

World Bank - Incineration Technology

Project IDs:

IFC Projects: 20509, 23966, 22787, 22440, 009719, 10591, 10839, 10492, 008084.

World Bank projects: P050657, INPE50651, INPA10496, INPA35825.

Since early 1990s, through loans, grants and open interference with policy making, the World Bank Group has promoted incineration as a disposal option of choice for medical, municipal and hazardous wastes. Incineration is a technology that is known to emit dioxins and furans – a category of chemicals that are the most toxic known to science. Dioxins and furans are known carcinogens that also affect the reproductive and immune systems. They are among 12 chemicals shortlisted for a global phase-out under the UNEP led Stockholm Convention on Persistent Organic Pollutants. All incinerators emit unacceptable quantities of dioxins in real-life operation. Further, they propagate wasteful use of resources and serve as a disincentive for waste prevention. Popularising this technology in India, knowing fully well the lack of regulatory oversight and the absence of resources and infrastructure for monitoring emissions has added to India's problems due to environmental contamination. Till date, the Bank has not conducted any review to see if the incinerators they funded were even capable of functioning without polluting. The Bank's single-minded promotion of end-of-pipe technologies is indefensible, given that non-governmental organizations were highlighting alternatives, including material substitution, resource recovery, extended producer responsibility and segregation at source, all of which are far more inexpensive and environmentally sustainable interventions.

As health, environmental, economic and social impacts of incinerators began becoming clear in the 1980s, communities in countries like the United States and Japan went up in arms against these unsustainable technologies. For more than two decades, community resistance built around concerns over the impacts of incinerators has resulted in the defeat of hundreds of incinerator proposals around the world.¹

Using its clout as a lender and a policy advisor, different arms of the World Bank have been promoting incinerators in India either through projects that finance purchase and construction of incinerators or through endorsing incinerators as viable options for waste disposal in their publications.

It was first revealed in February 1996 through a World Bank funded State Health Systems Project II, which included setting up of up to 100 of medical waste incinerators in state run health care facilities in Karnataka, Punjab, West Bengal.² Interestingly a month prior to this, in January 1996, a report prepared by World Bank's South Asia office, titled -"India's Environment - Taking Stock of Plans, Programs and Priorities" noted that:

¹ Bankrolling Pollution Technologies: The World Bank Group and Incineration. By Neil Tangri, Essential Action for GAIA (Global Alliance for Incinerator Alternatives/ Global Anti-Incinerator Alliance), September 2002.

² Letter dated February 14th, 1997 from Multinationals Resource Center to Andrew Steer, The World Bank, Washington DC.

*"Long-term environmental policies, guideline, and statutes should be linked with immediate requirements to segregate and decontaminate medical waste at its source. This linkage should include appropriate technology for sustainable environmental and public health protection, rather than imported high-technology incinerators that are expensive to purchase and difficult to maintain."*³

Strong local and global opposition to the project forced the Bank to withdraw funding of incinerators from this project and place an internal moratorium, which they never publicly revealed, on funding incinerators in public health care sector in India. World Bank continues to fund medical waste incinerators in other developing countries till date.

In March 1997, a report prepared by a World Bank consultant Professor Roger Willey of University of Paisley on Indian medical waste situation revealed attempts being made to influence a regulation that was being formulated to manage medical waste in the country. He questioned the facts presented by critics of incinerators labeling it "selective" and based on "outdated information or circumstances" and urged the Bank to "put any pressure which you can muster on the Ministry of Environment and Forests to reconsider their proposed regulations."

Interestingly, the Ministry of Environment and Forests was contemplating regulations that would include the sensible route of segregating the "clinical waste at source and remove those plastics which would give rise to dioxin emissions." Not only did the Bank consultant discourage segregation and downplay the role of chlorinated plastics in forming dioxins and furans, it also urged the Bank to use its clout to dilute the Biomedical Wastes Handling Rules, that were being formulated at the time.⁴

A casual internet search of publicly available documents from the World Bank and IFC websites yielded at least 13 projects, involving innumerable incinerators, approved by the World Bank (IBRD/IDA) and the IFC, including one project as recently as in June 2006.

