



Sustainability

GASIFICATION

WE ARE REGION'S LEADER IN WASTE MANAGEMENT

VOLUME

- **5 Mn Tons Annually - MUNICIPAL WASTE**
- **1 Mn TONS ANNUALLY OF INDUSTRIAL WASTE**
- **8,000 INDUSTRIES SERVED**
- **3,40,000 HOSPITAL BEDS**

SEGMENTS

- **MUNICIPAL – 21 CITIES**
- **INDUSTRIAL – 15 FACILITIES**
- **BIOMEDICAL – 30,000 HEC**

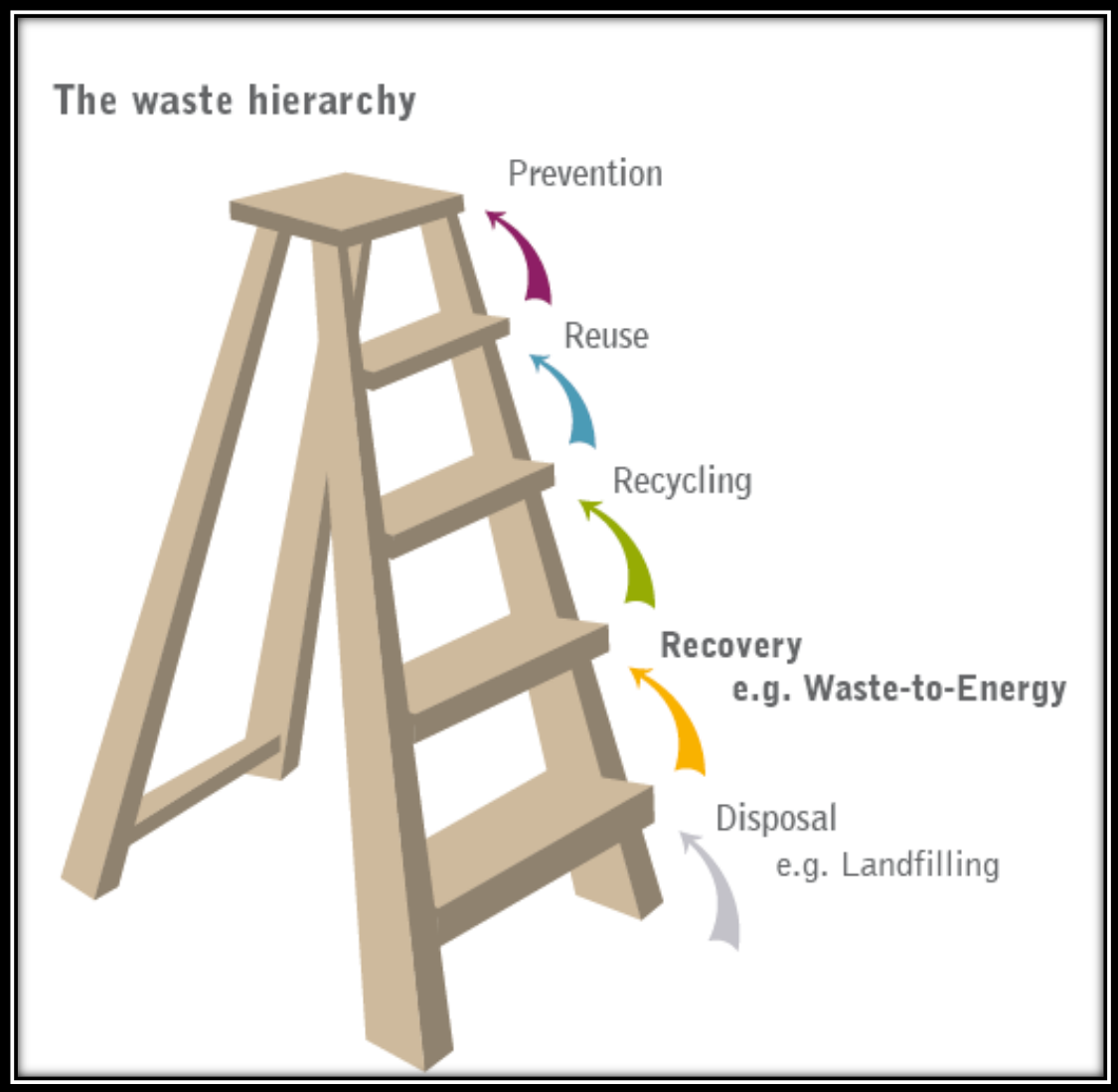
PPP IN WASTE

- **INVESTOR, DEVELOPER, OPERATOR**
- **PPP PIONEER IN INDIA**
- **40 PPP WASTE PROJECTS**
