EPCA Report No 117

Special Report on implementation of Hon'ble Supreme Court directions on stubble burning before the onset of the season 2020

30.9.2020

Every winter, the large-scale burning of crop residues from paddy crop in October-November in the neighbouring states of Punjab, Haryana and western Uttar Pradesh contributes significantly to the region's air pollution challenge.

On 28.2.2020, the Hon'ble Supreme Court directed that the Union and state governments take strong measures to ensure that stubble burning is stopped as it has serious adverse health impacts on local communities and on people living in the region.

The action plan directed by the Hon'ble Supreme Court was based on the affidavit dated 26.2.2020 filed by the Ministry of Agriculture and Farmers Welfare.

EPCA has reviewed the implementation of the action plan with the Union and state governments in its virtual meetings convened as of July 2020. As early stubble burning has been noted through satellite imagery, EPCA has written to state chief secretaries of the need to take urgent action for compliance with the directions of the Hon'ble Court.

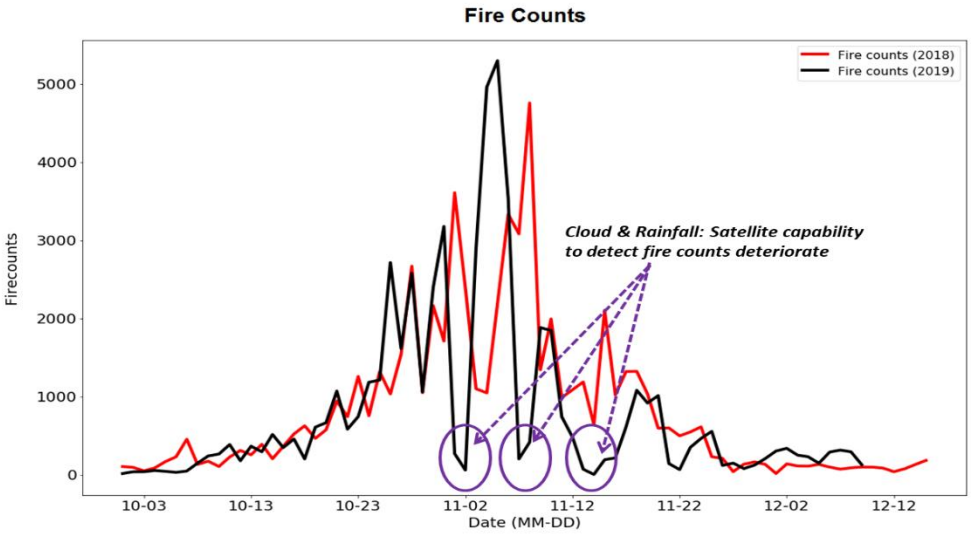
This report gives the status of implementation and the further directions which the Hon'ble Supreme Court may consider in this urgent matter.

1. Contribution of stubble burning to Delhi's air quality during winter

The System of Air Quality and Weather Forecasting and Research (SAFAR) under the aegis of the Ministry of Earth Sciences, has analyzed the trend in contribution of crop residue fire to the air quality of Delhi during November, 2019, which is the peak crop stubble burning period in Punjab and Haryana.

Usually, stubble burning starts in October and peaks during middle of November. The peak number of fire count is higher is 2019 compared to 2018. (see graph 1). This tells us of the need for greater action and enforcement.

