

Arguments against Adopting Waste Incineration in Lebanon

- 1- Waste management follows a hierarchy/pyramid that prioritizes waste minimization, reuse, and recycling. In this hierarchy the least preferred options are waste incineration and landfilling.
- 2- Worldwide, countries are moving to adopt circular economy principles. We would like to refer you to a document issued recently by the European Union (<http://ec.europa.eu/environment/waste/waste-to-energy.pdf>) that stresses on the adoption of circular economy and valuation of resources from waste and recommends a moratorium on new incinerators.
- 3- Although incineration technologies have evolved so that they pollute less; however, waste incineration is still considered one of the sources of emissions of persistent organic pollutant (dioxins and furans) according to the Stockholm Convention. The convention developed guidelines for best available techniques and best environmental practices for waste incineration, setting a large number of requirements in the design of incinerators and pollution control systems to be adopted. The document can be retrieved from the following link: (<http://chm.pops.int/Implementation/BATandBEP/BATBEPGuidelinesArticle5/tabid/187/Default.aspx>). Looking at page 21 of the document you will read the following paragraph: "emissions to air from waste incineration plants depend to a large extent on the firing conditions and the design and operating conditions of the flue gas treatment systems. PCDD/PCDF emissions from modern waste incineration plants using best available techniques are in the range of 0.0008-0.05 ng I-TEQ/Nm³ (see Stubenvoll, Bohmer et al. 2002). However, emissions can be higher than 150 ng I-TEQ/Nm³ in the case of badly designed and operated plants. Moreover, incinerators are a source of emissions of Benzo-a-Pyrene {B(a)P} a Polycyclic Aromatic Hydrocarbon (PAH). B(a)P is classified as a "Group 1: Carcinogenic to Humans" as per the International Agency for Research on Cancer (IARC) & have been known as a human carcinogen even long before Dioxins (chemical name: 2,3,7,8-Tetrachlorodibenzo-para-dioxin) & Furans. Please check website of IARC: 50-32-8 Benzo[a]pyrene (<https://monographs.iarc.fr/list-of->

[classifications-volumes/](#)); 1746-01-6 2,3,7,8-Tetrachlorodibenzo-para-dioxin <https://monographs.iarc.fr/list-of-classifications-volumes/>

- 4- There are many pre-requisites for the adoption of waste incinerators which are not available in Lebanon. Please find hereafter the link to 2 documents that might help assess the feasibility of using incinerators: https://www.giz.de/en/downloads/GIZ_WasteToEnergy_Guidelines_2017.pdf

<http://www.seas.columbia.edu/earth/wtert/sofos/CWG.PDF>

If you check the SEAS document it says: “If the municipal solid waste composition in your city has in excess of 50% of organic waste (i.e. food, vegetation, or other putrescible), and greater than 15% of inert waste (construction waste, debris, sand, silt, etc.), then thermal waste treatment will probably not be the right choice. As per a CDR report in 2016, 63% of the waste generated in Greater Beirut is organic. Proper calculation of the calorific value based on the composition of the waste in Lebanon will give a calorific value of less than 6 Megajoules per kg (for the mixed waste including recyclables) while a calorific value of 9 Megajoules per kg is needed for a waste to energy plant to sustain combustion (incineration plants in Europe operate at 10-11 MJ/Kg). As a result, RAMBOLL in its recommendations, suggested to the government to remove at least 20% of the organic and burn all the rest including recyclables. Recyclables are a valuable resource that can be recovered and create value chain economic benefits and generate employment. A study conducted by SWEEPNET in 2012, estimated that 39.7 million USD are annually lost from the 2,520 tons/day of waste in Beirut and Mount Lebanon area. If we extrapolate this figure to include all waste in Lebanon, which is estimated more than 6,500 tons/day, then the total financial loss due to the absence of complete recycling and composting would be greater than 103.3 million dollars. The energy to be generated by WtE facilities in Lebanon, will be minimal compared to the environmental damage that it will produce in view of the mismanagement that Lebanon has been witnessing in most of the central public facilities in the country.

