

Minutes of the Discussions Made in the Half Day Workshop on Utilisation of Priority Waste Streams from Vapi Industrial Estate in Cement Kilns in Gujarat

09 April 2018

VIA (Vapi Industrial Association) Conference Hall, Vapi

SINTEF is one of the leading applied multidisciplinary research institutions in Europe with more than 2000 professional employees. SINTEF has a long and relevant experience with capacity building & technical assistance in international projects for governments, industry and international organizations within industrial and hazardous waste management in general, and with co-processing.

SINTEF, as a technical consultant of the GIZ SEIP (Sustainable and Environment Friendly Industrial Production) project, has prioritised three waste streams generated from Vapi Industrial Estate, the recovery of which through co-processing in cement kilns will result in improving the life of the existing landfill, the overall environmental performance and CEPI (Comprehensive Environmental Performance Indicator) scores further. In the waste management hierarchy, Co-processing lies higher than conventional waste management options such as landfilling and incineration. CII-Green Business Centre will work as SINTEF's local consultant for the activities in SEIP Vapi site.

The details of the priority (selected) waste streams generated from Vapi are given in the table below.

SN	Waste	Generated from	Regular Generation in tonnes/day	Stock in tonnes	Current Management
1	Plastic Wastes	Paper Mills using recycled and imported feedstock	300-350	60 000+ in two locations in Vapi	Partial quantities sent to Ambuja and Ultratech cement plants
2	CETP Sludge	VGEL Common Effluent Treatment Plant (CETP)	200-250	~ 5 000 for drying at VGEL CETP	Landfilled in VGEL TSDF
3	Sludge from neutralization of soent acid	Dyes and Dyes Intermediates industries	300-350	0	Landfilled in VGEL TSDF, small quantities sent to cement plants

The 'Half Day Workshop on Utilization of Priority Waste Streams from Vapi Industrial Estate in Cement Kilns in Gujarat' was jointly organized by Gujarat Pollution Control Board (GPCB), Vapi Industrial Association (VIA), GIZ and SINTEF.

The workshop was attended by more than 30 participants (7% female) from Vapi Industrial Association, GPCB- Vapi Regional Office, GPCB- Gandhinagar (Head Office), Paper Mill Owners representing Vapi Paper Mill Association (VPMA), Dyes and dyes intermediate industries, Vapi Green Enviro Limited (VGEL) responsible for operating the Hazardous Waste Landfill (TSDF) and Common Effluent Treatment Plant (CETP) in Vapi, major cement companies of Gujarat such as Ambuja (Geocycle), Ultratech, Sanghi, Digvijay; CII-Green Business Centre, GIZ SEIP Vapi Cell and SINTEF.

Mr. Palash K Saha, Research Scientist- SINTEF set the context on baseline waste management scenario of the three selected (priority) waste streams generated from Vapi.

Dr. Kare Helge Karstensen, Chief Scientist- SINTEF presented on international best practices on improving resource efficiency and limiting environmental impacts by using integrated waste treatment options and on successful case studies from Asia.

Mr. Jalendu Desai from Ultratech Cement presented on the concepts and benefits of co-processing and on experiences of utilisation of wastes from Vapi. Ultratech has been co-processing plastic wastes since 2012-13; on an average 6000 tonnes/month of plastic wastes is currently utilised in Ultratech cement plants. Ultratech Kovaya will be able to receive higher quantity of plastic wastes from Vapi after installation of shredder. Current limitations of utilising plastic wastes are high moisture and presence of foreign materials such as stones and metal pieces.

Mr. Pratas Baruah from Geocycle (waste management business of Lafarge Holcim, representing ACC Cement and Ambuja Cement in India) presented on the concepts of pre-processing and Geocycle's experience of co-processing plastic wastes from Vapi. Geocycle has co-processed 14 million tonnes of wastes worldwide. In India, Geocycle has 7 pre-processing and 14 coprocessing facilities. Geocycle has, so far, co-processed more than 200 000 tonnes of plastic wastes from Vapi. The moisture content of plastic wastes received is approximately 60% and the net calorific value is approximately 2 000 kcal/kg. The need of the hour is that the paper mills invest in moisture reduction technology (sun drying, press or bailing machines). This will be win-win situation for both paper mills and the cement industry.

Ms Manali of GPCB talked on achievements of cement kiln co-processing in Gujarat, various initiatives taken by GPCB and regulatory requirements for co-processing of wastes. GPCB aspires to achieve 10% Thermal Substitution Rate (TSR) by 2020; current TSR of all the cement industries combined in Gujarat is approximately 5%. There are 5 pre-processing facility in Gujarat. GPCB is insisting that the high calorific value and high-volume waste be diverted to cement plants for co-processing. GPCB is currently implementing 'Waste Management Data Bank' and requested industry to share waste characteristics data.