Graph 2: Number of fire counts during 2018 and 2019

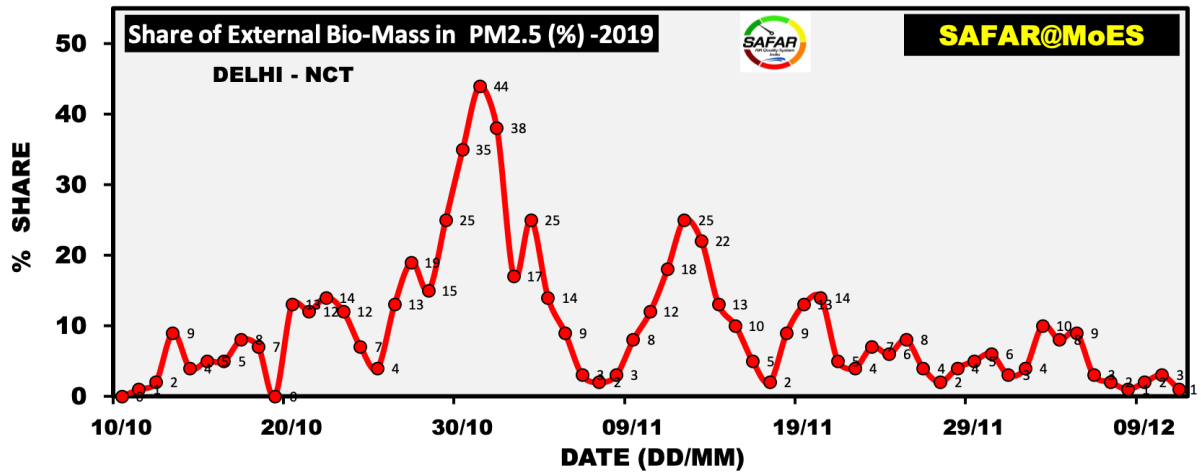


Source: Data provided by SAFAR

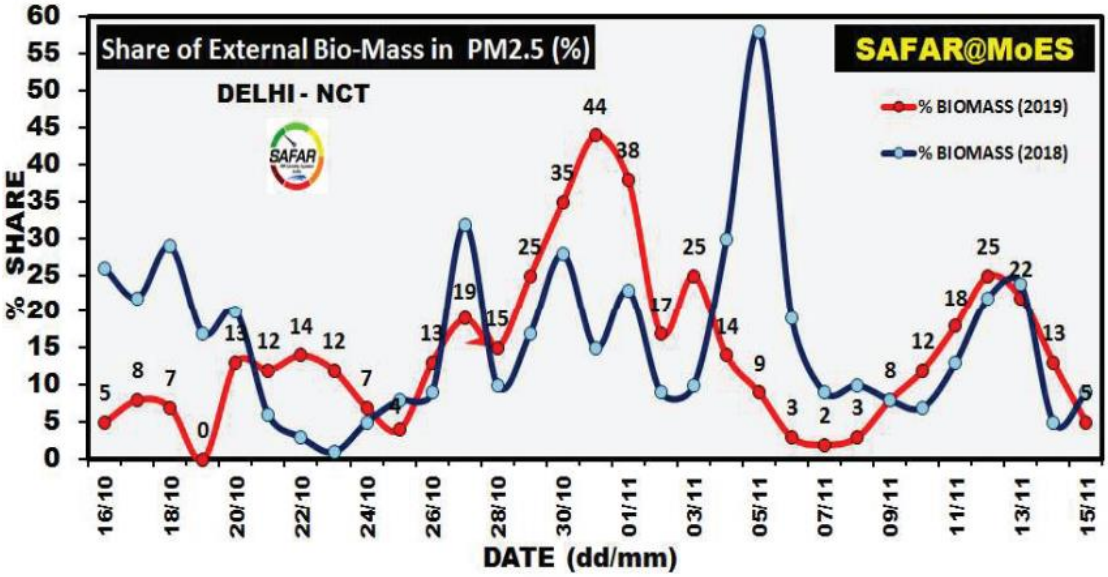
Note: Between November 5- 10, 2019, the satellite was not able to capture the exact fire count because of weather conditions - rains and clouds.

The daily contribution of crop residue burning to Delhi's air quality is highly variable and can vary from 4 per cent to 30 per cent—depending on the intensity of fire and direction and speed of the transporting wind. SAFAR data and analysis shows that highest contribution to Delhi's air from stubble burning was around the end of October. This period also post-Diwali, when Delhi's air had high levels of pollutants. Therefore, the impact was exacerbated and led to deadly smog incident, which was a public health emergency (see graph 2 and 3).

Graph 3: 2019 share of external crop residue burning to PM2.5 in Delhi



Graph 4: Comparison of share of contribution of external bio-mass burning (crop residue) to PM2.5 in Delhi in 2018 and 2019



Source: Gufran Beig, 2019: How Science of Forecasting Shapes Action, System of Air Quality and Weather Forecasting and Research (SAFAR- India), presented during Centre for Science and Environment media workshop: Controlling Air Pollution- What Next? The imperative of planning regionally on December 20, 2019, accessed at https://cdn.cseindia.org/attachments/0.08628800_1576820834_shapes-ation.pdf on September 21, 2020

2. Causes of stubble burning and approaches for mitigation

The reason why farmers burn crop residue are as follows:

- Mechanization of crops leads to smaller stubble left on the ground that is difficult to collect. This is combined with labour shortage and costs.
- In Punjab and Haryana, governments have notified that sowing of rice will be delayed to June because of concerns of groundwater depletion. This leaves the farmers with less time between the harvesting season of rice and sowing of wheat. Therefore, burning residue is the easiest option.
- The delay in the harvesting time also means that stubble is being burnt when the wind direction changes to northwesterly, which then brings the stubble fires to the northern Gangetic plains, and its already polluted and congested cities like Delhi.

- Crop intensification leaves farmers with small windows to clear the fields and so burning the residue is the easiest.

Also, this period of rice stubble-burning coincides with the onset of winter, when weather conditions become conducive to pollution – the cold settles the air closer to the surface (inversion); wind speeds drop and moisture increases. This makes the impact of this stubble burning much worse.

Therefore, even if it is not the only cause of pollution in the region, there is no doubt that the transportation of pollutants from burning fields is the tipping point that makes winter's already unhealthy air quality into a public health emergency.

The plan to stop stubble burning is broadly two-pronged: one, provide farmers with agricultural machines that can help to till back the straw into the ground; or other technologies that will aid the straw to be composted on the land itself. The cost of the machinery needs to be subsidized by government and its rental assured to small and marginal farmers.

The other complimentary strategy is to give farmers a value for the straw – rice straw in particular in this region is not used for fodder and so does not have any monetary value for farmers. The objective of ex-situ straw management is to set up straw-based power generation plants and bio-CNG/bio-ethanol plants, which will give farmers a price for the straw and therefore, an incentive not to burn it. This also requires machinery like balers, which would aid in collecting the straw in the fields and take it to power/gas plants for processing.

In the long-term the answer would be to diversify crops so that farmers move away from non-basmati paddy, which besides being a water-guzzler also has the added problem of stubble.

3. Hon'ble Supreme Court directives on stubble-burning of February 2020

The Hon'ble Supreme Court had during the stubble-burning period of October-November 2019 monitored the situation closely and directed state governments to take firm action against the fires. The Hon'ble Court also asked for a comprehensive plan to be presented to it on how stubble burning could be contained. The Union Ministry of Agriculture and Farmers Welfare in its affidavit dated 26.2.2020 gave this plan, which was then directed by the Hon'ble Court as follows:

	Action directed by Hon'ble Supreme Court based on Union government's plan on controlling stubble burning
1.	Central sector scheme on promotion of agricultural mechanization for in-situ management of crop residue for Punjab, Haryana, UP, Delhi to be continued during 200-21 with appropriate modification and tentative budgetary provision of Rs 600 crore (100% Central assistance)
	For in-situ management (crop residue is tilled back into the land using smart straw management)
2.	Under this scheme, agricultural machines, equipment for in-situ crop residue management for straw management system (SMS) will be provided to the farmers on individual ownership basis at 50 per cent subsidy. These machines enable farmers to till back the stubble into the ground and so improve soil carbon.
3.	Custom Hiring Centers (CHC) will be set up to make this equipment available to small and marginal farmers on reasonable rent. The government will provide machines costing up to Rs 5 lakhs to each village panchayat, primary agricultural cooperative society, farmer producer organization where paddy straw burning has taken place.
4.	The multi-lingual mobile APP, CHC Farm Machinery, will be used widely to make farmers aware of the closest machinery available for rent/and to rent the machine. This APP will be popularized and extensively used for optimum utilization of agricultural machines available with CHCs for the benefit of small and marginal farmers. The rental charges for different machinery will be rationalized by the state governments.
4.	Information, education and communication (IEC) activities will be taken up vigorously to make farmers aware of the problems of stubble burning and the availability of machines. An amount of Rs 100 crore will be earmarked for IEC during 2020-21
	For ex-situ management where straw is used for processed for bio-CNG to generation of power and this gives value to farmers
5.	Oil PSUs have launched the 'Sustainable Alternative Towards Affordable Transportation (SATAT) which will convert straw into CNG. The problem of transportation of residue will be tackled

	through the Sub-Mission on Agricultural Mechanization (SAM), which is providing balers for collection of straw and this will make transportation easier. The scheme for balers will continue for 2020-21.
	For effective enforcement through administration
6.	The state government will take all necessary administrative measures to control burning of paddy residues such as strict enforcement of provisions under section 19 (5) of the Air Act 1981, action on enforcement measures directed by NGT, mandatory fitting of SMS on combines, dis-incentivizing farmers from government assistance and red entry in Khasra Girdawari. In addition, they will ensure close monitoring of fire events at village level and any such administrative measures within the delegated powers of the district commissioners.
	For not providing incentive of Rs 100 per quintal of paddy produced to farmers who do not burn straw
7.	After deliberations it was found that inclusion of cost of stubble removal in MSP may not be a viable option. It has been agreed that any such incentive, if at all necessary, should be provided by the state government from their own budget

The Hon'ble Supreme Court has directed the implementation of the plan, submitted to it by the Union government. It is imperative that there is compliance with this in the coming winter-stubble burning period so that pollution is mitigated.

4. Status of implementation of the Hon'ble Supreme Court directions

EPCA has reviewed the current state of implementation with Union government (Ministry of Agriculture and Farmers Welfare) and state representatives from Punjab, Haryana, UP. EPCA also discussed the implementation of ex-situ programme with Indian Oil Corporation (IOC) and Union Ministry of New and Renewable Energy.

The following has been done till now:

1. **Union Ministry of Agriculture and Farmers Welfare has sanctioned the scheme for the year 2020-21.**

2. **Union Ministry of Agriculture and Farmers Welfare has now directed state governments to implement the plan as per the proposal submitted and ensure compliance with Hon'ble Supreme Court directions.**

3. **The state governments of Haryana, Punjab and UP have already bought stubble management machines (see tables below for details); have set up CHCs and have targets ensuring implementation this season.**

4. **In addition, the states have worked out schemes to make machines available to small and marginal farmers:**

    a. **Haryana on 24.8.2020 has issued directions that small and marginal farmers will be given preference in the use of these machines in the panchayat run CHCs, through reservation of 70% of the machines for them. While the state government has not prescribed any rates for CHC run by the panchayats, the government has informed EPCA that when they have checked with panchayats, they were told that they are not charging for rental for the equipment. However, EPCA has written to the state asking for more clarity on this so that small and marginal farmers get access to these machines, which have been provided at 80-100 per cent subsidy to the panchayat run CHC's at highly concessional rates/free.**

    b. **Punjab has directed on 14.8.2020 that as government has provided 80 per cent subsidy for machines for crop residue management, it is to be ensured that these machines are available to small and marginal farmers on priority basis and that these farmers will be charged on operational cost and no rental for the machines. The government has clarified that the operational charges include source of power and operator wages etc, but not the cost of capital. EPCA has written to the state that this requires clarification and that as the machines have been provided at subsidy to the panchayat run CHC there should not be any recovery of capital in any case.**

5. **The Union Ministry of New and Renewable Energy is working on the proposal sent by Punjab government that biomass power projects should be given a Viability Gap Funding so that the cost of power from these projects can be sustainability bought by discoms. It is also reviewing the proposal for a biomass-solar hybrid power project scheme.**

6. **The compressed bio-gas (CBG) projects are being commissioned. The last hurdles in the projects have been resolved in the last month; RBI has included CBG in its list of priority sector lending; SBI has circulated a loan scheme and Oil Companies have agreed on a buy-back rate of Rs 46/kg for five years; and to agree that beyond this period this rate will be the floor price. The private sector has shown great interest and already many CBG projects have been cleared. These projects, once commissioned will create a market for straw and provide farmers an incentive not to burn the resource (see Annexure 1-3 for the list of projects).**

7. **While there is a demand for additional funds to be paid to farmers for doing stubble management, but as this could be a perverse incentive it may not be advisable. Therefore, the funds already provided and the plan that exists should be implemented this season and in the coming period. The effort must be to ensure that farmers have easy and affordable access to the machines which allow them to do smart straw management.**

Based on the plan, the state governments of Haryana, Punjab and UP have set targets for this year and the in-situ plans are given below for each state.

The status of projects ex-situ use of rice straw are given in Annexure 1/2/3.

