

Government of Jammu and Kashmir
Industries and Commerce Department
Civil Secretariat Jammu/Srinagar.

Subject;- Jammu and Kashmir Pet-Coke Furnace Oil Policy.

Government Order No. 170 -IND of 2020
Dated. 23 - 11.2020

Sanction is hereby accorded to the adoption of Pet Coke & Furnace Oil Policy in the Union Territory of Jammu and Kashmir forming Annexure to this Government Order for its implementation with immediate effect.

By Order of the Government of Jammu and Kashmir.

Sd/-
(Manoj Kumar Dwivedi) IAS
Commissioner/Secretary to the Government
Industries and Commerce Department

No.IND/Legal-30/2020

Dated. 23 11.2020

Copy to the;-

1. All Financial Commissioners.
2. Director General of Police, J&K
3. All Principal Secretaries to the Government.
4. Principal Secretary to the Hon'ble Lieutenant Governor.
5. Principal Resident Commissioner, 5-Prithvi Raj Road, New Delhi.
6. Joint Secretary (J&K), Ministry of Home Affairs, Government of India, New Delhi.
7. All Commissioner/Secretaries to the Government.
8. Divisional Commissioner Kashmir/Jammu.
9. Chairman J&K State Pollution Control Board for information and necessary action.
10. Director Information, J&K.

11. All District Development Commissioners.
12. All Head of Department/Managing Directors/CEO of State PSUs/Autonomous Bodies/Societies.
13. Director Archives, Archaeology and Museums.
14. Director Industries and Commerce Jammu/Srinagar.
15. Managing Director J&K SIDCO/SICOP.
16. General Manager, Government Press Srinagar/Jammu.
17. Private Secretary to Hon'ble Advisor (S)/(F)/(B)/&(BK) to the Lieutenant Governor.
18. Private Secretary to the Chief Secretary.
19. Pvt. Secretary to the Ld. Advocate General, J&K High Court Srinagar/Jammu.
20. Private Secretary to the Commissioner/Secretary to the Government General Administration Department.
21. Private Secretary to the Commissioner/Secretary to the Government Industries and Commerce Department.
22. Incharge Website, Industries and Commerce Department
23. Government Order file/Stock file (2.wsc).


(Aadil Fareed)
Deputy Secretary to the Government


18.11.2020

Annexure to Government Order No. 170 - IND of 2020 DT. 23 11.2020.

Pet Coke & Furnace Oil Policy

UT Of Jammu & Kashmir

**Department of Industries & Commerce
Government of Jammu & Kashmir**

**In consultation with
Pollution Control Board Jammu and Kashmir**

Date 2020

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BACKGROUND

The Hon'ble Supreme Court in the matter titled as *M.C. Mehta Versus Union of India & Ors.* in Writ Petition (s) (Civil) No. 13029/1985 passed an order directing that **since the State Governments of UP, Haryana and Rajasthan have no objection and they have not taken any positive action, keeping the pollution level in NCR and particularly in Delhi, we have no option but to place a ban on use of Furnace Oil and Pet-Coke in the States of UP, Haryana and Rajasthan. The ban will come into effect from 1st November, 2017. We expect the State Governments to issue appropriate notification immediately. Even if they do not issue such notification then in compliance with the order of this Court, the ban will take effect from 1st November, 2017 in any case.**

Also the Hon'ble National Green Tribunal observed in OA No. 67/2019 titled as *Sumit Kumar Versus State of HP & Ors. with Amarjeet Kumar Versus Union of India & Ors.*, **Accordingly, the response has been received vide e-mail dated 15.02.2019 from the CPCB. The conclusion therein is as follows: "Considering the various directions and orders of Hon'ble Supreme Court regarding use of Pet-Coke and Furnace Oil (FO) containing higher sulphur, it is required that States and UTs, including Himachal Pradesh, formulate fuel policies regarding use of Pet-Coke and FO in light of Hon'ble Supreme Court order dated 24.10.2017 (banning use of Pet-Coke and FO in NCR States) and observing vide order dated 17.11.2017 that States/UTs are suggested to take similar measures. Also further Hon'ble Supreme Court order dated 13.12.2017, 05.02.2018 and 26.07.2017 allowing use of Pet-Coke in industries/processes which use Pet-Coke and FO either as feed stock such as Calcined Pet Coke (CPC) units, Aluminum industries or where they get absorbed along with product in manufacturing process such as Cement, Lime Kiln, Calcium Carbide Industries. It is relevant to mention that use of Raw Petroleum Coke (RPC) in CPC units has been allowed with condition of 90% recovery of SO₂ emission. The same principal may be followed in industrial processes where use of FO as feed stock is considered by States/UTs."**

The reason for the above conclusion is huge emission of SO₂ and other pollutants on account of use of *Pet-Coke* and *FO* by the industries which has been banned in several States but continuing in some of the States. A Technical Expert Committee was constituted to evaluate pollution load and as

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per the report of the said Committee, pollution load of SO₂ is four times higher when Low Sulphur Heavy Stock (LSHS) and LDO (Light Diesel Oil) are used.