Mr. Lalit Garg, Honorary Secretary of Gujarat Paper Mill Association requested GPCB to re-consider the classification of Plastic wastes; currently Plastic waste is classified as Hazardous Waste in Gujarat for better regulatory and monitoring control of the waste. Mr. Garg also requested to assess the technical feasibility of using plastic wastes in Paper Mill captive boilers.

Mr. Jignesh Ojha from Micas said that there are more than 30 Dyes and dyes intermediate industries in Vapi generating 600 to 700 tonnes of Spent Sulphuric Acid, the neutralization of which with lime generates 300-350 tonnes/day of sludge. The colour in the sludge, due to presence of organics, is one of the limitations; moisture content of sludge is approximately 25%. The sludge can be gainfully utilized in cement plants as substitute of Gypsum.

VGEL-TSDF currently landfills 90 000 tonnes/year of hazardous wastes. The TSDF operates for 8 to 9 months in a year (non-operational for 3-4 months during rainy season). More than 50% of hazardous wastes landfilled is CETP sludge. The current landfill with capacity of 1,4 million tonnes will be filled in one year. Another 35 acres of land, close to the current landfill, has been allotted which will have a capacity of landfilling 3 million tonnes of hazardous wastes.

The CETP is currently treating 58 to 60 million litres per day of waste water; the capacity will be upgraded to 70 million litres per day. The generation of CETP sludge will increase from current generation of 200-250 tonnes/day. For high COD waste water (for example, leachates from hazardous waste landfill) CETP has installed Common Multiple Effect Evaporator and Spray Dryer.

During discussions, Mr. Sharad Thakar, Ex- President of VIA suggested that decision makers from industries and VGEL should participate in such important workshops. He also requested the cement companies to assess the feasibility of setting up a pre-processing platform in Vapi. Mr. Himanshu from Richter-Themis Medicare mentioned that they could blend the various wastes generated from their facility in Vapi and supply to cement plants as alternative fuels.

Follow up actions

SN	Actions	Responsible	Timeline
1	Send the minutes of the discussions and the presentations made to all the participants	SINTEF	12 April 2018
2	Make a case on plastic waste utilization in Vapi which can be referred and replicated in other similar paper mill clusters. This document may be submitted to GPCB for their review.	SINTEF and CII-GBC Review by GPCB	September 2018
3	Analysis of samples of sludge from neutralization of spent acid by cement companies from different batch operations to understand variability of sludge quality- industries provide access to collect samples	Dyes and dyes intermediate industries in Vapi to send samples Cement companies for analysis	June 2018
4	Follow the Shree Cement- Vatva Acid Bank initiative and assess replicability for Vapi- present findings in next workshop/meeting	SINTEF and CII-GBC	June 2018
5	Life Cycle Analysis report with comparison of different waste management options for CETP sludge generated from Vapi- present findings in next workshop/meeting	SINTEF	May 2018
6	Send samples of CETP sludge to cement plants for analysis- separate samples for primary and secondary sludge	VGEL CETP to send samples Cement companies for analysis	June 2018
7	Publish the findings of the studies conducted in Vapi in journal/compendiums- for example Plastic waste success story, techno-economic feasibility studies etc.	SINTEF, CII-GBC, Industries, GPCB, GIZ	Continuous
8	Another consultation or follow up meeting to track progress of activities		Last week of June 2018



Figure 1: Dr. Karstensen- Chief Scientist, SINTEF presenting on Improving resource efficiency and limiting environmental impacts by using integrated waste treatment options



Figure 2: Participants listening to the presentation made by Ultratech Cement



Figure 3: Mr. Pratas Baruah from Geocycle presented on Lafarge Holcim Case study on utilisation of wastes from Vapi- current utilisation, opportunities and limitations



Figure 4: More than 30 participants attended the Half Day Workshop on Utilization of Priority Waste Streams from Vapi Industrial Estate in Cement Kilns in Gujarat



Figure 5: CETP Sludge from Decenters stored in concrete pits for drying- Photo taken on 09.04.2018



Figure 6: Plastic wastes being loaded on trucks for transport to Ultratech Cement- Photo taken on 09.04.2018



Figure 7: The 4th and last cell of the VGEL Hazardous Waste Landfill site which will be filled in one year- Photo taken on 09.04.2018