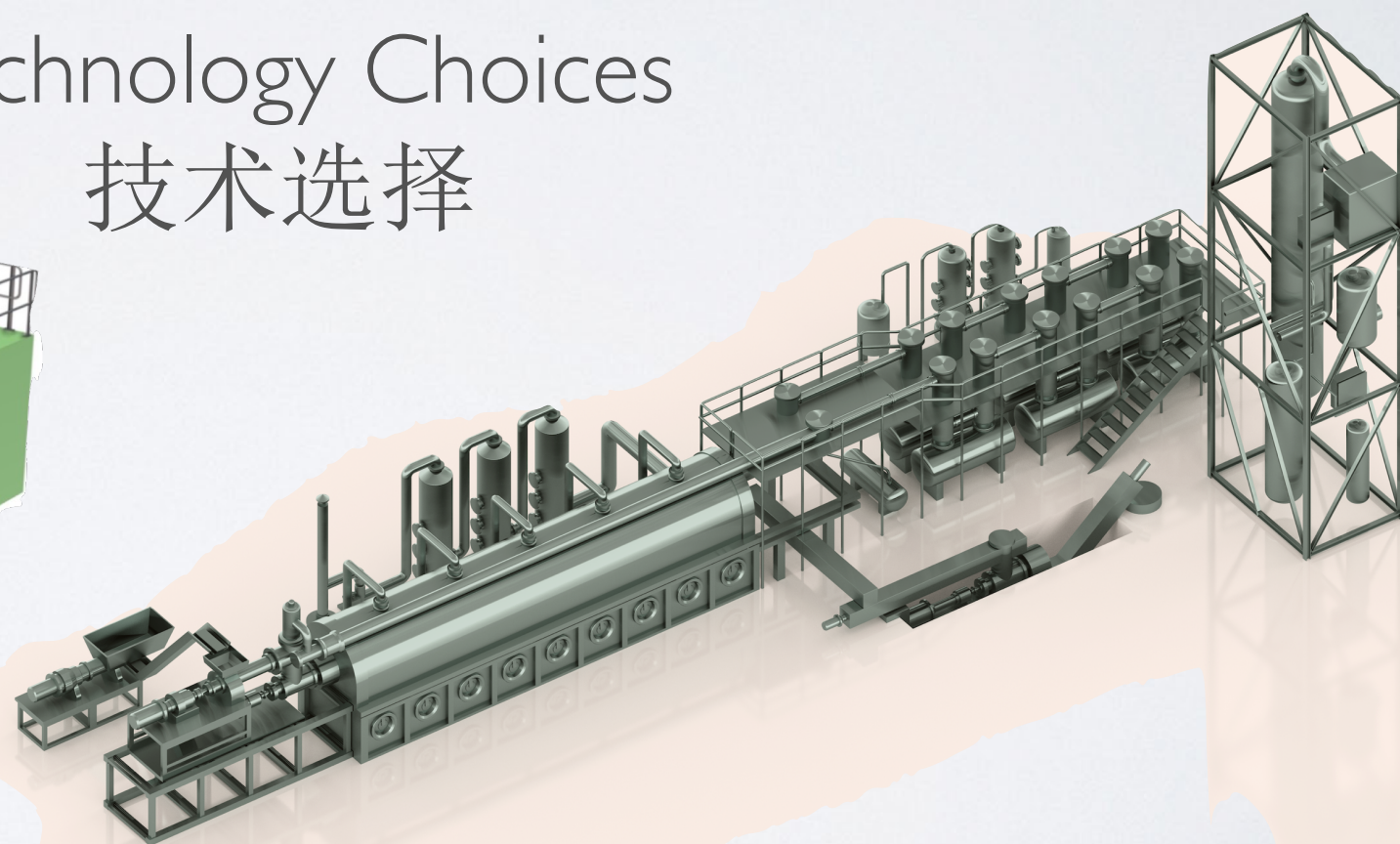
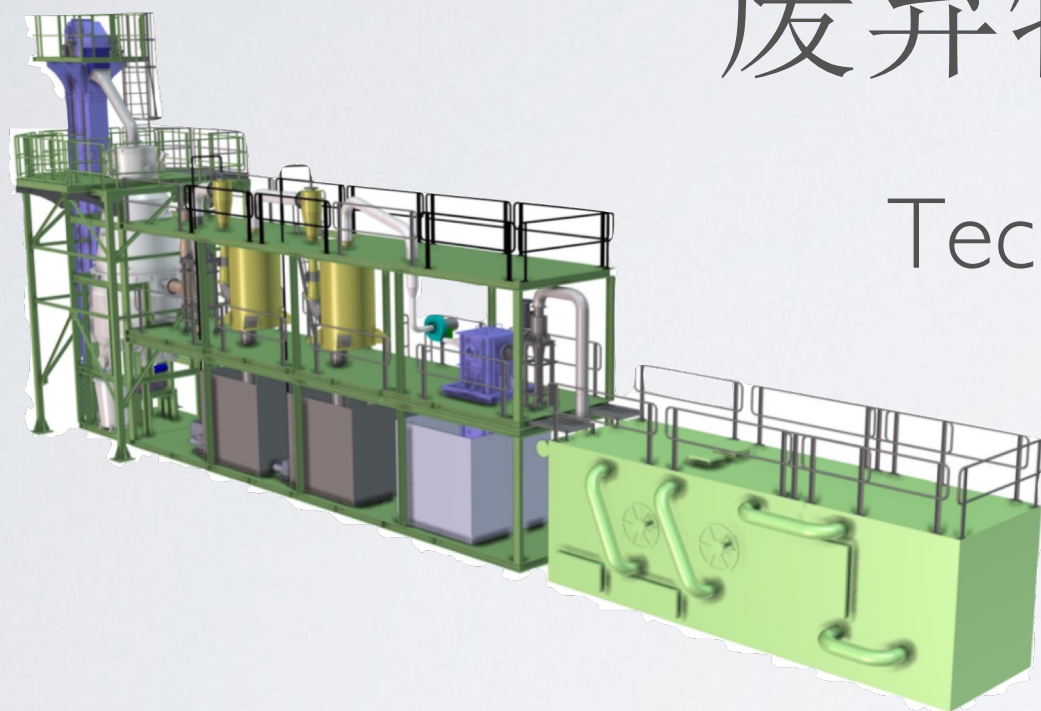