Haryana: Plan to combat stubble burning 2020-21:
in-situ measures

Sr No	Measures	Data
	Background Information [will be used to benchmark for 2020]	
	Estimated paddy crop residue 2019 [million tonnes]	**7.0**
	Estimated crop residue brunt 2019 [million tonnes]	**1.24**
	No of fires in 2019	**6364**
	Estimated area of stubble burning[acres]	**5.93 Lakh**
	% of area burnt of the total paddy cultivated	**17.7**
1	**Establish Custom Hiring Centre[80% subsidy / up to @ 5 lakh per center provided]**	
	No of CHC SET UP	**2879**
	Total no of Machinery provided	**15928**
	No of addition CHC to be set up by October 2020	**1500***
	% of panchayats reached	**851 Nos.**
	No of panchayats to be reached by October 2020	820
	% of primary agriculture cooperative society [PACS] reached	
	No of farmer producer organization [FPO] reached	**14 Nos.**
	No of additional farmer producer organization [FPO] to be reached in 2020	**15 No**
2	**CHC-App to utilized to popularize renting of machines**	
	Rental rationalized [yes or no]	**Yes**
	No of service providers registered	**5367**
	No of machines registered	**18758**
	% of no of machines in state registered	**76%**
	% of no of machines to be registered in 2020	**100%**
3	**IEC activity for awareness**	
	Expenses during 2019 [Rs]	**3.77 Crores**
	Budget proposed for 2020 [Rs]	**62 Crores**
4	**Implementation of Sub-Mission on Agriculture Mechanization [SMAM]**	

	Subsidy given for balers [40%]	**14.26 Crores**
	No of balers for which subsidy given till date	230
	No of balers to be supplied till October 2020	**791**
5	**Incentive given to non-basmati farmers for not burning[Rs 100/qt; Rs 1000/acre/Rs 1000 to informers]**	
	Quantum of incentive provided in 2019 [Rs]	**1.63 Crores**
	No of farmers provided incentives in 2019-20	**3930**
	Plan for 2020 [if same as 2019] pl. indicate saying same as 2019	**301 Crores**
6	**Crop diversification**	
	Area under non - basmati paddy [acres]	**13.75 Lakh**
	Area under basmati paddy [acres]	**18.75 lakh**
	Total area under paddy	**32.50 Lakh**
	Decrease in area under paddy [%] over past 2 years	**9.80%**
	Plan for diversification in coming year and next year [%]	**7.70%**

Punjab: Plan to combat stubble burning: 2020-21: In-situ measures

	Measure	**Data**
	Background information (will be used to benchmark for 2020)	
	Estimated paddy crop residue 2019 (million tonnes)	20 million tonnes
	Estimated crop residue burnt in 2019 (million tonnes)	9.8 million tonnes
	Number of fires in 2019	50738
	Estimated area of stubble burning (acres)	2770.07 ('000 acres)
	% of area burnt of total paddy cultivated	37.42%
1.	**Establishment of Custom Hiring Centre** (@ 80% subsidy provided / up to Rs5-10 lakh investment per center	
	Number of CHC set up	7378
	Total no. of machinery provided	50815 (33357 in

		CHC+17458 Indiv.)
	% of panchayats reached	59 %
	% of primary agricultural cooperative society (PACS) reached	90 % (Partially)
	% of Farmer Producer Organizations (FPO) reached	NA
	No. of additional CHC to be set up by October 2020	**5000**
	% of panchayats to be reached (12,000 panchayats)	**100%**
2.	**CHC-app to be utilized to popularize renting of machines**	
	Rental rationalized (yes or no)	Yes
	No. of service providers registered	2992
	No. of machines registered	9390
	% of no. of machines in the state registered	19 %
	% of no of machines to be registered in 2020	**100%**
3.	**IEC activity for awareness**	
	Expenses during 2019 (Rs.)	9.92 Cr
	Budget proposed for 2020 (Rs.)	10 Cr Proposed (7.80 CrReceived)
4.	**Implementation of Sub-Mission on Agricultural Mechanization (SMAM) scheme**	
	Subsidy given for Balers (40%)	9.58 Cr
	No. of balers for which subsidy given till date including RKVY	219
	No. of balers to be supplied till October 2020	**220**
5.	**Incentive given to Non-Basmati farmers for not burning (Rs 100/qt; Rs 1000/acre/ Rs 1000 to informers)**	
	Quantum of incentive provided in 2019 (Rs.)	28.51 Cr
	No of farmers provided incentives in 2019	31231
	Plan for 2020 (if same as 2019) pl. indicate saying same as 2019	No, State has sought funds from GoI and will not be able to

		pay from its own.
6.	**Crop Diversification**	
	Area under non-basmati paddy (acres)	5000 ('000 Acres)
	Area under basmati paddy (acres)	1750 ('000) Acre
	Total area under paddy	6750 ('000) Acre
	Decrease in area under paddy (%) over past 2 years	13.73%
	Plan for diversification in coming year and next year (%)	5%

UP: Plan to combat stubble burning 2020-21: In-situ measures

	Measure	**Data**
	Background Information (will be used to benchmark for 2020)	
	Estimated paddy crop residue 2019 (million tonnes)	16
	Estimated crop residue burnt in 2019 (million tonnes)	0.0042
	No of fires in 2019	4230
	Estimated area of stubble burning (acres)	25000
	% of area burnt of the total paddy cultivated	0.2
1	**Establish Custom Hiring Centre** (80% subsidy/up to @Rs 5 lakh per centre provided)	
	No of CHC set up	3989
	Total no of machinery provided	39553 (15345 in CHC + 24208 Indiv.)
	% of panchayats reached	28%
	% of primary agriculture cooperative society (PACS) reached	86%
	% of farmer producer organization (FPO) reached	50%
	No of additional CHC to be set up by October 2020	**1255**
2	**CHC-App to be utilized to popularize renting of machines**	
	Rental rationalized (yes or no)	Yes
	No of service providers registered	3950
	No of machines registered	9484
	% of no of machines in state registered	24%

	% of no of machines in the state to be registered by October, 2020	**100%**
3	**IEC activity for awareness**	
	Expenses during 2019 (Rs)	6.62 crore
	Budget proposed for 2020 (Rs)	6.94 crore
4	**Implementation of Sub-Mission on Agricultural Mechanization (SMAM) scheme**	
	Subsidy given for balers (40%)	6 lakh
	No of balers for which subsidy given till date including RKVY	3
	No of balers to be supplied till October	**315**
5	**Incentive given to non-basmati farmers for not burning (Rs 100/qt; Rs 1000/acre/Rs 1000 to informers)**	
	Quantum of incentive provided in 2019 (Rs)	Nil
	No of farmers provided incentive in 2019	Nil
	Plan for 2020 (if same as 2019) pl. indicate saying same as 2019	Nil
6	**Crop diversification**	
	Area under non-basmati paddy (acres)	127.5 lakh
	Area under basmati paddy (acres)	22.5 lakh
	Total area under paddy	150 lakh
	Decrease in area under paddy (%) over past 2 years	Nil
	Plan for diversification in coming year and next year (%)	0.022% (345,850 acre)

5. Directions sought from the Hon'ble Supreme Court that will ensure implementation of the plan to combat stubble burning

The state governments should implement of the plan and take all other actions that are required to provide farmers assistance to do smart straw management and also strict enforcement against violators. This will include:

1. **Sufficient numbers of stubble management machines are procured and available for use in the state.**
2. **These machines must be available in panchayat or other community run centers so that small and marginal farmers who cannot buy these machines have access to them**
3. **Rental/operational cost rates are fixed in such a manner that the cost is minimal for small and marginal farmers. The entire objective of**

providing 80-100 per cent subsidy for procurement and supply of these machines is to make sure that small and marginal farmers have easy access and that these are available at concessional cost/free to the farmers for use.

4. **Widespread publicity about the availability of the machines through the registration on the CHC-APP.**
5. **Widespread publicity and awareness creation of the directions against stubble burning and the alternatives and the health costs, not just to city residents but also to farmers.**
6. **Information on the ex-situ (biomass power projects and compressed bio-CNG projects) so that farmers have alternatives to burning stubble. Rakes and balers must be available to farmers for collection of the straw.**
7. **Enforcement of these directions will require daily monitoring through the use of satellite imagery and action at the village/block and district level. The local administration will be required to ensure compliance.**

The state government's may also be directed to set up a control room for monitoring daily fire reports and enforcement action that is being taken.

Annexure 1
Haryana ex-situ crop residue usage projects (status as of September 2020)

S. No.	Technology/plant/company	Capacity in MW/KLPD/TPD	Quantity of straw required for plant (mt per annum)	Status
1	**Biomass power plants (list)**	**64.3**	**2,37,000 MT but about 1.80 lakh ton procurement reported by these projects in 2019-20.**	**Operational plants (6)**
		60.35	**6,40,000 MT**	**Under Installation (6)**
2	**2-G Ethanol plants (list)**	**100 KLPD**	**2,00,000 MT**	**Under Installation (1)**
3	**Bio-CNG plants (list)**	**341.06 TPD of CBG**	**7,83,504 MT**	**1 Project commissioned, remaining 64 projects are under installation**
4	**Any others, industries using paddy straw in boilers**		**2,57,000**	**18 industries**

Sr. No.	Technology/plant/company	Capacity in MW	Quantity of straw required for plant (mt. per annum)	Status
A.	**Biomass power projects in operation using paddy straw**			
1	M/s Sri Jyoti Renewable Energy Pvt. Ltd., Village Dhana Narsan, Distt. Bhiwani	9.9	20,000.00	Operational
2	M/s Starwire (India) Ltd., Vill. Khurawata, Block & Dist. Mahendergarh	9.5	20,000.00	Operational
3	M/s GEMCO Energy Limited, Bhiwani	8	14,000.00	Operational
4	Naraingarh Sugar Mill Ltd., Naraingarh, Ambala	25	1,43,000.00	During Off seasonTariff matter in HERC
5	M/s AB Grains Spirits Pvt. Ltd., Village Jatwar, Tehsil Narayangarh, district Ambala	8.9	20,000.00	Operational
6	M/s Sainsons Paper Industries Pvt. Ltd. Kurukshetra	3	20,000.00	Operational

	Total	**64.3**	**2,37,000 MT but about 1.80 lakh ton procurement reported by these projects in 2019-20.**	
B.	**Biomass power projects under installation using paddy straw**	**Capacity in MW**	**Quantity of straw required for plant (mt. per annum)**	**Status**
1	M/s The Hind Samachar Ltd. in Kurukshetra District	15	1,72,000	As per PPA Feb 2021 Work in progress but under appeal in HERC for tariff
2	M/s SukhbirAgro Energy Ltd. in Kaithal District	15	1,72,000	As per PPA Feb 2021 Work in progress but under appeal in HERC for tariff
3	M/s Jind Bio Energy LLP in Jind District	9.9	1,13,000	As per PPA Feb 2021, Work not started as appeal is pending in APTEL for tariff
4	M/s Fatehabad Bio Energy LLP in Fatehabad District	9.9	1,13,000	As per PPA Feb 2021, Work not started as appeal is pending in APTEL for tariff
5	M/s Sainsons Paper Industries Pvt. Ltd. Kurukshetra	5	60,000	July, 2021, Installed but commissioning is pending, Likely to be commissioned by end of September 2020
6	M/s RSL Distilleries, Chandrao, Indri, Karnal	5.55	10,000	July, 2021, Installed but connectivity and commissioning is pending,

