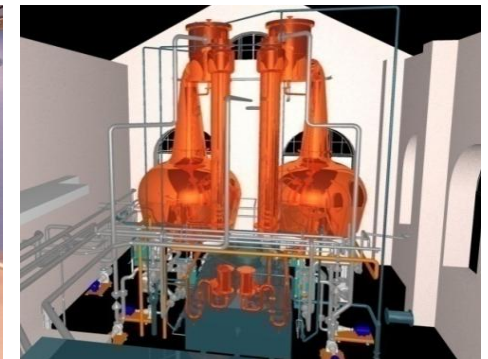
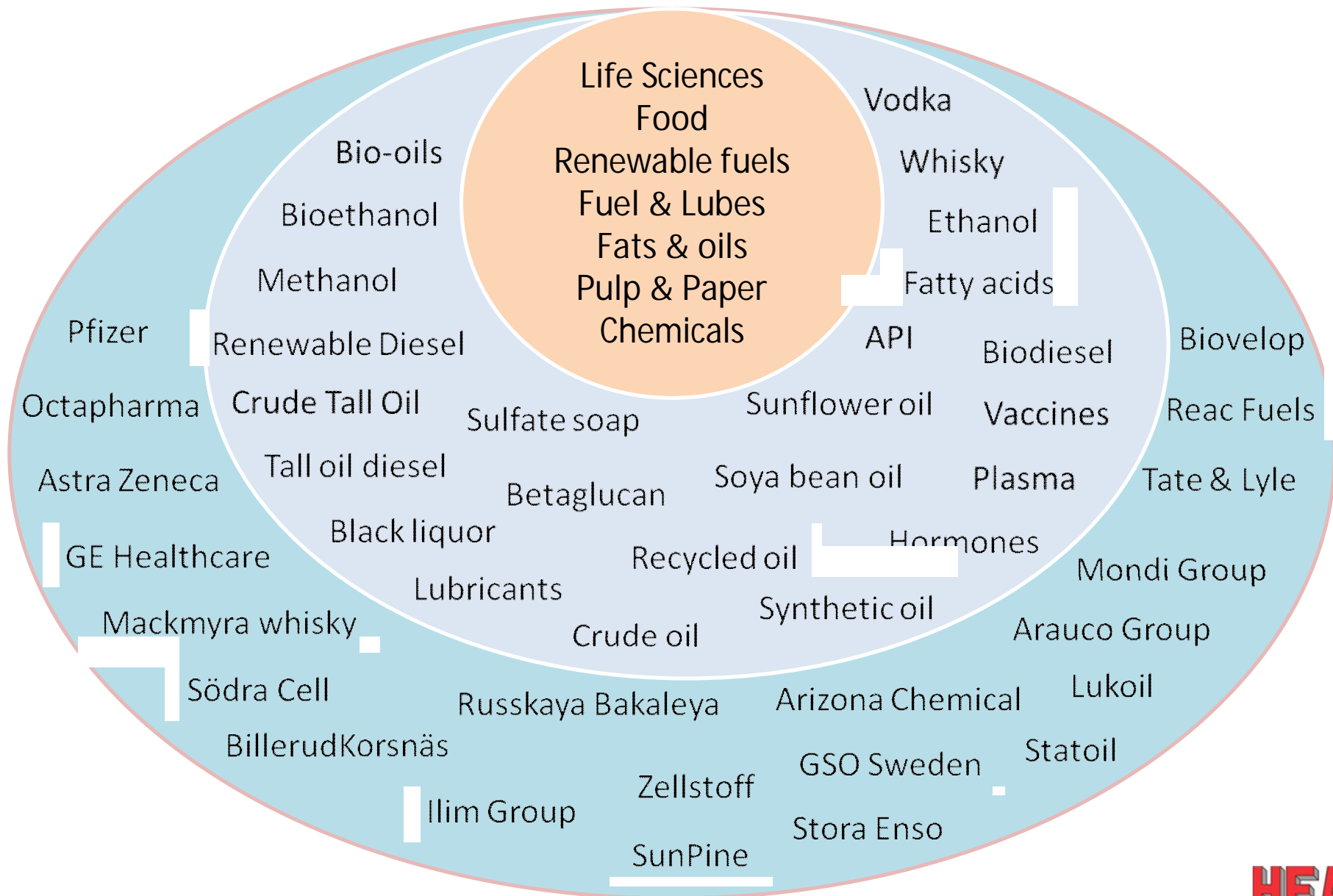


HEAD Engineering AB

Complete project delivery
for the process industry



Industries, Products & Customers



LIFE SCIENCE



Project ASP 1989-97

API production plant in France for AstraZeneca

Chemical synthesis plant for production of Active Pharmaceutical Ingredient (API).

Project management for the whole project, all design, procurement, installation supervision, start up and testing.

After the plant was completed, four additional projects for new products and processes were carried out during eight years of time.



