

Latest Developments in Fiberline Technology

AFCP

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Agenda

- Valmet in South America and Capabilities
- Valmet's Services Business Line
- Capital Projects – Turn key Installations
- Valmet Technology
- Rebuilds and Improvements
- Success cases of rebuilds



Valmet in South America

Valmet in South America

Local Operations



- Supports the South American pulp, paper and energy industry
- Approximately 460 employees
- Production plants, sales and service offices in five locations
- In 2013, South America was Valmet's second biggest area in terms of orders received and net sales.

Valmet in Brazil

Araucária workshop: Manufacturing and repairs

Chipper Disc



Liquor Filter



High Pressure feeder



Press Rolls



Smelt spouts



Boiler parts





Service Business Line

Services Business Line Overview

Empowered to serve the pulp, paper, and energy industries

Full offering: Mill and plant improvements, roll and workshop services, spare parts, consumables, fabrics, and lifecycle services

Stable and growing:
Business line sales growth 2010-2013: 5,4% p.a.



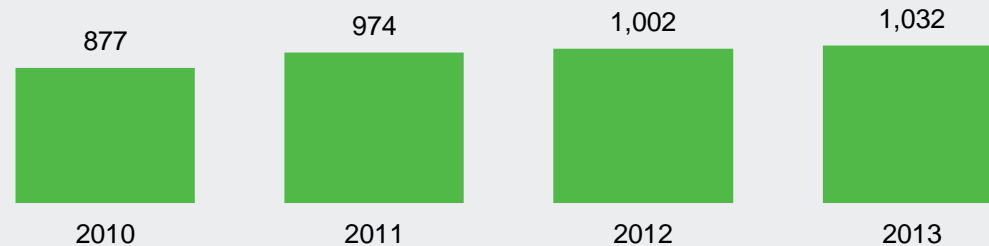
Market Position #1-2

3,800 pulp and paper mills worldwide, of which over 50% purchase services from Valmet
400 customers outside the paper industry

Net sales 2013: **EUR 1.03 bn**
Net sales of Group total: **39%**

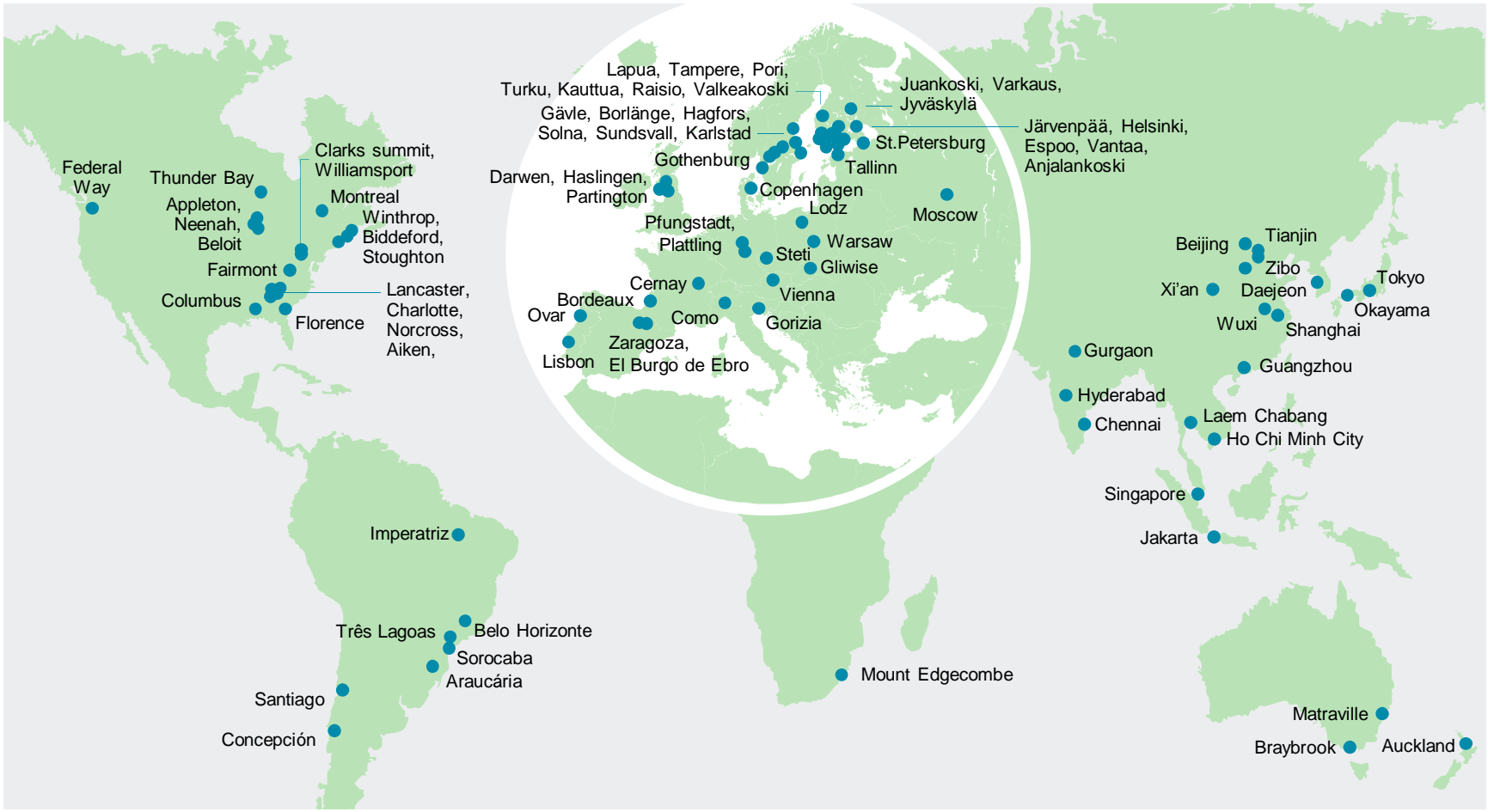
Employees **5,295**
Employees of Group total: **46%**

Net sales MEUR



Global Service Network

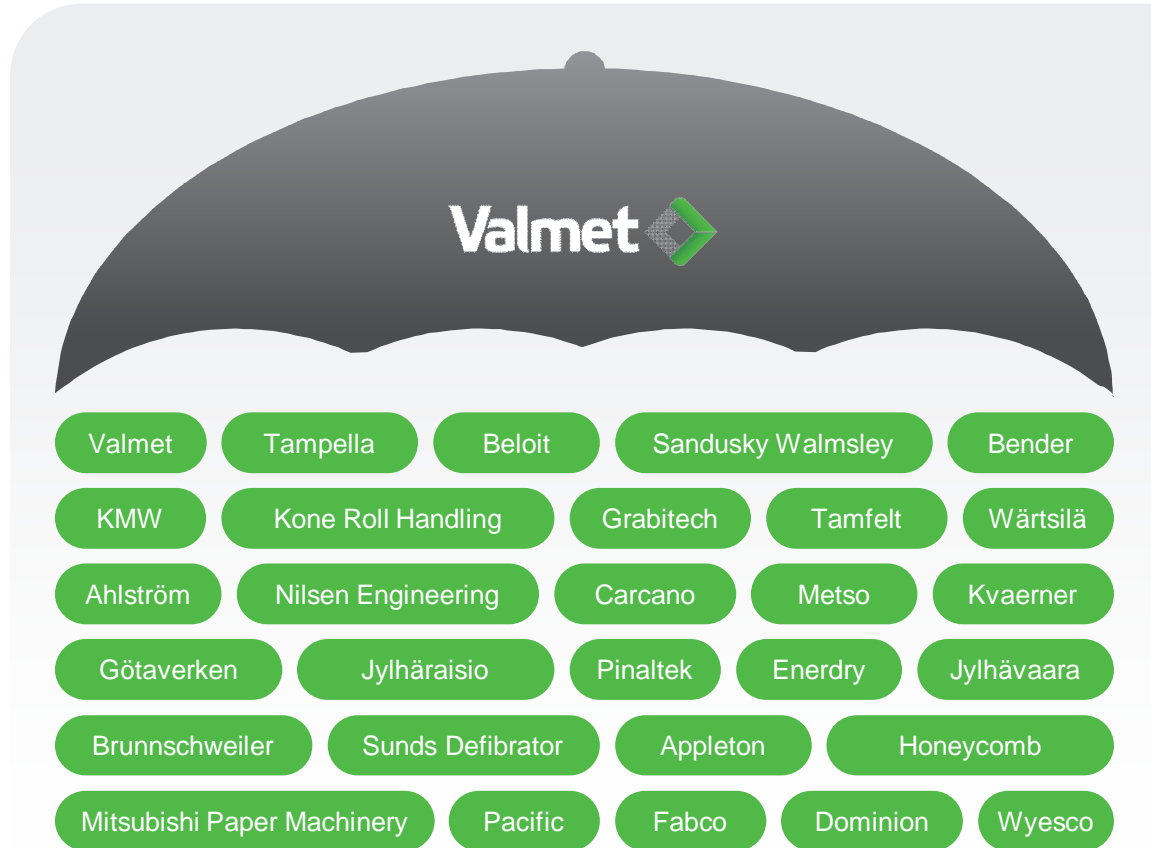
Close to you – over 70 service centers* in 20 countries



OEM Services to a Wide Machinery Base Worldwide

Valmet offers a full range of services regardless of the original supplier of the equipment

As a result of acquisitions and mergers, Valmet has a wide technology base to provide and develop OEM services further



Services for Pulp, Paper and Energy

Based on process and technology know-how

Long-term solutions

Consumables contracts

Service contracts

Maintenance outsourcing

Improvement projects

Production development

Maintenance development

Upgrades

Maintenance services

- OEM spare parts
- On-site and workshop services
- Shutdown services
- Roll maintenance



Production services

- Production support services
- Paper machine clothing, filter fabrics
- Roll covers
- Process parts



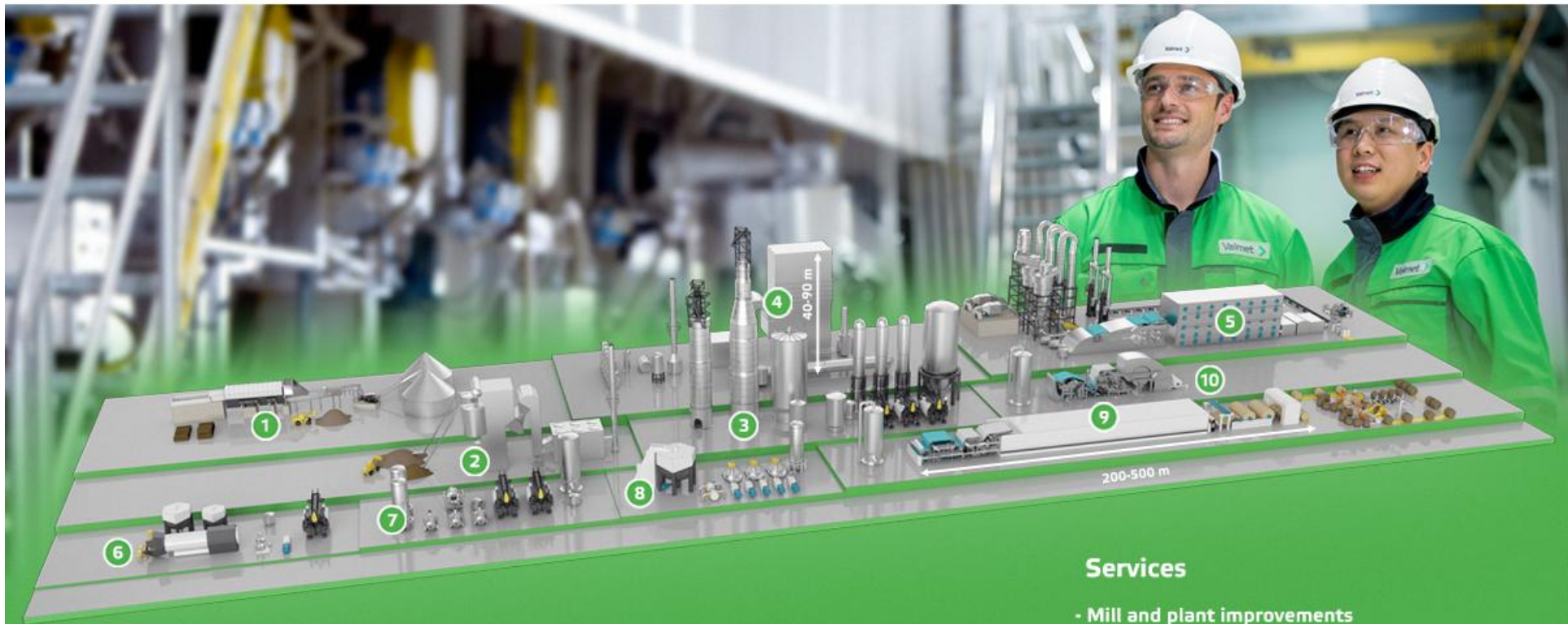
Reliability, cost-efficiency, capacity, quality

Energy efficiency, water and material efficiency, emissions management, safety and usability



Capital Projects Turn key Installations

Full scope offering for the pulp and paper industry



- ① Wood Handling
- ② Heat and Power Production
- ③ Chemical Pulping
- ④ Chemical Recovery
- ⑤ Pulp Drying

- ⑥ Recycled Fiber
- ⑦ Mechanical Fiber
- ⑧ Stock Preparation
- ⑨ Board and Paper Making
- ⑩ Tissue Making

Services

- Mill and plant improvements
- Spare and wear parts
- Paper machine clothing and filter fabrics
- Roll services
- Services for evaporation plants, power and recovery boilers
- Services for environmental equipment

Thousands of technology projects for our customers



Pulp

- **200** wood handling systems
- **470** cooking systems
- **300** complete fiber lines
- **400** evaporation systems
- **350** recovery islands



Paper

- **900** paper machines
- **700** board machines
- **200** tissue machines
- **200** mechanical pulping lines



Energy

- **270** fluidized bed boilers
- **120** BioGrate boilers
- **400** environmental protection systems

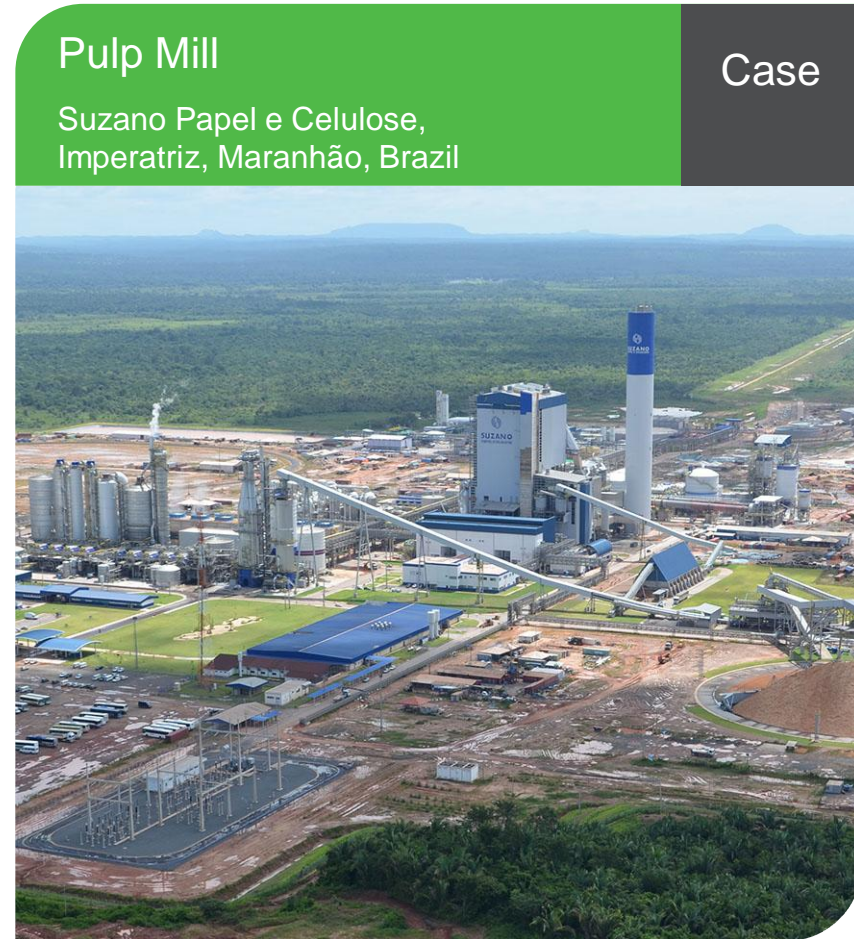


Biotechnologies

- Gasification
- Pyrolysis
- LignoBoost
- Prehydrolysis of biomass

One of the world's largest pulp mills supplied by Valmet successfully started up in Brazil

- Suzano Papel e Celulose is one of the largest vertically integrated producers of pulp and paper in Latin America.
- The new pulp mill has the capacity to produce 1.5 million tons of bleached eucalyptus market pulp per year.
- The mill is the first complete pulp mill supplied by Valmet to South America.



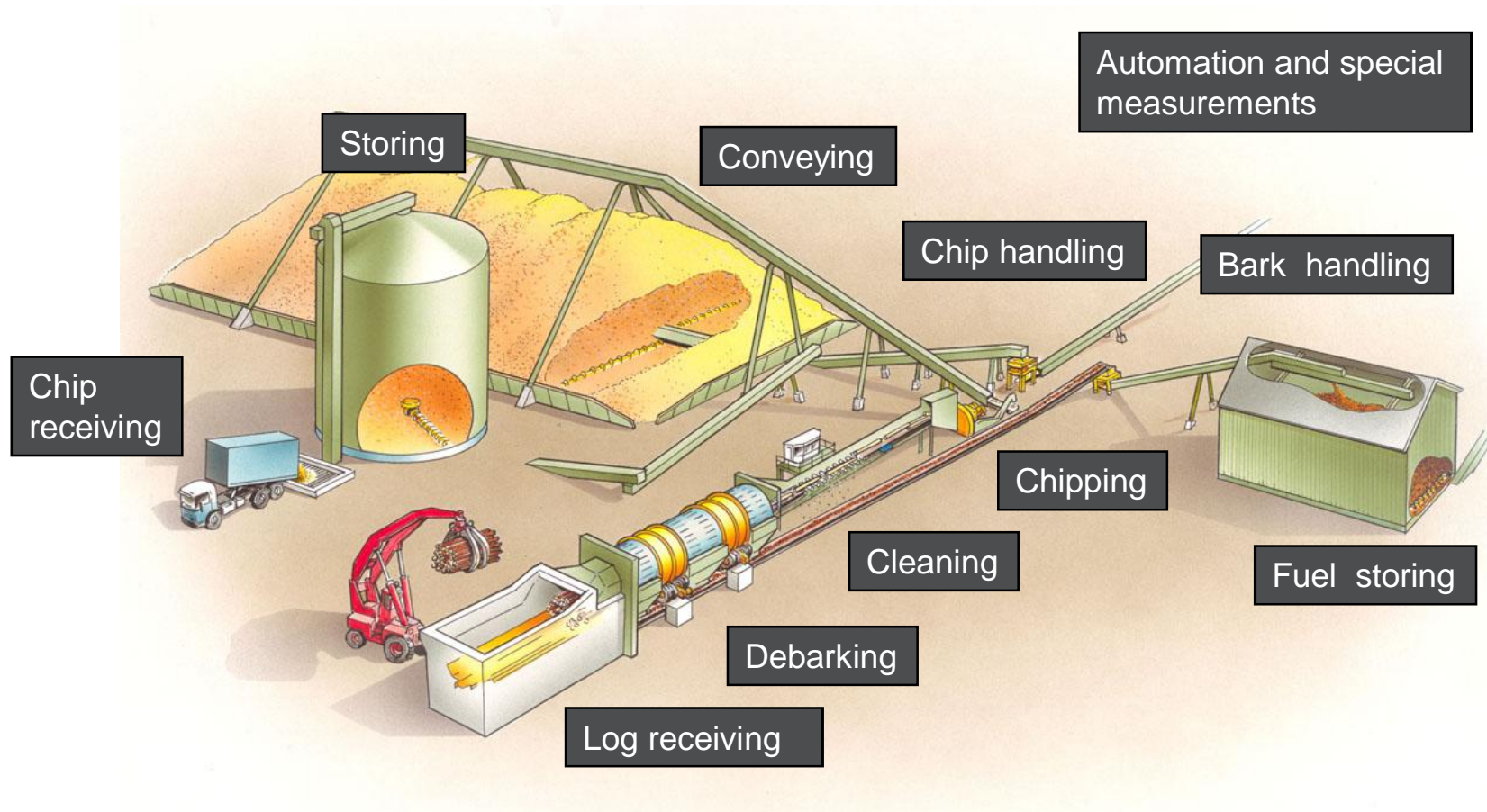


Technology

Wood Handling

Wood handling

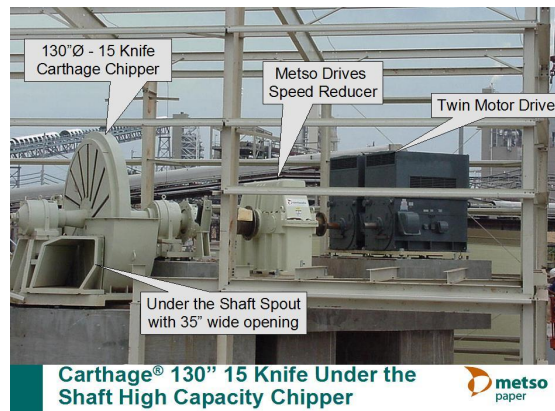
Wood handling solutions



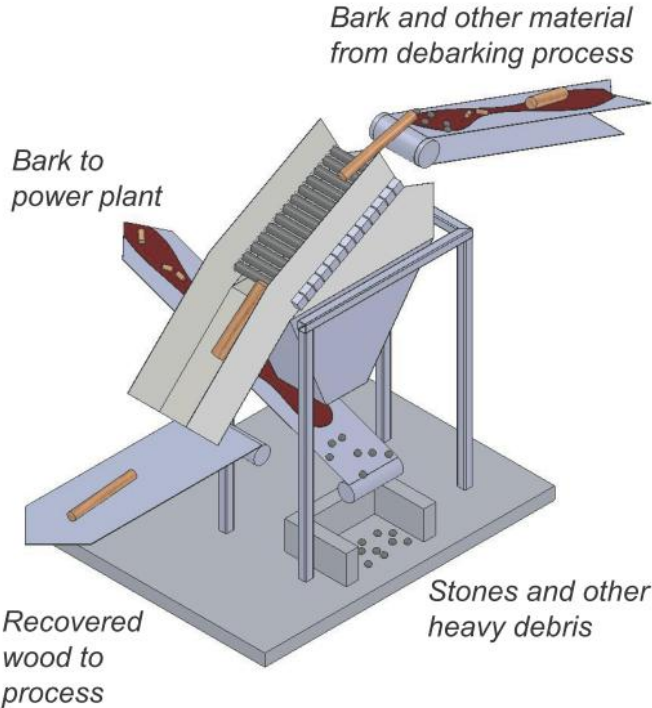
Valmet wood handling technology

Disc chippers

- *Camura GS* chipper
 - Up to 3900 mm chipper disc
 - Up to 7.20 m with gravity feed (Klabin)
 - QuickLock (Klabin, Fibria Três Lagoas, Veracel, Celbi)
- Carthage chipper
- 130", 138", common for tree length plants, horizontal feed



Wood saver



Valmet wood handling technology

Gentle Store



Valmet wood handling technology

Gentle Store – development and capacities



Eucatex-Salto
22.000m³l



Klabin/Kerinci
43.000m³l



Veracel 85.000m³l



Rizhao 5x190.000m³l



Valmet wood handling technology

Gentle Store – development and capacities



2013: Oji Nantong 3 x 250.000m³



2013: Suzano Maranhão 145.000m³



Cooking and Fiberline

Compact Cooking™

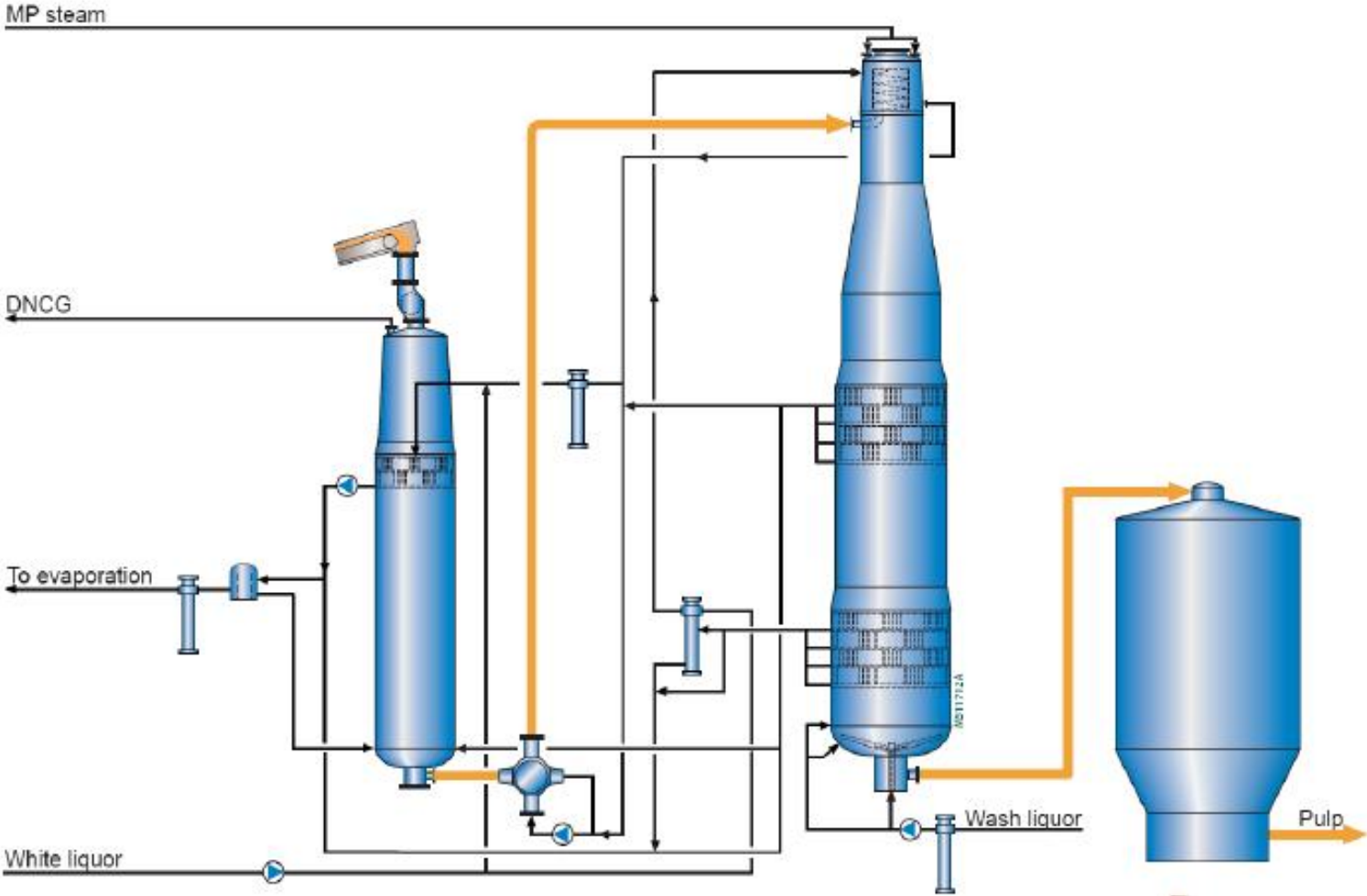
Cooking focus on:

- End product
- Cost reduction (investment and operational costs)



Compact Cooking G2

Typical G2 Installation

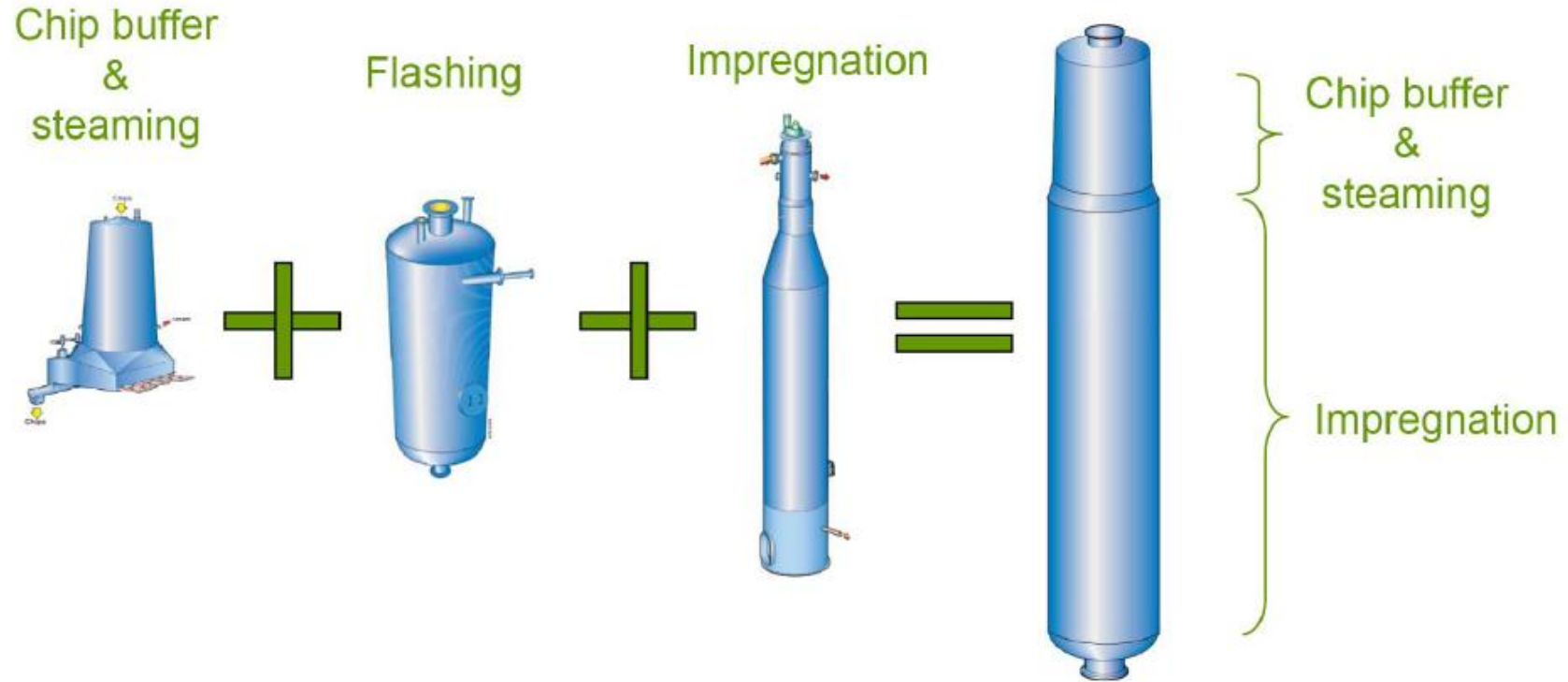


Compact Cooking™ G2

CONFIDENTIAL

- Few equipment / rotating machines;
- Only one pressure vessel;
- Compact Feed™ G2 allows longer High Pressure Feeder lifetime;
- System is low sand sensitive, since the machines in contact with chips work at low speed;

IMPBIN™ – Not only a Impregnation vessel



Why is long time impregnation at low temperatures important

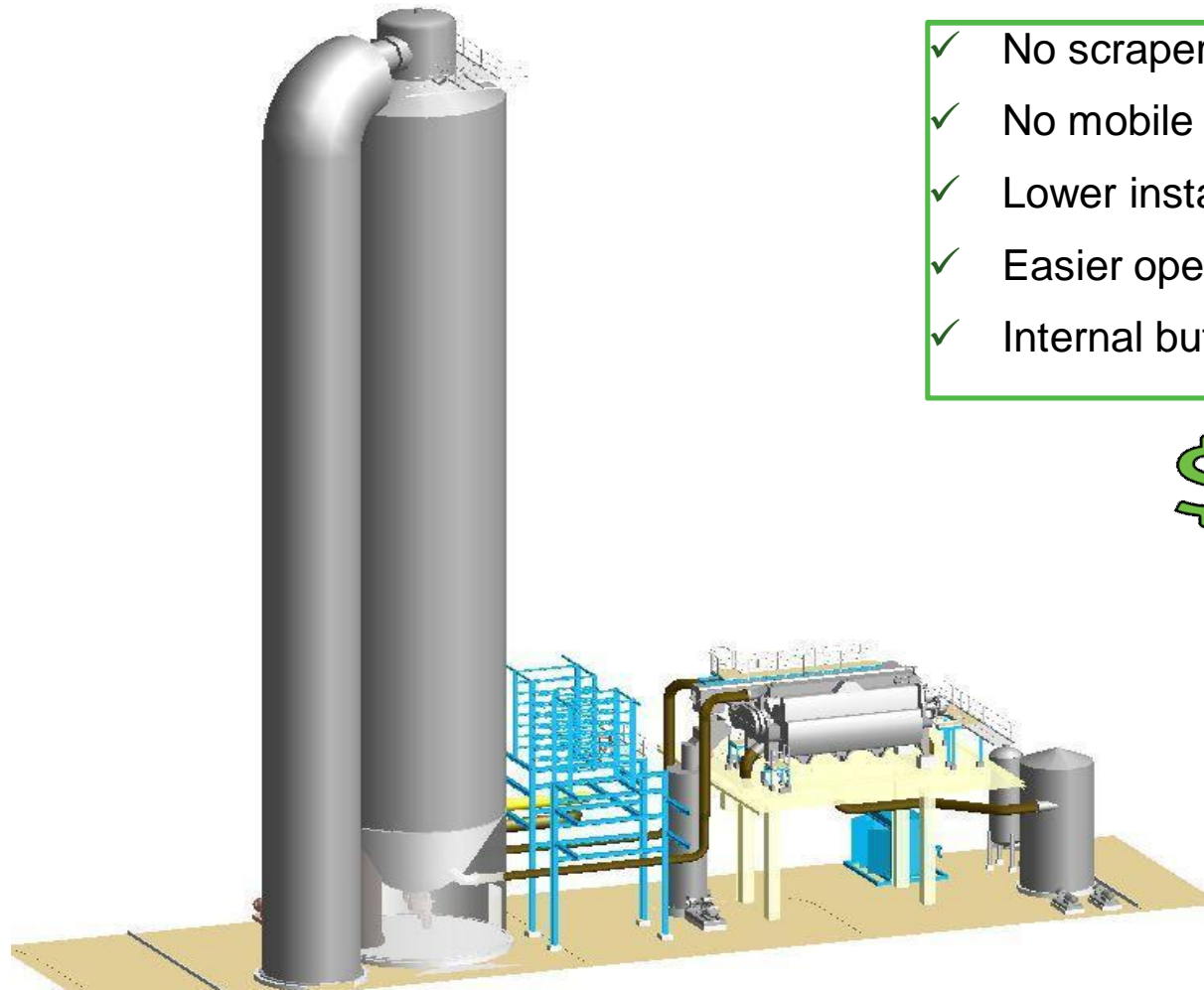
To reach:

- High yield
- Enables cooking to high kappa
- Low reject rate
- Less sensitive for uneven chip quality
- Enables large range of wood species mixtures
- Lower energy consumption (lower H factor)
- Uniform pulp quality
- Good bleachability



TwinRoll™ system

Low inlet pressure demand

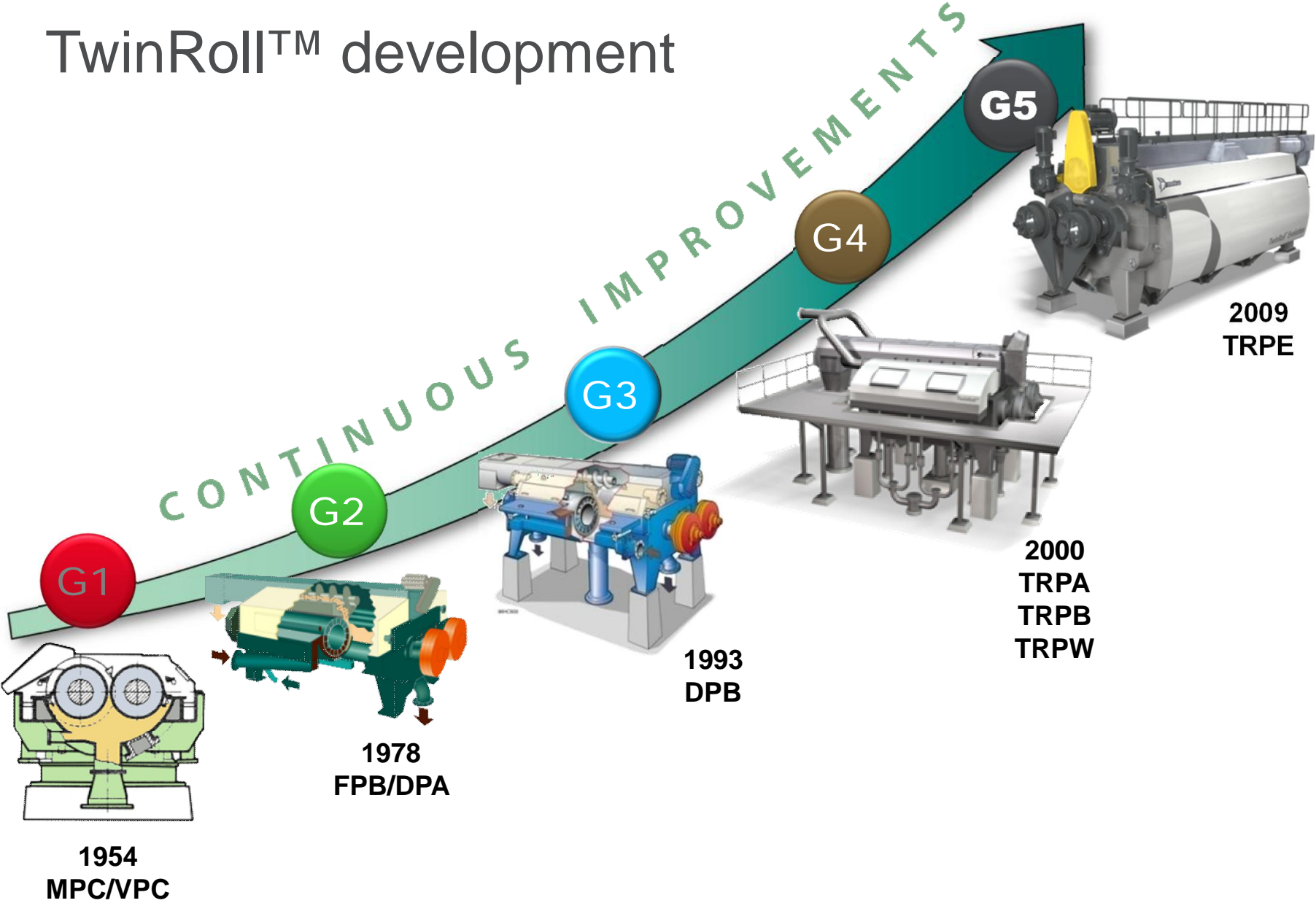


- ✓ No scraper at top of the tower
- ✓ No mobile crane needed for maintenance
- ✓ Lower installed power
- ✓ Easier operation
- ✓ Internal buffer inside the tower



- ✓ Saving of Energy
- ✓ Decrease Opex

TwinRoll™ development



TwinRoll™ Evolution

Main features



- 30% Higher capacity*
- Optimized operation
- Tower feed consistency
- Minimized operational and maintenance cost

*/Compared to G4

Pulp Drying

Dryer



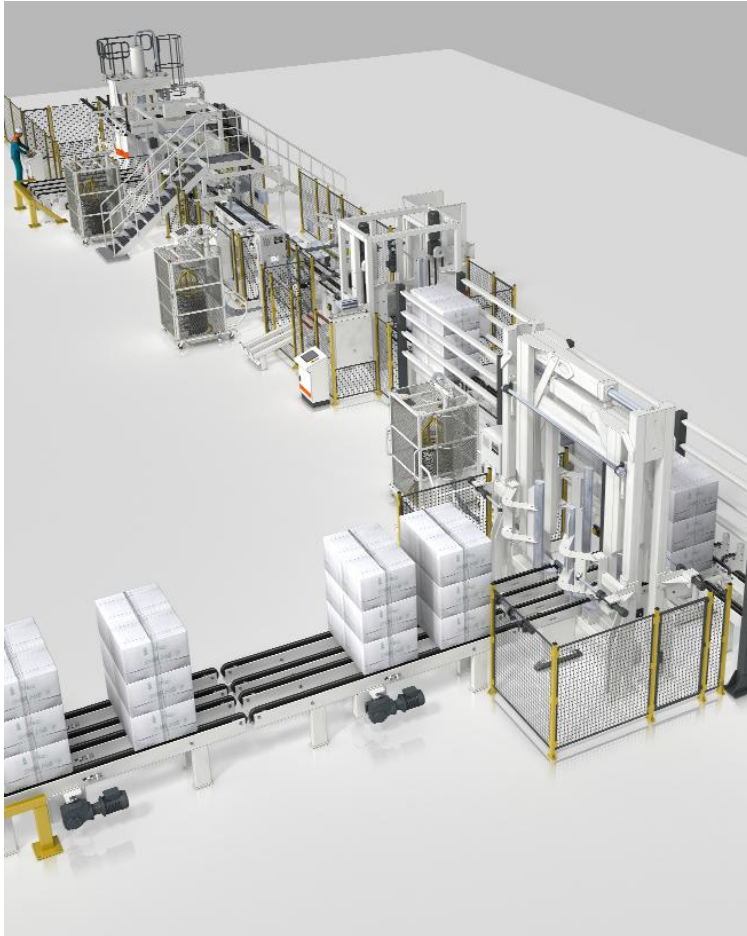
Pulp Drying

- Record capacity of 5395 ADt/day
- Record of 2.847 ADt/day in a single machine (13% above guaranteed capacity)
- Running very stable with high capacity and low consumption parameters
 - < 820 kg of steam/ADt
 - < 100 kW/ADt

Baling line



Key benefits Valmet RoboBaling™ technology



Key benefits for Valmet Robobaling technology

Robust and proven technology

Valmet has delivered bale finishing lines for over 50 years, with proven and robust technology.

High capacity and availability

Units in the Robobaling product series deliver high capacity, up to 300 bales/h.

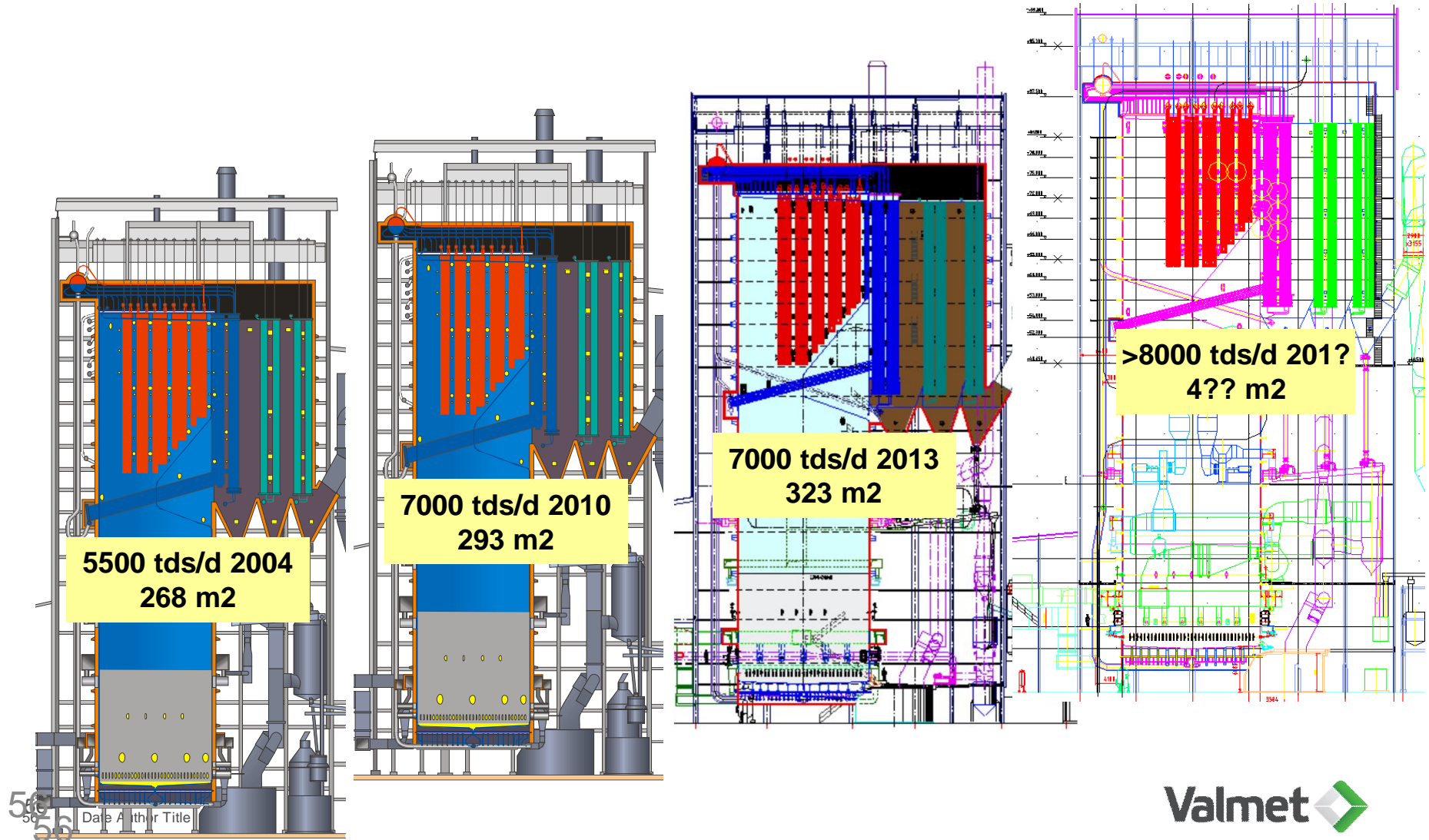
Short time for installation and start-up

The baling line is built as independent units with all functions included. Machines and control systems go through a comprehensive testing program before delivery, which secures short time for installation- and start-up.

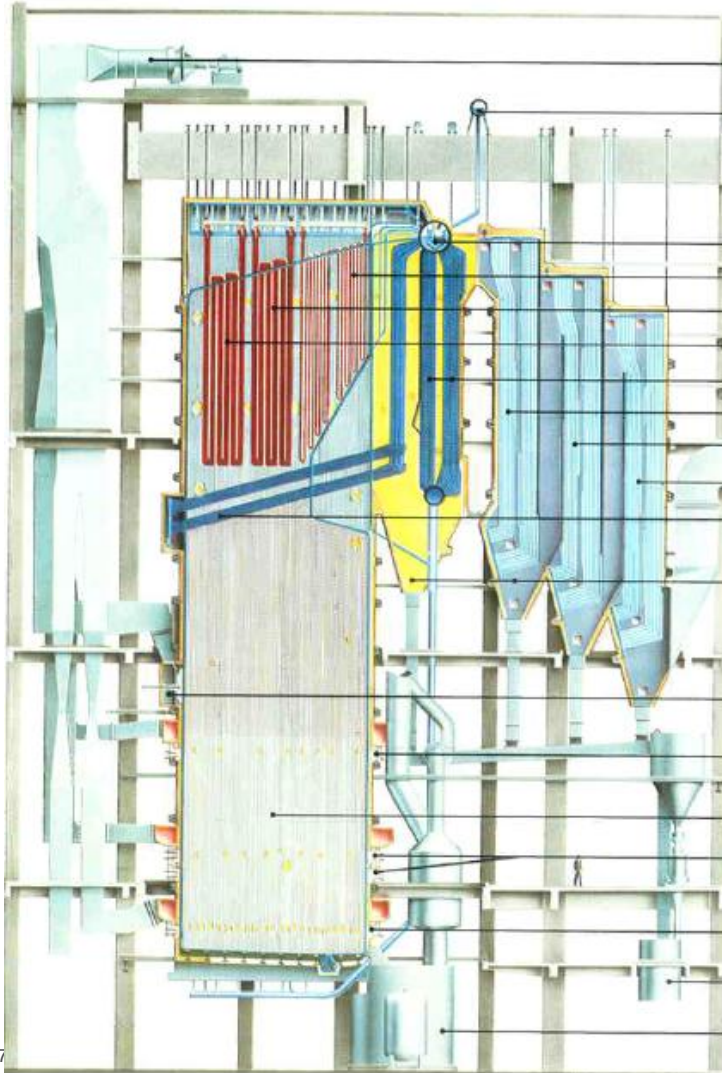


Recovery Boilers

Recovery Boiler Capacity Evolution



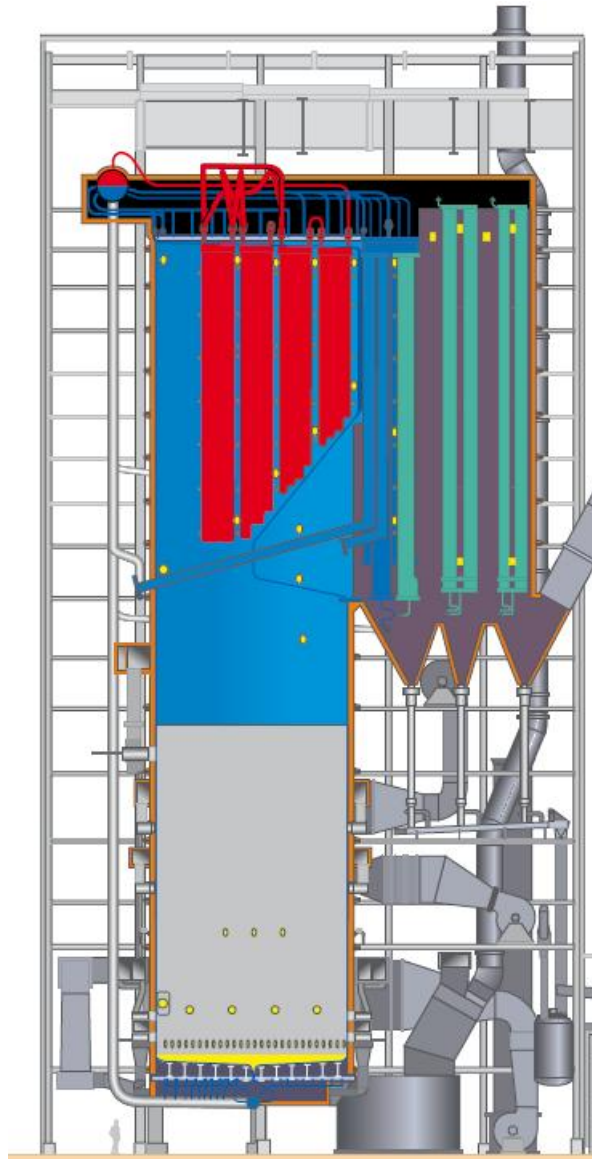
Fuels of recovery boilers in "early times"



Black liquor

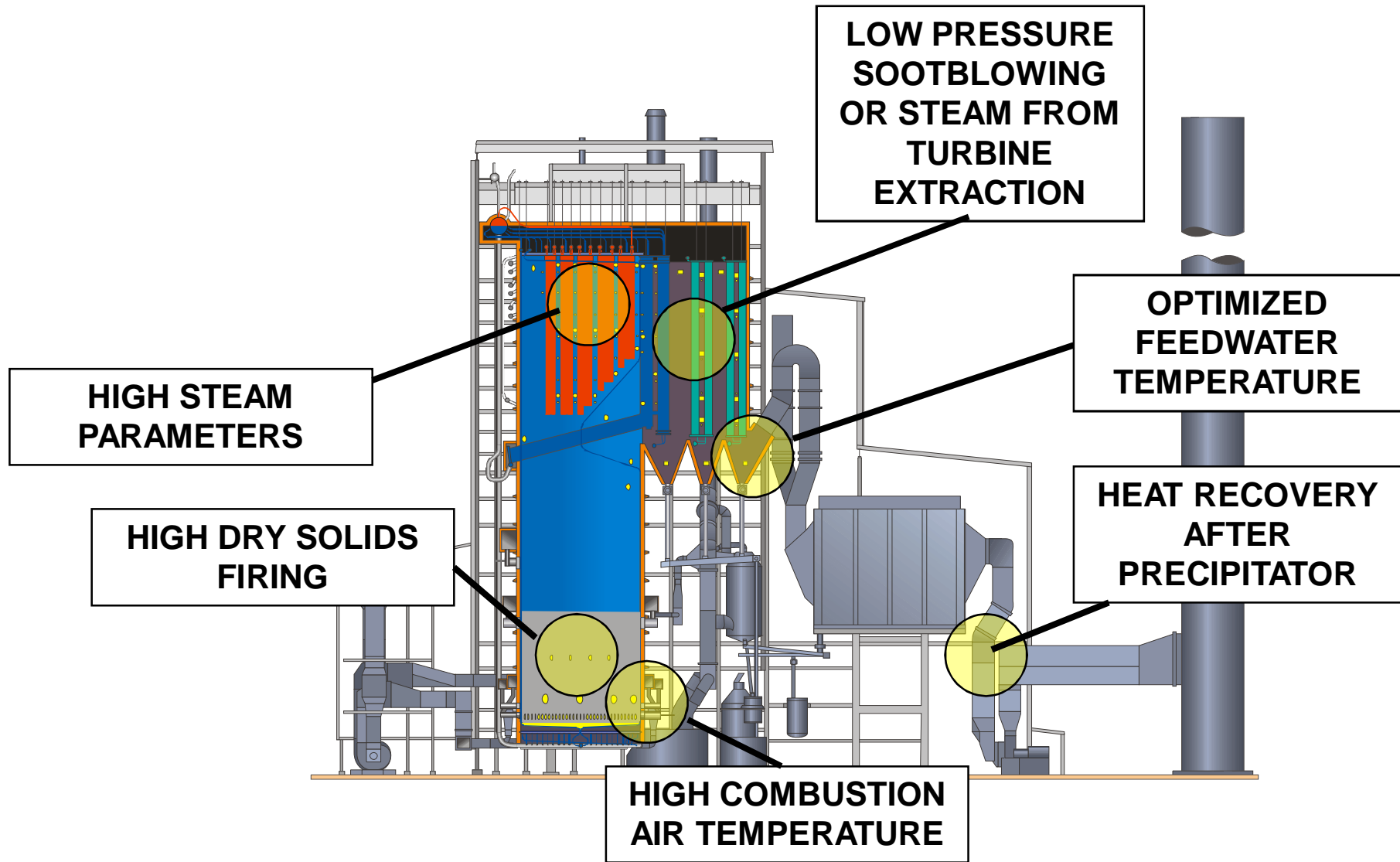
Oil

Today's Recovery Boiler is a Multi-fuel boiler



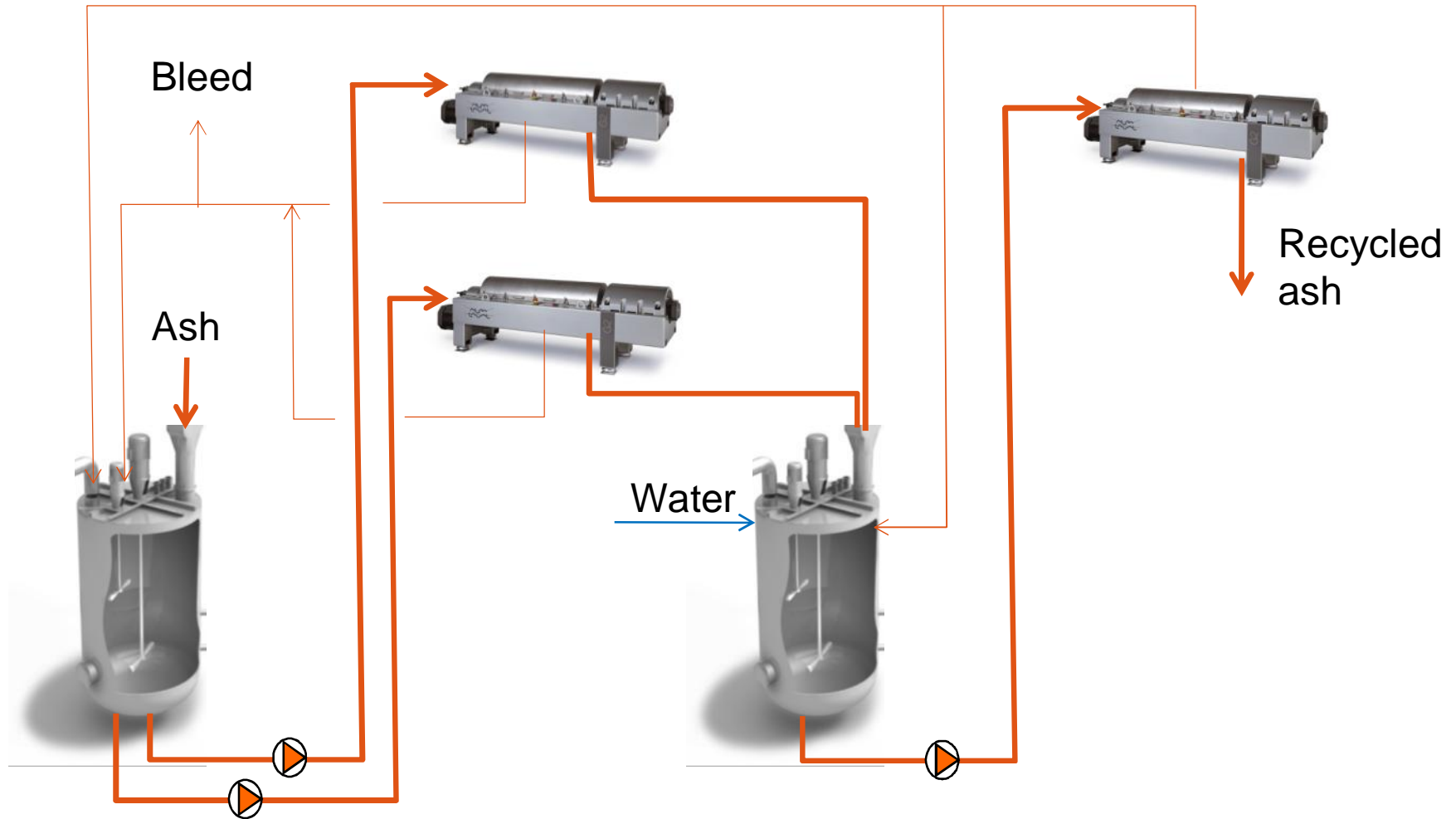
- Black liquor
- Oil
- Natural gas
- CNCG
- DNCG
- Vents (dissolving and mixing tank)
- Biosludge
- Soap
- Turpentine
- Methanol

High power features in Recovery Boilers



INTERNAL

Two stage AshLeach – Duo without acid



Why ash leaching?

- Control of chlorine and potassium levels in the pulp mill chemical cycle
- **Less corrosion and plugging**
- Longer runs between water washes
- Savings in make-up chemicals
- Environmental concerns





Rebuilds and Improvements

Mill and Plant Improvements

Optimized production line performance throughout its life cycle



- Process improvement services
- Production support services and process development cooperation
- Maintenance services
- Maintenance outsourcing
- Relocation services for equipment and production lines
- