Coordinated Destruction Ozone Depleating Substances (ODS) and Persistente Organic Pollutants (POPs) Central America Initiative

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Content

- ✓ Background
- ✓ Support for Initiative
- ✓ Participating Countries
- ✓ Objective
- ✓ Activities
- ✓ Emissions
- ✓ Guidelines
- ✓ Stockholm Convention Guidelines on Dioxins and Furans

….Content

- ✓ POPs Destruction Technologies
- ✓ Efficiency Removal/Destruction
- ✓ Technology assessment criteria
- ✓ Technologies
- ✓ Initiative Expansion

Background

- The ODS and POPS destruction initiative started with Swiss and Norwegian support, and then received Canadian support.
- It includes pilot decontamination/destruction of ODS and POPS supported by Norway.
- The initiative recently received additional support from Norway to include the preparation of a prefeasibility study of a certification program of cement kilns prepared for coprocessing, following Basel Technical Guidelines, in partnership with the Interamerican Federation of the Cement Industry (FICEM).

Background

- The ODS and POPs decontamination/destruction initiative is becoming a Hazardous Chemicals Decontamination/Destruction Initiative, which now includes ODS+POPS+Obsolete pesticides and outdated pharmaceutical products, as well as chemicals precursors of illegal drugs.

Supporting the Initiative

- ✓ Multilateral Environmental Conventions: BC, SC, VC and MP
- ✓ International Advisory Committee (IAC): SBC, MP, UNFCCC, UNEP, UNEP-ROLAC, Green Customs, Ozone Action, USEPA, USDD, NDM, FOEN, NME, Japan ITASNI, ISGD, Refrigerants Reclaim Australia, Hortitecnia-
- ✓ Regional Advisory Committee (RAC): NDA BSC and MP, CCAD, industry, academy, NGO, CA PCBs, Elimination Network (PEN)

Paticipating Countries

INITIATIVE OBJECTIVE

- ✓ To achieve the environmentally sound destruction of ODS and POPs in Central America through methods and technologies that prevent toxic contaminants releases, harmsway people health, workers safety and nearby communities.

Activities

- ✓ Feasibility assessment for environmentally sound destruction of ODS and POPs.
- ✓ Legal analysis for assessing feasibility of intra-regional movement of ODS and POPs for their destruction.
- ✓ ODS and POPs Pilot destructions for calibrating protocols.

Emissions

- During ODS and POPs destruction dioxins and furans could be generated as a non intentional by product, due to the chlorine and/or bromine content in these compounds. These contaminants could be released from the destruction facilities as gas, solids and liquid wastes.

Guidelines

- ✓ The Good Practice Code on ODS destruction of the Montreal Protocol, indicates that ODS destruction facilities must be monitor to ensure that:

'the emissions releases generated during the destruction are mantained at level environmentally sound acceptable, according to or stricter than those required by the national regulations or the established by protocols or international treaties.'

….Guidelines

- The recommended ODS destruction technologies are those that mantain dioxins emission levels under 0.2 ng/Nm^3 . Lately a recommedation has been made to further decrease this emission level to 0.1 ng/Nm^3 (Measured as total PCDD & PCDF ITEQ, international toxic equivalent units, in waste gas.)

Stockholm Convention Guidelines: Dioxins/Furans BAT Performance Levels

Source of dioxins/furans	**PCDD/F performance level associated with BAT**
Waste incinerators: solid municipal waste, hazardous waste	In air emissions: no higher than 0.1 ng/Nm^3 ITEQ (at 11% O_2). In waste water: well below 0.1 ng/l ITEQ.
Cement kilns firing hazardous waste	In flue gases: <0.1 ng/Nm^3 ITEQ (at 10% O_2)*

*With reference conditions of 273 K, 101.3 kPa, 10% O_2 and a dry gas basis.