Project in China 1997-98

Biotech production facility

HEAD Engineering supplied:

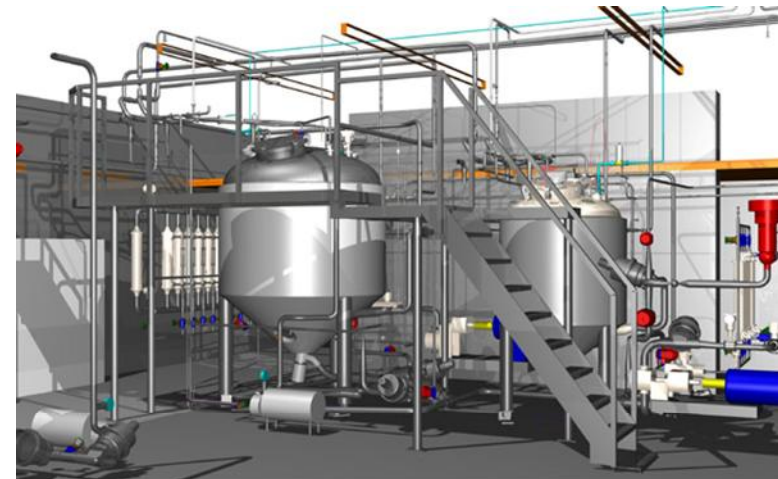
- Two process lines for harvest and purification.
- One system for aseptic preparation of final product.
- Three systems for CIP (Clean In Place).



Project in USA 2001-03 Vaccine production facility

HEAD Engineering supplied:

- One process line for harvest and purification.
- Media and buffer preparation systems.
- Six systems for CIP (Clean In Place).
- Distribution systems for WFI (Water for Injection) and other clean utilities as well as for standard utilities.



First Product Sweden – 2013-15 Biotechnological multipurpose Plant

Design and delivery of a complete multipurpose biotechnological plant. The scope includes basic design, detailed design, civil & building works, delivery of all process equipment, piping installations, el. & Instr., Automation programming and IQ/OQ/PQ.