- **25 YEARS MSW CONCESSIONS WITH MANY CITIES IN INDIA INCLUDING METRO CITIES LIKE DELHI, CHENNAI AND HYDERABAD INCLUDING PROJECTS IN MIDDLE EAST & SINGAPORE**

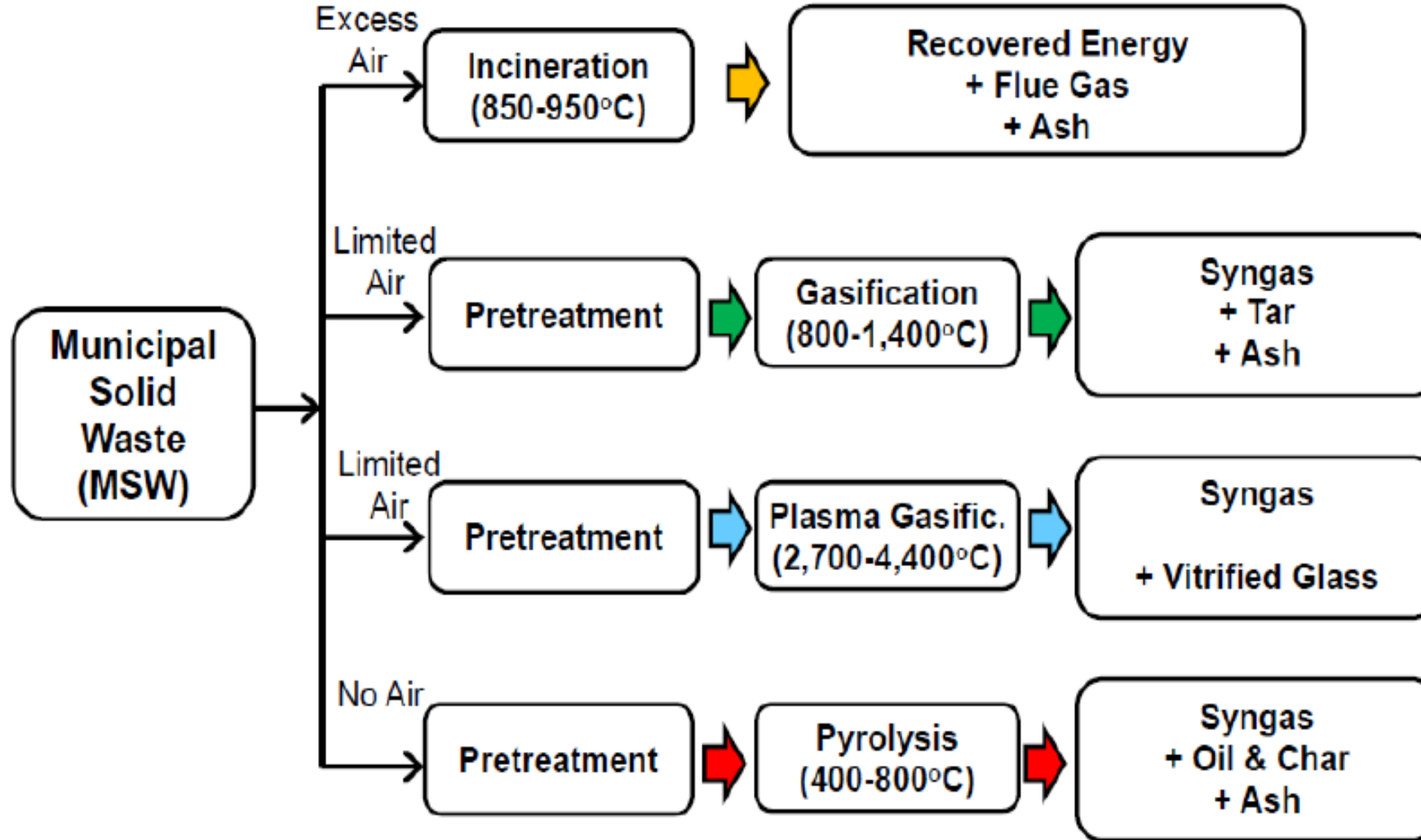
- ❑ In a Perfect world, all waste will be prevented . Hence , waste hierarchy is complied .
- ❑ Waste to Energy is considered environmentally inferior to Recycling - but superior to landfill
- ❑ Many waste components – that could theoretically be recycled – **but not in practice** – end up in landfill which is a worse environmental fate .

