GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

LOK SABHA
UNSTARRED QUESTION NO.2483
TO BE ANSWERED ON 26.12.2018

ENERGY CONSUMPTION

2483. SHRIMATI DARSHANA VIKRAM JARDOSH:

Will the Minister of RAILWAYS be pleased to state:

(a) the steps taken by the Railways to minimise use of fuel and bring energy efficiency with a view to cut down cost of operations;
(b) whether such steps have yielded results in terms of energy/monetary savings and if so, the details thereof;
(c) the details of energy consumption during the last one year, division-wise; and
(d) whether the Railways have charted out a plan to expand use of solar energy in its system, if so, the details thereof and the time by when it would be feasible to be used in train operations also?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF RAILWAYS

(SHRI RAJEN GOHAIN)

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

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STATEMENT REFERRED TO IN REPLY TO PARTS (a) TO (d) OF UNSTARRED QUESTION NO. 2483 BY SHRIMATI DARSHANA VIKRAM JARDOSH TO BE ANSWERED IN LOK SABHA ON 26.12.2018 REGARDING ENERGY CONSUMPTION

(a) The steps taken by the Railways to minimise use of fuel and bring energy efficiency with a view to cut down cost of operations are as under -

i. **Zonal Railways have been advised to reduce minimum inventories of all major RCDs from 15 to 5 days.**
ii. **Use of blended High Speed Diesel (HSD) with 5% of B-100 Biodiesel has been started for Diesel Locomotives.**
iii. **Zonal Railways have been advised to review trip ration properly to tighten the slack trip rationing.**
iv. **The performance of loco pilots is being monitored regularly. List of bad & good runners are being identified on the basis of fuel consumption vis-a-vis trip ration. Bad runners are being counseled & monitored by loco inspectors. Monitoring of Loco Pilots using dynamic brakes and performing coasting according to the topography are being done.**
v. **To avoid idle running of the Engine of Diesel locomotive, a JPO has been jointly issued at Railway Board level with operating department and accordingly at Zonal Railways level also for shutting down of diesel locos in case of idling of the locomotive.**
vi. **Zonal Railways have been advised to rationalize fuelling pattern based on landed price of HSD oil. The cheaper RCDs are fuelling more to diesel locomotive to avoid fuelling at costlier location of RCDs.**
vii. **All Overaged WDM2 locos have been withdrawn from mainline service.**

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viii. Conversion of Driving Power Car (DPC) of Diesel Electric Multiple Unit DEMU trains in dual fuel (Diesel + LNG/CNG) mode has been started to use CNG in place of HSD.

ix. Auxiliary Power Unit has been introduced in Diesel locos for automatic shutting down of the diesel locomotive while standing idle.

x. Common Rail electronic Direct Injection (CReDI) system has been developed and are being fitted in Diesel Locomotive.

xi. Miller cycle based turbochargers and Variable Turbine Geometry (VTG) Turbochargers to achieve fuel efficiency is at development stage.

(b) Yes, Madam. expected positive results yielded are as under:-

i. 4 % saving in fuel consumption has been realized at Eng Test Bed with the use of CReDI on ALCo locomotive engine and 2.5% saving in fuel consumption on HHP locomotives.

ii. Approx. 23 nos. of DPCs have been converted and running in dual fuel (Diesel + CNG) Mode. Diesel displacement of upto 20% has been achieved.

iii. Reliability verification testing of Miller cycle based turbocharger has been completed in field. Approx. 2% fuel saving and 20% reduction in NOx is expected by use of miller cycle based turbocharger. Performance evaluation on engine test bed is scheduled in next month.

iv. Variable turbine geometry (VTG) turbocharger has been fitted on a WDG3A loco and 2.5% fuel saving (approx.) has been realized on test bed.