The above data suffers a number of drawbacks. Most of the projects listed on the World Bank Group (WBG) websites do not get updated beyond pipeline/approval stage. Therefore, it is difficult to ascertain the changes in the project design during the implementation stage. Some projects which had incineration component at the pipeline stage may not have it during the implementation stage. Also from the publicly available documents it is always not clear whether total project funding includes a component to fund incinerators. As per the report Bankrolling Pollution Technologies: The World Bank Group and Incineration "... WBG is not required to mention incineration even in those projects for which it is intended during the design phase. Solid waste disposal is often mentioned in project documents as a concern and is one of the issues that the WBG considers sufficiently serious to merit mention. But incineration per se is not uniformly recognized as an issue of serious environmental concern, and therefore may be omitted

³ "India's Environment -Taking Stock of Plans, Programs and Priorities". The World Bank. January 1996.

⁴ "World Bank Consultant Report Recommends Incineration, Criticizes Environmentalists, Urges The Bank to Pressure Indian Government" Essential Information. Washington DC. 1997

from many project documents simply because those drafting the documents did not think it worthy of note. This can be seen in documents that indicate that waste will be handled “appropriately” without specifying a methodology for doing so.”⁵

Interestingly, the IFC Position Paper on Persistent Organic Pollutants (POPs) of December 2003, stated:

“IFC will continue to consider funding projects involving incineration, if after examination of the project-specific circumstances incineration is shown to be the best available waste disposal technique and is consistent with the applicable IFC Guidelines and the requirements of the Stockholm Convention. Project sponsors will be expected to justify selection of incineration as their preferred waste management option, and demonstrate consideration of waste minimization, separation, recycling and alternative means of disposal for each waste stream produced.

IFC will institute processes to monitor the development of operationally-proven alternatives to incineration technologies.”

Stockholm Convention on POPs recognizes incinerators as major source of dioxins and furans.⁶

Recent Guidelines published by IFC and World Bank on Environment, Health, and Safety (EHS) for Waste Management and Waste Management Facilities (under review) on April 30th 2007, still continues to lay strong emphasis on incineration and landfills, another discredited technology, rather than promote non-burn and provenly safer alternative disposal technologies.

Environmental contamination due to incineration technology: Studies from India

Free-range chicken eggs collected near the Queen Mary's Hospital, Lucknow medical waste incinerator in Uttar Pradesh (India) showed high levels of dioxins and PCBs. Dioxin levels exceeded background levels by more than 16-fold and were five and half times higher than the European Union (EU) dioxin limit for eggs. Levels of PCBs exceeded proposed regulatory limits by 4.7-fold.⁷ To our knowledge, this study represents the first data about POPs in chicken eggs from India.

Free-range chicken eggs collected in the Eloor area of Kerala, India near a chlorinated pesticides manufacturing plant and a hazardous waste incinerator showed contaminant levels exceeding the EU limit for dioxins in eggs by more than 4-fold. Dioxins and PCBs combined exceeded newly proposed EU limit for total WHO-TEQ level for dioxins and PCBs by three times.⁸

⁵ IBID Note 1. pg no. 16.

⁶ Annexure C, Part II, Stockholm Convention.

⁷ “Contamination of Chicken Eggs near the Queen Mary’s Hospital, Lucknow Medical Waste Incinerator in Uttar Pradesh (India) by dioxins, PCBs, Hexachlorobenzene.” Campaign Report: Prepared by Dioxin, PCBs and Waste Working Group of the International POPs Elimination Network Secretariat, Toxics Link-India and Arnika Association-Czech Republic March, 2005).

http://www.ipen.org/ipepweb1/library/ipep_pdf_reports/3ind%20lucknow_eggsreport.pdf

⁸ “Contamination of chicken eggs from the Eloor in Kerala, India.” Campaign Report. Dioxin, PCBs and Waste Working Group of the International POPs Elimination Network Secretariat, Periyar Malineekara

Key arguments against Incineration

- **INCINERATION DEMANDS CREATION OF WASTE - IT ENCOURAGES WASTE PRODUCTION**

Incineration completely destroys attempts to reduce, recycle and reuse waste because a lot of waste is required to ensure that the incinerator operates. The incinerator also removes responsibility of the waste creator to collect, reduce, and recycle the waste as the waste is burnt.

- **INCINERATION DESTROYS RESOURCES**

A commodity becomes waste when it is of no value to a consumer. However, the material from which the commodity is made is a resource that still has plenty of use. Incinerating the waste will not give any chance for the material to be reused in another form. Thus resources are lost. For example, plastic containers, paper envelopes and bags can be further reused.

- **INCINERATION IS NOT FINAL DISPOSAL IT REQUIRES LANDFILLS**

The ash from incineration is very toxic as it has contaminants ranging from heavy metals (lead, mercury, cadmium) to organochlorines (dioxins and furans). Disposing this waste requires engineered landfill, which will again cost crores of rupees. If the ash is disposed in ordinary municipal dumps, the heavy metals in the ash will leach into the ground water and also the ash can blow in the wind and disperse on land and water bodies.

- **INCINERATION PRODUCES TOXIC ASH AND SMOKE**

Incineration is a chemical process where heat reduces the waste into its chemical constituents. Incinerators release toxic pollutants in the form of stack gases, solid residues and sometimes liquid effluent. Hazardous pollutants from incineration include Persistent Organic Pollutants (POPs) such as dioxins and furans, as well as heavy metals, acid gases, particulates and greenhouse gases. POPs are especially dangerous because they bioaccumulate, biomagnify, resist decomposition and are capable of being transported great distances, thus threatening human populations and ecosystems around the world.

- **INCINERATION IS A VERY EXPENSIVE TECHNOLOGY**

Waste incineration is a very costly technology as the pollution control devices cost crores of rupees. For example, a new incinerator in Amsterdam (2000 tons per day) cost approximately US\$600 million, with about US\$300 million spent on pollution control. If the technology installed is for a few lakhs of rupees then the technology is being subsidised at the cost of health and environment.

- **THERE IS NO SUCH THING AS ECO-FRIENDLY INCINERATION**

Around the world, incineration as a technology to manage waste is being abandoned due to health-related and environmental problems associated with it.

- **INCINERATION IS ENERGY-INTENSIVE**

Incineration is a thermal process. To generate heat fuel is used. For instance, calorific value for Indian waste is around 600-800 k Cal/Kg. Whereas, to generate energy, the minimum calorific value needed is 1200-1400 k Cal/Kg. Therefore extra fuel has to be added to generate viable energy from incineration.

Contd.

- **INCINERATION WILL DESTROY LIVELIHOOD OF THOUSANDS OF PEOPLE**

Waste consists of biodegradable and non-biodegradable waste. The non-biodegradable waste has an economic value even after it is thrown out. Occupation and livelihood of a whole informal sector comprising of ragpickers or kabariwallahs (scrap dealers) and recycles depends on this waste. Incineration destroys the source of livelihood of this sector without providing for a safer alternative.

- **ENERGY FROM INCINERATION IS NON-RENEWABLE**

Waste is considered as a source of energy because of its calorific content. Its constituents like plastics, paper, metal and other organic material contribute to the calorific content of waste. All of these are recyclable and are derived from non-renewable sources.

- **ENVIRONMENTAL COST**

In terms of environmental costs, which is often not taken into consideration while calculating the costs of energy recovery from incineration, Friends of the Earth, UK, has compared the amount of carbon emission, major contributor to the global warming, from incineration versus recycling and composting of household waste. It estimates that up to 4.5 million tonnes of carbon emission can be saved each year by recycling and composting of household waste as compared to incineration with energy recovery. According to the report "Beyond the Bin, 2000", recycling 20% of municipal solid waste reduces the cost of environmental damage by as much as £200 per tonne (approximately Rs 13,200).

