Bill 98 and Colorado's Senate Bill 21-264. As utilities attempt to transition the energy network, they must never compromise system safety and reliability. Recognizing that raw biogas has dangerous levels of contaminants of concern (COC) and must be conditioned to pipeline quality, its important utility companies better understand the methods with which methane is extracted and the testing protocols used to confirm performance. This paper highlights the equipment, processes, and testing regime National Grid and its partner the New York City Department of Environmental Protection (NYC DEP) deployed as part of its Newtown Creek RNG project, which successfully began injecting RNG into the NYC gas distribution network in October 2022.

Short Communication **Published Date:- 2023-04-26**

Determination of the capture efficiency of a direct-flow cyclone

In addition to conventional cyclones, direct-flow cyclones are often used in industry to separate dust and gas systems, despite the fact that in some cases they are inferior to other types of cyclones in their characteristics.

Research Article **Published Date:- 2023-04-13**

Evaluation of factors affecting the quality of luxury residential buildings using the fuzzy BWM method

The construction sector consists of a collection of activities related to buildings and engineering constructions of all kinds. It is the close relationship between this sectors with other economic sectors, which distinguishes it. Therefore, it is an important indicator of the movement of the national economy, but this sector faces major risks, especially in the construction of luxury residential buildings, and these risks may affect the implementation of the project and may lead to increase costs, affect the quality and sometimes delay delivery. This study was carried out to evaluate the factors affecting the quality of luxury residential buildings in Iran using the fuzzy best-worst method (fuzzy BWM). The BWM method provides a consistent structural comparison of factors through best and worst criteria. And this method extended using a fuzzy set to address the ambiguity from the decision-maker's judgment. The evaluation consists of five criteria: Strength and stability, physical comfort and mental peace, visual proportions and beauty, safety, security and environment, and welfare and health. To determine the fuzzy criteria' weights, the nonlinearly constrained optimization problem was applied. The result indicated that the best and the worst criteria were Visual proportions and beauty and welfare and health.

Editorial **Published Date:- 2023-03-24**

Economic feasibility of using agricultural wastes for catalyst development

Resource recovery provides an opportunity to transform limited and abundant materials in form of waste into biobased products. In the production system, this technique could offer an economic means to utilize wastes to generate valuable products which are fundamental to a sustainable economy.

Research Article **Published Date:- 2023-02-14**

Impact of dyes used in the mat on groundwater in and around Pattamadai, Tirunelveli district, Tamilnadu

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The main focus of this study concentrates on evaluating the quality of groundwater in and around the zone of pattamadai where the production of the mat in this region is a landmark industry, which is using dyes in a larger volume. The primary work starts with the collection of water samples from 13 boreholes and 13 hand-dug wells in different time intervals in the month of March 2021, which is a dry season. As per standards the water quality parameters have been evaluated and observed to be within the range. All the physico-chemical parameters for the samples have been studied for boreholes and hand-dug wells as all the values are observed to be within the range and are highlighted in the results.