ZERO WASTE = ZERO ECONOMIC ACTIVITY

HOW TO GO UPTO THE LADDER OF WASTE HIERARCHY?

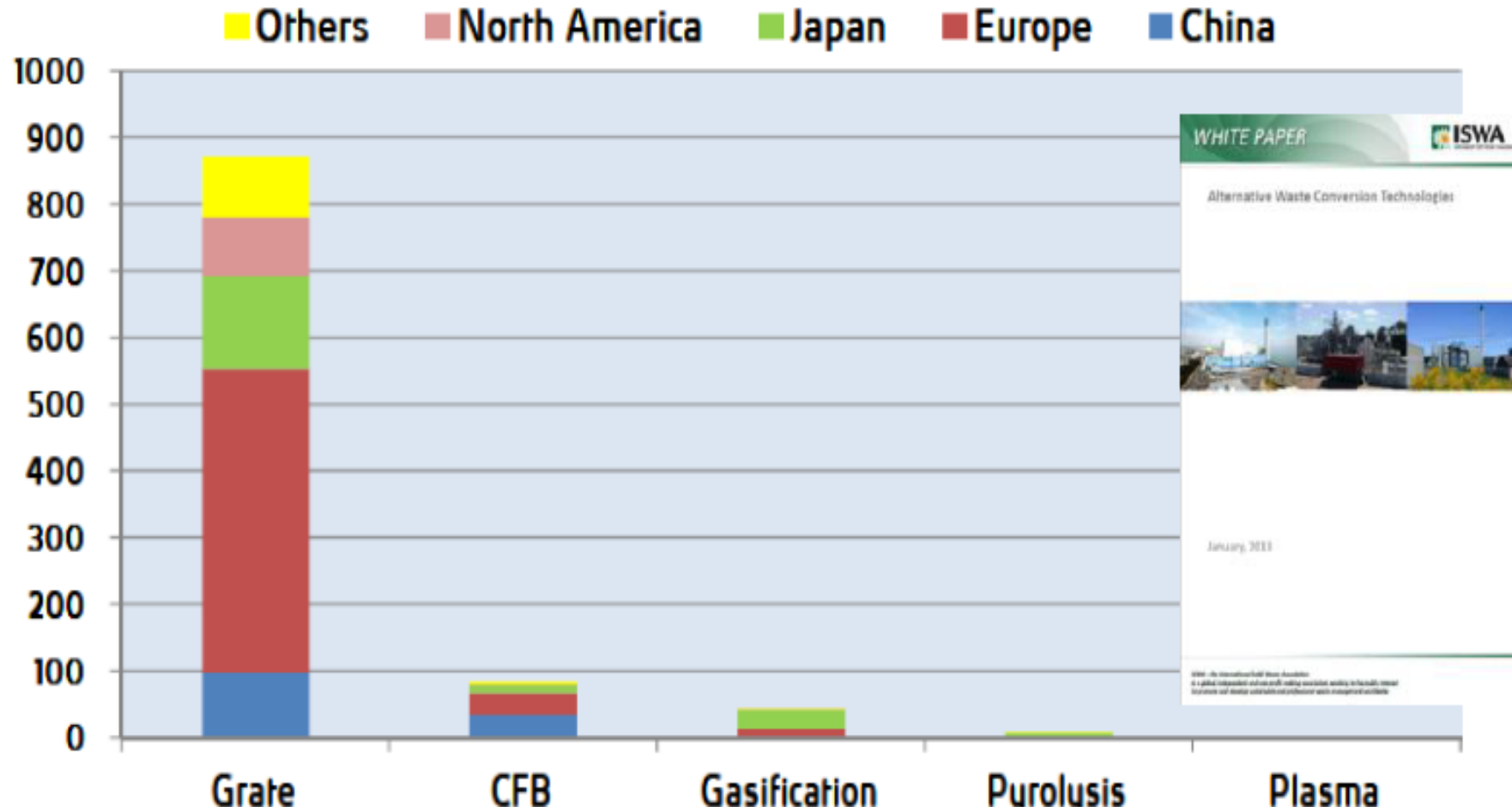


Year , City	Remarks
1985-87 , Timarpur , Delhi	Closed on account of heat value and institutional issues . Rotary Kiln based plant.
2003-2008 , Vijayawada & Hyderabad United Andhra Pradesh	1 st Generation RDF Grate Based WTE plants. Limited operation period . Operated for 5 years & closed on account of combination of reduced Tariff , No supporting tipping fee & technology inadequacy
2003 , Lucknow	Biomethanation Plant – ineffective segregation .
2012, Kanpur	CFB Technology WTE –
2012 , Okhla , Delhi	Operating WTE Plant Grate Based
2014 , Pune, Maharastra 2014 , Sholapur , Maharashtra	Pyrolysis Project – did not work . Biometh Plant
2015 Jabalpur , MP	Operational Grate based WTE
2017 , Delhi	Bawana - (Grate Based) Ghazipur – (Grate based)
2020, Telangana	Hyderabad – (Grate Based)
2021, Haryana	Sonipat, Haryana – (Grate Based)
2022, Andhra Pradesh	Guntur & Vishakhapatnam – (Grate Based)
2023	Hyderabad, Rewa(MP) & Pimpri (Pune) projects are planned to get commissioned