PINOLA
Kraft Soap Technology

Black liquor Soap

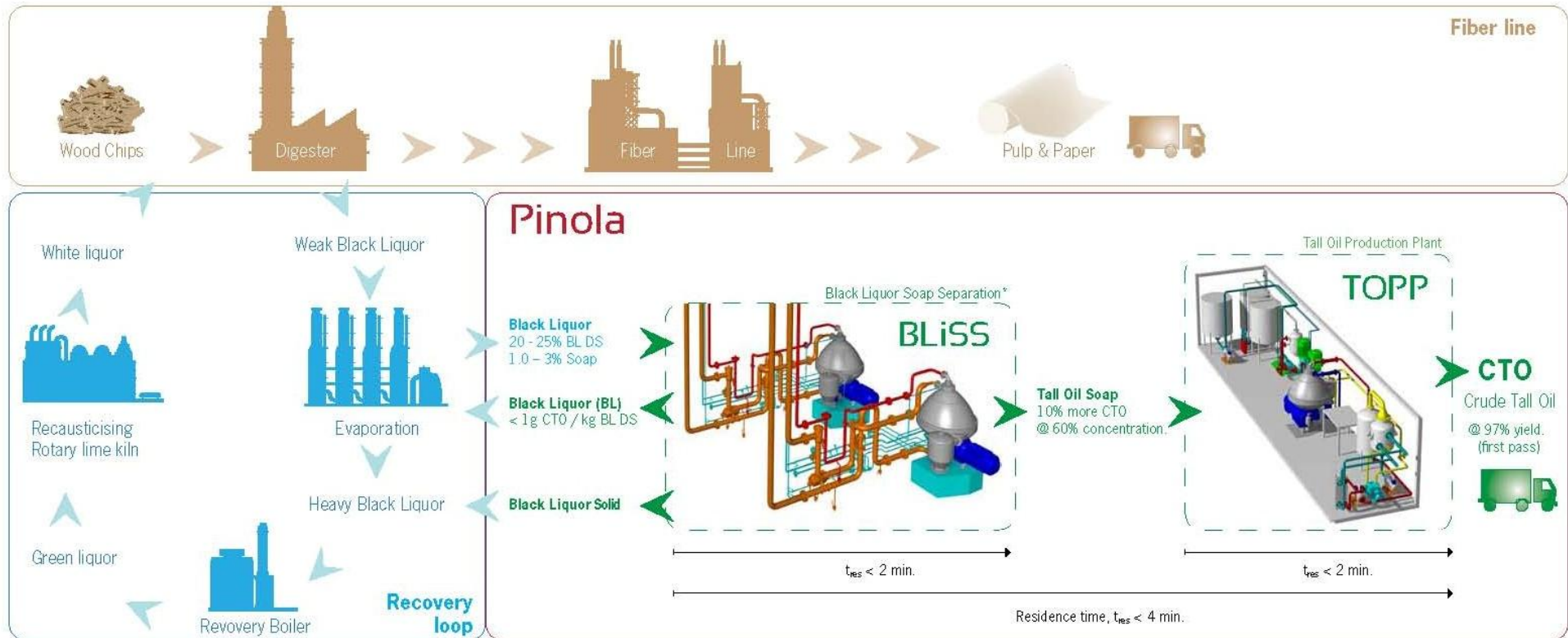


Crude Tall Oil



Analysis methods





PINOLA TOPP

Tall Oil Production Plant

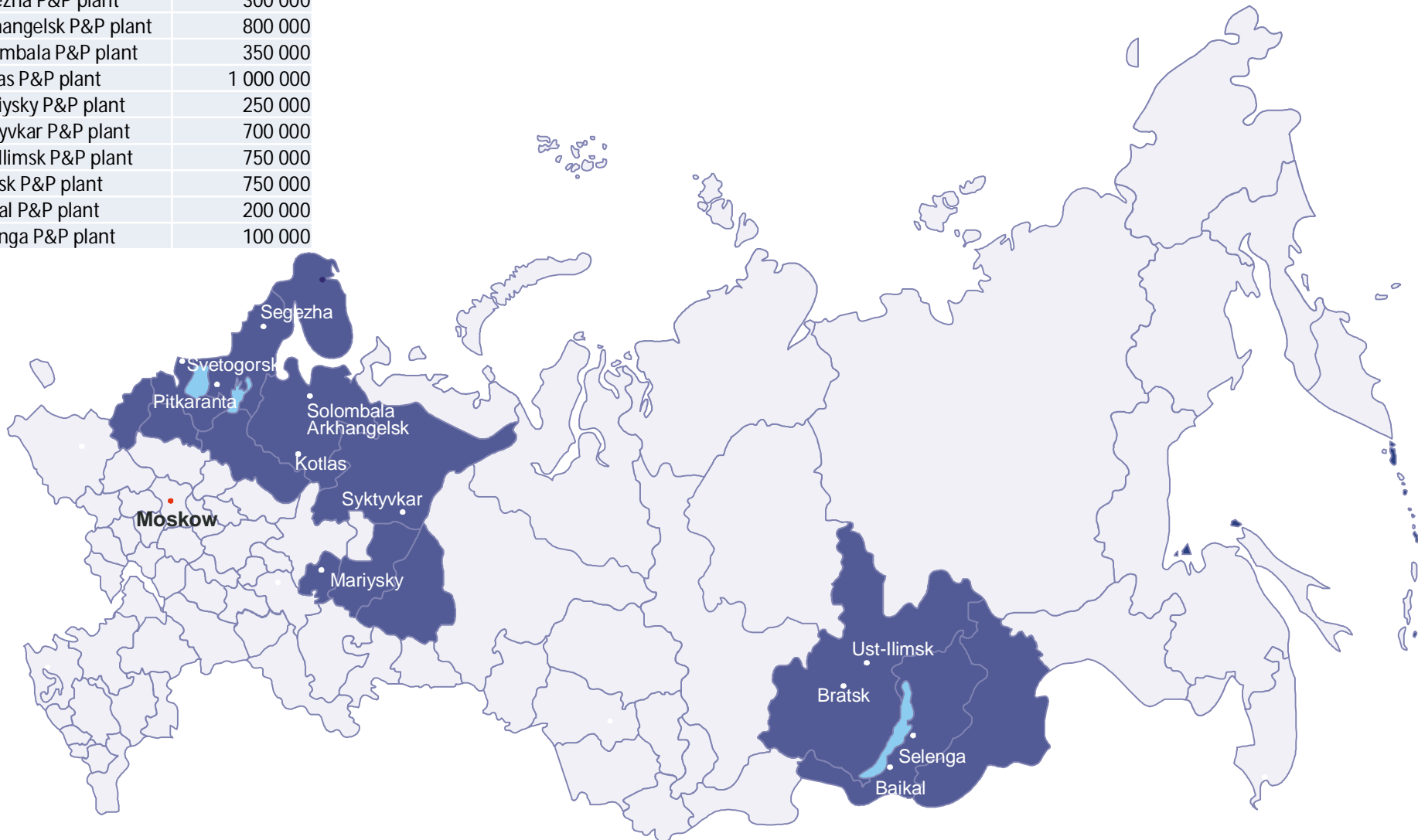
Reference plant

Södra Cell mill Värö Sweden, capacity 5MT CTO / hr. Commissioned April 2012.



Russian Market

	ton of pulp / yr
1 Svetogorsk P&P plant	400 000
2 Pitkaranta P&P plant	80 000
3 Segezha P&P plant	300 000
4 Arkhangelsk P&P plant	800 000
5 Solombala P&P plant	350 000
6 Kotlas P&P plant	1 000 000
7 Mariysky P&P plant	250 000
8 Syktyvkar P&P plant	700 000
9 Ust-Ilimsk P&P plant	750 000
10 Bratsk P&P plant	750 000
11 Baikalsk P&P plant	200 000
12 Selenga P&P plant	100 000



USED OIL RECYCLING

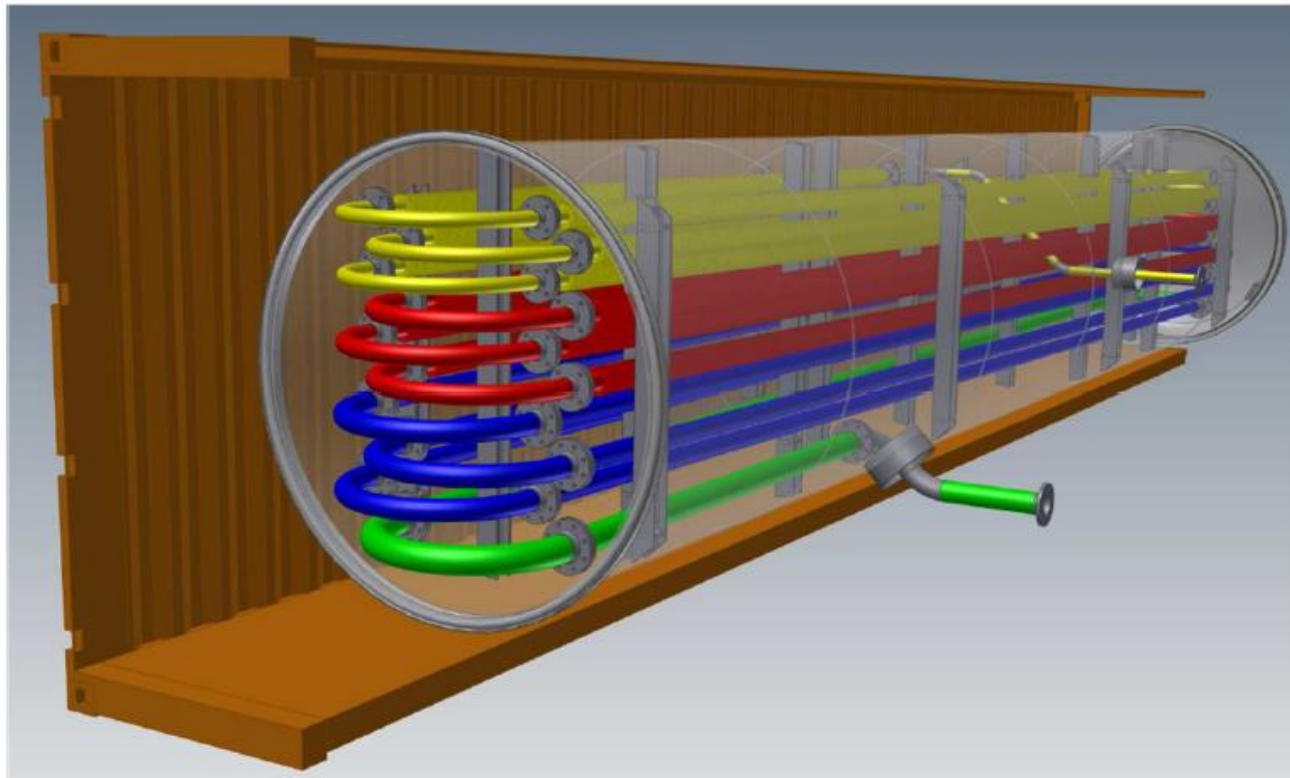


Why Oil Recycling?

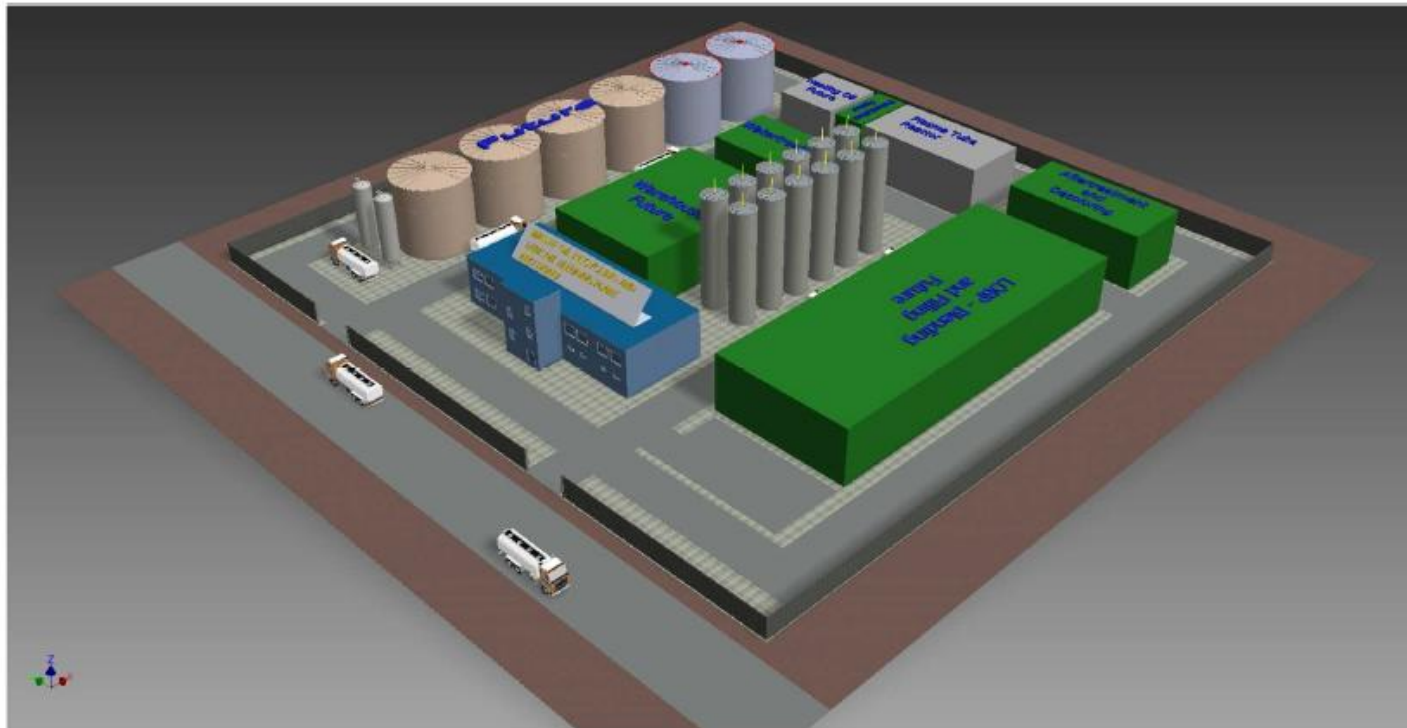
Resource Conserving Hierarchy

Waste Management Ranking (from Environmental Perspective)	Option	Considered Action Step
Most Preferable	Prevent the waste in the first place	Source reduction (e.g. extended oil drain intervals)
↓	Re-use and reclaim the product	Re-refine used oil
	Recover energy by burning	Combust used oil for heating value recovery*
	Least Preferable	Dispose of the waste by land filling or incineration

Plasma Reactor
3D Design Model



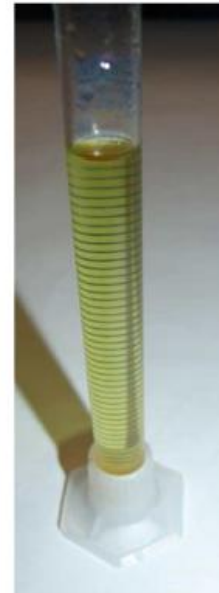
3D-Plan of typical Oil Recycling Plant



Result of Refinement



Conventional
Used Oil Distillates



Base Stock
Plasma Refined

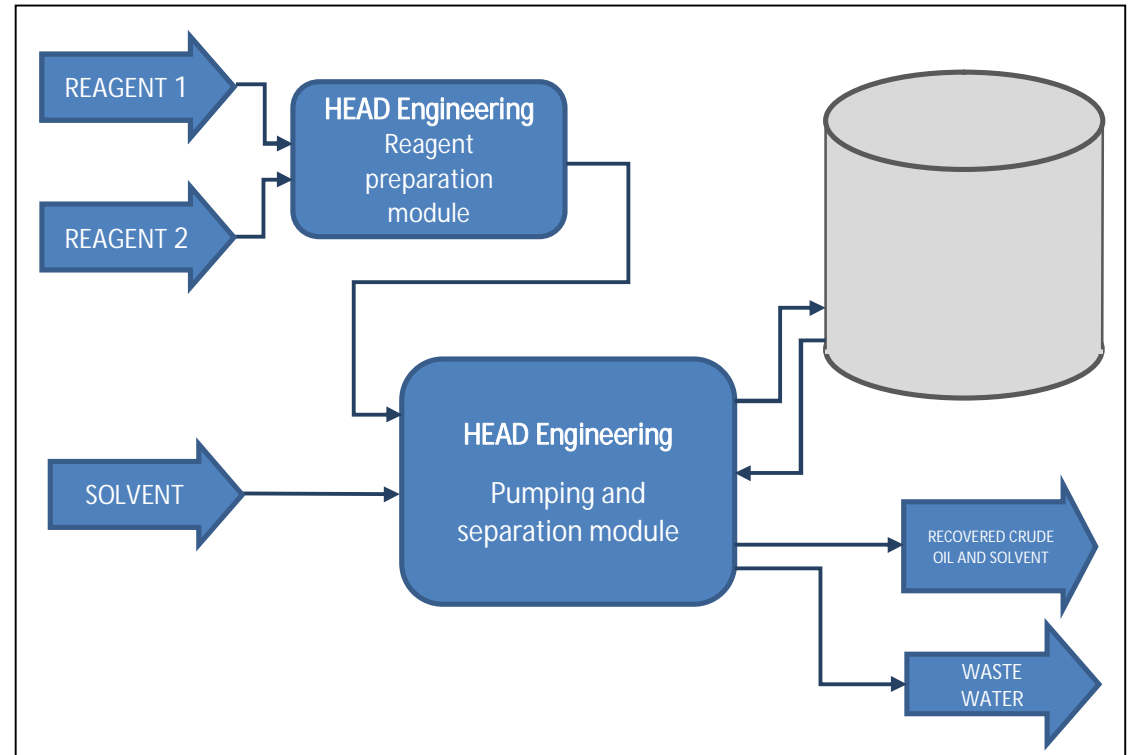
THERMAL TANK CLEANING



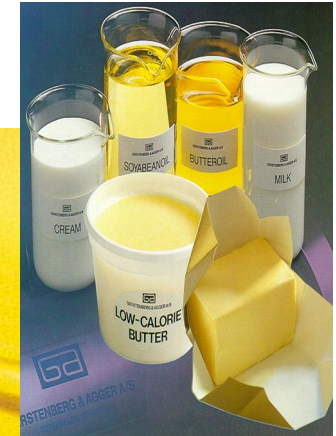
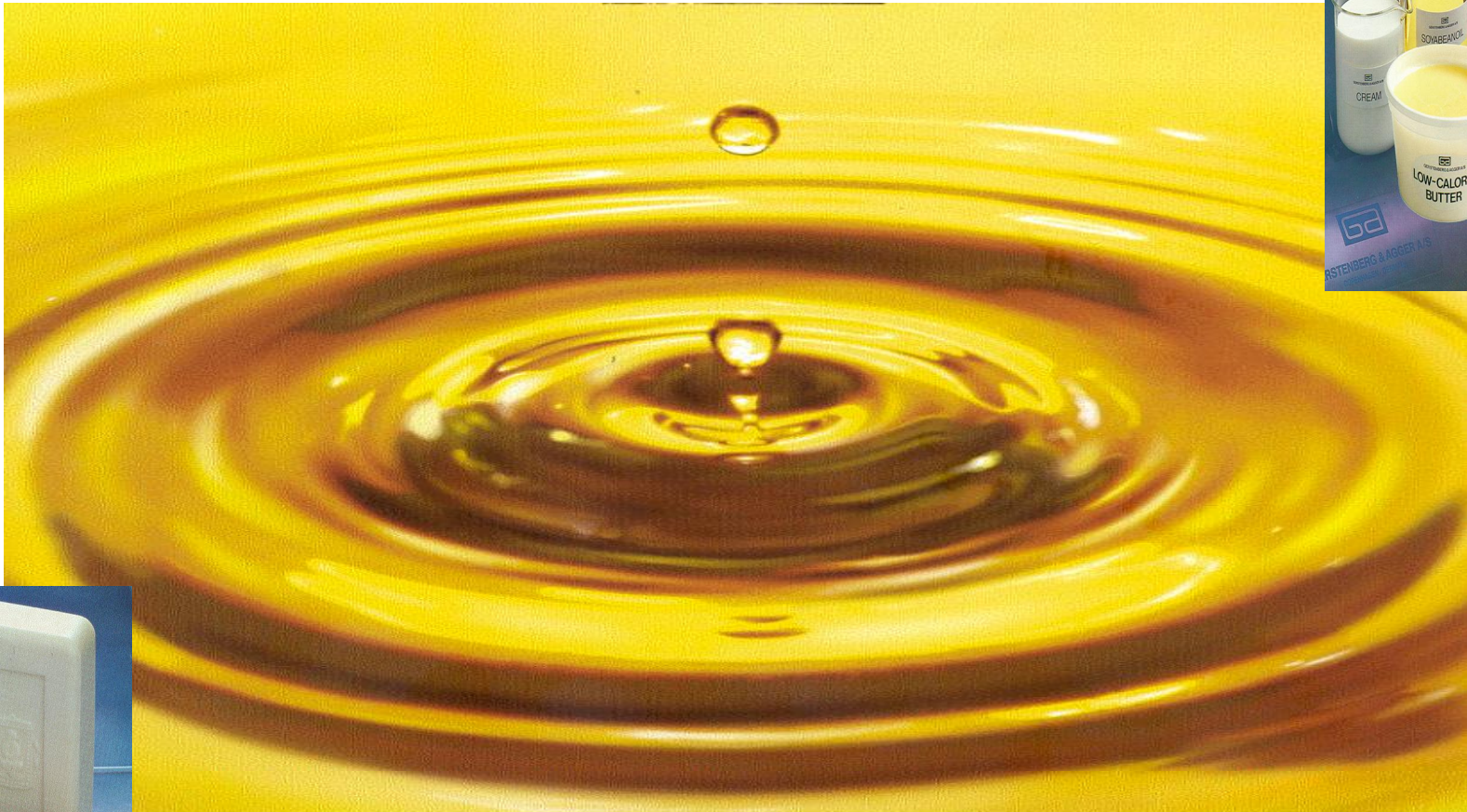
Thermal Tank Cleaning

Advantages of Head Engineering's thermal tank cleaning solution

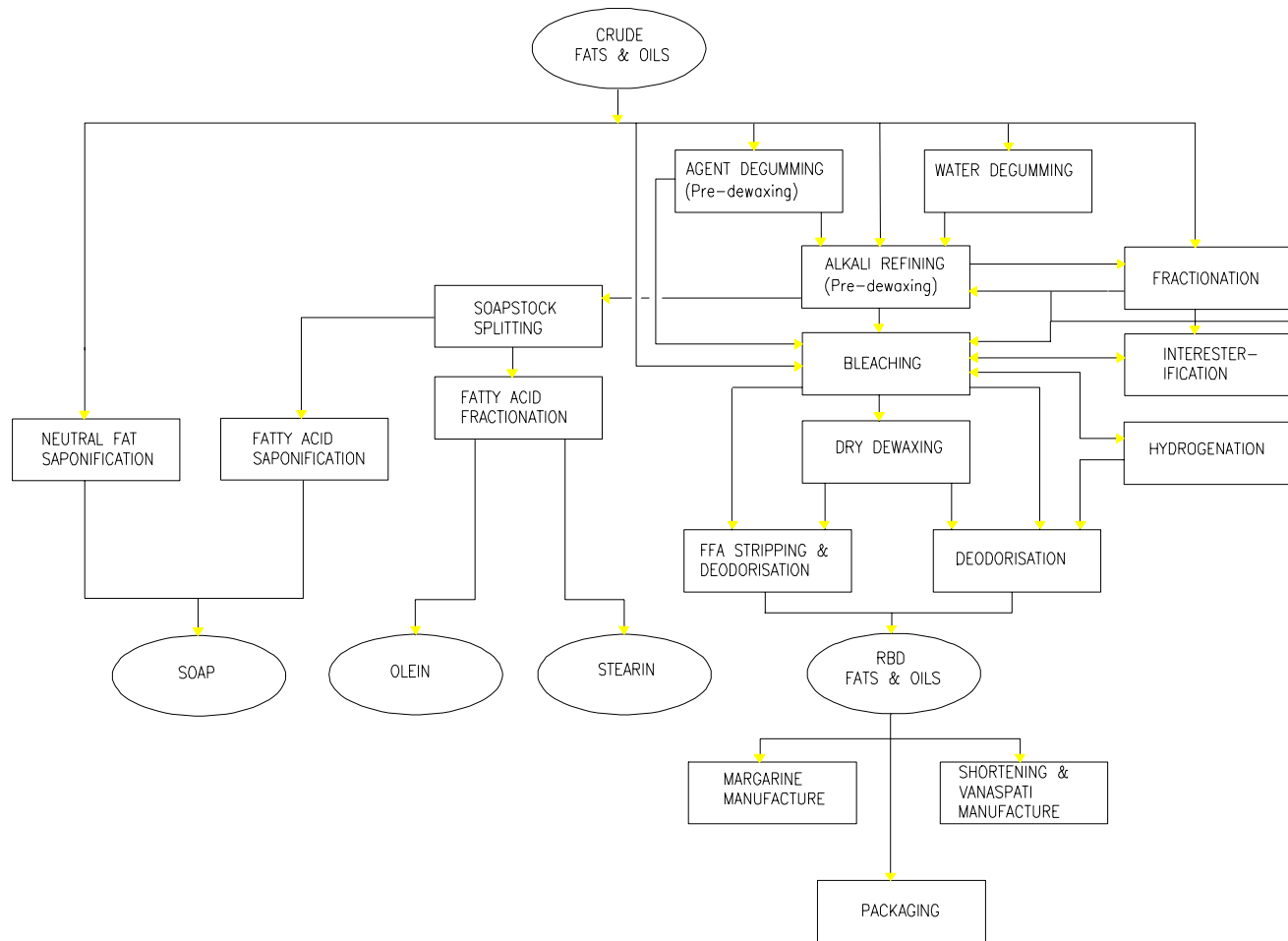
- Significant reduction of overall tank cleaning time and overall tank off-duty time
- Near 100% recovery of hydrocarbons
- Minimal solids-inorganics disposal necessary
- Minimal health and safety risks. Staff don't need to enter tank during cleaning. Inert atmosphere after settling.
- Separation of sludge into oil, water and solids minimizes waste for disposal.



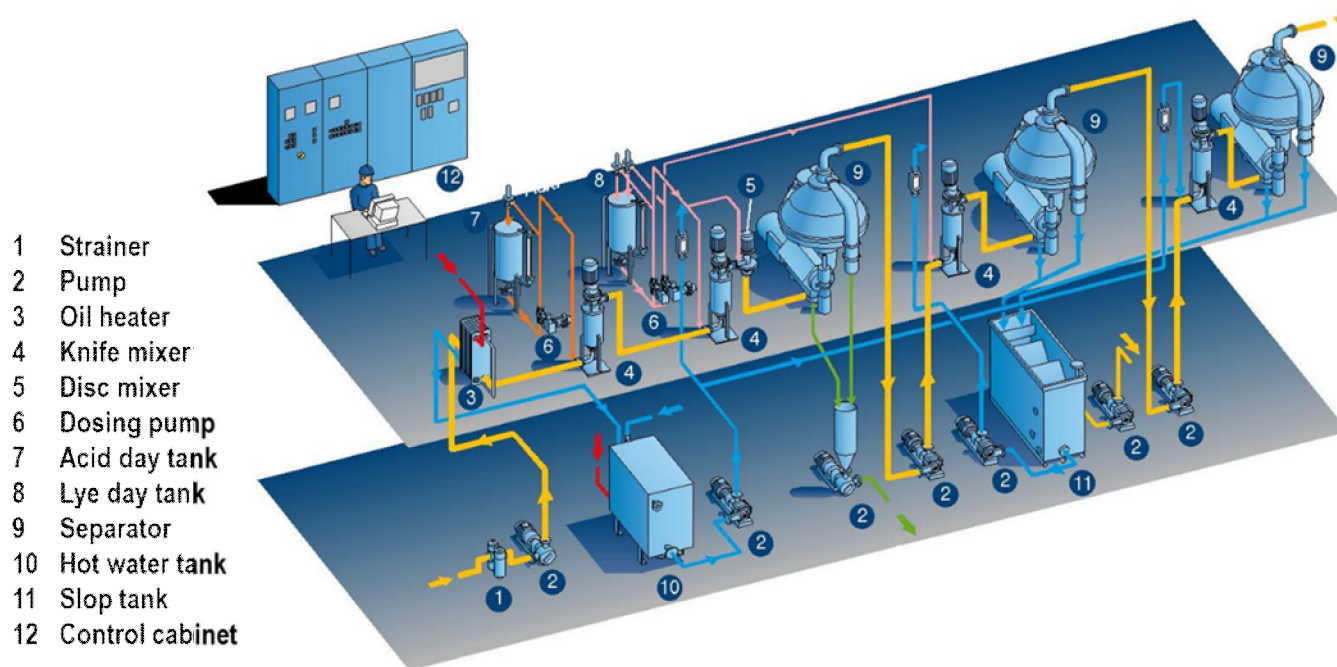
FATS & OILS



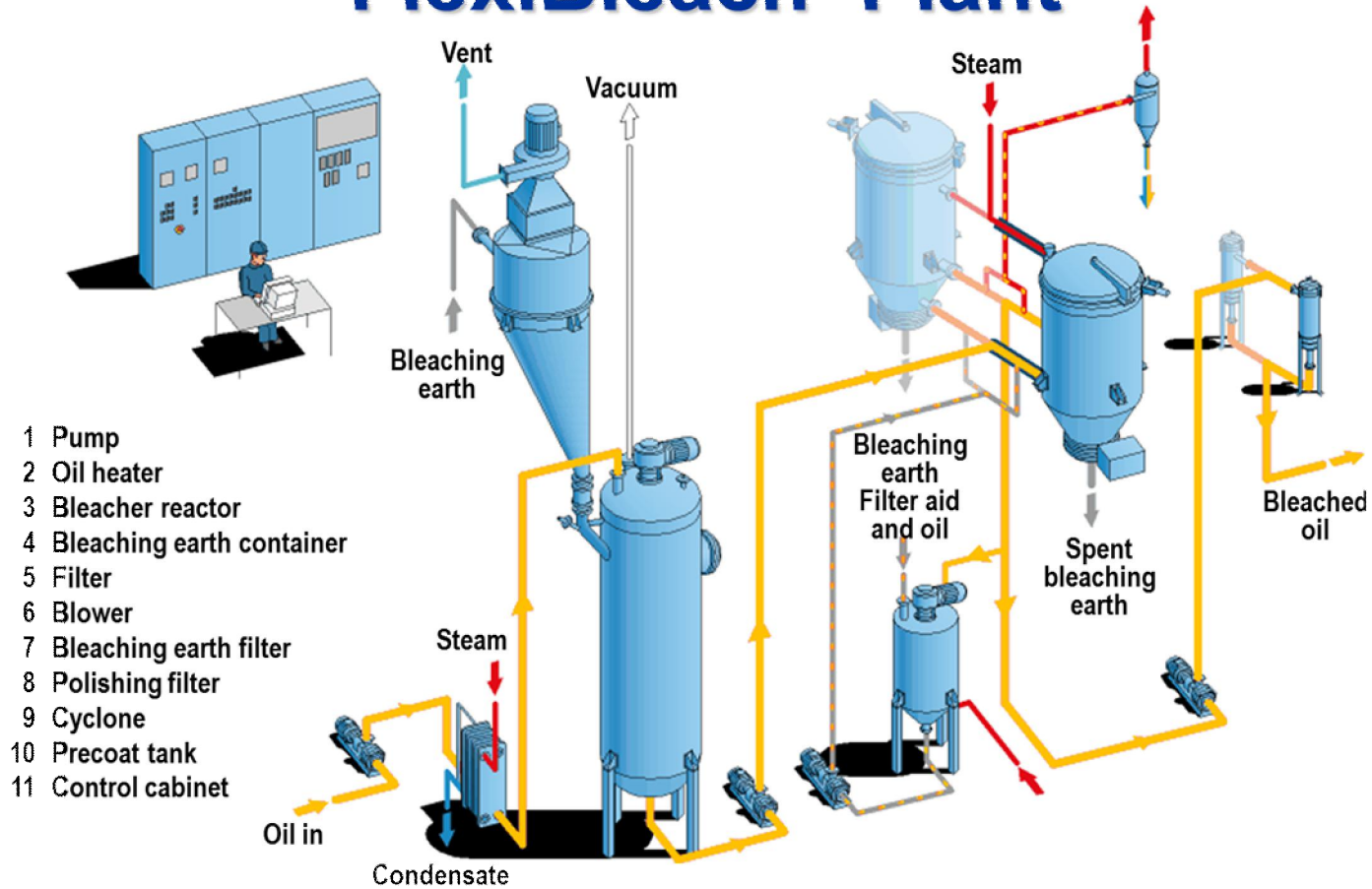
PROCESSING OF FATS & OILS (Survey)



FlexiMix™ Neutralisation Plant

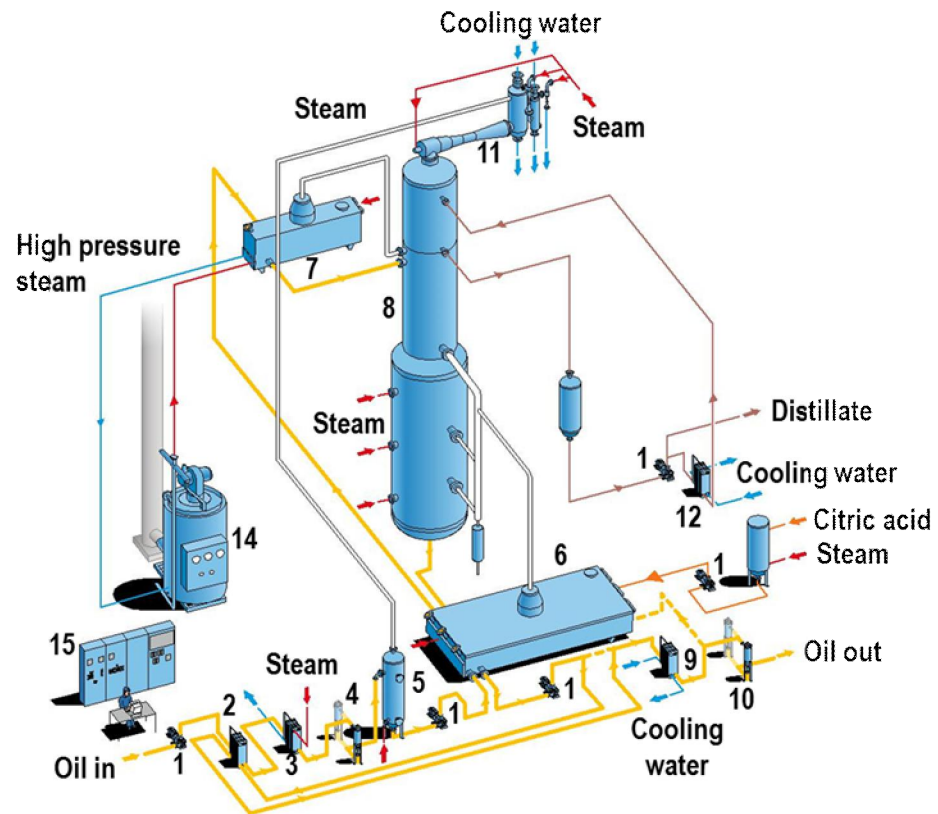


FlexiBleach™ Plant



FlexiFlow™ Deodorizer

- 1 Pump
- 2 PHE economizer
- 3 Oil preheater
- 4 Inlet filters
- 5 Deaerator
- 6 Economizer
- 7 final heater
- 8 Fx Column
- 9 Oil cooler
- 10 Polishing filters
- 11 Vacuum system
- 12 Distillate cooler
- 13 Citric acid tank
- 14 High pressure boiler
- 15 Control cabinet



THANK YOU!

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