- **INCINERATION DOES NOT COMPLETELY BURN ALL THE WASTE**

High temperatures are required to ensure that the entire waste is completely burnt. But the Indian experience shows that these high temperatures are never achieved because of the problems in design and operation. Waste comprises of different material including metals that may have high melting points. Also heat may not fully reach the waste that is piled inside the chamber. Thus portions of the waste do not come in contact with high temperatures.

Source: Global Alliance for Incinerator Alternatives (www.no-burn.org)

Based on the documents available on World Bank Group websites, a list of projects is given below which financed/endorsed/accepted/mentioned incinerators as viable waste management option:

1. Project Title: Duncan-Gleneagles Hospital

Project ID Number: 008084

Sector: Pollution Control/Waste Management

Dates: Projected Board Date: 6/9/97

Environmental Classification: Category B

Funding Institution: IFC

Quote from PID: "All pathogenic, infectious, hazardous and other hospital waste shall be segregated in color-coded containers for treatment and disposal. Human anatomical wastes, blood and fluids, microbiological waste and other bioethical waste are all incinerated following procedures and specifications established by the Central Pollution Control Board. Air emissions from the incinerators will be the only significant air emissions from the hospital, and will meet World Bank guidelines."

2. Project Title: State Health Systems Development Project II

Project ID Number: INPA35825 . 008084

Sector: Health

Dates: Appraisal date: 10/5/95; PID prepared: 2/13/96; Project Board date: 3/19/96

Environmental Classification: Category C

Funding Institution: World Bank

Quote from the Staff Appraisal: Report (2/96):

"For final disposal, the states have proposed to adopt three methods: incinerators for large institutions, purulators for small institutions, and burial methods in wells or pits for primary care facilities.

"Karnataka . . . All hospitals with 50 beds and above will be installed with incinerators.

"Punjab . . . With project assistance incinerators of various capacities would be provided to all hospitals based on their bed strength and the amount of waste likely to be generated at these institutions. 30 to 50 bedded hospitals will be provided with incinerators of . . . type, 100 to 200 bedded hospitals with . . . type, 400 bedded hospitals with . . . and those with more than 500 beds with . . . type.

"West Bengal . . . Incinerators will be made available for districts hospitals and some sub-divisional hospitals, where the number of beds is larger than 300."

3. Project Title: State Health Systems Development Project III

Project ID Number: INPA10496

Sector: Basic Health

Dates: Appraisal Date: 11/5/97; Projected Board Date: 6/9/98

Environmental Classification: Category B

Funding Institution: World Bank

Quote from the PID: (Annex, Environmental Aspects):

"Environmental Impacts: While the project will not contribute to any sizable increase in hospital waste, it will address the issue of the management of medical waste at the facility level, including collection, storage and final disposal. Due to concern with regard to the use of incineration technology and the expressed concern that incineration of

plastics results in emissions of dioxins and furans, alternative disposal technology will be fully evaluated. The state will produce an environmental action plan and the project preparations team will review the plan and incorporate it into project design."

4. Project Title: State Health Systems Development Project IV (+)

Project ID: INPE50651

Sector: Basic Health

Dates: Date PID prepared: 11/5/97; Projected board Date: 12/17/98

Environmental Classification: not provided in the PID.

Funding Institution: World bank

Quote from PID: (Annex, Environmental and Social Aspect):

"Environmental Impact. While the project will not contribute to any sizable increase in hospital waste, it will address the issue of the management of medical waste at the facility level, including the collection, storage and final disposal. Due to concern with regard to the use of incineration technology and the expressed concern that the incineration of plastics results in emissions of dioxins and furans, alternative disposal technology will be fully evaluated."

