

PFAS and WtE : study done in France

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France's national specificities

A specific decree for hazardous and non-hazardous waste incineration plants in 2024.

It outlines a three-year timeline for analyzing PFAS emissions into the air, based on treatment capacity and the type of waste processed:

- October 2025: hazardous waste incineration facilities;
- October 2026: large municipal waste incineration plants; with big capacitites; > 15 t/h
- April 2027: smaller capacity plants; < 15 t/h
- April 2028: facilities using RDF boilers.

Technical Specificities

- \odot Sampling and analysis using the OTM-45 method;
- Measurement of hydrogen fluoride (HF);
- Peripheral parameters: flow rate, oxygen concentration, temperature, pressure, water vapor content;

• Sampling duration: 4 hours with a minimum dry gas volume of 3 Nm³.

Objectives and overall approach

SVDU launched a study in 2024 involving six WtE plants

• Objectives :

- Anticipate regulatory obligations
- Acquire robust scientific data
- Work on analysis and sampling methods
- o Intersect scientific, regulatory, environmental requirements and operation

• Approach :

- Treatment capacities : 50 000 to 270 000 tonnes per year;
- Diverse waste streams : residual municipal solid waste(in majority), sludge, commercial and industrial non-hasardous waste, and sorting rejects;
- Gas treatment :
 - Dry flue gas treatment : 4 installations
 - Wet flue gas treatment : 2 installations
- $\circ~$ Combustion temperatures betwen 1100 °C and 1300 °C at furnace core.

Distribution of the different compounds by plants



By compound, the maximum concentration quantified is 21 ng/m0 on dry gas at O2 Ref. (compound 6 : 2 FTSA on site UVE6).

Main compounds measured

- 10:2 FTSA: Dominant in UVE1 and UVE4 (≈40%), moderate in UVE2 and UVE3 (≈20%), and minimal in UVE6 (≈1%).
- 8:2 FTSA: Present at ≈12% in UVE1, ≈5% in UVE2 and UVE3.
- 6:2 FTSA: Ranges from ≈12% in UVE2 to ≈80% in UVE6; ≈4% in UVE3.
- **N-EtFOSE**: Between ≈15% (UVE2, UVE4) and ≈40% (UVE3).
- N-MeFOSE: Between ≈15% (UVE2, UVE4) and ≈35% (UVE3); ≈6% in UVE1.
- **PFHxA**: Between ≈20% (UVE1) and ≈31% (UVE4); ≈7% in UVE6 and ≈2% in UVE2 and UVE3.
- **PFBA**: 100% in UVE5 (low concentrations); ≈1% in UVE6.
- **PFPeA**: ≈10% in UVE1; ≈1% in UVE6.
- Minor Compounds (<5%) include PFHpA and PFOA, detected in all samples except UVE4 and UVE5. PFDA and PFTDA are found in UVE2, while PFUnA and PFTrA are specific to UVE6.

Plant	Flow (mg/day)
UVE1	14
UVE2	11
UVE3	8
UVE4	3
UVE5	0,69
UVE6	56

Significant deviation from other sites: this plant uses wet gas treatment, with 80% 6:2 FTSA—likely linked to the water used. Analyses are underway. Nearby chemical industries are suspected as the source.



Thank you for your attention !



Note on Hydrogen Fluoride (HF)

No correlation between PFAS concentrations (by OTM-45) and HF measurements obtained from analyzers. In water, it can be done, but in air, at least for the moment, there's no correlation between the two.



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Future Perspectives – Detection of Very Short-Chain PFAS

Literature reviews indicate certain PFAS can decompose into very short-chain by-products such as:

- CF₄ (tetrafluoromethane);
- C_2F_6 (hexafluoroethane);
- TFA (trifluoroacetic acid, CF_3 -COOH).



The Institut national de l'environnement industriel et des risques is France's public expert in technological risk management.