	Total	**60.35**	**6,40,000 MT**	**Under Installation**
C.	**Compressed Bio-Gas Projects (CBG) for which LoIs issued by Oil Marketing Companies**	**Capacity in TPD of CBG**	**Paddy straw at 50% of organic fuel consumption is presumed Annually in MT**	**Status**
1	Sharp Renewal Energy Pvt. Ltd, Israna, Panipat	2.4	5,760	Yet to start
2	Haritma Ventures Pvt. Ltd, Kalayat	5.8	13,920	Yet to start
3	TVISI Energy Pvt. Ltd, Palwal	8	19,200	Yet to start
4	Matra Energy Pvt. Ltd, Kaith, Sonipat	8	19,200	Yet to start
5	Mann Residency Pvt. Limited, Sonipat	2.5	6,000	Yet to start
6	Mann Residency Pvt. Limited, Panipat	2.5	6,000	Yet to start
7	Mann Residency Pvt. Limited, Karnal	2.5	6,000	Yet to start
8	Mann Residency Pvt. Limited, Kurukshetra	2.5	6,000	Yet to start
9	Mann Residency Pvt. Limited, Palwal	2.5	6,000	Yet to start
10	Mann Residency Pvt. Limited, Ambala	2.5	6,000	Yet to start
11	Mann Residency Pvt. Limited, Yamunanagar	2.5	6,000	Yet to start
12	Quality Foils (India) Pvt. Ltd, Kharkhara	10	24,000	Yet to start
13	Quality Foils (India) Pvt. Ltd, Barwala	10	24,000	Yet to start
14	Quality Foils (India) Pvt. Ltd, Hathwala	10	24,000	Yet to start
15	Quality Foils (India) Pvt. Ltd, Kharad	10	24,000	Yet to start
16	Quality Stainless Pvt. Ltd, Kharkhara	10	24,000	Yet to start
17	Spectrum Renewable Energy Pvt. Ltd., Kalanaur, Rohtak	6	0	To be commissi-oned by 31.08.20, cattle dung based
18	Verbio India Pvt. Ltd, Karnal	30	72,000	Yet to start
19	Verbio India Pvt. Ltd, Ambala	30	72,000	Yet to start

20	Sam India Pvt. Ltd, Karnal	5	12,000	Yet to start
21	Sam India Pvt. Ltd, Kaithal	5	12,000	Yet to start
22	Sam India Pvt. Ltd, Fatehabad	5	12,000	Yet to start
23	TrinixImpexPvt. Ltd, CharkhiDadri	2	4,800	Yet to start
24	Adani Port and Special Economic Zone, Patil, Gurgaon	2	4,800	Yet to start
25	BRM Petrochem Pvt. Ltd., Sonepat	10	24,000	Yet to start
26	Falcon Force Private Limited, Sangel, Nuh	2	4,800	Yet to start
27	GKM Energy pvt Ltd, Thaska, Hisar	10	24,000	Yet to start
28	Royal Construction Co., Karnal	2	4,800	Yet to start
29	Vaman Rugs, Panipat	2	4,800	Yet to start
30	Clean Effentech International Pvt Ltd, Gohana	3.92	9,408	Yet to start
31	Clean Effentech International Pvt Ltd, Assandh	2.94	7,056	Yet to start
32	Dakshesha Hospitality Private Limited, Jhajjar	2	4,800	Yet to start
33	Daya Enterprises, Kurukshetra	2	4,800	Yet to start
34	Escalation managementservicespvt ltd., Bilaspur, Gurugram	2	4,800	Yet to start
35	Helping Hands Welfare Society, Sonepat	4	9,600	Yet to start
36	Helping Hands Welfare Society, Panipat	4	9,600	Yet to start
37	Nehamrit Organic and Renewal Energy Pvt Ltd, Karnal	2.5	6,000	Yet to start
38	Mahadev Bio Energy, Yamunanagar	8	19,200	Yet to start
39	KNY Projects Pvt. Ltd., Sonipat	2	4,800	Yet to start
40	Hindustan Fabricators & Contractors, Begampur, Karnal	5	12,000	Yet to start
41	Amrit Fertilizer, Kunjpura, Karnal	5	12,000	Yet to start
42	Zak Ventures Pvt. Ltd, Rewari	5	12,000	Yet to start

43	Zak Ventures Pvt. Ltd, Karnal	5	12,000	Yet to start
44	Shri Vijay Kr Satia “AVN Group”, Karnal	2	4,800	Yet to start
45	JPS Agrotech& Farms, Village: Assan, Rohtak	2.2	0	Operational (cattle dung based)
46	Contemply Energy Private Limited, Pinjupura, Kaithal	4	9,600	Yet to start
47	Sanjay Kaushik, Gohana, Sonipat	2	4,800	Yet to start
48	HRJ Industries Pvt. Ltd, Panipat	2	4,800	Yet to start
49	Gemco Energy Limited, Dinoda, Bhiwani	2	4,800	Yet to start
50	Jaglan Contractor and Security Pvt. Ltd, Datta, Hisar	4	0	To be commissioned by 31.01.2021, cattle dung based
51	SPBIO-ChemPvt. Ltd., Damla, Yamunanagar	6.4	15,360	Yet to start
52	Sainsons Paper Industries Private Ltd, Pehowa, Kaithal	2.4	0	To be commissioned by 31.10.2020, spent wash based
53	Cheme Tech Project Limited, Sonepat	8	19,200	Yet to start
54	PVP Energy Limited, Sonepat	2	4,800	Yet to start
55	Mann Residency Pvt Ltd, Sonepat	2	4,800	Yet to start
56	MBBS Consultancy Services, Rohtak	10	24,000	Yet to start
57	SS Bio Energy, Rohtak	2.4	5,760	Yet to start
58	VS Poultry Farm, Ambala	2.4	5,760	Yet to start
59	Agroking Deep Tubewell Drilling Company, Ambala	4.8	11,520	Yet to start
60	DCC Buildcon Private Ltd., Gurugram	2.4	5,760	Yet to start
61	DCC Buildcon Private Ltd., Gurugram	4.8	11,520	Yet to start
62	Shree Balaji Solar Traders, Hisar	4.8	11,520	Yet to start
63	Shree Balaji Solar Traders, Hisar	4.8	11,520	Yet to start
64	Sinexcel Power Technology Pvt. Ltd., Hisar	4.8	11,520	Yet to start