5. Project Title: Chemplast

Project ID: 10492

Sector: Chemicals

Approval Date: Pending as of September 2002 (dropped)

Env. Classification: A

Funding Institution: IFC

Document Date: March 29, 2002

Waste Stream: Organochlorines

Project Description: "The proposed project consists of: (i) the construction and operation of a greenfield plant, including a marine terminal and pipeline, at Cuddalore in Tamil Nadu state, to manufacture 170,000 metric tonnes per annum (mtpa) suspension-grade poly vinyl chloride (PVC) resin; and (ii) the upgrading of the existing PVC resin plant at Mettur and the industrial alcohol plant at Panruti, to enable them to meet IFC environmental standards and increase operating efficiencies."

Quote: "Process emissions [from the PVC plant] will include VCM [vinyl chloride monomer] & particulate matter emissions and HCl [hydrochloric acid] containing flue gases from incinerator."

6. Project Title: United Phosphorus Limited

Project ID: 10839

Sector: Chemicals

Approval Date: July 31, 2003

Env. Classification: B

Funding Institution: IFC

Document Date: Sept. 4, 2001

Waste Stream: Pesticides

Project Description: "The proposed project is a part of the corporate restructuring and investment program of United Phosphorus Limited ...the largest generic agrochemical company in India."

Quote: "UPL has three high temperature incineration facilities located strategically within the production. These facilities were implemented together with the initial production

units to ensure full destruction of active substances in [agrochemicals factory] waste before being deposited. Despite these initial forward looking initiatives the three high temperature incinerators will now need improvements in incineration temperature and retention time to comply with the latest international requirements for hazardous waste incineration (1200oC and ?2 seconds retention time). As part of the EAP preparation, UPL will present plans for upgrading the existing incinerators to these requirements, or alternatively present plans for installing a new incinerator according to these criteria at one of its locations."

7. Project Title: Orchid Chemicals & Pharmaceuticals Ltd.

Project ID: 10591

Sector: Chemicals

Approval Date: March 1, 2001

Env. Classification: B

Funding Institution: IFC

Document Date: Jan. 22, 2001

Waste Stream: Pharmaceuticals

Project Description: "Orchid Chemicals & Pharmaceuticals Limited (OCPL) is an export oriented pharmaceutical company with pharmaceutical manufacturing and R&D operations in India."

Quote: "The residues from the evaporator bottoms and the waste solvents [from the pharmaceuticals plant] are incinerated in a dedicated incinerator which air emissions are controlled with a scrubber." 10591 . 10839 . 10492 . INPE50651 . INPA10496 .

INPA35825 . 008084

8. Project Title: Astha Power Corporation Limited

Project ID: 009719

Sector: Power

Approval Date: October 13, 1999

Env. Classification: B

Funding Institution: IFC

Document Date: Aug. 3, 1999

Waste Stream: Industrial (other)

Project Description: "The project is a greenfield project being developed by private sponsors through Astha Power Corporation Limited (APCL). The project is to develop, own and operate a co-generation power plant based on heavy fuel oil"

Quote: "The dewatered sludge (from the fuel oil treatment plant) will be collected in a sludge pit for subsequent incineration."

9. Project Title: Uttar Pradesh Health Systems Development Project I

Project ID: P050657

Sector: Health, Nutrition & Population

Approval Date: April 25, 2000

Env. Classification: B

Funding Institution: World Bank

Document Date: Jan. 1, 1999

Waste Stream: Healthcare waste

Quote: "Incineration is another treatment option, which can be easy, fast, and effective as a method of treatment and disposal. Public perception and fear of toxic emission is the primary disadvantage of using this technology. However, state-of-the art incinerators are available which eliminate the environmental hazards due to noxious emission of

gases like dioxin and furans. With careful segregation of chlorine containing plastics and metals, use of incinerators is an appropriate option for effective disposal of waste in hospitals above 100 beds. The cost of incinerator will be funded by the State Government."

10. Project Title: H & R Johnson

Project ID: 22440

Sector: Nonmetallic Mineral Product Manufacturing

Environmental Category: B

Document date: 19-Apr-04

Approval date: 6 July 2006 (dropped)

Funding Institution: IFC

Quote: "Each plant maintains a high temperature incinerator for the disposal of combustible waste."