Hon'ble NGT further observed that on consideration of the matter, we find that in view of established adverse impact of use of **Pet-Coke** and **FO** by the industries, prohibition of its use may need consideration on 'Precautionary' principle as well as 'Sustainable Development' principle statutorily recognized under the National Green Tribunal Act, 2010, the industries may have to switch over to alternatives and cleaner fuels. We may note that air quality in many of the locations in India is not of prescribed quality and as many as 102 cities have been identified as "Non-attainment Cities". The said cities are spread over almost in all the States, including the State of Himachal Pradesh. 100 industrial clusters are declared critically polluted throughout India. This makes it imperative that any measure which is helpful in controlling air pollution must be preferred to the extent viable. These aspects have been considered by the Tribunal in order dated 08.10.2018 in O.A No. 681 of 2018 in News Item published in "The Times of India" Authored by Shri Vishwa Mohan Titled "NCAP with multiple timelines to clean air in 102 cities to be released around August 15" and order dated 13.12.2018 in Original Application No. 1038/2018 in News Item published in "The Asian Age" Authored by Sanjay Kaw Titled "CPCB to rank industrial units on pollution levels" respectively."

In the backdrop of aforesaid, it has been concluded that prohibition of use of **Pet-Coke** and Furnace oil need serious consideration by the Government of Jammu & Kashmir. Accordingly, the JKTPo has collected data on all aspects related to **Pet-Coke** and Furnace oil which has been elaborated herein followed by recommendations by Pollution Control Board Jammu and Kashmir for use of **Pet-Coke and** Furnace oil in the UT of Jammu & Kashmir.

JAMMU & KASHMIR AT A GLANCE

Jammu and Kashmir is newly formed Union Territory of Indian Union created under the Jammu and Kashmir Reorganization Act, 2019 on 31st October 2019. The Union Territory (erstwhile Jammu and Kashmir State) has made substantial progress in Industrial development over the last decades. The area of J&K is 2,22,236 square kilometers with a population of 1.25 Crores.

Srinagar is the summer capital of Jammu and Kashmir from May to October and Jammu in winter from November to April.

Department of Industry & Commerce, Government of Jammu and Kashmir is responsible for all round industrial development of the Union Territory (UT). It acts as a catalyst to modernize & strengthen the industrial units to make them globally competitive.

While creating an enabling work environment for industrial development, the policy emphasizes on pollution and environmental safe guards to ensure ecological stability and sustainable development.

Pet Coke is utilized as raw material/ fuel in Cement Industries and POP units of Jammu & Kashmir. However, Furnace oil is used in Furnaces of different steel Plants, Power plants and boilers as fuel in Jammu Division. This oil is mainly used in different furnaces of steel plants, power plants and boilers for raising steam and for injection in the blast furnace, and no such unit including calcium carbide unit exists in Kashmir Division excepting rolling steel units.

2. FUEL

Polluting fuels such as Petroleum Coke (PC) and Furnace Oil (FO) are used by industrial units, especially the Small and Medium-Sized Enterprises (SMEs). Even some categories of waste such as tyres, oils and used lubricants are used as source of energy in some industrial units.

2.1 PET COKE (PC)

Petroleum coke, abbreviated coke or petcoke, is a final carbon-rich solid material which is derived from oil refining, and is one type of the group of fuels referred to as cokes. This coke can either be fuel grade (high in sulfur and metals) or anode grade (low in sulfur and metals). Pet-Coke is over 80% Carbon and emits 5% to 10% more Carbon Dioxide (CO₂) than Coal on a per unit-of-energy basis when it is burned.

Heavier oils are naturally higher in their carbon content, creating challenges in production, refining, transport, and marketing. The heavier the oil, the more Pet-Coke produced. The higher oil's sulfur and heavy metal content, the lower the Pet-Coke's quality and value, while Pet-Coke that is low in sulfur and heavy metals can be treated (Calcined).