POPs DESTRUCTION TECHNOLOGIES

- ✓ Co-processing in cement kilns
- ✓ Plasma Arc Technologies
- ✓ De-chlorination
- ✓ Mediated Electrochemical Oxidation(Cerium Oxidation)
- ✓ Reduction with H_2 or donors gas-phase chemical reduction (GPCR)
- ✓ Base catalized decomposition (BCD)
- ✓ Alcaline metal reuduction

…POPS DESTRUCTION TECHNOLOGIES

- ✓ Super critical water oxidation (SCWO) and subcritical water oxidation
- ✓ Catalytic hydrochlorination (CHC)
- ✓ Hazardous waste incineration

Efficiency Removal/Destruction

ED = Total mass entrance – (Products mass+ Sub-products mass+ environment mass releases emissions) / Total mass entrance X 100

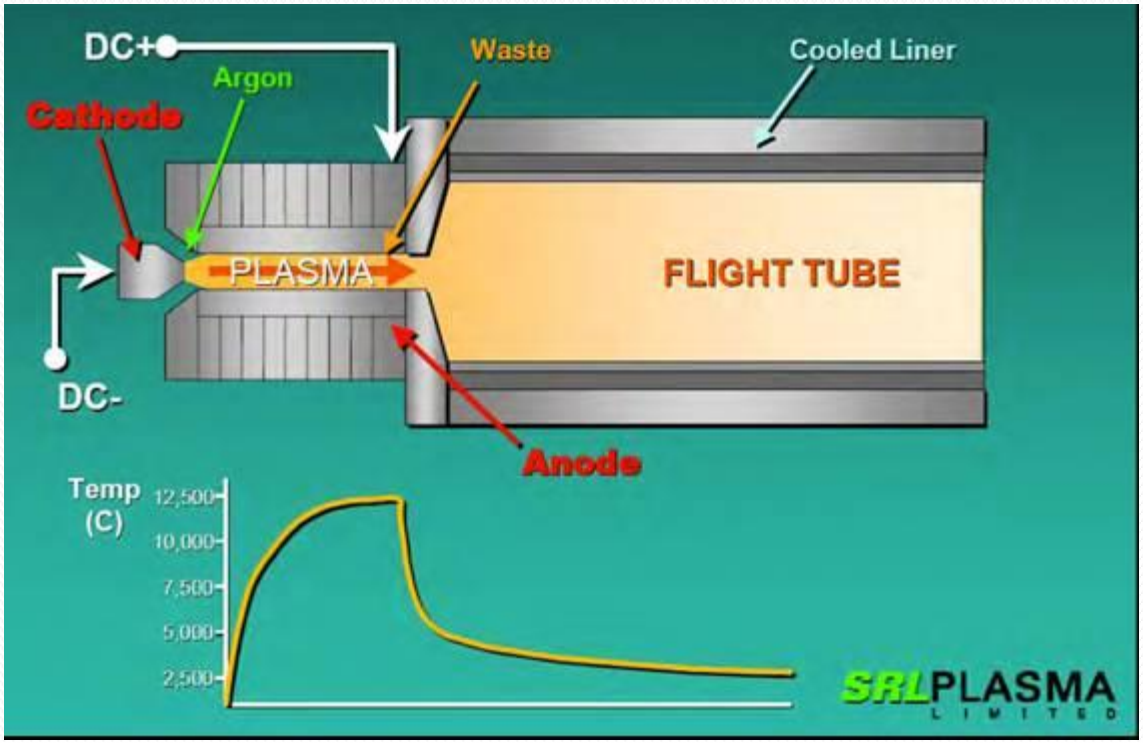
ERD = Total mass entrance – mass gases process exit / Total mass entrance X 100

