

US EPA ARCHIVE DOCUMENT

**Conversion of Municipal Solid
Waste into Clean Energy Products
Using the InEnTec
Plasma Enhanced Melter[®]**

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Outline



- PEM[®] Technology Description
- Project Review
 - S4 Energy – Columbia Ridge
- Future Commercialization
- Summary

S4 Energy Solutions, LLC



- Originally 50/50 JV: combined an environmental services leader (WM) with a proven technology leader (InEnTec)
 - JV formed to integrate and commercially deploy gasification and other technologies to produce flexible, clean energy using waste feedstocks
 - JV was formed in February 2009
- WM converts to become one of InEnTec's largest shareholders in October 2011
 - S4 now wholly owned subsidiary of InEnTec



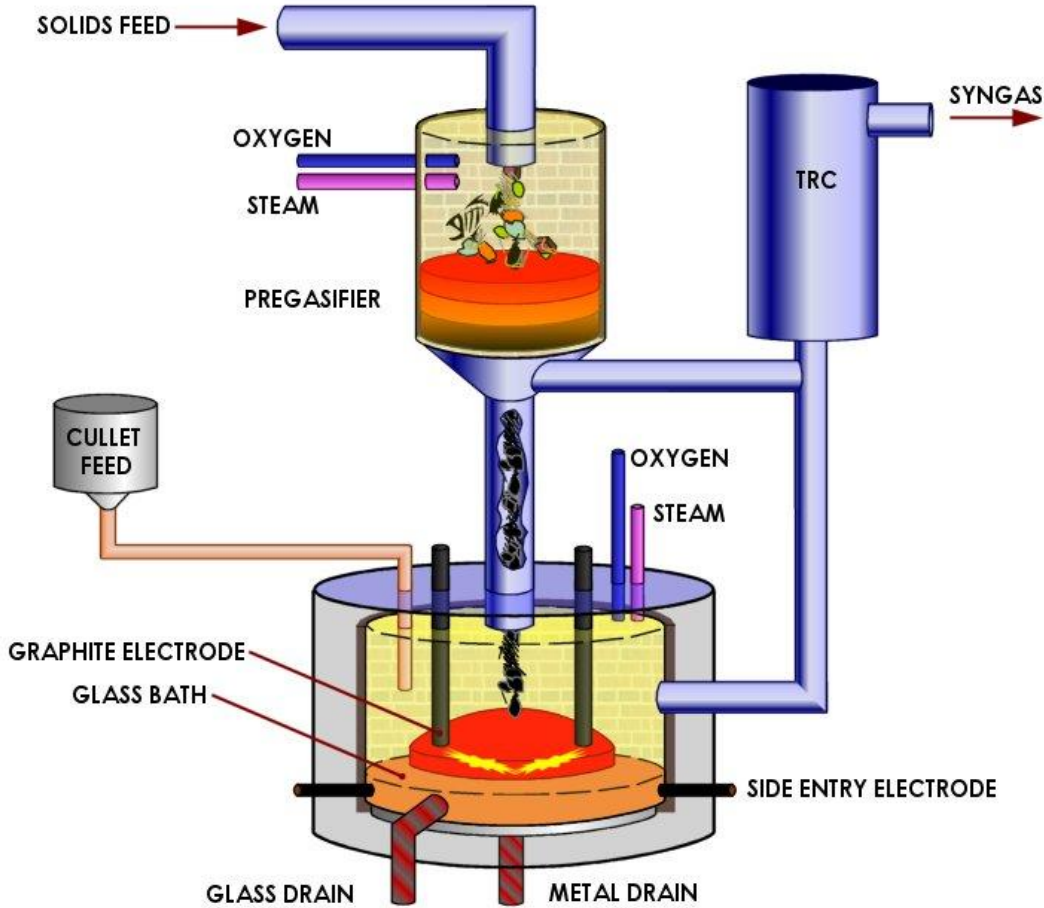


InEnTec MSW Gasification Technology

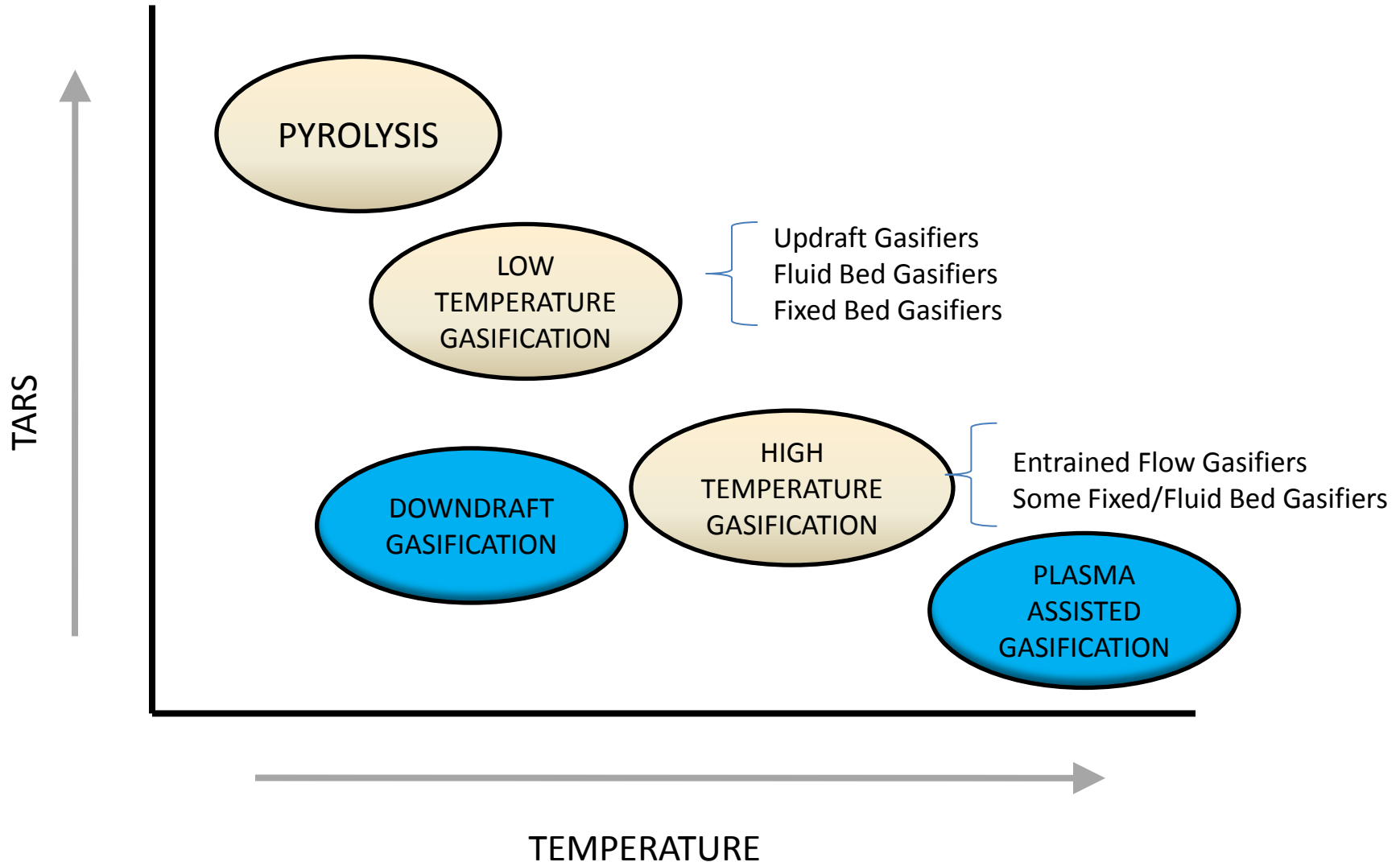
PEM[®] Technology



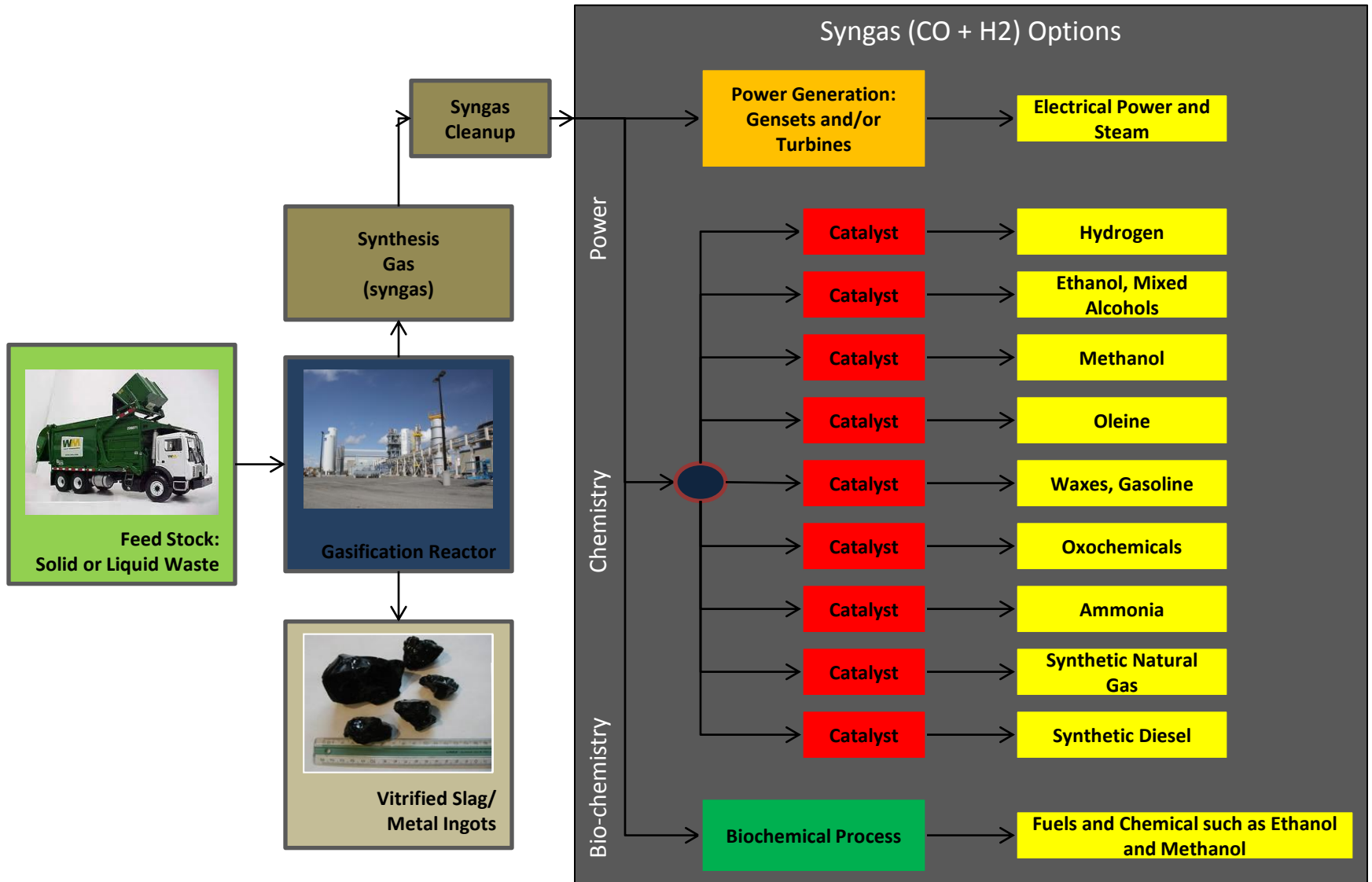
PEM Overview



Clean Syngas Key to Value Added Products



Clean Syngas Key to Value-Added Products



Columbia Ridge Facility, Arlington, Oregon

Status

- Construction started August 2010
- Construction completed April 2011
- Commissioning May through November 2011
- Commercial pilot operations began December 2011

Plant Capability

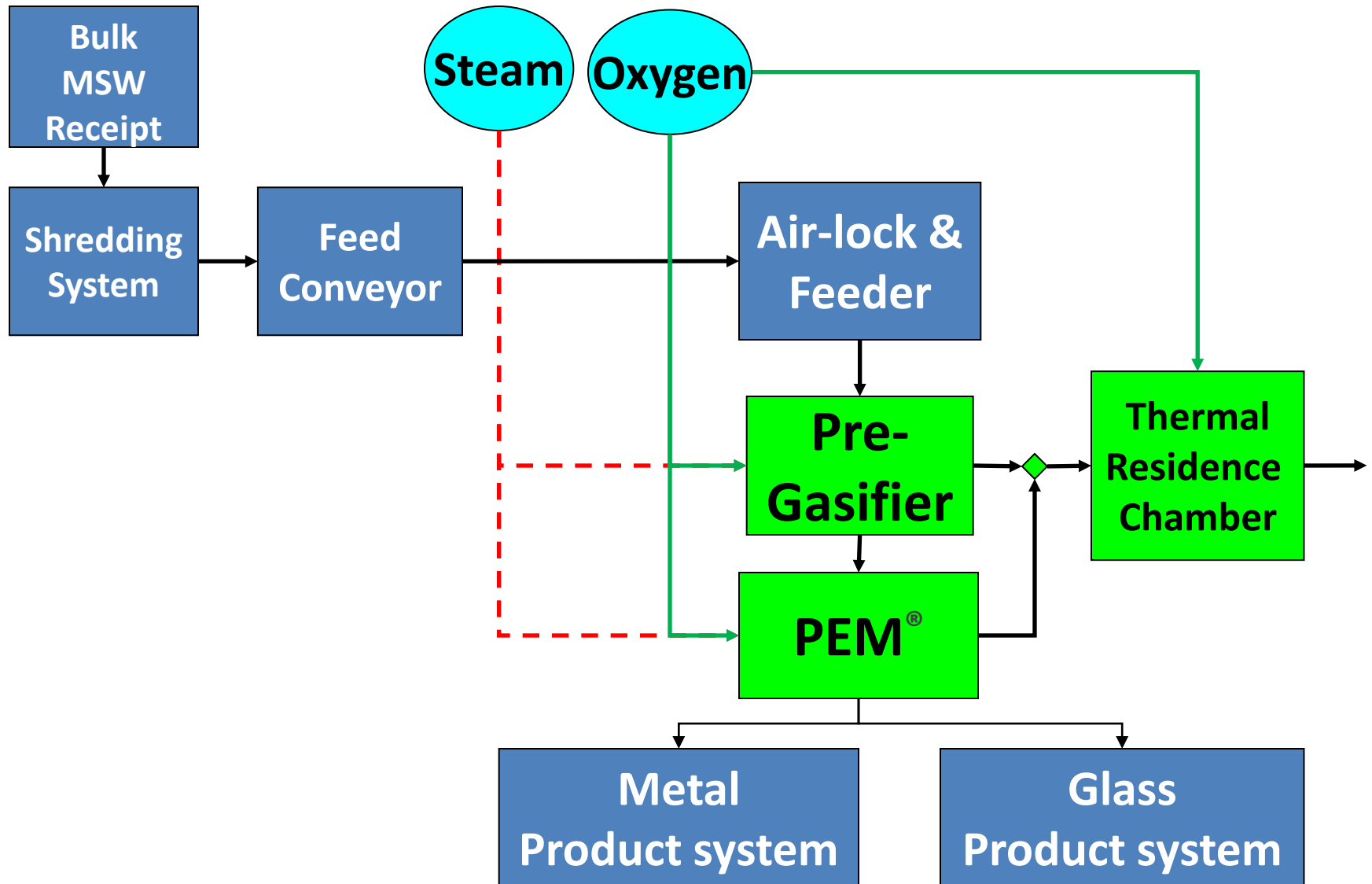
- Commercially hardened design
- Feedstock capacity of 25 tpd of high carbon waste (e.g., medical, ASR, high plastic MSW etc.)
- Initial operations will not include conversion of syngas into product
- Facility to convert syngas to a hydrogen product which will be added in the near term



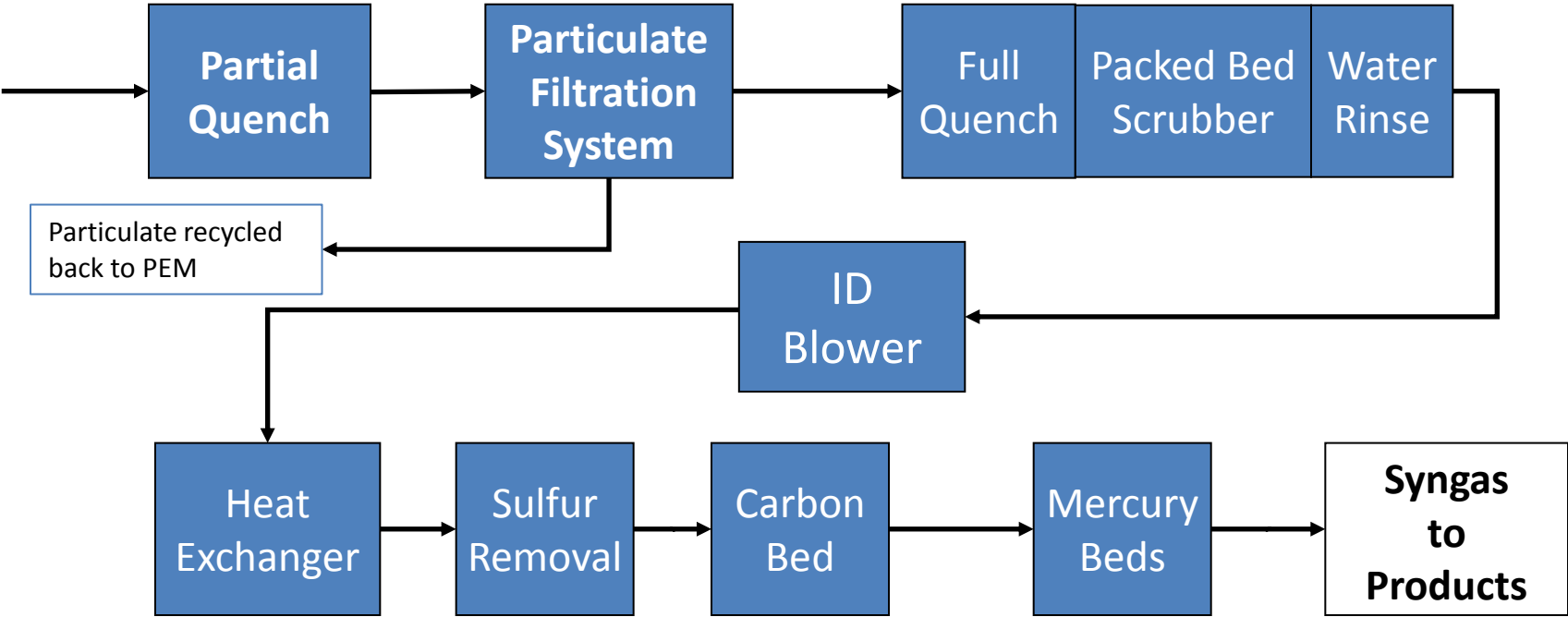
S4 Columbia Ridge Facility, Arlington, Oregon



Columbia Ridge - Process Flow



Process Flow



Raw MSW Feed



Shredded MSW



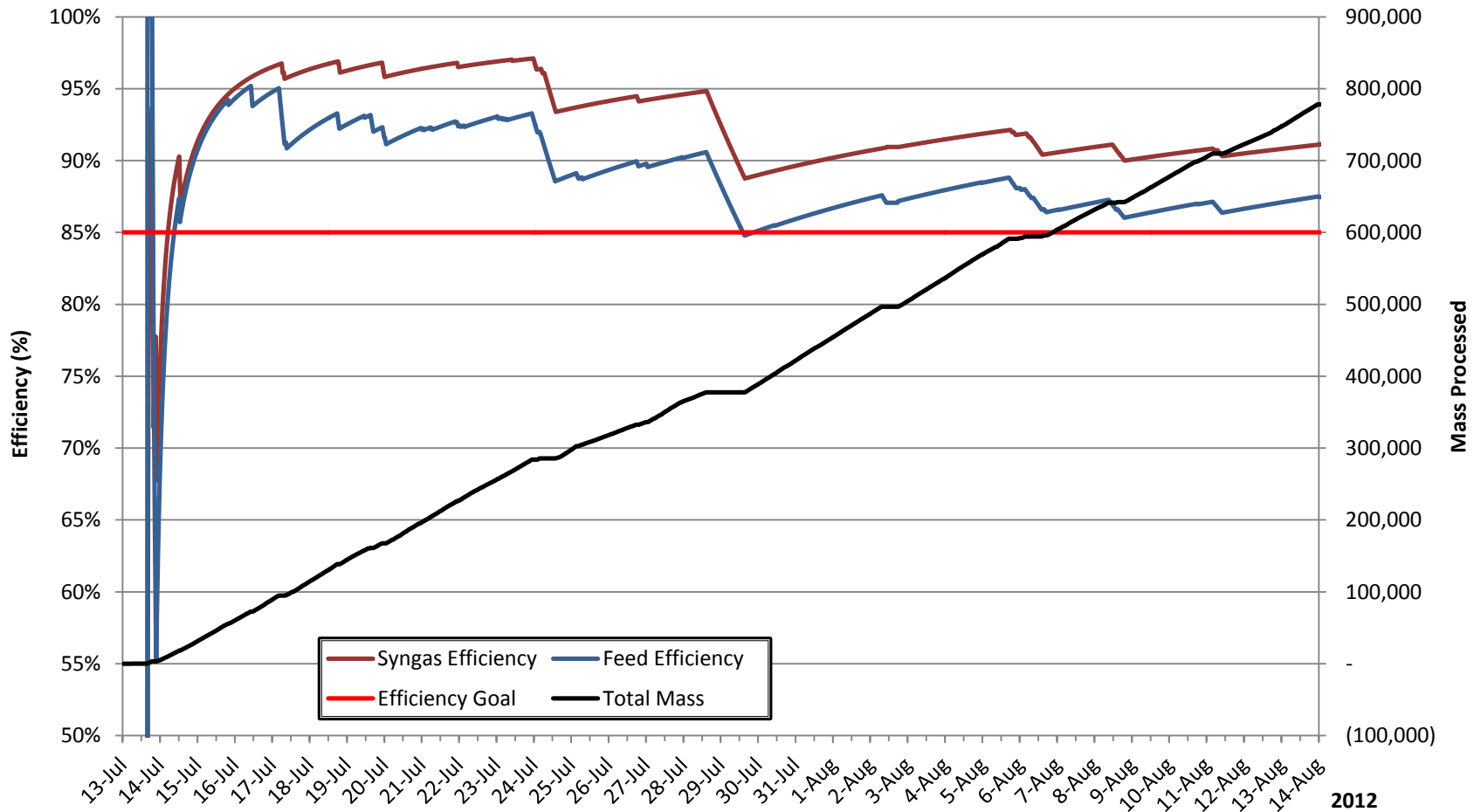
S4 Columbia Ridge Facility, Arlington, Oregon



Operations Data



InEnTec Inc.
InEnTec Columbia Ridge - Biomass& MSW Processing



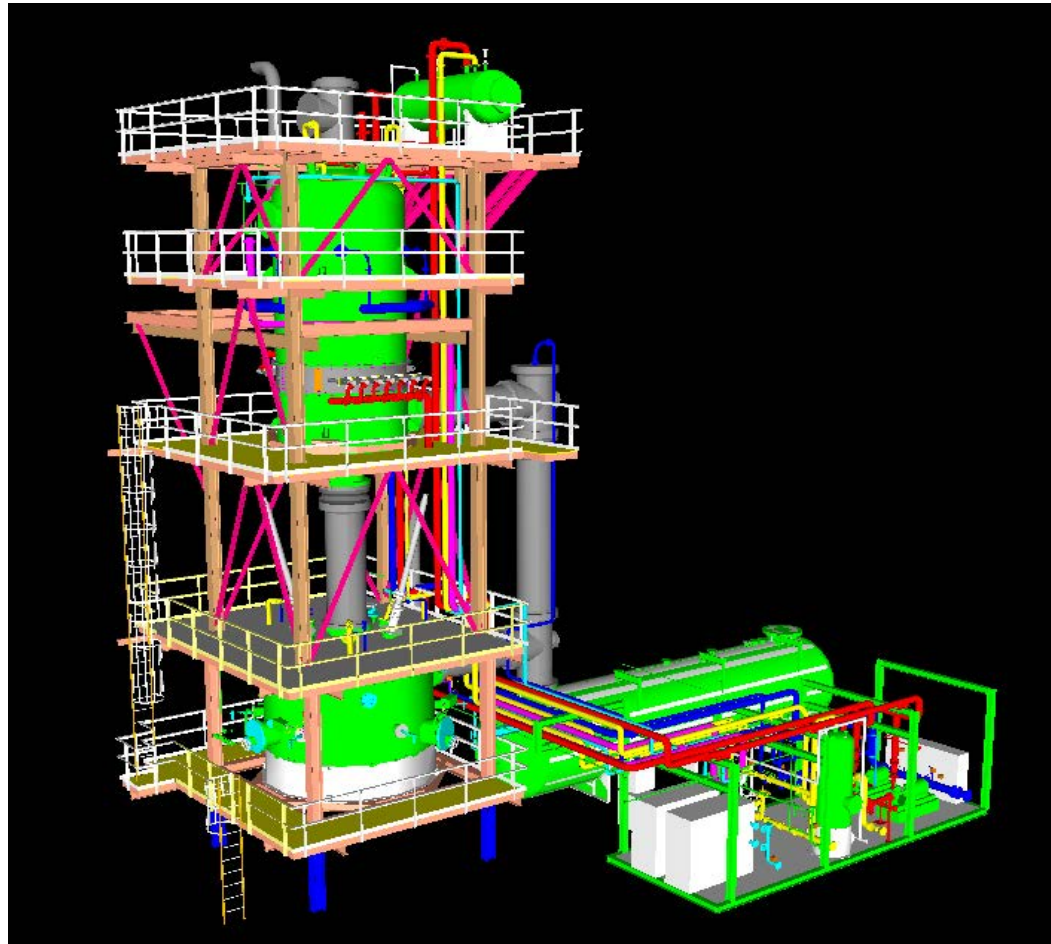


- CR plant has been demonstrated at full processing capacity
- Sustained online efficiency has been demonstrated at over 91%
- Syngas quality exceeded expectations
- The PEM system at Columbia Ridge landfill demonstrated robust processing of heterogeneous MSW waste materials



- Initial gasification facilities will be small, focusing on high value waste streams
- Full scale (5x), modular system is designed; capacity is 125 tpd of feedstock
- Larger facilities will be multiples of the base 125 tpd system and may incorporate 25 tpd systems targeting waste specific demands
- In larger facilities, gasification island is only 10 to 15 percent of total facility cost

Commercial Scale (125 tpd) PEM Design



Summary

Several commercial PEM systems have been built

InEnTec's Columbia Ridge plant will be one of the first commercial systems in the US to convert municipal solid waste into useful products using plasma gasification

InEnTec has multiple projects under development



For more information, please contact:

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