2.2 FURNACE OIL (FO)

Fuel oil (also known as heavy oil, marine fuel or furnace oil) is a fraction obtained from petroleum distillation, either as a distillate or a residue. Fuel oil is made of long hydrocarbon chains, particularly alkanes, cycloalkanes and aromatics.

Furnace oil is used mainly in different furnaces of the steel plant, in power plant boilers for raising steam and for injection in the blast furnace. A water based scrubber is used in the exhaust chimney of furnace, which arrests considerable amount of carbon soot and improves the emissions. It has Ash, % wt., max (0.1) and Sulphur, total %wt., max. (4.0).

3. INDUSTRIAL AREAS IN JAMMU & KASHMIR

The department of Industries and Commerce has 53 existing Industrial estates in the UT of Jammu & Kashmir under the control of Directorate of Industries and Commerce and SIDCO/SICOP. These Industrial Estates are spread over an area of 31, 335 kanals. As of now 29,449 Small Scale units were registered in the UT of Jammu & Kashmir in addition, 83 large and medium enterprises.

3.1 INDUSTRIES USING PET COKE & FURNACE OIL IN JAMMU

District Wise data of Jammu

Sno	Name of District	No. of Units	Line of activity	Assessed Capacity	
				Pet Coke (K.L.)	Furnace oil (K.L.)
1	Udhampur	07 units	Cement	24921.495	Nil
2	Samba	15 unit	Cement/ POP/ Metal/ Paints	49476.800	6800.000
3	Kathua	27 units	Cement/ Lead/ Paper/ TOR steel	176818.150	74733.650
4	Jammu	27 unit	Cement/ Lead/ Paper/ TOR steel/ POP/ Potato Chips/ Hajmola Tablets/ Mosquito Repellant Coil/ G.I & M.S pipes/ PVC Shoes/ Cocoa and Cocoa products/ Printing/ Unprinted Embossed/ unembossed Metalised/ M.s	45274.000	81362.000

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			Round/ M.S Flat etc.		
5	Rajouri	Nil	Nil	Nil	Nil
6	Poonch	Nil	Nil	Nil	Nil
7	Reasi	Nil	Nil	Nil	Nil
8	Ramban	Nil	Nil	Nil	Nil
9	Doda	Nil	Nil	Nil	Nil
10	kishtawar	Nil	Nil	Nil	Nil

3.2 INDUSTRIES USING PET COKE & FURNACE OIL IN KASHMIR

District Wise data of Kashmir

Sno	Name of District	N1o. of Units	Line of activity	Name of fuel/ raw material	Assessed capacity (Quantity in MTs Per annum)
1	Srinagar	02 units	OPC (other Portland cement)	Petcoke	1,87,238,700 MTs
2	Budgam	01 unit	Steel Rolling Mill	Furnace Oil	3000 MTs
3	Pulwama	06 units	OPC (other Portland cement)	Petcoke	70,000 MTs
4	Anantnag	01 unit	OPC (other Portland cement)	Petcoke	6000 MTs
5	Baramulla	Nil	Nil	Nil	Nil
6	Kulgam	Nil	Nil	Nil	Nil
7	Ganderbal	Nil	Nil	Nil	Nil
8	Bandipora	Nil	Nil	Nil	Nil
9	Kupwara	Nil	Nil	Nil	Nil
10	Shopian	Nil	Nil	Nil	Nil

4. Environmental Data [Air Quality Status Jammu & Kashmir]

The Environmental Data of emission levels of RSPM, SPM, SO₂ and NO₂ in respect of various cities of Jammu & Kashmir for the last few years is given in the Tables below.

Ambient Air Quality Status of Jammu City & Kathua during the last three Years 2014-15 to 2016-17.

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Yearly Annual Average & Standard Limits

Year →		Area	2014-15				2015-16				2016-17			
S. No	Monitoring Location		RSPM	SPM	SO ₂	NO ₂	RSPM	SPM	SO ₂	NO ₂	RSPM	SPM	SO ₂	NO ₂
			60 (µg/m ³)	150 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)	60 (µg/m ³)	150 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)	60 (µg/m ³)	150 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)
1	SPCB-Office complex Narwal, Jammu	R	132	238	3.2	14	123	218	3.0	15.0	137	255	3.24	17.6
2	MAM, Stadium, Jewel chowk, Jammu	R	127	234	3.5	15	122	217	3.1	15.9	133	244	3.52	16.7
3	Bari-Brahmna, Ind.area.	I	126	238	4.8	16	125	222	4.2	16.8	136	247	4	18.4
4	Industrial Area Kathua (SPCB Station).	I	139	270	4.2	7.2	145	277	3.5	6.6	153	308	4.0	7.46