GLOBAL SPREAD OF THERMAL WTE PROCESS

Number of plants in commercial operation (> 5t/h) - Source : Ecoprog



Waste to Energy – Chinese Strides 242000 TPD and 460 Plants

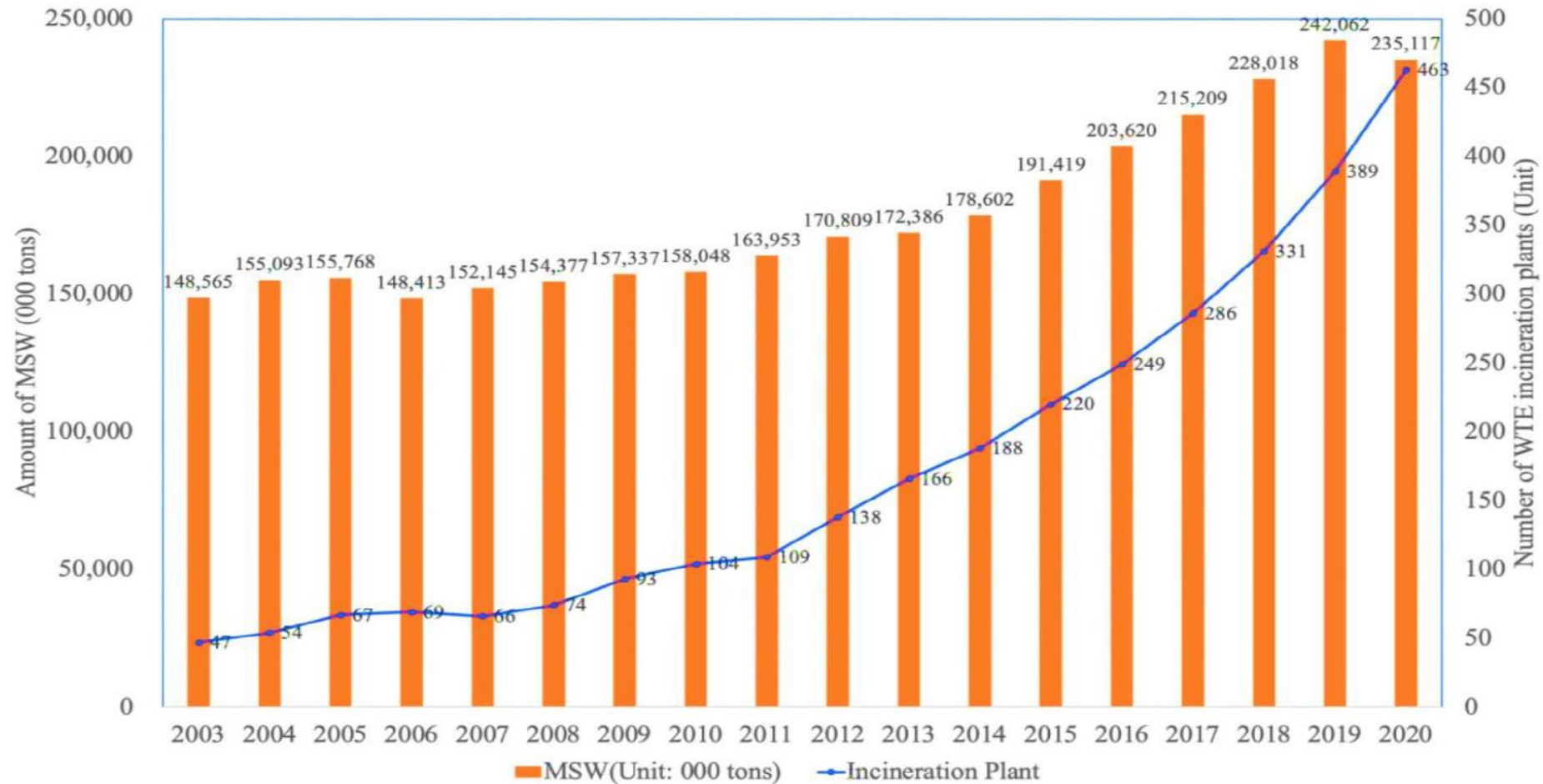


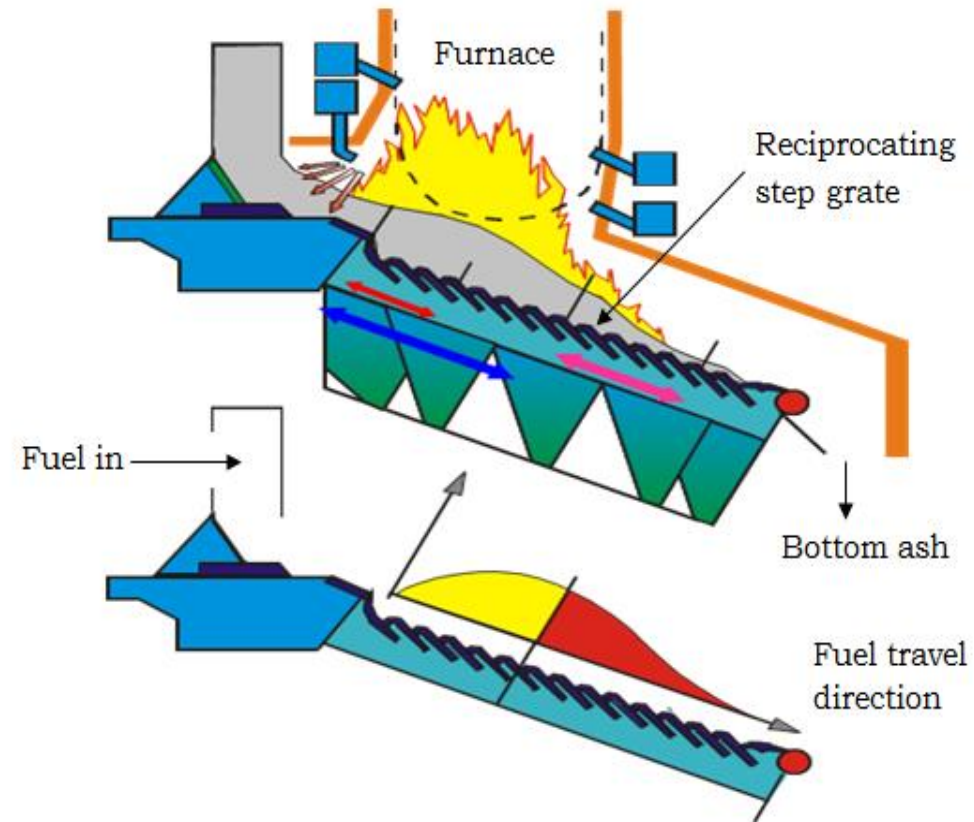
Figure 1. Municipal solid waste and number of WTE incineration projects in China from 2003 to 2020 [23,24].

Pros

- More than 1600 lines world wide are grate based
- Larger Unit throughput Capacity and lower foot print
- Proven for Mixed waste regime without any requirement for pre processing
- Higher efficiency if pre-processed waste is used
- Good number of proven suppliers

Cons

- High Capital & O&M Costs
- Requires Skilled operational crew
- Operate on Excess Air Concept and results in higher flue gas volume necessitating large downstream FGT

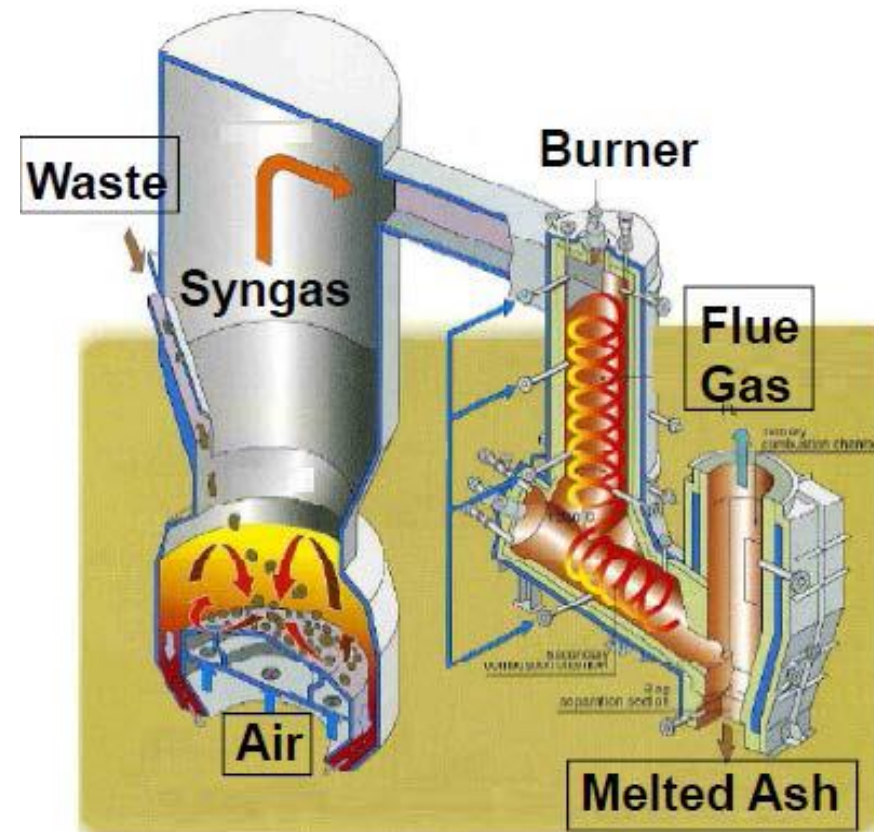


Pros

- Operate on limited air basis and hence lower flue gas volume post treatment and thereby perceived intrinsic environment advantage
- Prospective higher energy recovery

Cons

- Extremely limited commercial scale operations
- Lack of suppliers . Confined to large and Only few large R&D houses
- String of failures in Europe at pilot scale level
- Requires pre treatment of MSW

