



## Enhancing solar energy projects in Karnataka: Exploring incentive schemes

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### Abstract

Incentives play a pivotal role in shaping economic landscapes, particularly in regions like Karnataka, India, renowned for their dynamic business ecosystems. This conceptual paper embarks on a journey to dissect the intricate web of incentives in Karnataka, probing their diverse manifestations and implications for economic development. Drawing upon an extensive analysis of incentive schemes spanning various sectors, including IT, manufacturing, and agriculture.

This paper serves as a foundational framework for further research and policy deliberations, offering valuable insights into the evolving landscape of incentives in Karnataka and their pivotal role in shaping its economic trajectory. As Karnataka charts its course towards prosperity, leveraging the potential of incentives emerges as a cornerstone for realizing its aspirations and fostering sustainable growth for all stakeholders.

**Keywords:** Incentives, solar energy project, Karnataka

### Introduction

Renewable energy has emerged as a pivotal component of India's energy strategy, driven by both environmental concerns and the need to enhance energy security. The government of India has instituted a range of incentives and support mechanisms to promote the development and deployment of renewable energy projects across the country. These incentives aim to foster investment, innovation, and sustainable growth in the renewable energy sector while addressing key challenges such as climate change mitigation, energy access, and economic development.

Karnataka, a state in southern India, has emerged as a frontrunner in the adoption and promotion of renewable energy projects. With its progressive policies, supportive regulatory framework, and abundant renewable resources, Karnataka has become a leading destination for renewable energy investment in India. The state government, recognizing the importance of transitioning towards sustainable energy sources, has implemented various incentives to encourage the development of renewable energy projects across the state.

One of the key incentives offered by the Karnataka government is in the form of favorable policies and regulations that facilitate the development and operation of renewable energy projects. The state has introduced a Renewable Energy Policy with the aim of promoting renewable energy generation and achieving energy security. This policy provides various incentives such as exemptions from electricity duty, concessional land allotment, and streamlined approval processes for renewable energy projects. Additionally, the state government offers preferential tariff rates and power purchase agreements (PPAs) to renewable energy developers, ensuring a stable and attractive investment environment.

Furthermore, Karnataka has set ambitious renewable energy targets to increase the share of renewable energy in its energy mix. The state aims to achieve a renewable energy

capacity of 20,000 megawatts (MW) by 2025, with a significant focus on solar and wind power projects. To support this target, Karnataka has introduced incentives such as capital subsidies, interest subsidies, and tax benefits for renewable energy developers. These incentives reduce the financial burden on developers and enhance the viability of renewable energy projects, thereby attracting more investment into the sector.

Another key incentive provided by the Karnataka government is the establishment of dedicated renewable energy parks and zones. These parks offer infrastructure support, including land, transmission facilities, and other amenities, to facilitate the development of renewable energy projects. The state government provides incentives such as preferential land allocation, single-window clearance, and facilitation of power evacuation for projects located within these parks. This initiative not only accelerates the pace of renewable energy development but also creates employment opportunities and promotes local economic growth.

In addition to these incentives, Karnataka has implemented various financing mechanisms to support renewable energy projects. The state government offers financial assistance in the form of grants, soft loans, and subsidies to renewable energy developers. Financial institutions and banks in Karnataka provide customized financing solutions, including project loans, working capital finance, and equipment leasing, to meet the specific requirements of renewable energy projects. Furthermore, Karnataka has partnered with international agencies and financial institutions to access funding through mechanisms such as green bonds, climate funds, and carbon credits, further boosting investment in renewable energy projects. The paper highlights the incentives on solar energy projects in Karnataka.

### Literature Review

Nicole Tryndina., et.al. (2022) The analytical literature on the dynamics of various strategies for promoting renewable

energy is the focus of this review. The article discusses the main forms of green energy incentives, such as carbon taxes, feed-in tariffs, and R&D investments, as well as the obstacles and constraints to these initiatives and the inconsistencies in the renewable energy sector. The dynamics of the strategies used to promote green energy during this time have been discussed. Energy-related factors are examined in this paper, along with the significance of increasing public knowledge of the problem. The evidence gathered through the literature analysis has demonstrated that, despite a great deal of work being done in the field to transition to renewable energy sources, including the implementation of various incentives, contentious issues still need to be addressed and policymakers and economists should pay close attention to them. Government initiatives or the private sector can serve as the foundation for contemporary best practices in the field of green energy subsidies.

Sikandar A Q., et.al. (2021) The availability of fossil fuels is running out, and using them is destroying the ecosystem. This demonstrates the necessity of increasing funding for energy supplies that can supply the world's needs without endangering the environment. Even while clean energy sources like hydropower, wind, and solar are widely accessible and successful, investment in them has been erratic. The delayed uptake of investment in renewable energy projects has been partly attributed to the cost, ease of supply, and technological maturity of oil in certain places. This essay addresses the primary obstacles to investment in the generation of clean energy, identifies important incentives that could expedite the investment process, and looks at a number of essential tactics for the shift from conventional sources.

Gülden Boluk and Ramazan., (2021) The goal is to examine how incentive policies have affected the adoption of renewable energy in Turkey and the member states of the European Union between 2000 and 2018. We compared the outcomes of these two distinct approaches using both the dynamic panel estimation method and the panel fixed effect method. Additionally, we added "net metering," which has never been examined previously, to our policy toolset, which consists of numerous incentives. Our data provides new insights into various renewable energy policies and factors for the countries under analysis, and it covers a longer time period than the earlier research in the literature. The capacity for renewable energy is positively and statistically significantly impacted by grants, R&D, taxes, certification, and policy assistance, whereas direct investments, loans, and net metering instruments have the opposite effect.