65	Sinexcel Power Technology Pvt. Ltd., Hisar	4.8	11,520	Yet to start
	Total	**341.06 TPD of CBG**	**7,83,504 MT**	**1 Project commissioned, remaining 64 projects are under installation**
D.	**BIO-Ethanol projects underexecution/pipeline**	**Capacity**	**Quantity of straw required for plant (mt. per annum)**	**Status**
1	Ajay Bio Energy Private Ltd, Village Bastara, Gharaunda, Karna, Karnal (CBG Project100% paddy straw based)	100 KLPD	2,00,000 MT	Under Installation
E.	**Other Industries Currently using paddy straw also as a fuel for running their boilers**			
	Name of Unit	**District**	**Quantity of Paddy Straw being used annually in MT**	
1	M/s Sainsons Paper Industries Pvt. Ltd.	Kurukshetra	70,000	
2	M/s Sawaria Food & Fats	Karnal	8,000	
3	M/s NU Chen Oils Pvt. Ltd.	Karnal	6,000	
4	M/s MahakalAgro Industries Ltd.	Ambala	9,000	
5	M/s Niklesh Cooking Oil Refineries	Kaithal	4,000	
6	M/s M.D. Solvent	Karnal	8,000	
7	M/s Jain Agro Industries	Hissar	76,000	
8	M/s R.S. Solvent Extractions Ltd.,	Kaithal	4,000	
9	M/s Kaithal Solvent Pvt. Ltd.,	Kaithal	4,000	
10	M/s Cheeka Solvent Pvt. Ltd.	Kaithal	4,000	
11	M/s Singhal Solvent Ltd.,	Kaithal	3,000	
12	M/s Shri Ram Paper Mill	Sirsa	700	
13	M/s Nishant Paper Board	Kurukshetra	6,000	
14	M/s Bue Bell Exim	Karnal	300	
15	M/s Imperial Malts Ltd.	Gurugram	36,000	
16	A2P Energy	Rajpura	4,000	
17	PRESPL	Yamunanagar	12,000	
18	Anand Industries	Kaithal	2,000	
	Total		**2,57,000**	

Annexure 2:
Punjab ex-situ crop residue usage projects (status as of September 2020)

S. No.	Technology/plant/company	Capacity in MW	Quantity of straw required for plant (mt per annum)	Status
1	**Biomass power plants (list)**	**97.5**	**876500**	**Operational plants (11)**
		14	**126000**	**Under Installation (2)**
2	**2-G Ethanol plants (list)**	**100 KLPD**	**2.000 lac**	**Under Installation (1)**
3	**Bio-CNG plants (list)**	**70.48 TPD of CBG**	**2.519 lac**	**6 projects are under installation**

Sr. No.	Technology/plant/company	Capacity in MW	Quantity of straw required for plant (mt. per annum)	Status
A.	**Biomass power projects completed/commissioned**			
1	M/s. Malwa Power Ltd. / Village: Gulabewala, Tehsil & Distt: Mukatsar	6	54000	Commissioned and operational since **May 2005**
2	M/s. Dee Development Engineers Pvt. Ltd / Village: GaddaDhob, Tehsil: Abohar, Distt: Ferozepur	8	72000	Commissioned and operational since **Feb' 2009**
3	M/s. Universal Biomass Energy Pvt. Ltd. / Village: Channu, Tehsil: Malout, Distt: Mukatsar	14.5	130500	Commissioned and operational since **Oct'2009**
4	M/s. Green Planet Energy Pvt. Ltd. / Village: Binjon, Tehsil: Garhshankar, Distt; Hoshiarpur	6	54000	Commissioned and operational since **March'2012**
5	M/s. Green Planet Energy Pvt. Ltd. / Village: Bir Pind, Tehsil: Nakodar, Distt; Jalandhar	6	54000	Commissioned and operational since **Feb'2013**
6	M/s. Viaton Energy Pvt. Ltd. / Village: Khokhar Khurd,	10	90000	Commissioned and operational

	Tehsil & Distt: Mansa			since **July 2013**
7	M/s. Green Planet Energy Pvt. Ltd. / Village: Binjon, Tehsil: Garhshankar, Distt; Hoshiarpur	4	36000	Commissioned and operational since **August 2018**
8	M/s. Green Planet Energy Pvt. Ltd. / Village: Manuke Gill, Tehsil: Baghapurana, Distt: Moga	6	54000	Commissioned and operational since **August 2019**
9	M/s. SampuranAgri Venture Pvt. Ltd. / Village: Panchewali, Teshil: Fazilka, Distt: Fazilka	1	8000	Commissioned and operational since February 2015
10	M/s. SukhbirAgro Energy Limited / Tehsil: Jaitu, Distt: Faridkot	18	162000	Commissioned and operational since December 2019
11	M/s. SukhbirAgro Energy Limited/ Tehsil & Distt: Ferozepur	18	162000	Commissioned and operational since December 2019
	Total	**97.5**	876500 **Say 0.88 million ton per annum**	
B.	**Biomass power projects under execution**			
1	M/s. Green Planet Energy Pvt. Ltd. / Village: Bir Pind Tehsil: Nakodar, Distt; Jalandhar	4	36000	Under Execution and will be commissioned by August' 2021
2	M/s. SukhbirAgro Energy Limited(PSPCL Jalkheri Project) / Tehsil & Distt: Fatehgarh Sahib	10	90000	Under Execution and will be commissioned by June 2021(Project has been allocated by PSPCL.)
		14	126000 **Say 0.12 million ton per annum**	
C.	**BIO-CNG projects under execution/pipeline**			

