Item No. 01 Court No. 1

**BEFORE THE NATIONAL GREEN TRIBUNAL**
**PRINCIPAL BENCH, NEW DELHI**

Original Application No. 766/2024
(I.A. No. 562/2024)

Citizen Action Forum Applicant

Versus

Union of India & Ors. Respondent(s)

Date of hearing: 19.05.2025

**CORAM: HON'BLE MR. JUSTICE PRAKASH SHRIVASTAVA, CHAIRPERSON**
**HON'BLE MR. JUSTICE ARUN KUMAR TYAGI, JUDICAL MEMBER**
**HON'BLE DR. AFROZ AHMAD, EXPERT MEMBER**

Applicant: Mr. Pratap Shanker & Mr. Gautam Mishra, Advocates

**ORDER**

1. In this original application, the applicant has raised a grievance against Coal-based Rotary Kiln Technology for manufacturing steel.

2. Submission of counsel for the applicant is that the Direct Reduced Iron (DRI) obtained by the use of Rotary Kiln Technology, based upon the use of coal as raw material, causes pollution, therefore, the technology that uses green/clean fuel should only be allowed to be adopted in that process.

3. In support of such a submission, learned counsel for the applicant has referred to the report "Financing Decarbonization of the Secondary Steel Sector in India Towards an Enabling Environment" and Potential Pathways for Decarbonization mentioned therein as under: -

> *"3. POTENTIAL PATHWAYS FOR DECARBONIZATION*
> *Section 3 discusses two potential pathways for decarbonizing the secondary steel sector, alongside their mitigation potential, investment requirements, and the maturity status of concerned technologies. The short-term pathway focuses on targeting low-hanging fruits and focuses on incremental options – to integrate the best available technologies (BATs) in DRI, EAF, IF, and Re-rolling mills' production processes. The rationale behind the incremental approach is targeting emission-reduction by replacing outdated technologies with relatively lower investment. Additionally, as an incremental option, input substitution for*

*DRIs, EAFs and IFs could also be a game changer for both - short-term and long-term low-carbon transitioning.*
*The long-term strategy for decarbonization identifies potential transitional options for the secondary steel sector. These include the replacement of coal-based DRI plants to natural gas/hydrogen based DRI plants, and integration of direct re-rolling with DRI, EAF and IF units."*

4. He has also placed reliance upon the report Annexure – A/16 "Decarbonising Coal-based Direct Reduced Iron Production" and referred to the following recommendations mentioned therein as under: -

*"5. Recommendation*

*Following recommendations can help coal-DRI industry achieve decarbonisation:*

- *Due to the wide variation in fuel and raw material consumption, there is a lack of clear understanding of the functioning of rotary kilns. A detailed study should be conducted to characterise rotary kilns and evaluate their potential for decarbonisation.*

- *An assessment of waste heat recovery (WHR) potential and potential incentives is necessary to promote wider adoption in the SME sector.*

- *The economics of pelletisation should be evaluated, considering the trade-offs involved w.r.t lower coal consumption but higher pellet cost.*

- *Explore the potential of alternative decarbonisation options such as alternative fuels, through the implementation of pilot studies."*

5. He has also relied upon the report Annexure – A/17 "Decarbonisation Options for Rotary Kiln-Induction Furnace Process of Crude Steel Production" and has referred to the Decarbonisation Measures mentioned therein as under: -

***"3. Decarbonisation measures***

*Decarbonisation of the rotary kiln–induction furnace process is necessary to improve the emission intensity of the Indian iron and steel sector. Four emission reduction measures – one each encompassing energy efficiency, material efficiency, fuel change, and use of renewable energy – are considered in this study. Their impacts and the corresponding carbon abatement costs are mentioned in Table 2. The total cost of an option is calculated by adding the fixed cost, maintenance cost, and operation cost. Annual maintenance cost is assumed to be 10 % of the fixed cost. The annualised fixed cost is the fixed cost times the capital recovery factor.*

*Table 2: CO2 abatement potential and associated costs for various decarbonisation options*

| *Sl. No.* | *Decarbonisation options* | *Type of options* | *Direct $CO_2$ abatement (kg/tcs)* | *Loss in power generation (kWh/tcs)* | *Net CO2 abatement (kg/tcs)* | *Carbon abatement cost (US$/t $CO_2$)* |
|---|---|---|---|---|---|---|
| *1* | *Gravimetric separator* | *Energy efficiency* | *0.0* | *-175.9* | *213.7* | *-39.5* |
| *2* | *Bio-char Replaces feed Coal* | *Use of renewable energy* | *1,241.5* | *-378.7* | *1701.6* | *45.4* |
| *3* | *Better grade dolomite* | *Material efficiency* | *56.6* | *0.0* | *56.6* | *45.8* |
| *4* | *Natural gas Injection* | *Fuel change* | *607.1* | *180.8* | *607.1* | *66.0* |

6. The reliance of the applicant is also upon the report Annexure – A/1 "Decarbonizing India" where it has been observed as under: -

> *"1.1 GLOBAL CONTEXT*
> *Combating catastrophic climate change is on the agenda of governments around the world. Calls from climate change prediction agencies to reduce greenhouse gas (ghg) emissions grow more urgent every year. Countries across the globe have decided to act and reduce their emissions drastically, with net zero emission targets in sight. India has announced that it will reach net zero emissions by 2070.*
>
> *Anthropogenic emissions of carbon dioxide (co2) and other greenhouse gases are the primary cause of climate change and one of the most pressing challenges of the contemporary world. Significant quantities of co2 and other greenhouse gases are emitted every year. They join historical emissions already present in the atmosphere and will themselves remain in the air for hundreds of years. The increasingly high levels of co2 are the cause of rise in average global temperature and are 'forcing' changes in the world's climate.*
>
> *Thus, current global warming is a result of both recent emissions as well as emissions in the past. During the last three decades, there has been a rapid and alarming rise in global co2 levels. Annual global ghg emissions have grown by 50 per cent from 1990 to 2018 and are still on the rise.1 This cannot continue without seriously jeopardizing human survival on this planet.*
>
> *The significant sectors contributing to ghg emissions worldwide are energy, agriculture, waste, industry, forestry and land use. The energy sector remains the largest contributor— with a 73.2 per cent share (36.2 gigatonne/gt). Of this, the industrial sector contributes 24.2 per cent (12 gt), buildings contribute 17.5 per cent (8.7 gt) and transport contributes 16.2 per cent (8 gt)."*

7. Referring to the above, the submission of counsel for the applicant is that to reduce the pollution from coal-based Rotary Kiln, switching these kilns to hydrogen-based and PNG fuel is necessary.

8. Issue notice to the respondents. Applicant is directed to serve the respondents and file the affidavit of service at least one week before the next date of hearing.

9. To ascertain the correctness of the plea taken by the applicant, we find it appropriate to request a detailed report from IIT, Kharagpur, regarding the issue raised by the applicant in this OA. Let the report be submitted by IIT Kharagpur within 8 weeks.

10. A copy of this order, along with all the documents filed by the applicant, be forwarded to the Director, IIT, Kharagpur, for the necessary compliance.

11. List on 12.08.2025.

Prakash Shrivastava, CP

Arun Kumar Tyagi, JM

Dr. Afroz Ahmad, EM

May 19, 2025
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AS..