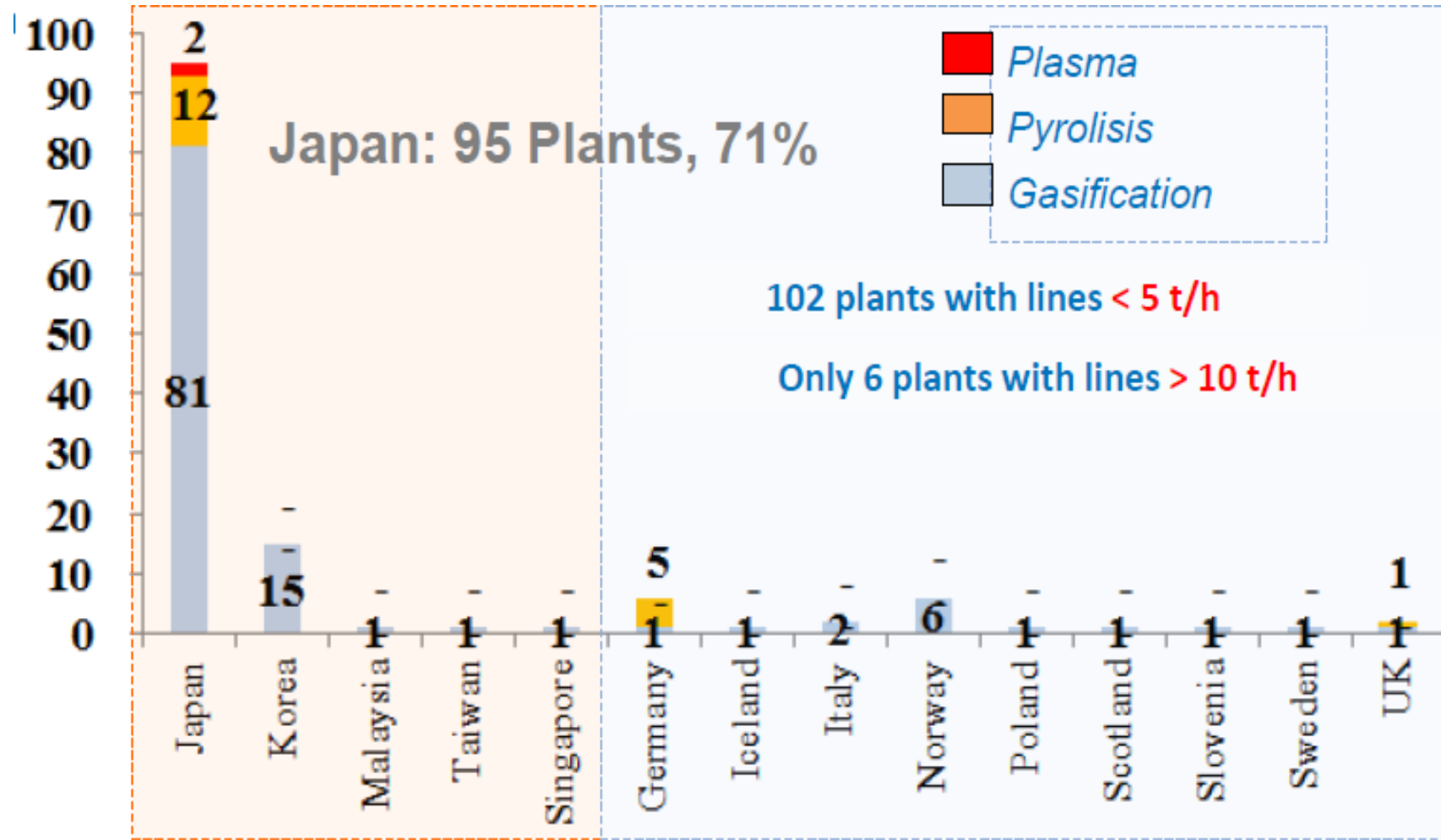


(Source: Ebara Corporation)

Plasma Gasification is an advanced technique under active development. Some plants in Japan use this for disposal of bottom ash

Description	Reciprocating Grate	Gasification	Pyrolysis
Flue Gas Volume	High	Medium	Low
Ash Generation	Large	Medium	Low
Track Record	Very High	Limited	Limited
Key Suppliers	Many	Limited	Limited
Capital Costs	High	High	High
O&M Costs	High	High	High

COUNTRY WISE: CAPACITY COMPARISON



Asia: 113 Plants, 84%

Europe: 21 Plants, 16%

- Gasification offers an alternative to more established ways of converting feedstocks into electricity and other useful products.
- Efforts to be made to set up pilot projects for Solid waste and examine this technology , in an economically viable manner



Thank you

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