1	M/s. Verbio India Private Limited / Teshil: Lehragaga Distt: Sangrur	80000m^3 biogas per day (equivalent to 33.23 ton of BioCNG per day)	1.10 lac metric ton p.a	Execution of work is in progress. Civil work at advance stage, plant machinery is in transit from Germany. The project is expected to be commissioned by March 2021.
2	M/s. Cities Innovative Biofuels Private Limited, Bengaluru / Tehsil & District: Fatehgarh Sahib	5000m^3 raw Biogas per day/2.25 ton BioCNG per day.	0.075 lac metric ton p.a.	Ground break done. The project is expected to be commissioned by December 2021.
3	M/s. Gurdaspur Biogas Private Limited, New Delhi / Tehsil & District Gurdaspur	24000m^3 raw Biogas per day/10 ton Bio-CNG per day	0.336 lac metric ton p.a	DPR approved, Implementation agreement signed. The company is in the process of acquiring private land for the project. The project is expected to be commissioned by December 2022.
4	M/s IRM Energy Private Limited, Ahmedabad / Tehsil Ludhiana East, District Ludhiana	24000m^3 raw biogas per day/10 ton Bio-CNG per day	0.336 lac metric ton p.a	DPR stage. The project is expected to be commissioned by December 2022.
5	M/s PES Engineers /Private Limited, Hyderabad / Tehsil: Nabha, District Patiala	24000m^3 raw biogas per day	0.336 lac metric ton p.a	DPR stage. The company is in the process of acquiring private land for the project. The project is expected to be commissioned by December 2022.
6	M/s. PanjAab Bio Fuel and	12000m^3	0.336 lac metric	DPR approved.

	Fertilizers Pvt. Ltd. / Tehsil:Samrala, Distt: Ludhiana	raw biogas per day with provision to expand upto 32000m^3 raw biogas per day	ton p.a	Implementation Agreement signed. The company is in the process of acquiring private land for the project. The project is expected to be commissioned by December 2022 (first phase) and December 2023(second phase).
D	**BIO-Ethanol projects underexecution/pipeline**			
1	Hindustan petroleum Corporation Limited / village: Nasibpura, Tehsil: TalwandiSaboo, Distt: Bathinda	100 kl/ day production of Food Grade Ethanol based on Biofuel	2 lac metric ton per annum	Project work held up by HPCL due to technology issues with ICT Mumbai. The project is expected to be commissioned by 2022-23.
		Total	4.519 lac metric ton **Say 0.45 million ton per annum**	

Annexure 3
UP ex-situ crop residue usage projects (status as of September 2020)

Ex-situ management

	Technology/plant/ company	**Capacity in TPD/KLPD**	**Quantity of biomass required for plant (mt per day)**	**Status**
1	2-G Ethanol plants (list)	320 KLPD	5.84 lakh per annum (1600 MT per day including Gorakhpur plant)	Approved (04)
2	Bio-CNG/CBG plants (list)	60.5 TPD	750 MT per day (excluding Gorakhpur plant)	Approved (06)
3	Biocoal plants (list)	315 MT per shift (Plants may operate 2/3 shifts per day)	347 MT per day	Operational (08) Approved (04)
4	Drop in fuel	175 KLPD	550 MT per day	Approved (01)
5	Others (cow shelters)		6900 MT used in 2019-20 and target utilization 10000 MT	In-use

Note: Total 23 biomass utilization plants planned by March 2023 out of which 08 plants are operational.

Sr. No.	**District name**	**Capacity**	**Quantity of biomass required for plant (per day)**	**Status**
A.	**Compressed Bio-Gas Projects/Bio-CNG (CBG)**			
1	Muzaffarnagar	5.1 ton	125-150 ton	Approved
2	Hapur	5.1 ton	125-150 ton	Approved
3	Sitapur	5.1 ton	125-150 ton	Approved
4	Bareilly	5.1 ton	125-150 ton	Approved
5	Meerut	5.1 ton	125-150 ton	Approved
6	Gorakhpur	40 MT per day	Refer Sr. 03 2G Ethanol project	Approved
B.	**2G Ethanol Projects**			

1	Saharanpur	40-60 KL per day	125-150 ton per day	Approved
2	Bijnor	40-60 KL per day	125-150 ton per day	Approved
3	Gorakhpur	100 KL per day	750 ton per day (including CBG plant consumption)	Approved
4	Badaun	100 KL per day	550 ton per day	Approved
C.	**Biocoal projects**			
1	Kanpur (4 plants)	120 ton per shift	125-130 ton per shift	Operational-4 units
2	Mainpuri (2 plants)	50 ton per shift	52-55 ton per shift	Operational-2 units
3	Lakhimpur Kheri (2 plants)	50 ton per shift	52-55 ton per shift	Operational-2 units
4	Ghaziabad	40 ton per shift	42-45 ton per shift	Approved
5	Bareilly	15 ton per shift	16-18 ton	Approved
6	Baghpat	28 ton per shift	30 ton per shift	Approved
7	Bijnor	12 ton per shift	13-14 ton per shift	Approved
D.	**Drop-in-fuel projects**			
1	Sitapur	175 KL per day	550 ton per day	Approved