(c) Yes, Madam. The details of energy consumption during the last one year, division-wise are as under:-

Energy consumption for Diesel Traction

S.N	ZONAL RAILWAY	DIVISION	2017-18(April 17-March 18)	2018-19 (April 18-October 18)
			Fuel Consumption (in KLs)	Fuel Consumption (in KLs)
1	Central Railway	Bhusawal	41432	26059
		Mumbai CST	50187	36917
		Nagpur	9857	4587
		Pune	57976	42809
		Solapur	89239	56846
		Total	248691	167218
2	East Coast Railway	Khurda Road	35911	26677
		Waltair	85042	60260
		Sambhalpur	55743	37585
		Total	176696	124522
3	East Central Railway	Dhanbad	50317	36726
		Danapur	11426	8232
		Mughalsarai	51242	34259
		Sonpur	46742	31093
		Samastipur	24089	16571
		Total	183816	126881
4	Eastern Railway	Asansol	22541	13389
		Howrah	35918	24005
		Sealdah	11108	8113
		Malda	59835	42269
		Total	129402	87776
5	North Central Railway	Agra	8945	5525
		Allahabad	42954	31148
		Jhansi	40508	26688
		Total	92407	63361
6	North Eastern Railway	Varanasi	34829	18183
		Lucknow	71986	44770
		Izzatnagar	24839	16004
		Total	131654	78957
7	Northeast Frontier Railway	Katihar	95351	66974
		Rangiya	28102	20811
		Lumding	78249	55936
		Tinsukia	15836	12539
		Total	217538	156260

8	Northern Railway	Delhi	115361	81352
		Firozpur	51968	35261
		Lucknow	106434	75441
		Moradabad	68828	48009
		Ambala	74700	51952
		Total	417291	292015
9	North Western Railway	Jaipur	141980	94254
		Ajmer	69416	49138
		Bikaner	45774	28733
		Jodhpur	85192	59936
		Total	342363	232061
10	South Central Railway	Vijayawada	25574	17014
		Guntur	20663	13442
		Guntakal	98070	68461
		Hyderabad	34311	31980
		Secunderabad	72687	53266
		Nanded	39330	24036
		Total	290635	208199
11	South East Central Railway	Bilaspur	22068	14703
		Nagpur	10941	6061
		Raipur	29738	18330
		Total	62747	39094
12	South Eastern Railway	Adra	5683	3683
		Chakradharpur	21793	14238
		Kharagpur	8359	5700
		Ranchi	7050	3414
		Total	42885	27035
13	Southern Railway	Chennai	4825	3284
		Madurai	27100	17055
		Palakkad	48346	25927
		Salem	22002	12131
		Tiruchchirappalli	35359	26094
		Thiruvananthapuram	13980	10011
		Total	151612	94502
14	South Western Railway	Bengaluru	71829	48061
		Hubballi	102468	65884
		Mysuru	43959	28634
		Total	218256	142579
15	West Central Railway	Bhopal	64784	34599
		Jabalpur	82804	61977
		Kota	8427	5791
		Total	156015	102367

16	Western Railway	Ahmedabad	112986	79555
		Mumbai	2534	1735
		Vadodara	15763	10934
		Ratlam	37580	27729
		Rajkot	21380	15059
		Bhavnagar	25531	17037
		Total	215774	152049
		GRAND TOTAL	3077782	2094876

Energy consumption for Electric Traction

S.N	RAILWAYS	DIVISION	2017-18(April 17-March 18)	2018-19 (April 18-October 18)
			Energy Consumption (in Million Unit)	Energy Consumption (in Million Unit)
1	Central Railway	Bhusawal	575.89	362.87
		Mumbai CST	739.14	444.28
		Nagpur	570.63	343.69
		Pune	7.07	4.48
		Solapur	47.11	32.10
		Total	1939.84	1187.42
2	East Coast Railway	Khurda Road	679.28	393.96
		Waltair	443.13	270.15
		Sambhalpur	1.77	5.63
		Total	1124.18	669.74
3	East Central Railway	Dhanbad	466.70	275.79
		Danapur	253.32	164.01
		Mughalsarai	340.03	205.45
		Sonpur	63.70	48.24
		Samastipur	0.00	0.00
		Total	1123.75	693.49
4	Eastern Railway	Asansol	256.56	144.76
		Howrah	403.72	236.86
		Sealdah	371.62	215.54
		Malda	0.00	0.00
		Total	1031.90	597.16