Scandgreen Energy AB SGE能源公司

Waste to Energy 废弃物转换成能源

Technology Choices 技术选择

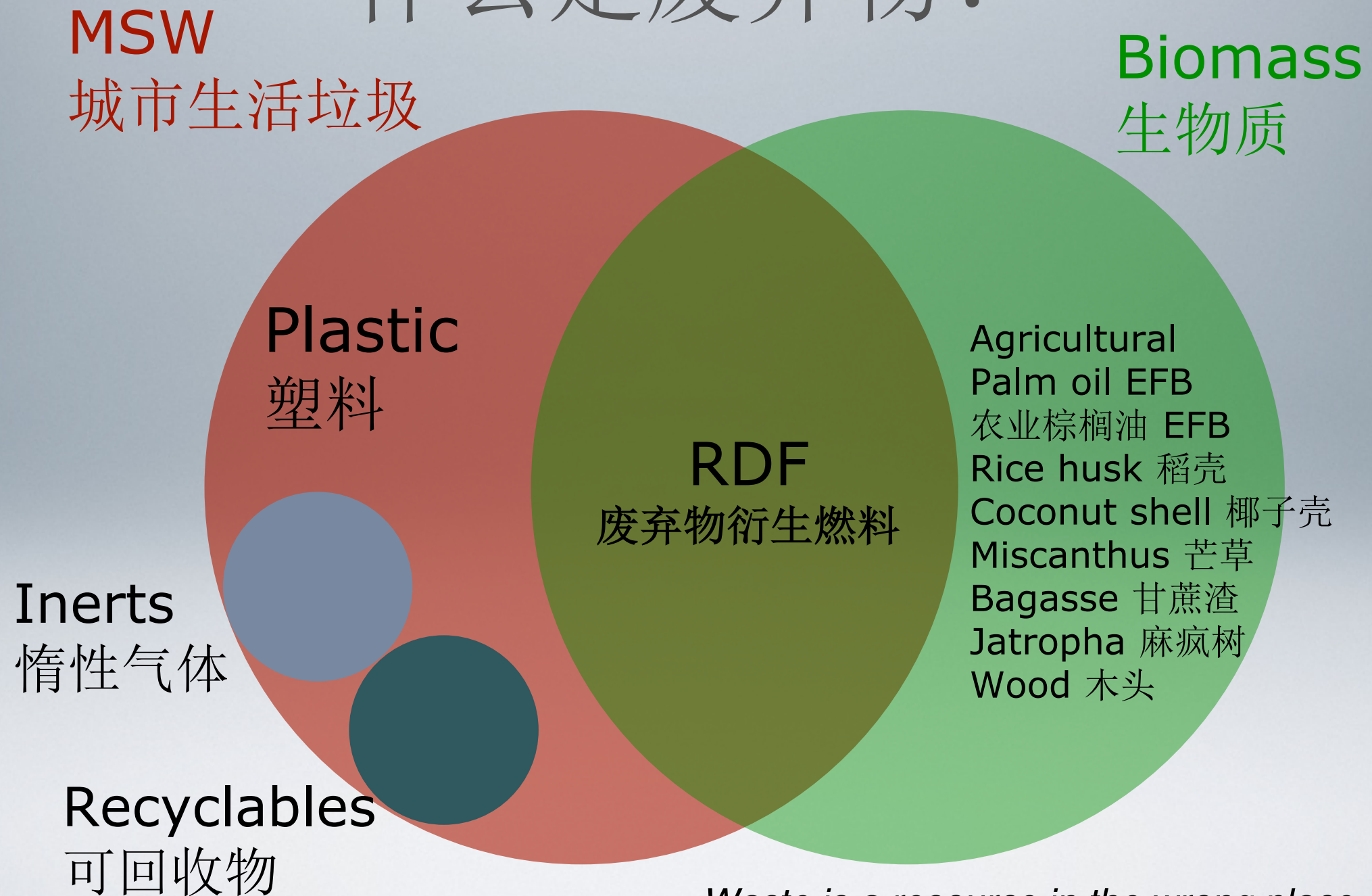


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WHAT IS WASTE?

什么是废弃物？



Waste is a resource in the wrong place
废弃物就是放在了在错误地方的资源

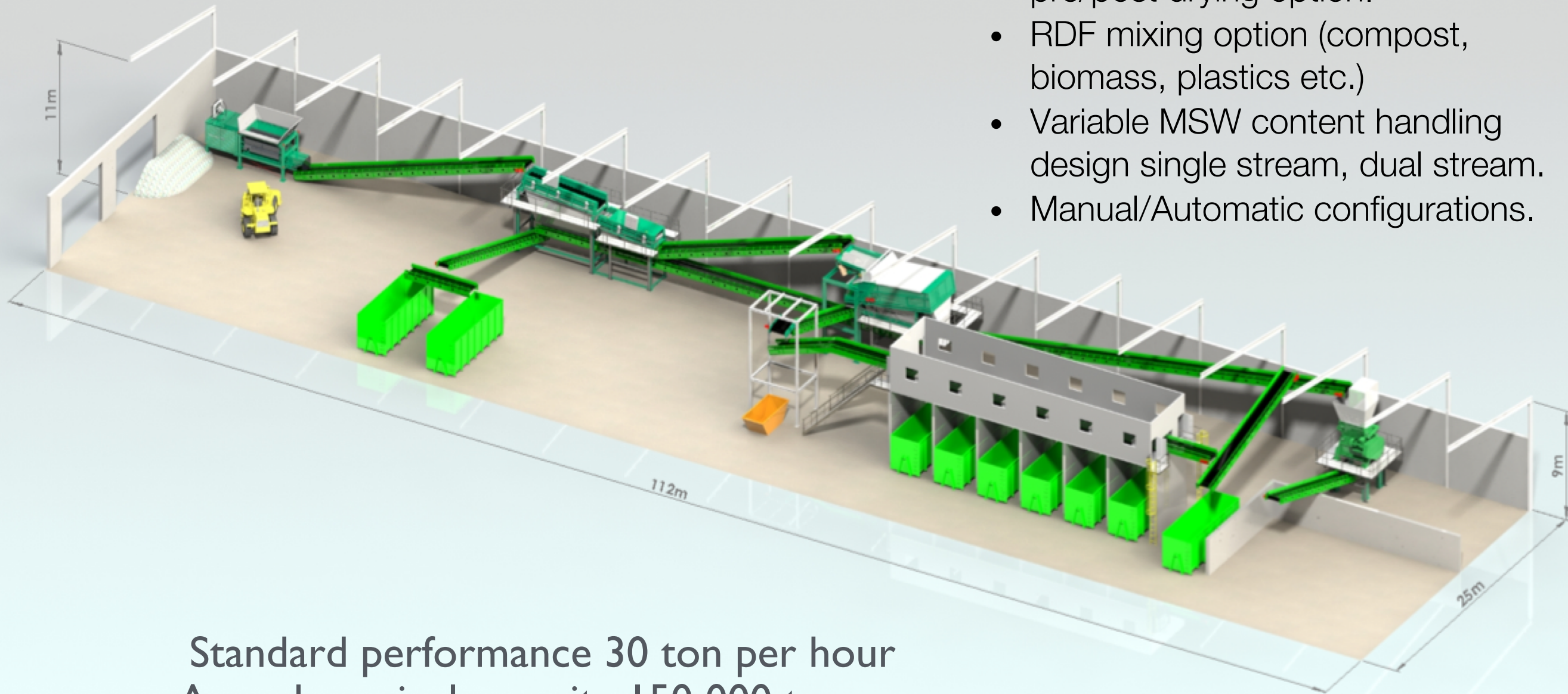


Standard Materials Recovery Facility (MRF)

标准材料回收设施 (MRF)

The Solution:
Materials Processing Facility
解决方案：
材料加工设施

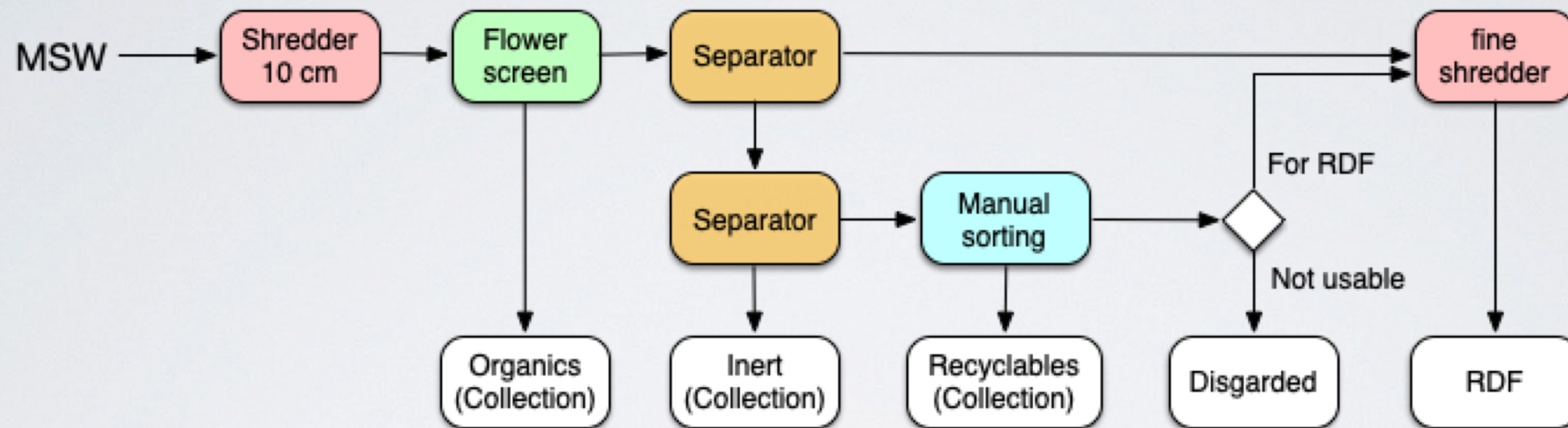
- Waste and organic fraction pre/post drying option.
- RDF mixing option (compost, biomass, plastics etc.)
- Variable MSW content handling design single stream, dual stream.
- Manual/Automatic configurations.



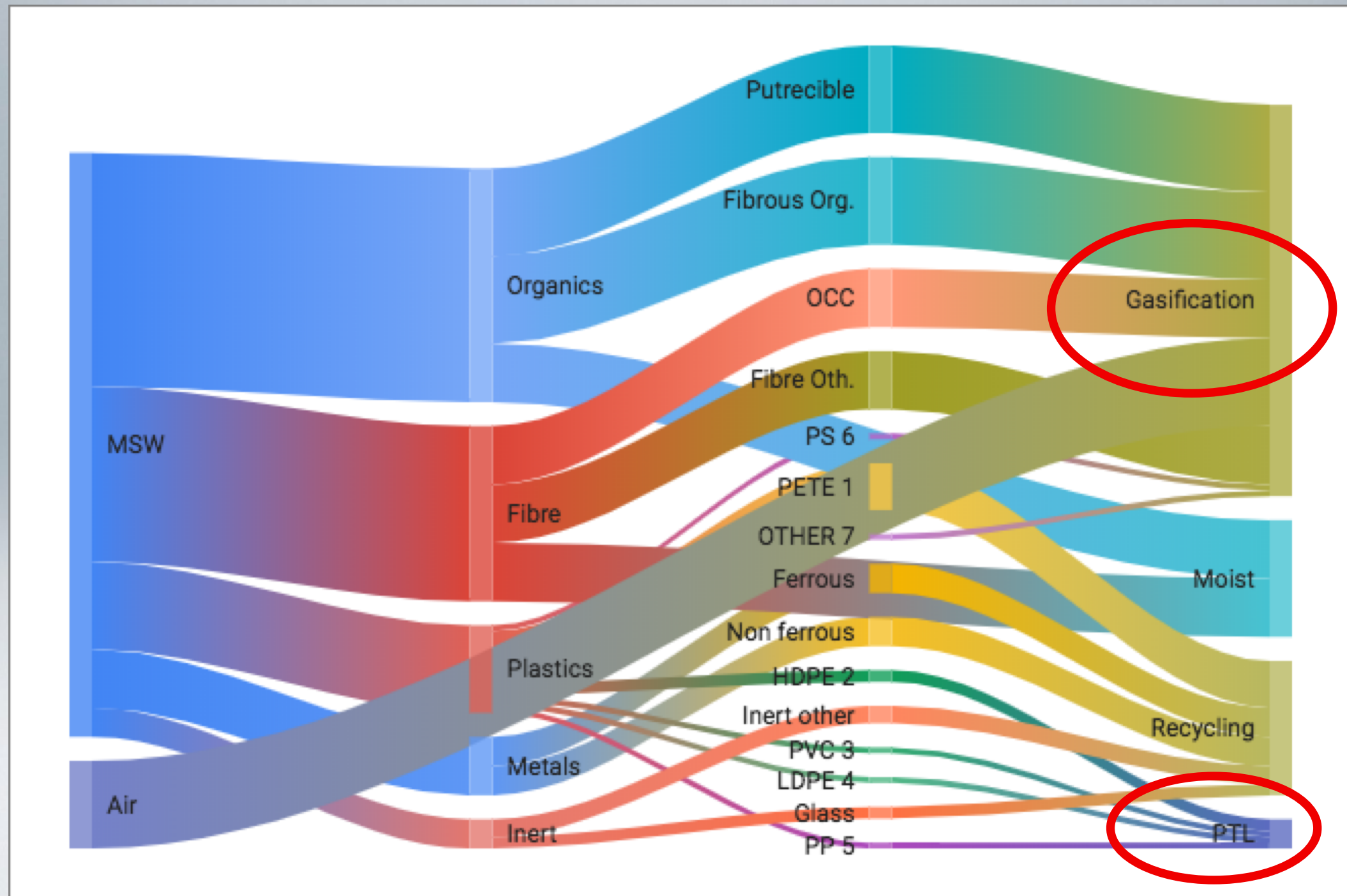
Standard performance 30 ton per hour
Annual nominal capacity 150 000 tonnes
标准处理能力每小时30吨
年处理能力15万吨

MSW SORTING

城市生活垃圾分类

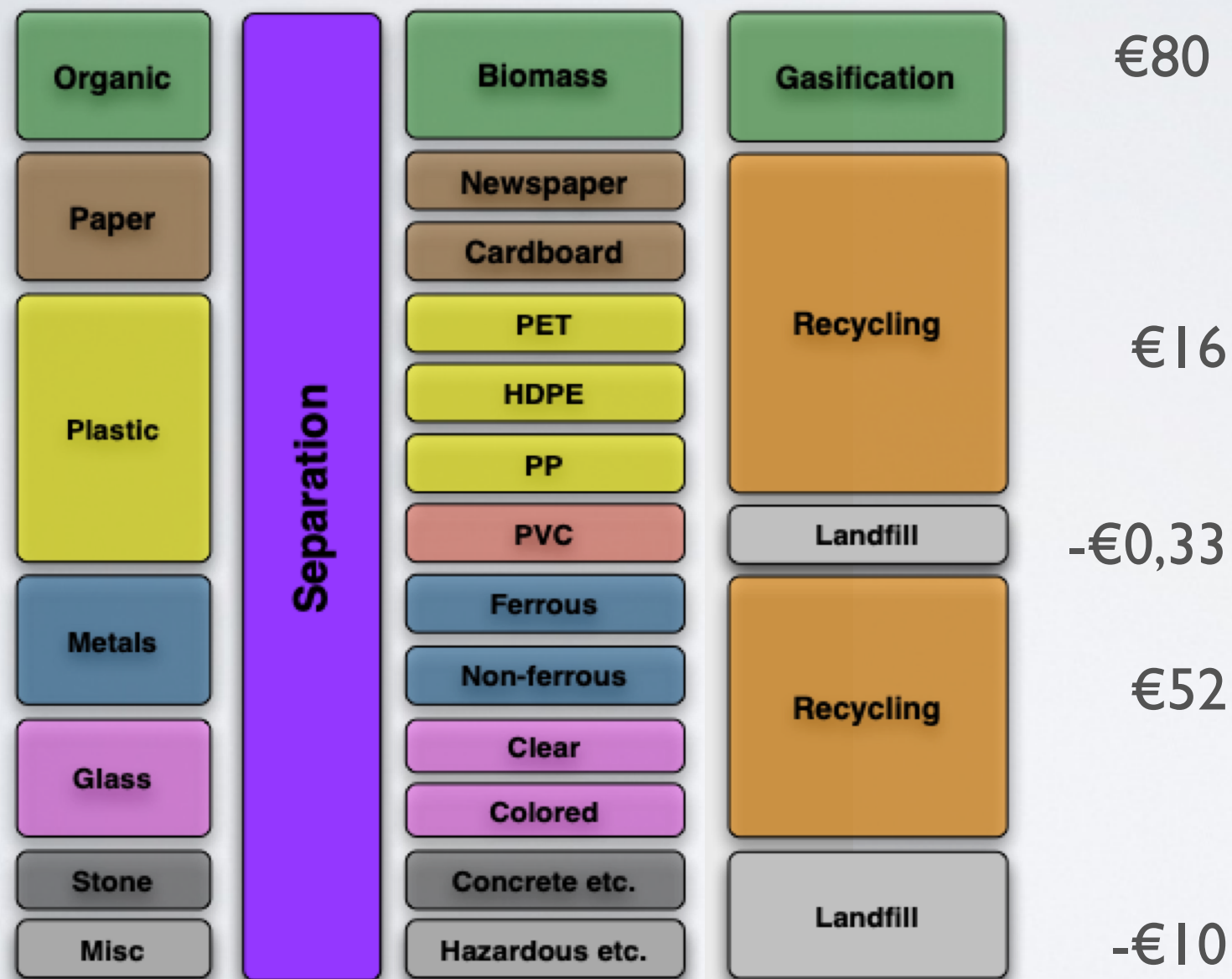


The key to waste treatment is in the sorting
废物处理的关键在于分类



Case study; recycling focus

案例分析; 循环利用重点



RDF reforming:

Total €138

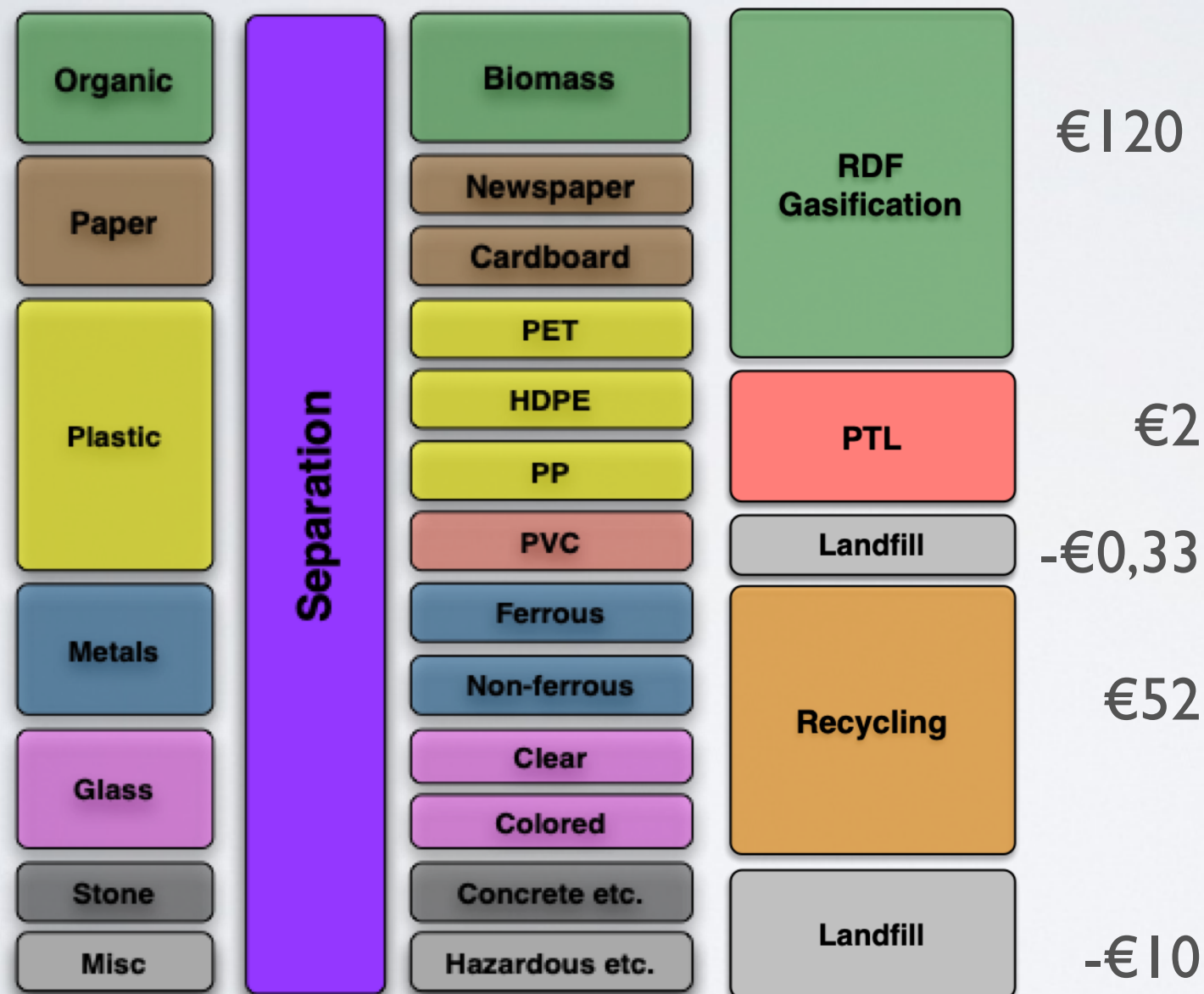
per ton waste

垃圾衍生燃料重组：

每吨废物总计138欧元

RDF gasification & plastic pyrolysis

垃圾衍生燃料气化和塑料热解



RDF reforming:

Total €164

per ton waste

垃圾衍生燃料重组：

每吨废物总计164欧元

THERMAL GASIFICATION

final drying at 100°C

热气化

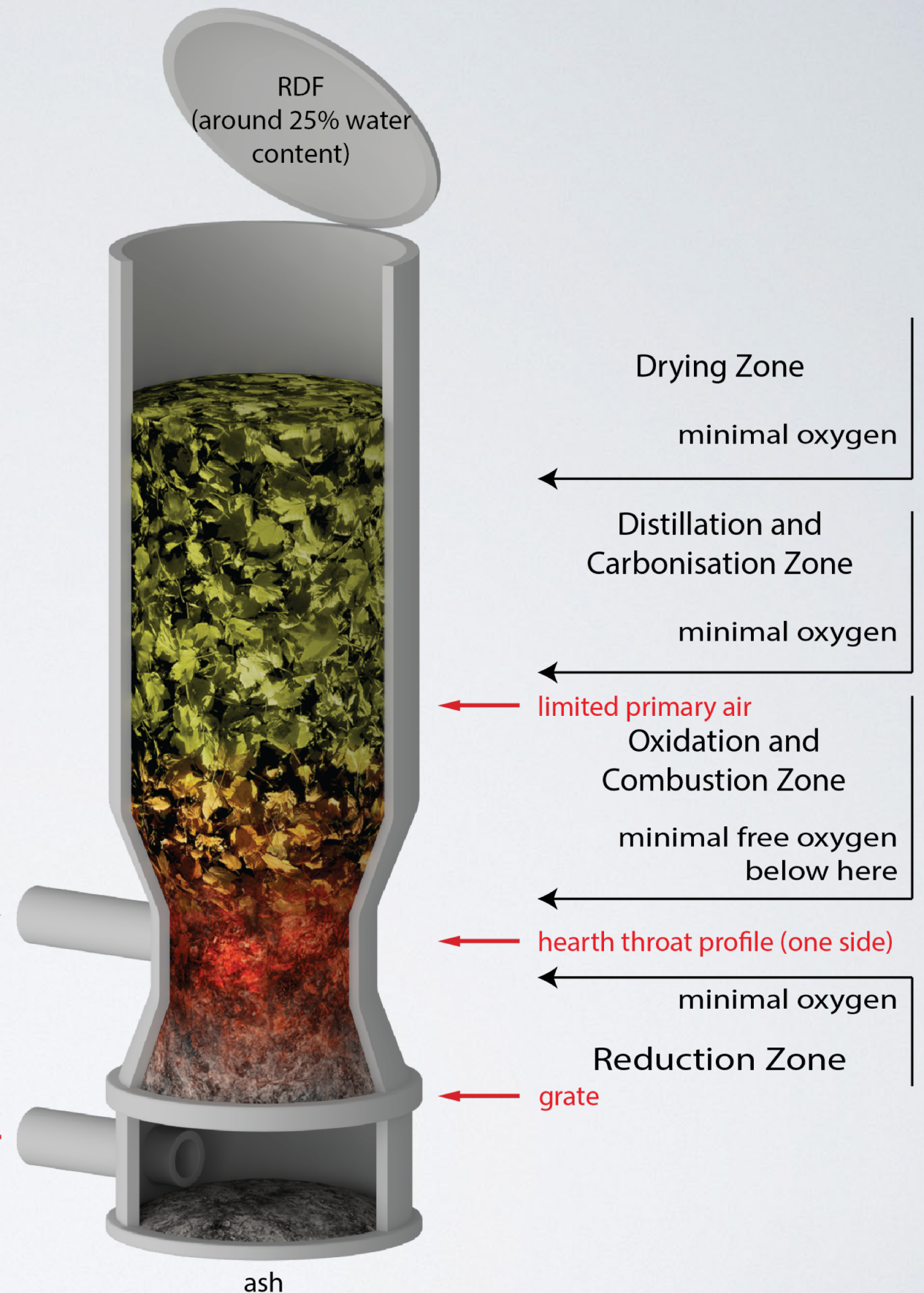
above air inlets heated wood pyrolyses at
250° to 450°C releasing its V.O.C.
(hydrocarbons)

↓
carbonising to charcoal

↓
charcoal within air stream
 $C+H_2O \rightarrow CO+H_2$ and $C+O_2 \rightarrow 2CO$
then $H_2+1/2 O_2$ and $2CO+O_2 \rightleftharpoons 2CO_2$
in equilibrium

air in →
peak temperature: 1100°C
all free oxygen consumed
hot char below the reach of free oxygen
(685° to 885°C)
 $C+H_2O \rightarrow CO+H_2$ and $C+CO_2 \rightarrow 2CO$

hot, syngas out →



GASIFICATION vs. COMBUSTION/INCINERATION

气化与燃烧/焚烧

- Studies has shown that Gasification is superior to Combustion in regards to Environmental Gases 研究表明，在环境气体方面，气化优于燃烧
- Gasification with Generator Set has a higher efficiency than Combustion with Steam Turbine 使用发电机组进行气化比使用蒸汽轮机燃烧效率更高
- Syngas is superior as a waste product since it could be used as fuel as well as raw material 合成气可以和原料一样被用作燃料
- Gasification assumes waste assortment which improves recycling 气化采用废物分类，改善了回收利用
- Gasification units could be built in modules and are relatively small. For Electricity units conventional gas generators could be used. Combustion uses complex Steam Turbine generators. 气化装置可以构建在模块中并且相对较小。对于电力单位，可以使用传统的气体发生器。燃烧使用复杂的汽轮机发电机。

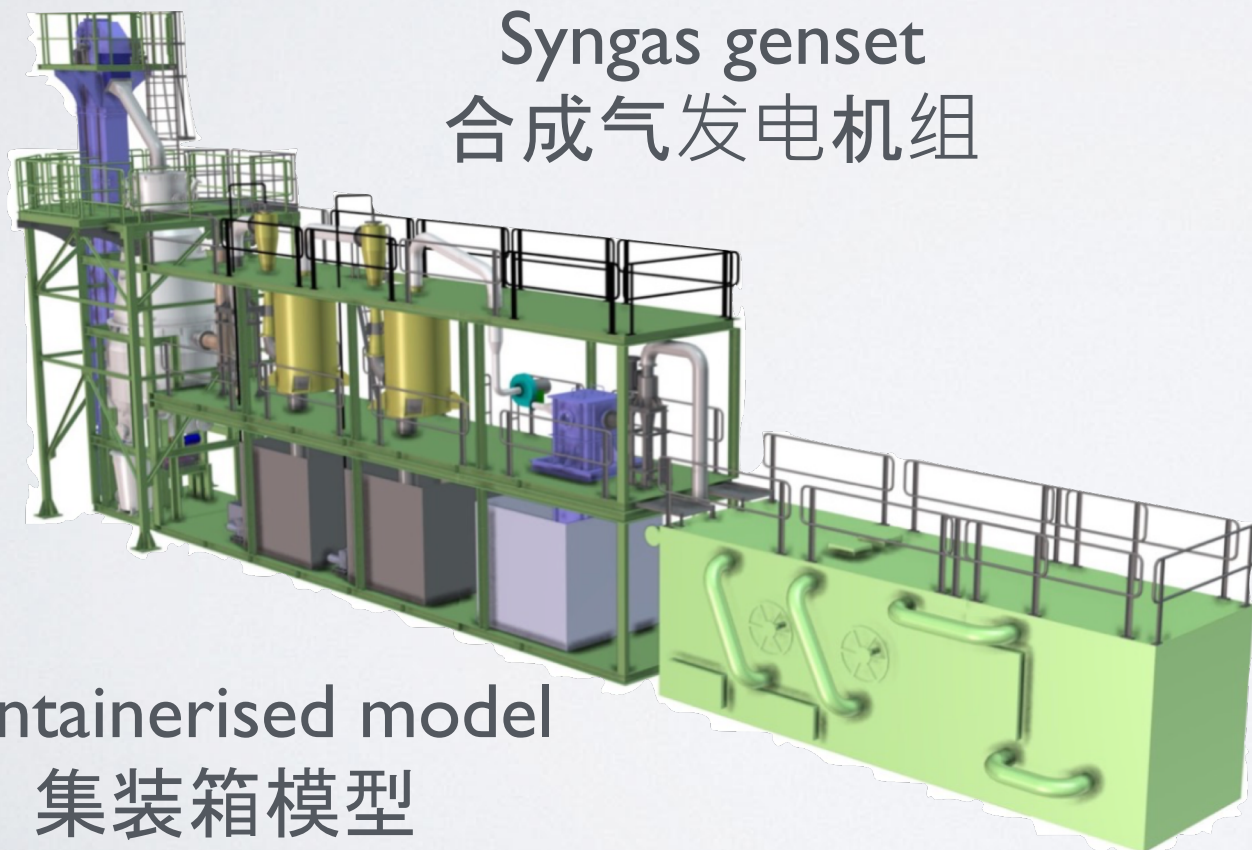


MODULARISED GASIFIERS

模块化气化炉



Syngas genset
合成气发电机组



Containerised model
集装箱模型



500 kW Slovakia
500千瓦Slovakia

PTL plastic-to-liquid fuels

塑料液体燃料

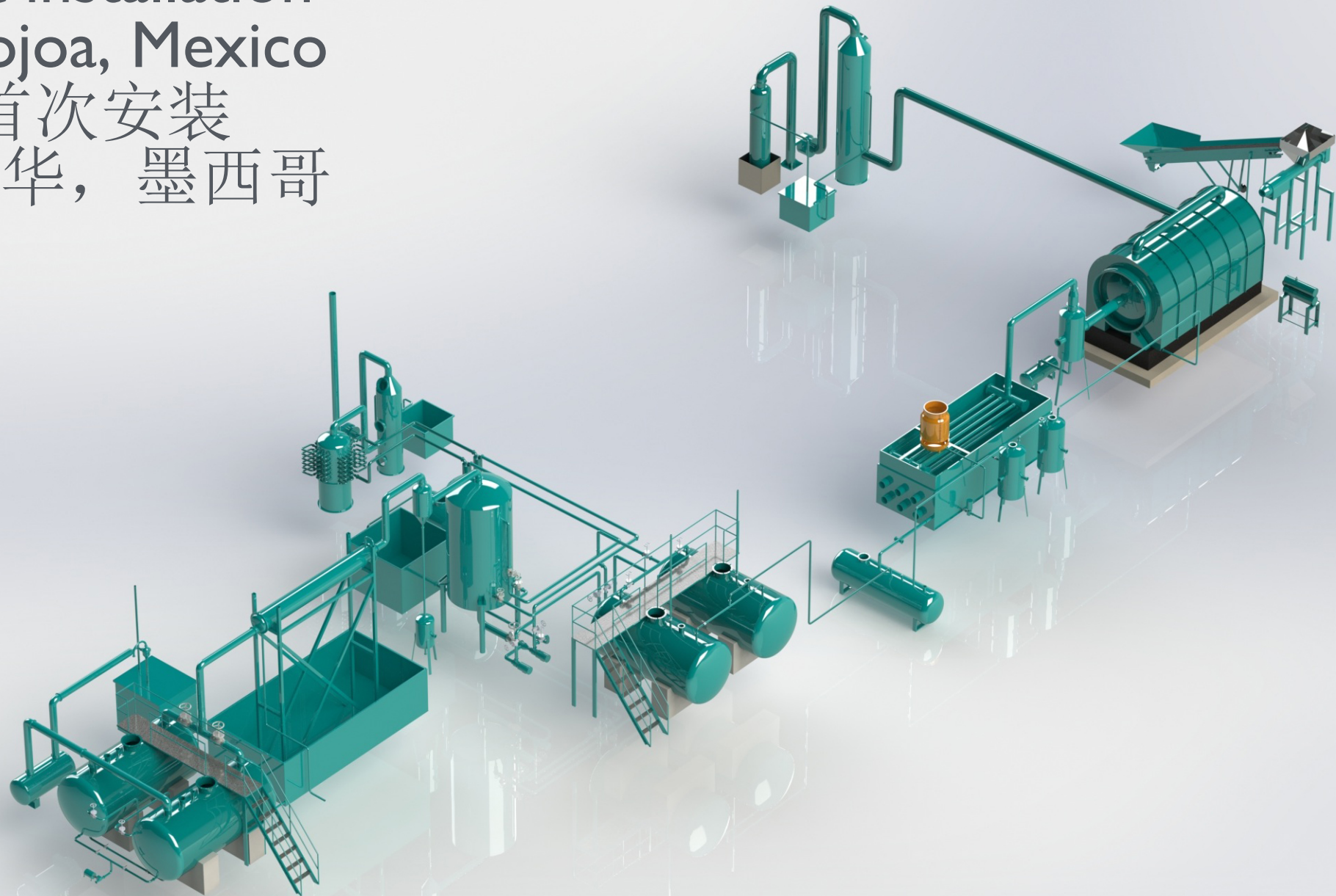
- Complement to RDF gasification 对垃圾衍生燃料气化的补充
- Better use of plastic waste (CO_2 neutral) 更好地利用塑料废弃物（二氧化碳中性）
- Shorter route to synthetic diesel 更快合成柴油
- Shorter return of investment - low entry threshold 投资回报快 - 进入门槛较低
- In operation Q2 2016 在2016年第二季度运营