Ambient Air Quality Status of Bari-Brahmna monitoring Station (Industrial Estate) during the Last five Years 2014 to 2018-19

Yearly Annual Average & Standard Limits

		Area	2014-15				2015-16				2016-17				2017-18				2018-19			
S. No	Monitoring Locations		RSPM	SPM	SO ₂	NO ₂	RSPM	SPM	SO ₂	NO ₂	RSPM	SPM	SO ₂	NO ₂	RSPM	PM _{2.5}	SO ₂	NO ₂	RSPM	PM _{2.5}	SO ₂	NO ₂
			60 (µg/m ³)	150 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)	60 (µg/m ³)	150 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)	60 (µg/m ³)	150 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)	60 (µg/m ³)	40 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)	60 (µg/m ³)	40 (µg/m ³)	50 (µg/m ³)	40 (µg/m ³)
1	Bari-Brahmna, Industrial Area	I	126	238	4.8	16	125	222	4.2	16.8	136	247	4	18.4	153	43	4.2	19.6	152	38.7	3.85	17.0

Ambient Air Quality Status of Kathua monitoring Station (Industrial

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Estate) during the Last five Years 2014 to 2018-19
Yearly Annual Average & Standard Limits

S. No	Monitoring Locations	Area	2014-15				2015-16				2016-17				2017-18				2018-19			
			RS PM	SP M	SO 2	NO 2	RS PM	SP M	SO 2	NO 2	RS PM	SP M	SO 2	NO 2	RS PM	SP M	SO 2	NO 2	RS PM	SP M	SO 2	NO 2
			60 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)	40 ($\mu\text{g}/\text{m}^3$)	60 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)	40 ($\mu\text{g}/\text{m}^3$)	60 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)	40 ($\mu\text{g}/\text{m}^3$)	60 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)	40 ($\mu\text{g}/\text{m}^3$)	60 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)	50 ($\mu\text{g}/\text{m}^3$)	40 ($\mu\text{g}/\text{m}^3$)
1	Industrial Area Kathua (SPCB Station).	I	139	270	4.2	7.2	145	277	3.5	6.6	153	308	4.0	7.4	146	294	4.23	8.18	185	346	4.97	16.69

Ambient Air Quality Status of Jammu City on the basis NAMP Monitoring during Last five Years 2015-16 to 2019-20 (Annual Average)

S.No	Pollutant	2015-16	2016-17	2017-18	2018-19	2019-20	Annual Std Limits ($\mu\text{g}/\text{m}^3$)
1	RSPM(PM10) ($\mu\text{g}/\text{m}^3$)	123	135	157	153	144 (Till Jan-2020)	60
2	PM2.5 ($\mu\text{g}/\text{m}^3$)	-	-	47.5	40	35	40
3	SO2 ($\mu\text{g}/\text{m}^3$)	3.43	3.6	4.0	3.8	3.2	50
4	NO2 ($\mu\text{g}/\text{m}^3$)	16.0	17.6	18.2	17.2	17.3	40

Ambient Air Quality Status of Jammu City on the basis NAMP Monitoring during Last three Years 2017-18 to 2019-20 (Annual Average)

S.No	Pollutant	2017-18	2018-19	2019-20	Annual Std Limits ($\mu\text{g}/\text{m}^3$)
1	RSPM(PM10) ($\mu\text{g}/\text{m}^3$)	157	153	144 (Till Jan-2020)	60

2	PM2.5 ($\mu\text{g}/\text{m}^3$)	47.5	40	35	40
3	SO2 ($\mu\text{g}/\text{m}^3$)	4.0	3.8	3.2	50
4	NO2 ($\mu\text{g}/\text{m}^3$)	18.2	17.2	17.3	40

Ambient Air Quality Status of Srinagar City on the basis NAMP Monitoring during Last five Years 2017-18 to 2019-20 (Annual Average)s

S.No	Pollutant	2015-16	2016-17	2017-18	2018-19	2019-20	Annual Std Limits ($\mu\text{g}/\text{m}^3$)
1	RSPM(PM10) ($\mu\text{g}/\text{m}^3$)	116	96	130.4	154	100 (Till Jan-2020)	60
2	PM2.5 ($\mu\text{g}/\text{m}^3$)	-	-	-	64.3	56.07	40
3	SO2 ($\mu\text{g}/\text{m}^3$)	-	-	-	-	-	50
4	NO2 ($\mu\text{g}/\text{m}^3$)	-	-	-	-	-	40