Technology assessment Criteria

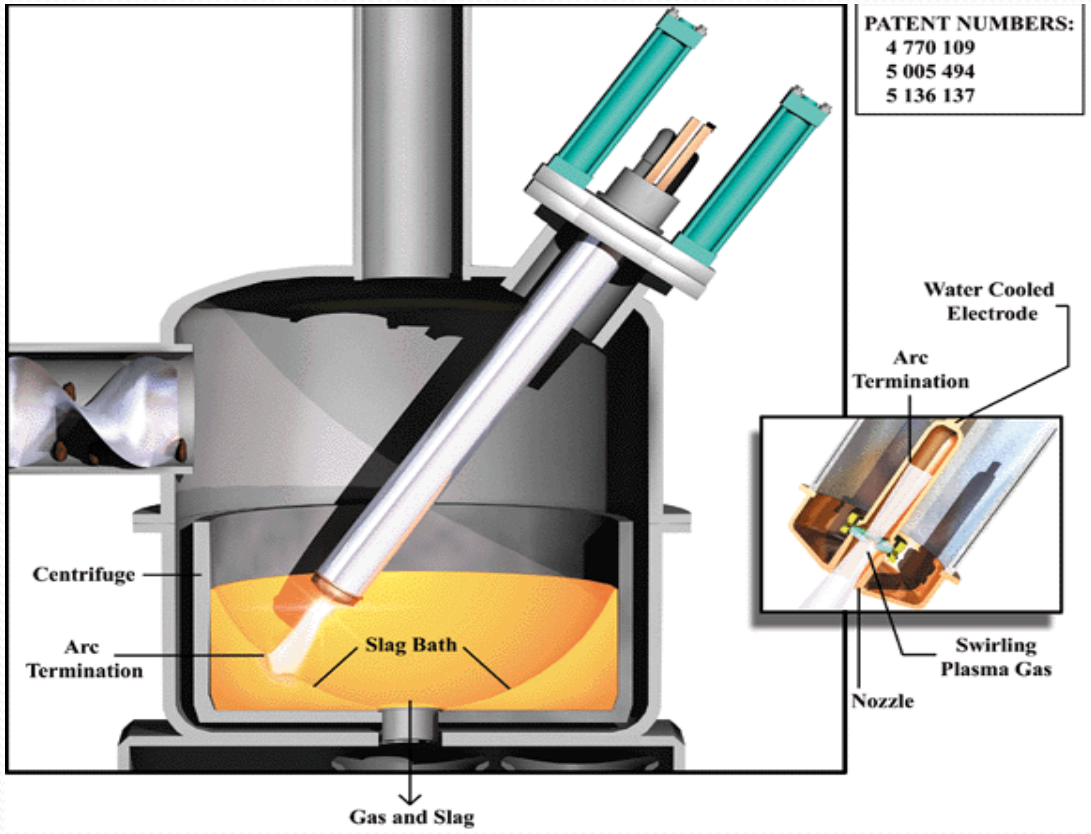
Efficiency Destruction >99.99 % ERD

Dioxin Emissions < 0.1 ng/Nm^3

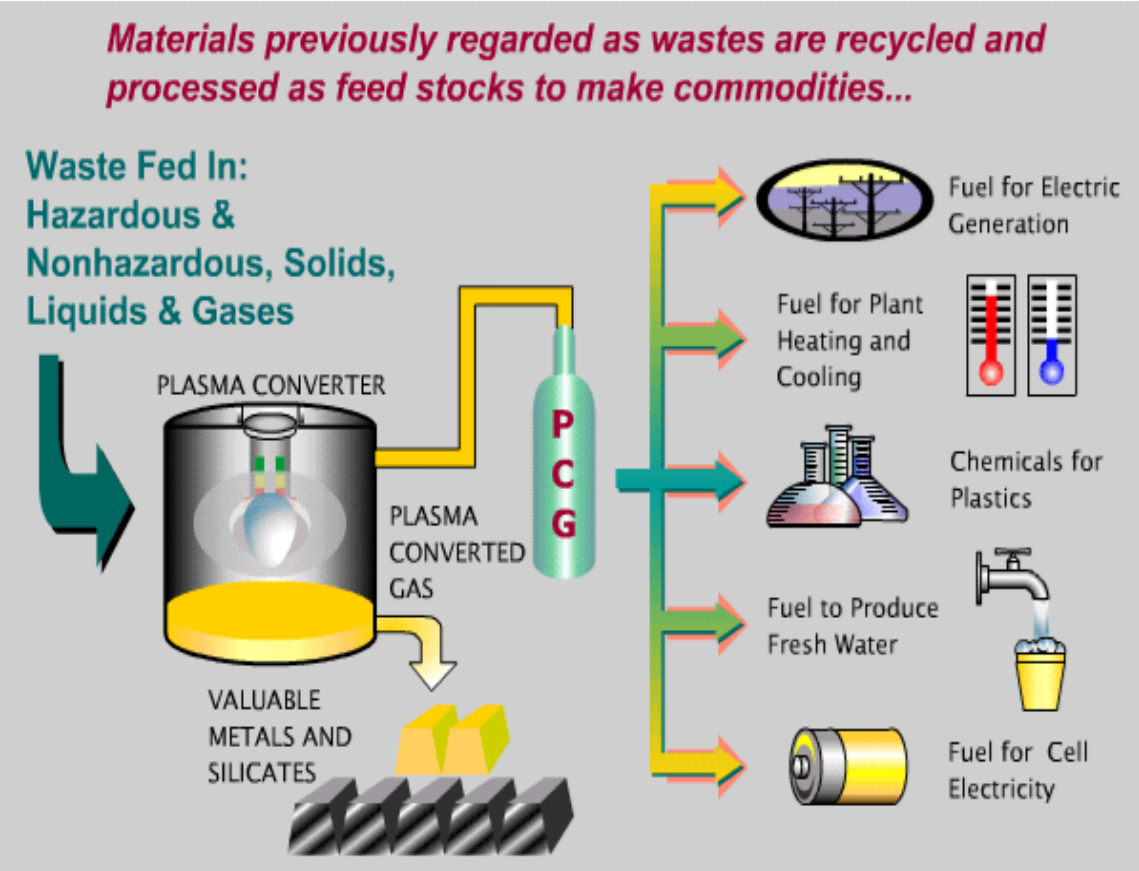
Plasma Arc Technology (PLASCON Plasma Converter



