ENERGY AND CLIMATE
PANORAMA

Assessment of **SOLAR TUBE WELL POTENTIAL** In Balochistan

ABOUT US

Who we are

We are a dedicated team of researchers and experts who recognize the urgent need for action in addressing climate resilience and energy transition in Pakistan. Our mission is to develop and implement effective policies for cleaner, renewable energy sources like solar and wind, aligning with Pakistan's 2030 goal of 30% renewable energy in its electricity mix. As a multidisciplinary team, we leverage expertise in three key disciplines of study—Energy Systems Engineering, Thermal Energy Engineering, and Electrical Power Engineering—to drive our mission forward. We are united by a shared vision of creating a sustainable and resilient future for Pakistan, where cleaner energy sources play a pivotal role in reducing the nation's vulnerability to climate-related challenges.

What we do

We conduct in-depth, evidence-based research to analyze and improve energy policies in Pakistan. Our focus is on advancing renewable energy solutions and engaging stakeholders to ensure effective policy implementation. Our methodology involves a critical examination of current energy policies to pinpoint areas of improvement and formulate strategies for the widespread adoption of renewable energy sources across various levels.

In line with our commitment to fostering sustainable practices, we have established a fellowship program as part of our broader initiatives that aims to facilitate evidence-based research for promoting energy transition in Pakistan. Through research studies, surveys, and forecasting, we plan to assess various aspects of energy transition, including the adoption of renewable energy technologies and their impact on climate change. Our approach involves active engagement with stakeholders to address their concerns and facilitate the effective implementation of policies, fostering the growth of renewable energy manufacturing and marketing facilities.

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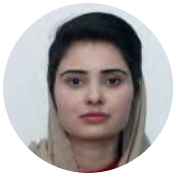

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Executive Summary

Water is a vital resource with diverse applications, supporting livelihoods globally in activities such as household chores, drinking, power generation, and notably, agriculture. In Pakistan, particularly in rural areas like Balochistan, agriculture is a cornerstone of the economy, making water resources crucial. However, conventional electricity generation for agricultural needs contributes to greenhouse gas emissions, prompting a global shift towards renewable energy in line with the Paris Agreement. Balochistan faces the pressing issue of water scarcity, affecting its agriculture-dependent economy. With agriculture contributing significantly to Balochistan's GDP, dwindling water resources hinder productivity. Prolonged droughts, exacerbated by climate change, have led farmers to rely on diesel or electric tube wells, presenting challenges like rising fuel costs and carbon emissions. Despite these challenges, Balochistan's abundant solar energy potential makes it an ideal candidate for transitioning to solar-powered tube wells.

The report evaluates the feasibility of deploying solar-powered tube wells in Gawadar, Balochistan, emphasizing economic and technical considerations. Despite the positive environmental impact, challenges related to governmental policies and sustainable development goals must be addressed. Surveys involving government officials, experts, and local residents are conducted to gather insights into water availability, quality, energy crisis, and the effects of existing solar tube wells. Technical and environmental assessments using RETScreen software reveal that an 8.9KW solar tube well can be economically viable, with a 26.9KW photovoltaic system demonstrating a substantial benefit-cost ratio in off-grid scenarios. Adopting off-grid solar systems not only meets load demand but also significantly reduces greenhouse gas emissions, contributing to a pollution-free operation.

In conclusion, transitioning to solar-powered tube wells in Balochistan presents a promising solution to water scarcity, enhancing agricultural productivity and aligning with environmental sustainability. However, addressing barriers and policy challenges is crucial to fully realizing the potential benefits of this clean energy solution.

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