Ambient Air Quality Status of Srinagar City on the basis NAMP Monitoring during Last five Years 2017-18 to 2019-20 (Annual Average)s

S.No	Pollutant	2017-18	2018-19	2019-20	Annual Std Limits ($\mu\text{g}/\text{m}^3$)
1	RSPM(PM10) ($\mu\text{g}/\text{m}^3$)	130.4	154	100 (Till Jan-2020)	60
2	PM2.5 ($\mu\text{g}/\text{m}^3$)	-	64.3	56.07	40

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3	SO ₂ (µg/m ³)	-	-	-	50
4	NO ₂ (µg/m ³)	-	-	-	40

Ambient Air Quality Status of Khonmoh (Srinagar) monitoring Station during the Last four Years 2014 to 2018-19

Annual average of Air Pollutant (PM₁₀ in µg/m³) at two monitoring locations, at Rajbagh and Khonmoh locations in Srinagar

Year	Khonmoh(Srinagar)
2015	127.3
2016	110.2
2017	171.8
2018	186.2

4.1 CONCLUSION-EMISSION RESULTS

The level of RSPM evaluated on monitoring during last few years exceeded the standard permissible limits, there is almost increase of these pollutants in ambient air because of so many intrinsic reasons like vehicular emissions, industrial, civil construction works, etc. The monitoring results of gaseous pollutants (SO₂/NO₂) are with-in standard limits.

5. CPCB-Report of the Technical Expert Committee (TEC) to evaluate pollution load of Pet-Coke Vs. Possible Alternatives Emission load for Industrial Boilers

The estimated Particulate Matter (PM) and SO₂ emission loads for Pet-Coke, Coal, Natural Gas, FO, Low Sulphur Heavy Stock (LSHS) & Light Diesel Oil (LDO) from 2, 10, 15 and 40 Tonnes per hour steam generating capacity Boilers are given in **Table-V** below. The emission load in respect to PM (primary and secondary) and SO₂ is much less in industrial Boilers compared to Thermal Power Plants. However, reduction in pollution load using alternative fuels such as Coal, LSHS, LDO and Natural gas instead of Pet-Coke would be proportionately same as in case of Thermal Power Plants.

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For a 40 TPH Boiler, the fuel consumption is calculated as follows; $FC = [SP * (hs - hw) / (BE \& VHI)]$

Where:

FC = Fuel consumption

SP = Steam Produced (T/hr)

hs = Enthalpy of feed water @ required pressure (810.1 Kcal / kg at 67 atm pressure & 490° C) hw = Enthalpy of feed water @ saturation temperature (132 k Cal/kg)

BE = Boiler efficiency (82%

assumed) VHI = Fuel

Heating Valve (GCV)

Boiler Capacity : 2 TPH						
Pollutant	Pet coke	Coal	Natural Gas	FO	LSHS	LDO
Fuel consumption	4.96	9.92	-	3.97	3.77	3.71
Uncontrolled Emission						
SO ₂ emission	0.66	0.09	NM	0.34	0.9	0.13
Secondary Particulate emission as (NH ₄) ₂ SO ₄	1.36	0.19	NM	0.698	0.18	0.26
Primary PM emission	0.04	3.17	NM	0.03	NM	NM
Total PM emission load (Primary + Secondary)	1.40	3.36	NM	0.728	0.18	0.26
Controlled Emission						
Scenario 1: Assuming 50% removal efficiency of control system for SO ₂ and 70% for PM (coal & petcoke)						
SO ₂ emission	0.33	0.05	NM	0.36	0.9	0.13
Secondary Particulate emission as (NH ₄) ₂ SO ₄	0.68	0.10	NM	0.74	0.19	0.27
PM emission	0.01	0.95	NM	0.01	NM	NM
Total PM emission load (Primary + Secondary)	0.69	1.05	NM	0.75	0.19	0.27

8.

