OPPORTUNITIES AND RISK FACTORS IN CONSTRUCTION OF SOLAR PHOTOVOLTAIC PLANT WITH VENTURE OF PUBLIC PRIVATE PARTNERSHIP.CASE STUDY OF PV PLANT

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Solar is the fastest developing renewable energy technology which can be divided into two types solar Photovoltaic(PV) and solar thermal. Solar PV system converts directly sun light into electricity. This study delineate a 1000 Mega watt (MW) very large scale PV system is designed in three phases, from which 100 MW has started working and the remaining two phases of 300MW and 600 MW has yet to be functional at Quaid-e-Azam Solar park (QSP) in Cholistan desert near Bahawalpur city of Pakistan. This study describes the opportunities and risks in the construction of one of the largest solar PV plant (QSP), which is constructed through public private partnership (3P). 3P used for the purpose that variety of risks including financial, legal, social, political, regulatory, commercial, skills inefficiencies have been shared. This study uses the mixed methodology in which case study is part of the survey, which is conducted by interviews, questionnaire responses from the respondents working at the project. This study finds outs the main opportunities especially in Pakistani context are benchmark practices through largest solar PV plant based on 3P, adoption of barren land, poor pro development, new markets, green growth and play role in supply balances. Furthermore this study also finds out main risk factors in the construction of QSP PV Plant are related to design, site, contractor performance, delay risk, cost overrun, environmental risks and safety risk.

Abstract

Investment in renewable energy (Billion $) by sector, 2016

In this study we used Mixed methodology approach in which case study of ongoing project of Quaid-e-Azam Solar park is a part of survey. So questionnaire based on Meta Literature review for construction related risk factors, interviews with technical managers working in solar PV field.

Methodology

Technical risks during project development are resource estimation, component specifications, system design, testing, installation, transportation. Technical risks during operation phases mainly related to operation and maintenance. Non technical risks are mainly policy environment, political engagement in adopting solar technology, and macroeconomic factors. Construction risks, transmission/distribution line risks. Power purchase agreement pricing risks, insurability, site controls safety.

Result

What is PPP? why their need? Benefits and various arrangements of PPP

Defining of PPP

HM Treasury GOV.UK 2000

3P depict the opportunities associated with variety of partnership arrangements and signify how 3P will deliver real improvements to public services, for mutual benefits of both parties.

Canadian Council for the Public-Private Partnership

As a joint venture between the public and the private sectors depend on the expertise of each partner that best meets clearly defined public needs through the adequate allocation of resources, risks and rewards (CC3P, 2010).

Asian Development Bank,

The term “public-private partnership” describes a range of possible relationships among public and private entities in the context of infrastructure and other services. Other terms used for this type of activity include private sector participation and privatization” (ADB, 2016).

Risk Factors

EaUnremitting source of energy

Human planet needs just 90 minutes to fulfill 1 year energy requirements

China is leading in PV technology

COP21-FRANCE (150 State Heads from the world) (www.cop21.gouv.fr/en/)

PV system price declines of around 75% in less than 10 years (www.iea.com)

Crying need of hour to develop sustainable infrastructure

What is solution? PPP accepted as brand

ch year around 6.5 million premature deaths caused to air pollution

Motivation and back ground of Renewable energy sector worldwide

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Economic Coordination Committee

Public Private Partnerships (3P) engage the financing, development, operation and maintenance of infrastructure.

References


Conclusion

The findings of this study is for all those nations who are adopting PV renewable technologies in situation particularly for Pakistan. Firstly the results techniques, risk mitigation strategies used in this study can be followed as benchmark practices for other developing plants, like adoption of barren land in desert. Furthermore suggestions for policy makers to develop poor community with the growth of new markets. New opportunities for private sector investments with public support. Both cases can be sustained on the ground to improve the condition of energy sector.

References