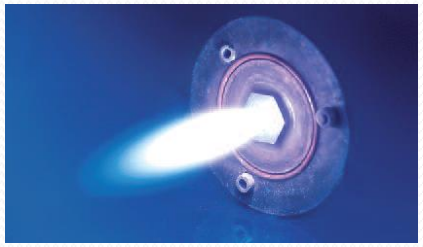
PACT System (Plasma Arc Centrifugal Technology



Plasma Waste Converter (PWC)

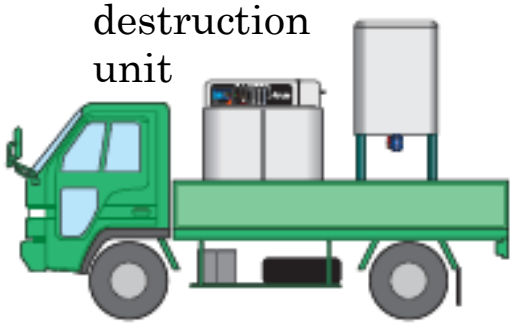


Plasma Arc Small Scale

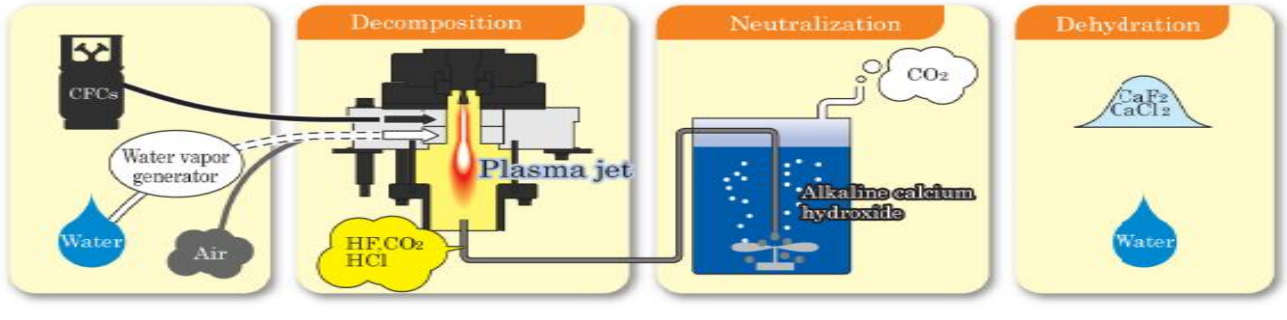


Small plasma
(several cm in diameter)