Scenario 2: Assuming 90% removal efficiency of control system for SO ₂ and 70% for PM (coal & petcoke)						
SO ₂ emission	0.08	0.01	NM	0.3	0.9	0.1
Secondary Particulate emission as (NH ₄) ₂ SO ₄	0.16	0.02	NM	0.6	0.18	0.2

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PM emission	0.01	0.95	NM	0.01	NM	NM
Total PM emission load (Primary + Secondary)	0.17	0.97	-	0.7	0.18	0.02

Boiler Capacity : 10 TPH						
Pollutant	Pet coke	Coal	Natural gas	FO	LSHS	LDO
Fuel consumption	24.8	49.6	-	19.85	18.85	18.54
Uncontrolled Emission						
SO ₂ emission	3.30	0.47	NM	1.70	0.43	0.64
Secondary Particulate emission as (NH ₄) ₂ SO ₄	6.79	0.97	NM	3.49	0.90	1.32
Primary PM emission	0.19	15.87	NM	0.13	0.005	0.004
Total PM emission load (Primary + Secondary)	6.98	16.84	NM	3.62	0.905	1.324
Controlled Emission						
Scenario 1: Assuming 50% removal efficiency of control system for SO ₂ and 70% for PM (coal & petcoke)						
SO ₂ emission	1.65	0.24	NM	0.85	0.22	0.32
Secondary Particulate emission as (NH ₄) ₂ SO ₄	3.40	0.49	NM	1.75	0.45	0.66
PM emission	0.06	4.76	NM	0.04	0.002	0.001
Total PM emission load (Primary + Secondary)	3.46	5.25	NM	1.79	0.452	0.661
Scenario 2: Assuming 90% removal efficiency of control system for SO ₂ and 70% for PM (coal & petcoke)						
SO ₂ emission	0.33	0.047	NM	0.17	0.043	0.064
Secondary Particulate emission as (NH ₄) ₂ SO ₄	0.68	0.10	NM	0.35	0.09	0.13
PM emission	0.06	4.76	NM	0.04	0.002	0.001
Total PM emission load (Primary + Secondary)	0.74	4.86	NM	0.39	0.092	0.131

Boiler Capacity: 15 TPH						
Pollutant	Pet coke	Coal	Natural gas	FO	LSHS	LDO
Fuel consumption	37.2	74.4	-	29.78	28.28	27.82
Uncontrolled Emission						
SO ₂ emission	4.95	0.706	NM	2.54	0.65	0.96

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Secondary Particulate emission as (NH ₄) 2SO ₄	10.19	1.46	NM	5.23	1.34	1.98
Primary PM emission	0.30	23.81	NM	0.19	0.007	0.006
Total PM emission load (Primary + Secondary)	10.49	25.27	NM	5.42	1.347	1.986

Controlled Emission

Scenario 1: Assuming 50% removal efficiency of control system for SO₂ and 70% for PM (coal & petcoke)

SO ₂ emission	2.47	0.35	NM	1.27	0.33	0.48
Secondary Particulate emission as (NH ₄) 2SO ₄	5.10	0.73	NM	2.62	0.68	0.99
PM emission	0.003	0.24	NM	0.002	NM	NM
Total PM emission load (Primary + Secondary)	5.103	0.97	NM	2.622	0.68	0.99

Scenario 2: Assuming 90% removal efficiency of control system for SO₂ and 70% for PM (coal & petcoke)

SO ₂ emission	0.50	0.07	NM	0.25	0.07	0.10
Secondary Particulate emission as (NH ₄) 2SO ₄	1.03	0.14	NM	0.51	0.14	0.21
PM emission	0.003	0.24	NM	0.002	NM	NM
Total PM emission load (Primary + Secondary)	1.033	0.38	NM	0.512	0.14	0.21

Boiler Capacity: 40 TPH

Pollutant	Pet coke	Coal	Natural gas	FO	LSHS	LDO
Fuel consumption	99.22	198.48	-	79.31	75.36	74.16

Uncontrolled Emission

SO ₂ emission	13.2	1.89	NM	6.78	1.74	2.57
Secondary Particulate emission as (NH ₄) 2SO ₄	27.18	3.89	NM	13.97	3.59	5.29
Primary PM emission	0.79	63.6	NM	0.51	0.018	0.017
Total PM emission load (Primary + Secondary)	27.97	67.49	NM	14.48	3.608	5.307

Controlled Emission

Scenario 1: Assuming 50% removal efficiency of control system for SO₂ and 70% for PM (coal & petcoke)

SO ₂ emission	6.6	0.95	NM	3.39	0.87	1.285
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Secondary Particulate emission as $(\text{NH}_4)_2\text{SO}_4$	13.6	1.96	NM	6.99	1.79	2.65
PM emission	0.08	0.63	NM	0.51	0.018	0.017
Total PM emission load (Primary + Secondary)	13.68	2.59	NM	7.50	1.808	2.667
Scenario 2: Assuming 90% removal efficiency of control system for SO_2 and 70% for PM (coal & petcoke)						
SO_2 emission	1.32	0.19	NM	0.68	0.17	0.26
Secondary Particulate emission as $(\text{NH}_4)_2\text{SO}_4$	2.72	0.39	NM	1.401	0.358	0.54
PM emission	0.08	0.63	NM	0.51	0.018	0.017
Total PM emission load (Primary + Secondary)	2.8	1.02	NM	1.911	0.368	0.557

Assuming 100% SO_2 conversion as Secondary particulates and Scrubber.

6. RECOMMENDATIONS

The major concern of Pet-Coke and Furnace Oil to be used as fuel in industry is high Sulphur concentration, which leads to emission of SO_2 and NO_x . Whereas, the ambient air quality data of J&K for the last few years reveal that the parameters of SO_2 and NO_x are well below the prescribed limits.

However, keeping in view of the direction of the Hon'ble Supreme Court and Hon'ble National Green Tribunal and also to maintain the futuristic ambient air quality, it is **recommended to use of following alternative fuels for various sectors in general.**

6.1 Futuristic fuel for industries/alternate fuels.

- i) Liquefied Petroleum Gas (LPG)
- ii) Liquefied Natural Gas (LNG)
- iii) Piped Natural Gas (PNG)
- iv) High Speed Diesel (HSD)
- v) Bio Gas
- vi) Bio-fuel (Bio-Ethanol etc.)
- vii) Refuse Derived Fuel (RDP): RDF as fuel derived from combustible waste

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fractions of Solid Waste like Plastic Wood, Pulp or Organic Waste, other than chlorinated material in the form of pellets/fluffs shall be used as alternative fuel for either steamers or electricity generated or as alternate fuel in industrial furnaces or boilers. Cement units, Lime units shall also use the fuel in the co-processing or co-incineration. All such industrial units using RDFs as fuel shall have to adhere to prescribed standards for emissions under Environmental (**Protection**) Act, 1986. Detail of RDF as fuel is as per Municipal Solid Waste Manual (II) under Such Baharat mission issued by CPHEEO, Ministry of Housing and Urban Development Department, Government of India.

viii) Biomass as fuel (like Pine Needles, Briquettes/Pellets of Pine Needles and other Biomass (including *Lantana* etc.): **Pet Coke utilizing Industries** shall meet atleast 1% of their annual fuel consumption from Forest base biomass like Pine Needles, Briquettes/Pellets of Pine Needles and other Biomass including *Lantana* etc. whether in briquette form or otherwise.

ix) Pet Coke subject to Specific Conditions :

- a) In view of the notification issued by the Ministry of Commerce & Industry, Department of Commerce New Delhi vide notification No.25/2015-2020 dated 07.06.2018, import of pet coke is prohibited except for **Cement, Lime kiln, Calcium carbide** and gasification **industries** for use as feed stock in the manufacturing process only on actual user basis. This is as per Office Memorandum issued by **MoEF & CC**, Government of India for regulation and manufacturing of imported pet coke in India dated-10-09-2018. The **Cement units** in **J&K** have to switch over to alternative fuels, such as mentioned at **6.1 above**, within a period of **three years** from the date of notification of this policy. **J&K** Government shall **impose a ban on the use of pet**



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coke after the completion of three years period in all such industries. In the meanwhile concern Department of J&K Government shall arrange the availability of such alternative fuel within the stipulated **time period of three years.**

- b) The condition to use pet coke is only subject to installation of high-end State of Air Pollution Control System (**De Sox and De Nox**) such as Wet Scrubber (**properly designed/Absorption system/Adsorption system to control So2 and Particulate Matter**). A caustic media has to be used in wet scrubber necessarily for proper emission controls.
- c) Units having Boiler with capacity of **20 TPH** or less, Pet-coke as a fuel may be allowed with a condition that, unit shall install the system for 90% recovery of SO₂ emission **within a period of one year** from notification of this policy.
- d) Unit having Boiler more than **20 TPH**, Pet-Coke as a fuel may be allowed with a condition that, unit shall install the system for 90% recovery of SO₂ emission and unit(s) shall install the **continuous online emission monitoring system within a period of one year** from notification of this policy.
- e) For those Units having furnaces based upon Pet-Coke fuel may be allowed with a condition that Unit(s) shall install the system for 90% recovery of SO₂ emission and unit(s) shall install the continuous online emission monitoring system **within a period of one year** from notification of this policy.

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- (i) Use of Pet-Coke as a fuel is allowed to be used by other industries as per schedule in **TABLE-I** upto **December 2020**. In case if the Units further stick to use of Pet-Coke as fuel for their industrial operation after the time lines (**01-12-2020**) as given in **TABLE-I**, Unit has to comply the conditions of **Sr. No. 6.1 (ix), b) c) & d)** or the industry has to shift from Pet- Coke/Furnace Oil to alternate fuel/cleaner fuel as mentioned above in **Sr. No. 6.1 (i) to (viii)** by modifying technology. In case of non-compliance, the Unit shall be closed without any notice after allowing time as per the details given below:

Table-I		
Category		Time period for which Pet Coke or Furnace Oil as fuel may be allowed from 1st Aug, 2020
Unit(s) irrespective of category falling in Critical Polluted Area (CPAs)/Severely Polluted Areas (SPAs) based on the Comprehensive Environmental Pollution Index (CEPI) developed by CPCB .		One year
Rest of Areas in Jammu & Kashmir	Red Category	Two Years
	Orange Category	Three Years
	Green Category	

- x)** Any other fuel notified/to be notified by the Central Government/J&K Government.

6.1.1 POLICY FOR FURNACE OIL

Units which are using Furnace Oil as fuel shall shift to HSD or any other cleaner fuel mentioned at **Sr. No. 6 (i) to (viii)** within stipulated timeline mentioned in **Table-I**.

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6.2 FUEL FOR TRANSPORTATION

- (i) Bharat Stage-VI compliant petrol and diesel with 10 ppm Sulphur.
- (ii) Liquid Petroleum Gas
- (iii) Natural gas/ Compressed Natural Gas (CNG)
- (iv) Biofuels
- (v) Any other fuel notified/to be notified by the Central Government/J&K Government.

6.3 FUEL FOR COMMERCIAL SECTOR (Restaurants/ Dhabas/ Hotels/ Canteens/ Hostel Canteens Etc.

- (i) Liquid Petroleum Gas
- (ii) Biogas
- (iii) Bio-diesel or any other fuel notified/to be notified by the Central Government/J&K Government.

7. OTHER RECOMMENDATIONS

- (i) In no case Furnace Oil as fuel shall be allowed as per time mentioned w.e.f. 01-08-2020, which means that all existing units/under-construction/up-coming units shall have to follow this fuel policy or else shall close down the production.
- (ii) In no case fuel such as **tyre/pyrolysis oil** and **LDO** shall be allowed in J&K.
- (iii) This Fuel Policy shall be subject to any direction/notification/modification/guidelines issued/to be issued by the **Supreme Court/ National Green Tribunal/any Court of Law/Central Govt./ Govt. of J&K/CPCB/SPCB** at any subsequent stage.
- (iv) As per the timeline (mentioned in Table-IV), all the units either have to comply the above conditions or shall close down the production.
- (v) Industrial units using Pet-Coke as fuel either have to comply

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specific condition No. 6 (ix) or may also have to switch over to cleaner fuels by altering their plant & machinery along with necessary pollution control devices to comply with the ambient air quality norms as specified in Environment (**Protection**) Act, 1986.

- (vi) The sulfur content in the pet coke should not be above **5%** or more than 50,000 PPM, otherwise it shall be hazardous waste and regulated under HOWM **rules 2016**. *treated as*
- (vii) Use of Pet Coke as an alternative fuel may not be advisable in areas identified as critically polluted by **MoEF, GOI**. It can only be considered for large/medium industries, on in the non critically areas where assimilation capacity is available.
- (viii) The industry shall not store petcoke for **more than three months consumption** and shall directly import the petcoke and the consignment shall be in the name of industry for its own use.
- (ix) Pet Coke shall be store properly in covered shed having paved flooring surface and under no circumstances, shall be allowed without having paved flooring.
- (x) **Government of Jammu & Kashmir shall review the Policy after two years and may consider revising the same in view of the results of the emission levels.**
- (xi) All the units using petcoke shall have to adhere to **Guidelines for Regulation and Monitoring of Imported petcoke in India** as per office memorandum issued by MoEF & CC dated 10.09.2018 vide No.Q-18011/54/2018-CPA **in the matter of WP(C) no.13029 of 1985.**

Sd/-

A. K.Gupta
(AEE)

Sd/-

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