### **Incentives for Utility Scale Solar Energy Projects in Karnataka**

#### **▪ JNNISM with Viability Gap Funding Support from NCEF**

It is a financial tool used by governments to support infrastructure projects that are economically viable but may not be financially feasible due to certain constraints. In this case, bidders for a project are selected based on the amount of VGF required for the project. Bidders offering the lowest VGF are given preference. The VGF is limited to either 30% of the project cost or 2.5 crore per MW, whichever is lower. This means that the maximum amount of VGF a project can receive is capped at either 30% of the total

project cost or 2.5 crore per megawatt of installed capacity, depending on which limit is reached first. Solar Energy Corporation of India (SECI) is a government company responsible for implementing various solar energy projects in India. SECI signs Power Purchase Agreements (PPAs) with project developers. A PPA is a contract between the generator of electricity and the purchaser, specifying terms and conditions of the sale of electricity. In this case, SECI signs PPAs with project developers agreeing to purchase the entire power generated by the project for duration of 25 years. The price at which SECI agrees to purchase the power from the project developers is specified in the PPA. In this case, the agreed price is Rs. 5.45 per unit of electricity. Additionally, there's a lower price of Rs. 4.75 per unit for projects that avail accelerated depreciation. Accelerated depreciation is a tax incentive that allows businesses to depreciate their assets at a faster rate than usual.

#### **▪ Scheme for development of solar parks and ultra mega solar power projects**

The scheme aims to promote the development of solar parks and ultra mega solar power projects in India. It provides financial support to project developers to establish these solar parks and projects, thereby increasing the country's solar power generation capacity. Under the scheme, financial support is provided to project developers in the form of Central Financial Assistance (CFA). The CFA is provided at a rate of Rs. 20 lakhs per megawatt (MW) of installed capacity or 30% of the project cost, including grid-connectivity cost, whichever is lower. This means that the project developer can receive financial support up to a maximum of either Rs. 20 lakhs per MW or 30% of the total project cost, including the cost of grid connectivity, depending on which amount is lower.

The financial support aims to make the projects economically viable and encourage their development. In addition to financial support for the development of solar parks and projects, the scheme also provides Central Financial Assistance (CFA) for specific activities related to project development. The CFA provided for these activities is at a fixed rate of Rs. 25.00 lakh per park. This financial support is intended for activities such as the preparation of Detailed Project Reports (DPR), conducting surveys, and other preliminary activities necessary for the development of solar parks.

#### **▪ Scheme for setting up of 1000 MW of Grid-Connected Solar PV Power projects by Central Public Sector Undertakings (CPSUs) under Batch-V of Phase II of JNNISM**

The scheme aims to promote the setting up of grid-connected solar photovoltaic (PV) power projects by Central Public Sector Undertakings (CPSUs) in India. It is part of Phase II of the Jawaharlal Nehru National Solar Mission (JNNISM), a government initiative to promote solar energy in the country. Under the scheme, Viability Gap Funding (VGF) is provided through the Solar Energy Corporation of India (SECI). The VGF is provided at a fixed rate of Rs. 1 crore per megawatt (MW) for projects where domestically produced cells and modules are used. For projects using domestically produced modules only, the VGF is provided at a fixed rate of Rs. 50 lakh per MW.

The VGF is released to the project developers in two tranches:

50% of the VGF is released upon the successful commissioning of the full capacity of the project (Commercial Operation Date - COD).

The balance 50% of the VGF is released after one year of successful operation of the project.

The scheme incentivizes the use of domestically produced solar cells and modules by providing a higher VGF for projects using domestically produced components. This objective aligns with the government's aim to promote domestic manufacturing and reduce dependence on imported components in the solar power sector.

#### ▪ **Operationalization of 300 MW Solar PV Projects by defence establishment and para military forces**

The scheme aims to facilitate the establishment of 300 MW Solar Photovoltaic (PV) Projects by the defence establishment and para-military forces in India. It encourages the participation of these entities in renewable energy generation, contributing to the country's energy security and sustainability goals. The bidders are selected based on their bids for the minimum Viability Gap Funding (VGF) requirement for the project.

Bidders offering the lowest VGF requirement are given preference in the selection process. Additionally, selected bidders must commit to supplying solar power at a specified tariff rate of Rs. 5.50 per kilowatt-hour (KWh) for duration of 25 years.

The scheme defines three categories based on the project capacity, each with its respective upper limit for Viability Gap Funding (VGF).

**Category-I:** For project capacities up to 5 MW.

**Category-II:** For project capacities greater than 5 MW up to 25 MW.

**Category-III:** For project capacities greater than 25 MW. The upper limits of VGF for each category are as follows:

**Category-I:** Rs. 2.5 crore per MW or 30% of the project cost, whichever is lower.

**Category-II:** Rs. 2 crore per MW or 30% of the project cost, whichever is lower.

**Category-III:** Rs. 1.5 crore per MW or 30% of the project cost, whichever is lower.

These upper limits ensure that the amount of VGF provided for each project is within a reasonable range, based on the project's capacity and cost.

#### **Conclusion**

This paper has delved into the intricate landscape of incentives in Karnataka, exploring their multifaceted nature and implications for economic development. Through a thorough examination of various incentive schemes across sectors such as IT, manufacturing, and agriculture, we have uncovered the diverse range of mechanisms employed by the state government to spur investment and innovation.

Furthermore, this paper has underscored the need for continuous refinement and adaptation of incentive frameworks in response to evolving economic trends and challenges. Embracing a holistic approach that integrates incentives with complementary policies such as

infrastructure development, skill enhancement, and regulatory reforms is essential for fostering a conducive business environment and enhancing the competitiveness of Karnataka on the global stage.

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