11. Project Title: Bharat Biotech

Project ID: 22787

Sector: Chemicals

Environmental Category: B

Document date: 23-jun-04

Approval date: Pending approval

Funding Institution: IFC

Quote: "The hazardous wastes generated from BBIL include killed animals/animal incineration ash, waste engine oil, and oil slag. The killed animals are treated at an on-site incinerator with the capacity of 17 kg/hr. The temperature in the incinerator is only 800 (C, which is far lower than the 1,000 (C suggested by WBG/IFC Guideline. However, there is no organic chloride used on site. It is strongly suggested that BBIL conduct one test to verify non-existing of dioxins and furans in the emission of incinerator.

12. Project Title: Ramky

Project ID: 23966

Waste stream: Hazardous/Municipal waste

Sector: Utilities

Environmental Category: B

Document date: 5 mar 2005

Approval date: June 29, 2005 (pending disbursement)

Funding Institution: IFC

Project description: The project involves IFC's financing of the hazardous waste (HW) and municipal solid waste (MSW) management businesses of the Ramky Group. Through these two businesses, Ramky offers modern, environmentally and technologically sound waste management services in India. The Group presently operates two international caliber HW treatment, storage and disposal facilities in Hyderabad and Mumbai, and plans to construct and operate four additional facilities in Kolkata, Chennai, Vizag, and Indore to serve the waste disposal needs of Indian industry. The Group also is constructing an integrated MSW management facility, the first of its kind in India, at two sites in Bangalore to enable the City to meet its waste management obligations under national law. IFC would support the Group's plans to grow both the HW and MSW management businesses throughout the country.

Quote from ERS document: Hazardous waste -“Organic hazardous wastes are burned in rotary kiln type incinerators manufactured by a leading U.S.-based company (Alstom). With a destruction efficiency of 99.99%, incinerator emissions of pollutants and hazardous constituents – SO₂, NO_x, SPM, HCl, heavy metals, dioxins and furans -- are designed to comply with Indian (i.e., CPCB) and U.S. EPA hazardous waste regulations. Ramky’s monitoring activities demonstrate that incinerator emissions are well within the U.S. EPA and Indian limits, as well as World Bank guidelines¹ . Going forward, Ramky will install continuous emission monitors on all incinerators to meet the conditions of the state pollution control boards’ operating consents.

Municipal Waste-“The remaining organic waste with fuel value will be converted to refused derived fuel (RDF) in both pelletized and/or “fluff” forms in an enclosed processing building. RDF will then be combusted in an incinerator and steam boiler system to produce power. Steam will be converted to as much as 12 MWH of electrical energy using a turbine. Incinerator emissions will meet Indian CPCB standards and World Bank guidelines. Ash will be disposed in the landfill.”

13. Project Title: Atul Limited

Project ID: 20509

Waste Stream: Organic waste

Sector: Chemicals

Environmental Category: B

Document date: 3/3/2006

Approval date: 9 June 2006 (pending disbursement)

Funding Institution: IFC

Quote from ERS document: “Atul also generates approximately two tons of various organic wastes per day. The organic wastes generated at Ankleshwar site are disposed of at a licensed incinerator. The incinerator is designed to destroy dioxins/furans, and dioxins/furans are also monitored. The organic wastes from Atul site is incinerated at an onsite incinerator. The incinerator is designed to destroy dioxins/furans. However, there is no monitoring of dioxins/furans from the incineration emissions. Atul agrees to dispose of all the chlorinated wastes at the Ankleshwar incinerator before the dioxins/furans are monitored and the results meet both local regulatory requirements and best industrial practices. Atul will also improve the segregation of chlorinated and non-chlorinated organic wastes. At the Atul site, a new incinerator will be commissioned in the next few months which is expected to achieve complete destruction of dioxins and furans. As required in the CAP, Atul will monitor dioxins/furans routinely if the onsite incinerator is used to dispose of chlorinated organic wastes.”

(Note: The above list of projects has been compiled from different sets of lists available from Essential Information and GAIA. Most of the projects listed above have been cross checked with information publicly available on the WBG’s websites)