Decision of Ministry of Environment, Forest and Climate Change with respect to discussion on issues pertaining to clarifications sought on Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016, as approved by the Competent Authority on the basis of recommendation of the 91st Meeting of the Technical Review Committee (TRC) held on 28th January, 2025.

Agenda 1. Request to ban export of Black mass – Representation by M/s Attero Recycling Private Limited, Noida

M/s Attero Recycling Private Limited, Noida mentioned that India is in the midst of a global raw materials race for strategically important critical minerals, REE, and precious metals. At the crux of the race for securing materials for the manufacture of batteries is 'black mass, the shredded remains of old lithium-ion batteries that contain critical minerals such as Lithium, Cobalt, Nickel, Manganese, Rhenium, Silicon, Tin, Titanium, Graphite, Iron etc. While India does not have many mines or resources from which these can be procured, waste streams of Electrical Electronics and Lithium-Ion batteries can be a rich sources of these extremely important materials.

2. From manufacturing solar panels and electric vehicles to all electronic devices, such critical minerals are vitally needed for modern technologies, and the net-zero economy. Several countries have started to impose strict regulation and bans on the export of these materials including - Black Mass which is a mixture of critical materials produced after the shredding of Lithium- ion battery cells.

3. In view of the above, it is requested that a ban on the export of Black Mass and other precious metal bearing waste may be imposed so that these critical and rare materials which are not available in India are kept available within India for domestic manufacturing.

The matter was last discussed in 90th meeting of TRC held on 20th December, 2024 and after deliberation upon the issue the that CPCB/applicant may be asked to provide the details of stakeholders producing Black mass along with details of domestic recycling capacity available and quantity exported. The committee also recommended that CPCB may be requested to provide inputs on the classification of black mass in consents issued by SPCB and their view on whether Black mass is a waste or intermediate product.

Now, the applicant and CPCB have submitted the requisite details. Accordingly, the matter is placed before TRC for deliberation/decision.

Deliberation: The committee deliberated upon the issue and heard the views of CPCB and applicant. CPCB informed that presently there are 16 units in India which process Li-ion batteries. But a few (i.e. 12 units which are registered on EPR Portal) among them are further engaged in processing of Black mass to metal compounds. The input capacity of the li-ion batteries of companies which are processing the Black mass is 75,500 MT/Annum. Further, it was also informed that CPCB has already finalized SOP in this regard. The SOP states that if any unit is self-processing the black mass in the same premise, then in that case it can be considered as intermediate. But, if the black mass is transported or sold to another processing unit, in that case, it will be considered as hazardous waste as per Hazardous and Other Wastes

(Management and Transboundary Movement) Rules, 2016 as amended from time to time. The committee also found that the SPCBs are not following uniform policy in this regard. In some cases, black mass is treated as a hazardous waste, while there are many cases where CTOs are granted mentioning the production of Black mass as other names like metal oxide powder (Co, Ni, Mn, Li), copper with graphite powder though the companies are not having hydrometallurgical process or facility to process Black mass and therefore the black mass is treated as a product in the consents.

Recommendation: The committee noted that a product or by product should usually have a fixed composition and follow some standards. The composition of black mass generated would depend on the chemistry of the batteries being recycled. It would therefore have no fixed composition, but vary from batch to batch. Though black mass is traded as such, it has no use unless further processed for recovery of metals. Hence, the trade is more in the nature of a trade in wastes. It is also true that black mass would contain heavy metals with concentration beyond the limits mentioned in the rules. After hearing the views of the CPCB and the applicant, the committee was also of the opinion that Black mass should be considered as Hazardous waste, unless processed in the same premises for recovery of critical minerals. Any import/export of Black mass needs to be dealt under HOWM Rules, 2016. However, since Black mass is not mentioned standalone in HOWM Rules, 2016, its import/export shall be dealt under Rule 12(8) of HOWM Rules, 2016. Accordingly, any import/export of black mass should be allowed only to actual user and after permission from MoEF&CC as per the HOWM Rules, 2016 as amended from time to time. Committee also recommended that since, CPCB has already finalized SOP in this regard, CTOs and Authorisation granted or to be granted by SPCBs/PCCs must align with the CPCB's SOP.

Agenda. 2. Granting permission for import of Scrap tyres for 10 years for manufacturing of rCB (recovered Carbon Black) – Representation from M/s Birla Carbon SCM India Private Limited, Worli, Mumbai

The applicant *vide* letter dated 10th October, 2024 stated that Birla Carbon is one of the leading global suppliers of carbon-based solutions. In India, Birla Carbon has become a partner in Finster Black Private Limited to manufacture and supply rCB at large scale to the Indian tire manufacturers looking for more circular raw materials. It is therefore requested to consider the original request of M/s Finster Black Private Limited for granting NOC for import of Scrap tyre for a 10-year period for a volume of 50,000 TPA.

The matter was discussed in 139th EC meeting held on 29th November, 2024 and the committee found that Birla Carbon has already introduced the Continua brand for sustainable carbonaceous material in Europe and has announced plans to do the same in partnership with Finster. They are looking at upgrading the facilities and laboratory at Finster, which would require substantial investments. It was also stated that the supplies to tyre companies usually involve medium to long term contracts, and assurance of supply of raw materials will help in tying up such contracts. The committee also desired to know what steps applicants would take to source material domestically

and how they would assure that all imported material would be used for manufacturing rCB only. The committee after hearing the views of the applicant recommended that the applicant may be asked to provide details as discussed in the meeting to the Ministry for further deliberation/decision in the matter in TRC meeting.

Now, the applicant *vide* email dated 10/12/2024 has provided the reply stating that in order to supply the Indian market with rCB, Birla Carbon has taken a stake in Finster Black. Also, they are upgrading the emission norms at Finster Black to align with stringent European standards. This involves substantial capital investment and increased operational costs, underscoring our commitment to producer responsibility and environmental stewardship. In order to meet international benchmarks, including ISCC PLUS, ISO, and REACH certifications, investment in technologies, training, continuous monitoring and reduction of variance resulting in higher compliance costs will be required.

Companies like Apollo or CEAT will commit only if the production facility meets the highest global environmental standards and if rCB supply is secured for several years. In order to achieve the "expected large rCB volumes" from the tyre manufacturers, large volumes of spent tyres of similar natures need to be available. Further, they are investing significantly in establishing a high-end R&D laboratory in Finster Black, complementing their centralized world class testing facility in Atlanta, USA, for rCB and rubber compound testing. They have tried to source Indian ELT locally but have not been able to identify any stable sources at the volume and homogeneity required. The main reason seems to be the presence of small scale recycling facilities within 10-20 km radius of ELT collection.

As a consequence, in order to achieve consistent ELT access, the Finster group has invested 50 crores in collection facilities across the USA. So, the approval for a 10-year NOC to import 50,000 TPA of scrap tyres will secure their operational sustainability to produce large volume of rCB.

Accordingly, the matter is placed before TRC for deliberation/decision in the matter.

The matter was last discussed in 90th meeting of TRC held on 20th December, 2024 and after deliberation on the issue the committee recommended that the applicant may be asked to provide a detailed project report specifying their investment plans vis-à-vis upgrading thefacilities and laboratory at Finster Black Private Limited, plan for using rCB in manufacturing of new tyre, assurance on developing the domestic supply chain etc. Till then the matter is deferred.

Now, the applicant has submitted the requisite details. Accordingly, the matter is placed before TRC for deliberation/decision in the matter.

Deliberation: The committee deliberated upon the investment plan along with time line provided by the applicant for next two years and also heard the explanation of the applicant on it. M/s Birla Carbon clarifies that since it already has a running plant so installation of new equipment is time taking. Regarding rCB sales to tyre manufacturers, they have informed that currently rCB is being supplied to Non tyre, plastic and rubber segments. Sampling to tyre customers like CEAT and Appollo was done in November 2024 and feedback was positive. Plant is being set for ISO Audit for that detailed record keeping and traceability has been completed. Unit will be ready for audit by April 2025 and will be completed by June 2025. Hopefully, by

August 2025, Unit should expect first truck load order for plant trials in tyre companies.

M/s Birla Carbon further informed that in absence of assured scrap tyre supply, they will not be able to run this truly green initiative which completes the loop of recycling and which was promoted by NITI Aayog in its circular economy recommendations. This would result in India losing a great opportunity to excel its rubber recycling potential to the next level, and requested TRC to kindly issue the 10-year NOC so that we can freely make the above investments without worrying about availability of raw material and concentrate our efforts towards operations of plant.

Recommendation: **The committee noted that the applicant has given some investment plans and also detailed their efforts in getting their product accepted by leading tyre manufacturers. The committee also appreciated the anxiety to have an assurance on the availability of tyres of uniform requisite quality. The committee also remains conscious of the risks that the promised investments may be delayed or not materialised or that a product acceptable to tyre manufacturers may not be realised. However, the committee noted that M/s Birla Carbon Ltd are one of the largest manufacturers of Carbon Black globally, and already have a well-established rCB product line in Europe. Virgin carbon black is presently being made by cracking of petroleum based feed stock, and adds to the overall dependence on imported petroleum. On balance, after detailed deliberation upon the issue, the committee recommended that the permission for import of 50,000 MT of Used tyre scrap in baled/multicut form for production of Recovered Carbon Black (RCB) which will replace the virgin Carbon Black in manufacturing Industry, may be extended further for 3 years (FY 2026-27, 2027-28 and 2028-29) in addition to earlier permission recommended and granted initially for a period of 3 years. This recommendation will be reviewed by TRC after 2 years to check and verify the compliance and intended use of waste tyre imported, and may further extend the permission, subject to maximum total 10 years, on satisfactory compliance.**

Once this policy recommendation of the TRC is considered and approved by the competent authority, the application for actual import may apply before the EC. The EC may further levy any conditions as deemed fit while giving the permission for import.

Agenda 3. Crumb rubber modifier to be blended in bitumen for use in road construction in view of the recommendation given in circular Economy Report on 'Tyre and Rubber Recycling Industry' and subsequent Circular Economy Action Plan Finalized by NITI Aayog.

Deliberation: The committee discussed the use of crumb rubber modifier to be blended in bitumen for use in road construction at refinery level and also took opinions of various stakeholders on its production, constraints, facility upgrades, techno-economic viability issues, safety, extent of limit for blending etc. The views

and recent updates on R&D were taken from various delegates of organization like Ministry of Road, Transport and Highways (MoRTH), BPCL, IRC, NHAI etc. It was noted that, Crumb Rubber Modifier (CRM) is blend of waste tyre Rubber Powder, Hydrocarbons and Crosslinkers. The Rubber gives the additional bindings strength & increased elasticity. Hydrocarbon & Crosslinkers dissolves into the bitumen & helps in improving the softening values & water repellent properties. It was informed by BPCL that CRM can be prepared by grinding it in cryogenic conditions to a size of less than 600 microns. The process is a physical dispersion of crumb rubber into bitumen and grades like CRMB 55&60 are good as per BIS No.17079, 2019 where the specifications of the product are already laid. Further, it was also highlighted that after preparation, the material should be placed at site within 6-8 hours due to stability issues though tankers are available which are providing optimum heat required during transportation. It is a cost effective practice but the geographical conditions viz. temperature, traffic loading etc. are a matter of concerns as per MoRTH. It was also seen that not only cryogenic process, which is widely used but also shredded product can also be used ranging up to 300 microns (around 30-40 mesh) particle size. As per, ASTM D8 worldwide standard, the recommended minimum rubber content for asphalt rubber is 15% by weight of the asphalt cement. The benefit of using this standard is 30 to 40 years of extended life with low maintenance.

According to NHAI, in India, around 3 Lac MT/ annum of CRMB (mostly grade 55 & 60) are used as per IRC 107 specification i.e. for Bitumen Concrete (BC) and are being projected for more use.

It was also informed that MoRTH has already issued guidelines regarding the usage of CRMB, PMB etc. for construction of roads in August, 2023 in consultation to the CRRI and other stakeholders.

Recommendation: **The committee noted the concerns expressed by the representative of MoRTH, but also felt that a definite plan for mitigating those concerns and increasing the use of CRMB needs to be made. After detailed deliberation, the committee felt that more discussion is required on the matter and stakeholders especially from the refineries and recyclers associations, like IOCL, CRRI, Ministry of Petroleum and Natural Gas etc. may be called in the next meeting. Further, more details viz. ground reality, logistics issues and any other constraints may also be obtained from Ministry of Road, Transport and Highways**. **The matter may be taken up in the next meeting of TRC.**

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