

# Sustainable Development of Aviation Industry - A Case Study of Cochin International Airport Limited

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**Abstract:** *The study agenda developed is focused on aviation sustainability in its broadest sense, but the innovative solution offered by Cochin International Airport for reducing energy crisis issue in more detail. Green airports are gradually becoming an essential all around the country due to various reasons like a booming traffic, pressure to reduce carbon emissions and for financial and sustainable imperatives. Despite the current economic climate, there are good prospects for air transport growth in the medium term (20-30 years), but environmental issues associated with that growth threaten the longer term sustainability of the industry. At a global level, the fact that aviation climate, change emissions are increasing, and that aircraft will remain a legacy user of carbon fuels and producer of greenhouse gas emissions. At a local level, the environmental costs associated with airport growth like noise and community disturbance, local air quality, habitat destruction and energy usage make it increasingly difficult to secure additional capacity. Aviation is measured as one of the major sources of environmental troubles and a prominent cause of sustainability. In order to solve these problems, sustainable aviation strategy is formed aiming to offer innovative solutions to the challenges facing the aviation industry.*

**Keywords:** Sustainability, Green Airport, Aviation Industry, Public-Private Partnership

## 1. Introduction

Over the past 50 years, aviation has had a major authority upon national and global socio-economic development, patterns of trade, tourism, migration and political alliances. Air transport plays a significant role in the current globalized world, it being one of the primary means of movement of freight and passengers from one angle of the world to the other. India is amid the top five fastest growing countries for plane passengers. In 2015-2016, Indian airports had a total of 223.6 million passenger's almost 55 million international passengers and 169 million domestic ones. Its growth, therefore, in terms of passengers is one of the fastest in the world with an estimated to reach 367 million passengers by 2034, according to a report by International Air Transport Association (IATA).

Green airports are gradually becoming an essential all around the country due to various reasons like a booming traffic, pressure to reduce carbon emissions and for financial and sustainable imperatives. In India, the airports are either managed by Airports Authority of India (AAI) or are managed under Public Private Partnership (PPP). The study agenda developed is focused on aviation sustainability in its broadest sense, but the innovative solution offered by Cochin International Airport for reducing energy crisis issue in more detail.

The first international conference with the objective of analyzing special environmental concerns was held by the United Nations on the Human Environment in Stockholm in 1972. Just after this conference, the Brundtland Commission (1987) laid the foundation for the widespread reference to the idea of sustainable development. Sustainability can be described as development that serves the demands of the present day without compromising the needs of future generations. Two significant conferences related to sustainability was held they are The United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992 and the World Summit on

Sustainable Development (WSSD) convened in Johannesburg in 2002. During that phase, the plan of sustainability outgrew the environmental phase to include socio-economic features. Sustainability is defined by the American Society of Civil Engineers as "A compilation of environmental, social and economic circumstances that permits all the individuals of a community to handle plus improve its standard of living by giving them the same level of viewpoints for the predictable future without degrading the amount, characteristics or the presence of natural, financial and social sources." The Transportation Research Board (TRB) held a seminar in 2005 named "Integrating Sustainability into the Transportation Planning Process" and predicted sustainability as its most fundamental level.

Sustainability in the airport field is not unanimously explained by the aviation society. The Airport Cooperative Research Program (ACRP) explains airport sustainability as "A deeper terminology that involves a large variety of techniques that can be applied to the organization of airports". The Sustainable Aviation Guidance Alliance (SAGA) suggests that airport operators should realize the meaning of sustainability in the context of particular organizations or individuals, keeping in view the distinctive nature of the airport and its community. SAGA declared that sustainability includes vital elements under the "Triple Bottom Line"—Economic Growth, Social Responsibility and Environmental Stewardship. In order to increase the effectiveness of operations airport stakeholders have also started seeking ways to achieve sustainability.

Cochin International Airport Limited (CIAL) is the first Greenfield airport setup in the Public Private Partnership (PPP) model in civil aviation infrastructure sector in India. This is the initial international airfield in India to be built with only a marginal (26%) State and Central Government stake in a public-private partnership (PPP) venture with an outlay of Rs.300 crores. CIAL is the natural outcome of the liberalisation process initiated by the Government of India and the enthusiasm and support the

people have showered upon this project surely makes it a people's project and one of the biggest success stories of democratic India.

Cochin airport has scripted an additional episode in aviation record by becoming the first airfield in the globe that absolutely operates on solar power. The preparation of tapping the green power arises when the power bill and daily consumption of electricity increase to 48,000 units (KWh). Airport, which has always been adhered to the thinking of sustainable development, ventured into the Solar PV sector for the period of March 2013, by installing a 100-kilowatt peak (kWp) solar photovoltaic power station (PV) plant on the roof top of the Arrival Terminal Block. This was a trend setter in the ground of grid-connected solar PV in the State of Kerala. The first plant in the airfield which was installed by The Kolkata based M/s Vikram Solar Pvt. Ltd, with four hundred numbers of polycrystalline modules of 250Wp with five numbers of 20kW capacity Refu-sol make string inverters were used. After the successful commissioning of this plant, Vikram solar Pvt.Ltd installed a 1 MWp solar PV power plant partly on the roof top and partly on the ground in the Aircraft Maintenance Hangar facility. The initial Megawatt scale installation of Solar PV method in the State of Kerala was done by Emvee Photovoltaic Power Pvt. Ltd .it installed the plant with four thousand numbers of monocrystalline modules of 250Wp with thirty- three numbers of 30kW capacity Delta make string inverters were used. Both these plants are prepared with an SCADA system, through which remote monitoring is agreed out. After commissioning, these plants have so far saved more than 550MT of CO<sub>2</sub> emission contributing to the hard work of CIAL towards minimizing environmental deprivation. In order to increase the effectiveness of operations airport stakeholders have also started seeking ways to achieve sustainability.

CIAL is also aiming at modification of production methods where a solar component could be added to every new project. Stimulated by the success of the above plants, CIAL decided to set up a larger scale 12MWp solar PV plant, installed by the Germany based M/s Bosch Ltd, an area of about 45 acres near the International Cargo complex as part of its green initiatives. The plant is equipped with a supervisory control and data acquisition system (SCADA), through which remote monitoring is carried out. Important solar components are manufactured by leading companies like Renesola and ABB India with a capacity of 265 Wp and 1 MW making the total output around 60,000 units. During the day time CIAL operate without the grid of KSEB and only in night it buy back the power from KSEB. One of the important impact is that all the operations in the airport are conducted with the help of solar which technically make the airport absolutely power neutral.

## 2. Environmental Impact

One of the significant green impacts is that solar plant will produce 18 million units of power from sun annually and in future, this green power project will evade carbon dioxide emissions from thermal based power plants by more than 3 lakh metric tonnes, which is correspondent to planting million. Another foremost impact is that the CIAL is looking

forward to emerge as a key contributor in the state's renewable power production sector and company received approval from the state government to set up eight small hydroelectric power stations across the state with a total capacity of 42.61 MW. The company has also paying concern on implements 'canal-top power projects' across the state, introducing sun tracking planetary panels, which can adjust positions in accordance with the sun's movement, as an alternative to the existing stationary solar panels under the name of its subsidiary company CIAL Infrastructures Limited. Thus, CIAL is looking forward to emerging as a key contributor in the state's renewable power production sector.

## 3. Conclusion

Cochin International Airport Ltd (CIAL), which set a model for the rest of the world by becoming the first 'Green Airport,' by tapping solar power to meet its energy requirements and CIAL Infra spent around Rs.7 crores on this unit. This sustainable approach is a must for an airport that consumes around 48,000 units of power a day under the present climatic conditions of Kerala. Now, CIAL will rarely necessitate using energy from the grid, resulting in a saving of Rs. 7-8 lakh per month. This innovative approach is also clearly an answer to the challenges of the near future. In terms of *passenger* movement and travel business, CIAL maintaining the status-quo of being the fourth in terms of international passengers and seventh in terms of total passengers in the country. The airport witnessed an overall increase of 15.06 per cent in passenger traffic during 2016-2017. Kochi records more than 1200 aircraft movements per week and the Airline services at CIAL went up to 61,463 during 2016 as against 56,196 in 2015. Through this green and sustainable expansion technology, Cochin airport transcend a message to the world

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