5	North Central Railway	Agra	270.77	170.38
		Allahabad	985.16	606.92
		Jhansi	416.57	261.98
		Total	1672.50	1039.28
6	North Eastern Railway	Varanasi	34.03	30.61
		Lucknow	92.77	59.15
		Izzatnagar	0.00	0.00
		Total	126.80	89.76
7	Northeast Frontier Railway	Katihar	6.84	6.25
		Alipurduar	0.00	0.00
		Rangiya	0.00	0.00
		Lumding	0.00	0.00
		Tinsukia	0.00	0.00
		Total	6.84	6.25
8	Northern Railway	Delhi	420.69	208.01
		Firozpur	148.29	97.83
		Lucknow	133.81	102.44
		Moradabad	183.55	129.17
		Ambala	123.75	80.14
		Total	1010.09	617.58
9	North Western Railway	Jaipur	3.44	2.14
		Ajmer	0.00	0.75
		Bikaner	0.00	0.00
		Jodhpur	0.00	0.00
		Total	3.44	2.89
10	South Central Railway	Vijayawada	685.02	465.11
		Guntur	17.41	17.91
		Guntakal	248.42	225.69
		Hyderabad	7.42	5.19
		Secunderabad	654.41	473.99
		Nanded	0.00	0.00
		Total	1612.68	1187.89
11	South East Central Railway	Bilaspur	754.14	456.52
		Nagpur	297.94	193.89
		Raipur	213.59	130.20
		Total	1265.67	780.61
12	South Eastern Railway	Adra	221.34	133.55
		Chakradharpur	687.06	399.44
		Kharagpur	556.39	325.71
		Ranchi	156.07	103.12
		Total	1620.86	961.82

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13	Southern Railway	Chennai	570.21	351.28
		Madurai	46.63	33.35
		Palakkad	102.74	82.11
		Salem	194.16	125.55
		Tiruchchirappalli	69.90	43.97
		Thiruvananthapuram	178.32	104.55
		Total	1161.96	740.80
14	South Western Railway	Bengaluru	113.87	80.93
		Hubballi	0.00	0.00
		Mysuru	0.00	0.00
		Total	113.87	80.93
15	West Central Railway	Bhopal	541.84	312.23
		Jabalpur	200.53	130.25
		Kota	425.32	268.47
		Total	1167.69	710.95
16	Western Railway	Ahmedabad	17.41	10.65
		Mumbai	778.54	469.97
		Vadodara	347.04	216.90
		Ratlam	392.07	242.80
		Rajkot	0.00	0.00
		Bhavnagar	0.00	0.00
		Total	1535.06	940.32
GRAND TOTAL			16517.13	10306.88

(d) Details of plan for use of solar energy are as under:-

(i) Indian Railways has plans to set up 1000 MW solar power plants by 2020-21 across Zonal Railways & Production Units. Feasibility of using solar power for train operations is presently under study, as no readymade solutions are available presently for using solar power for 25,000 volts, single phase traction purpose.

(ii) In Passenger Trains Solar Panels on trial basis has been fitted on the roof top of 06 Nos. Trailer Coaches (TC) of Diesel Electric Multiple Unit (DEMU) at ICF/Chennai presently working at Diesel Shed/Shakurbasti and TCs of DEMU at diesel Shed/Jamalpur. Solar panels have been installed on 10 nos Exhibition Coaches of Swachhata Express.

(iii) **Further there are sanction Provision of solar panels on 250 nos. TC of DEMUs, fitment of solar panels on 250 DEMU TC coaches and provision of solar energy in 30 DEMU coaches.**

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