

**GOVERNMENT OF INDIA  
MINISTRY OF RAILWAYS**

**LOK SABHA  
UNSTARRED QUESTION NO. 5204  
TO BE ANSWERED ON 24.07.2019**

**SOLAR PANELS ON TRAIN ROOFS**

**5204. SHRI BIDYUT BARAN MAHATO:  
SHRI SANJAY SADASHIV RAO MANDLIK:  
SHRI SUDHEER GUPTA:  
SHRI GAJANAN KIRTIKAR:**

**Will the Minister of RAILWAYS be pleased to state:**

- (a) whether the Railways has taken various steps to reduce dependency on fossil fuels and if so, the details thereof;**
- (b) whether the Railways has also installed solar energy panels on the roof of some trains on trial basis;**
- (c) if so, the details thereof and the outcome of such trial;**
- (d) whether the Railways proposes to install the same type of solar energy panels on the roofs of other trains as well and if so, the details thereof, train-wise; and**
- (e) the other measures taken/being taken by the Railways to reduce the dependency on fossil fuels and save energy?**

**ANSWER**

**MINISTER OF RAILWAYS AND COMMERCE & INDUSTRY**

**(SHRI PIYUSH GOYAL)**

**(a) to (e): A Statement is laid on the Table of the House.**

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**STATEMENT REFERRED TO IN REPLY TO PARTS (a) TO (e) OF UNSTARRED QUESTION NO. 5204 BY SHRI BIDYUT BARAN MAHATO, SHRI SANJAY SADASHIV RAO MANDLIK, SHRI SUDHEER GUPTA AND SHRI GAJANAN KIRTIKAR TO BE ANSWERED IN LOK SABHA ON 24.07.2019 REGARDING SOLAR PANELS ON TRAIN ROOFS**

**(a) and (e) Yes, Sir. In order to reduce dependence on fossil fuels, Indian Railways (IR) is following a two pronged strategy which involves sourcing of electrical power from renewable sources and also taking various energy conservation measures to reduce the energy consumption.**

**Indian Railways (IR) is taking the various steps to reduce the dependency on fossil fuels and save energy along with various other Energy efficiency measures taken to reduce carbon footprints, this include the following:**

- Indian Railway has planned to install 1000 Mega Watt (MW) of Solar and 200 MW of wind power plants across its Zonal Railways and Production Units. Till date, Railways have installed about 88 MW of solar power plant and 103 MW of wind power plants.**
- Use of energy efficient 3-Phase technology with regenerative features for electric locomotives, Mainline Electrical Multiple Units (MEMUs), Electrical Multiple Units (EMUs), train sets for better energy efficiency.**
- Introduction of Head On Generation (HOG) system in trains to reduce diesel fuel consumption in power cars.**

- **Provision of energy efficient Light Emitting Diode (LED) lighting in all Railway installations including Railway stations, service buildings, Residential quarters & coaches for reduction in electricity consumption. 100% Railway stations, Service buildings have already been provided with LED lights and about 74% of residential quarters have been provided with 100% LED lights.**
- **Regular energy audits at consumption points - Energy Efficiency studies of six (6) Production Units (PUs) and four (4) Workshops were conducted and upto 15% energy efficiency improvement achieved.**
- **Rail Wheel Factory, Yelahanka, a production unit of IR, has started use of Natural Gas for operation of its furnaces, Two Railway workshops have switched over to the use of CNG in place of industrial gases for metal cutting.**
- **Emphasis on use of 5 Star rated electrical equipments.**
- **Regular training of Loco pilots for use of coasting, regenerative braking features and switching off blowers of electric locos in case yard detention is more than 50 minutes. Similarly, diesel locos are also shut down if expected detention is more than 30 minutes and thereby resulting in reduction of Green House Gases (GHG) emissions.**

- **Trailing locomotive of multi units (MU) hauling empty freight trains are switched off to save energy.**
- **Energy consumption on electric locomotives is regularly monitored through microprocessor based energy meters provided in all the electric locomotives and benchmarking is done based on average energy consumption.**
- **Monitoring the fuel consumption with respect to trip ration of diesel locomotive drivers.**
- **Auxiliary Power Unit (APU) has been provided in 986 diesel locomotives to reduce fuel consumption when locomotive is idle.**
- **Monitoring of idling of diesel locomotives is being done through remote monitoring and management of Locomotives and trains (called as REMMLOT). 2606 locomotives at present are equipped with REMMLOT.**
- **Use of 5% bio-diesel in traction fuel- Blending of bio-diesel with High Speed Diesel (HSD), to the extent of 5%, to save HSD.**
- **20% Compressed Natural Gas (CNG) substitution in DEMUs -CNG usage emits less GHG than liquid fuels. Indian Railways have the distinction of being the only railway in the world to be using CNG run power cars for passenger transportation. IR has started conversion of DEMU Driving Power Car (DPC) into dual fuel mode DEMU/DPC with CNG. 25**

**number of DPCs have been converted and are under operation.**

**(b) to (d) Yes, Sir. Indian Railways have already provided solar panels on roof top of 19 Narrow Gauge coaches on Trains in Kalka-Shimla and Kangra Valley in Northern Railways and 40 Broad Gauge non-air conditioned coaches which are presently in service [13 coaches in train no. 54075/76, 54085/86 of Northern Railway, 7 coaches in train no.12084/83 of Southern Railway and 20 trailer coaches, of Diesel Electrical Multiple Unit (DEMU) (Train nos.11137/38-6 coaches, 11133/34-8 coaches, and 6 coaches in other passenger trains)]. Also roof top solar panels have been provided on 50 nos. of Goods Guard Brake Vans to supply electricity for fan, light and a charging point for the Guards.**

**Solar system works during sunlight and generates battery backup of approx. 4 to 5 hours. System does not work properly during fog/rain and winter season and battery backup goes down to 2 to 3 hours depending upon weather condition. Solar panels on train rooftops requires very frequent cleaning as lot of dust gets deposited during to movement of trains. Also, Solar power generation is maximum if the panels are directly exposed to sun light. Solar power generation in moving train is less due to frequent changes in direction, shadow of trees and fixed structures along the track. Moreover, the generation will depend lot on terrain and there will be Zero generation**

**during night hours. The weight of Solar panels on coach rooftops is an additional constraint. Hence, the provision of Solar panels on rooftop of train coaches is presently under experimental stage and hence not considered for installation on all train coaches.**

**Railways have taken decision to provide solar panel on roof top of 10 coaches in 1 Train of day running intercity train, 50 coaches of 3 number of passenger trains and 50% Narrow Gauge coaches plying on Pathankot-Joginder Nagar route in Kangra Valley section and Kalka-Shimla section of Northern Railway for conducting extended trials.**

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