From Theory to Practice

从理论到实践

First installation
Navojoa, Mexico
首次安装
纳沃华，墨西哥



MODIFIED PYROLYSIS

改性热解



分析报告

REPORT OF ANALYSIS

Drop-in Diesel 即用型柴油

Date of Report	APRIL 11TH, 2017
Intertek Reference Number	MX01146-0000569
Vessel Name	NOT APPLICABLE
Port / Terminal	NOT APPLICABLE
Report Number	LAC-0474/17
Client Reference Number	NOT APPLICABLE

Customer Name
Customer Address
Customer Sample Description
Sampling Place
Drawn by
Analyzed by
Witnessed by (*)
Submitted by
Sample ID (Identification of the Sample Depending of the Customer)
Sample Number (Sequencing of Samples)
Date and Time of Sample
Date and Time of Reception
Date and Time of Analysis

KARL CO. S.A. DE C.V.















Diesel EN590 compliant 符合柴油EN590标准
15-55 % less NO_x 氮氧化物减少15-55%
Less than 1 ppm SO_x 硫氧化物含量小于1%

KARL CO. S.A. DE C.V.
DIESEL D3 (MUESTRA #03)
MX01146-0000569-C
MARCH 28TH, 2017 From: NOT DATA To: NOT DATA
APRIL 07TH, 2017 16:00
APRIL 10TH TO 11TH, 2017 From: 09:30 To: 11:00

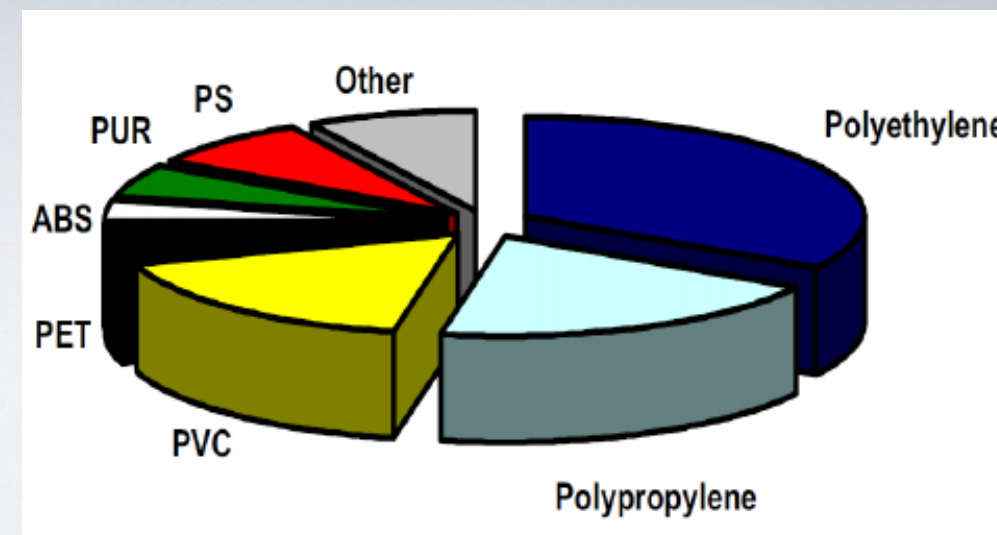
No.	Test Description	Method	Specification	Units	Results
1	KINEMATIC VISCOSITY AT 40°C (+)	ASTM D 445-15a	1,9 - 4,1	mm ² /S	2,008
2	FLASH POINT (+)	ASTM D 93-16	45 MIN.	°C	62,0
3	SULFUR CONTENT (+)	ASTM D 5453-16	500 MAX.	mg/kg	144
4	INITIAL BOILING POINT (+)	ASTM D 86-15	TO REPORT	°C	168,4
	AT 10% (+)	ASTM D 86-15	275 MAX.	°C	202,9
	AT 50% (+)	ASTM D 86-15	TO REPORT	°C	255,5
	AT 90% (+)	ASTM D 86-15	345 MAX.	°C	302,5
	FINAL BOILING POINT (+)	ASTM D 86-15	TO REPORT	°C	333,0
	PCT. RECOVERED (+)	ASTM D 86-15	TO REPORT	-	98,4
5	PCT. RESIDUE (+)	ASTM D 86-15	TO REPORT	-	1,4
	DENSITY AT 15°C (+)	ASTM D 4052-15	TO REPORT	kg/L	0,825 6
	SPECIFIC GRAVITY AT 60°/60° (+)	ASTM D 4052-15	TO REPORT	-	0,826 0
6	CETANE INDEX (+)	ASTM D 976-06 (2016)	45 MIN.	-	52,93

PLASTIC SORTING

塑料分类

 PET	 PE-HD	 PVC	 PE-LD	 PP	 PS	 O
Polyethylene terephthalate	Polyethylene (high density)	Polyvinyl chloride	Polyethylene (low density)	Polypropylene	Polystyrene	Bisphenol A and others
PET is commonly used in commercially sold water bottles, soft drink bottles, sports drink bottles, and condiment bottles.	HDPE is commonly used in milk and juice bottles, detergent bottles, shampoo bottles, grocery bags, and cereal box liners.	PVC can be flexible or rigid, and is used for plumbing pipes, clear food packaging, shrink wrap, plastic children's toys, tablecloths, vinyl flooring, children's play mats, and blister packs (such as for medicines).	LDPE is used for dry cleaning bags, bread bags, newspaper bags, produce bags, and garbage bags, as well as "paper" milk cartons and hot/cold beverage cups.	PP is used to make yogurt containers, deli food containers, furniture, luggage and winter clothing insulation.	PS, also popularly known as Styrofoam, is used for cups, plates, take-out containers, supermarket meat trays, and packing peanuts.	Any plastic item not made from the above six plastics is lumped together as a #7 plastic. things like CD's baby bottles and headlight lens
						

65-80 % of waste plastic can be used for pyrolysis
65-80%的废塑料可用于热解



CONTINUOUS PTL

塑料液体燃料