- 5- Adopting incinerators requires a mature solid waste management system whereby waste is properly segregated (hazardous from non-hazardous among others) which is not the case. We refer you to the

document entitled “Policy Note on small scale incinerators” (August 2018) which is part of the part of the EU funded project “Technical support to upgrading the solid waste management capacities in Lebanon – ENPI/2017/389-095” which states that :

- a. The required conditions are not presently in place for the effective and safe implementation of MSW incineration. The main reason is that incinerators are effective only when they are working in a proper supportive ecosystem that ensures the quality and the quantity of the feedstock, addresses the institutional, financial and environmental challenges and integrates them in the waste supply chain. This supportive ecosystem does not exist in Lebanon.
- b. Accordingly, the construction of incinerators without the proper supporting ecosystem might present environmental, health and economic risks as well potentially undermining the implementation of an effective waste management strategy.
- c. Proposals for incinerators, large or small, should be shelved until a detailed, independent assessment is made of their longer-term role, if any, in the national waste management strategy, including conformance to the waste hierarchy. Standalone interim proposals should not be easily approved because of their impact on the overall waste management system.
- d. No incinerator projects should be approved until appropriate environmental regulatory and management controls and conditions are in place; this includes establishing a specific regulatory framework and subjecting all proposals to environmental assessment as well as permitting.
- e. Having implemented effective legal, regulatory and related institutional changes, all proposals should be subject to independent and detailed economic and financial evaluation, including examination of suppliers; claims on costs and performance, training and maintenance obligations.

- 6- We would like to refer you to a document by UNEP entitled “Municipal solid waste: Is it garbage or gold?”. We would like to quote few paragraphs from this policy paper namely:
 - “Incineration is expensive in terms of capital and operating costs, and requires high standards of operation and maintenance. In many developing countries, MSW generally has a low energy value because of its high moisture content and the prior removal of paper and plastic by waste pickers. Incineration of such waste will require additional fuel in order to keep the wastes burning”.
 - “Some WtE techniques might be more appropriate in developed or middle-income countries, while in developing countries, composting organic waste and biogas capture may be more useful to deal with waste high in organic matter. Large-scale investment in a specific technology, such as WtE, might also lead to technological "lock-in," narrowing options in the future”.
 - National governments can make a critical contribution by making waste management a national priority. They can also ensure the availability of skills, knowledge, and capacity to implement waste management programs effectively, especially at the local level, helping turn garbage to "gold."
- 7- We would like to refer you to the report prepared by EGIS to study the environmental impact of the tender documents for waste incinerators especially in Beirut. The report’s conclusion stated that launching of tender documents should be postponed for 1.5 to 2 years to complete several studies and assessments including a master plan for waste management, assessment of the locations, energy balance studies, preliminary environmental and social impact assessments for the different proposed locations, assessment on the treatment and disposal of ashes, analysis of different waste management options, etc...
- 8- We don’t have a legal framework that can govern this type of technologies and their management especially in terms of emission monitoring, ash disposal etc...
- 9- We have weak enforcement of legislation, and we are witnessing mismanagement in the public sectors in Lebanon as a common practice;

taking as examples the power, water, wastewater sectors etc. The performance of the private sector environmentally is not better. We are afraid of bad design and bad operations (you can see many examples of the quality of public services in Lebanon: emissions from power plants, polluted drinking water, non-operational wastewater treatment plants, etc...). this is why we are pushing for the adoption of less polluting waste management options and the concentration on the upper part of the waste hierarchy. Even in Europe some incinerators are mismanaged and causing pollution. We can refer you to some cases and incidents that happened lately:

<https://www.irisht Examiner.com/breakingnews/ireland/poolbeg-incinerator-owners-fined-for-breaking-environmental-licence-in-first-week-834378.html>

<https://www.wastedive.com/news/joplin-incinerator-fined-nearly-600000-for-emission-violations/83848/>

<https://airqualitynews.com/2015/12/09/air-pollution-waste-incineration-significant-report-warns/>

- 10- As per the MoE/UNEP/GEF (2017) - National Implementation Plan on Persistent Organic Pollutants- Lebanon existing waste incinerators are contributing to persistent organic pollutants as shown in the below tables. How can we control the large incinerators if we are unable to control the small existing ones?