Plasma destruction unit



Mobile plant for transportation



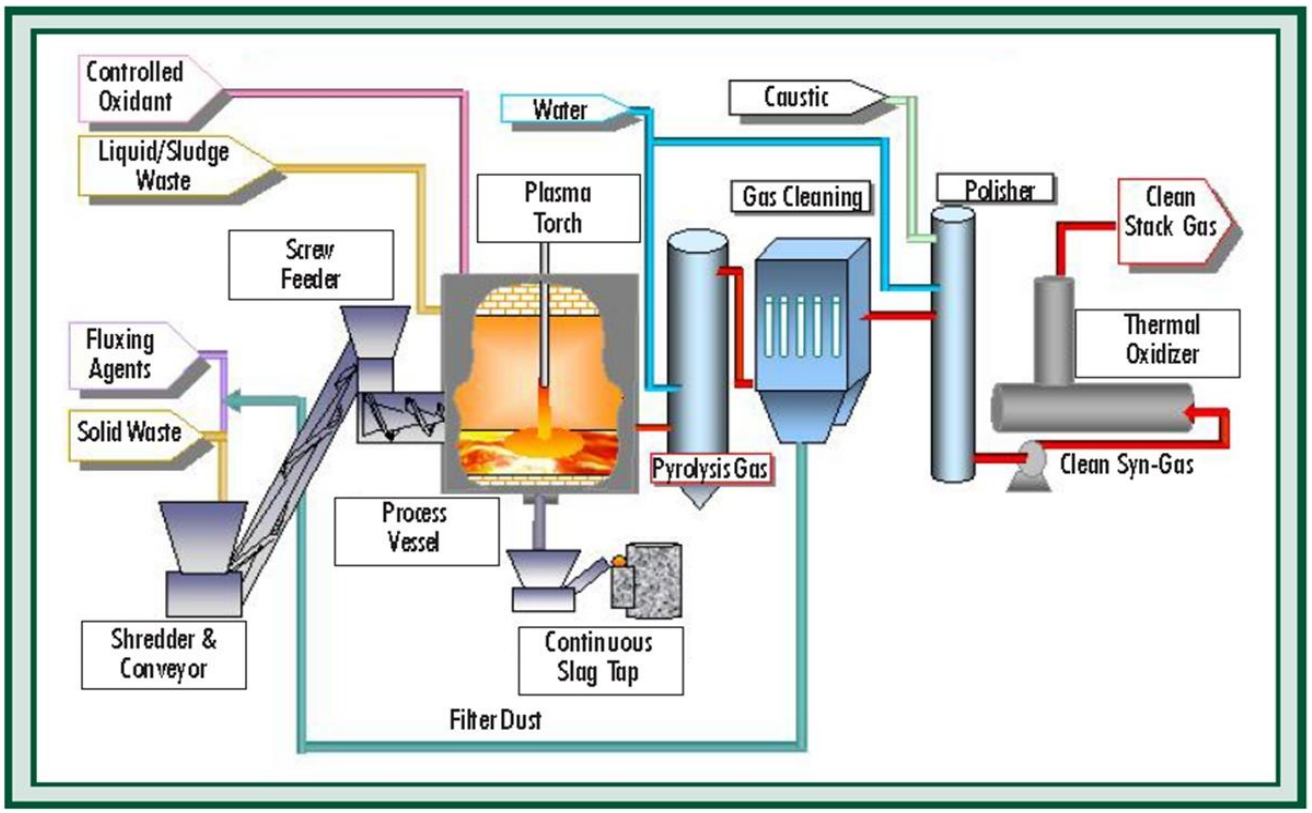
Feed

Destruction of Fluorocarbons

Neutralization by $Ca(OH)_2$

Waste

Plasma Energy Pyrolysis System(PEPS®)



Schematic of the Mobile Plasma Energy Pyrolysis System (PEPS®) depicting how the system destroys wastes through a combination of vitrification of inorganic matter and the controlled pyrolysis of organic matter

ODS Destruction Technologies Approved by the 23rd Montreal Protocol Meeting (2011)

- **Chemical Reaction with H_2 y CO_2**
- **Thermal Porous Reactor**
- **Mobil Plasma Arc**
- **Thermal Reaction with methanol**

Initiative Expansion

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Many thanks for your kind attention

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