Table 15 - Estimated UOPs emissions - Source Group 1

Categories	PCDD / PCDF (g TEQ)	
	Air	Residues
Medical Waste Incineration	14.452	0.082
Animal Carcasses Burning	0.02	---

Table 13 - PCDD/PCDF emissions from each source group to different matrices

Group	Source Groups	Annual Releases (g TEQ/a)					
		Air	Water	Land	Product	Residue	%
1	Waste Incineration	14.5	0.0	0.0	0.0	0.1	1
2	Ferrous and Non-Ferrous Metal Production	11.9	0.0	0.0	0.0	10.3	1
3	Heat and Power Generation	3.7	0.0	0.0	0.0	0.0	0
4	Production of Mineral Products	36.4	0.0	0.0	0.0	0.9	2
5	Transportation	2.2	0.0	0.0	0.0	0.0	0
6	Open Burning Processes	400.4	0.0	10.1	0.0	0.0	26
7	Production of Chemicals and Consumer Goods	0.0	0.0	0.0	44.4	0.0	3
8	Miscellaneous	0.0	0.0	0.0	0.0	0.3	0
9	Disposal	0.0	22.6	0.0	35.5	917.7	61
10	Identification of Potential Hot-Spots				86	0.0	5.4
1-10	Total	469.2	22.6	10.1	165.9	929.3	100
	Grand Total			1597			

- 11- We don't have the proper infrastructure to dispose of hazardous fly ash. Some existing incinerators are mixing the fly ash with ready mix concrete without any precautions and tests. Talking about exporting the fly ash is not reasonable due to the complications of documentation and procedure of Basel Convention and the high cost it will entail.
- 12- We don't have labs to monitor emissions of such facilities especially persistent organic pollutants such as dioxins, furans and poly-aromatic hydrocarbons.
- 13- A major concern is the impact on health Air pollutants in Lebanon exceed the permissible level set by WHO by 3 folds and Lebanon sustains the highest rate of cancer incidence in the Arab region.
- 14- Lebanon is the third most indebted country in the world and what the government submitted to CEDRE in terms of waste management plan included 3 incinerators (one for the South, one for Tripoli and one for Beirut & Mount Lebanon) for \$1.125 billion instead of going for the simpler and less costly plan of the year 2006. Why are they increasing this debt to implement incinerators? Why aren't they rehabilitating the

infrastructure we have and keeping all the recyclables for the recycling industry?

15- The World Bank's comments on the waste management projects submitted by the Lebanese Government at CEDRE discouraged the use of three incinerators. They recommended that the government starts with one, but even one incinerator might be too much knowing that similar developing countries with the same level of income and waste composition do not adopt incinerators. The World Bank report in reply to the Government's capital investment program proposed for solid waste at CEDRE indicates that:

- a. Specifically for Beirut incinerator no substantial market test for the scheme based on a 25 years concession has been made.
- b. Contingency planning: The development of WtE is complex and at the current development stage, without a solid market test, it is difficult to foresee what challenges lie ahead in contractual and financing arrangements with investors, in planning (ESIA, public consultation) and in operational and financial arrangements to be made with the participating LGs (local government). It is important to plan for waste management in the period up to the operationalization of the 5 regional facilities and include provisions for set-backs.
- c. Lebanon is locking in into waste incineration and treatment, with limited focus on waste recycling and waste reduction. In high income countries, incineration has been a key element in waste systems to reduce waste for disposal. However, it is regarded as a lower level solution in the waste management hierarchy and recent developments (circular economy) see a substantial shift from waste incineration to waste recycling and reduction. With the proposed program, Lebanon is locking in into waste incineration for decades.
- d. Financial sustainability, tariff system and financial arrangements with LGs. In addition to the US\$ 1.4 billion investments, the schemes will need roughly US\$ 150-200 million per year to operate. At present there are no arrangements to have these costs

covered by waste generators (households) or the LGs. There is thinking of putting a tariff system in place based on electricity consumption, and possibly linking billing to electricity billing. Tariffs systems take time to develop and have social implications. It is critical for the success of the regional investments that improvement in services go hand in hand with cost recovery, etc...

The World Bank report confirms that there are lack of studies and assessments for the adoption of incinerators in Lebanon and we also know that the choice of this technology was not based on strategic environmental, social and economic assessments.

16- During a number workshops organized by the Ministry of Environment early 2018 with municipalities and civil society organizations, they presented a map produced by UNDP showing the available waste management facilities and indicated that the existing operational facilities can treat 4,500 T/day, the existing non-operational facilities can treat 1,500T/day and the planned facilities can accommodate 1,750 T/day. The total would be 7,750 T/day while Lebanon produces 6,500 T/day. If this infrastructure exists, then why is the government adopting incinerators?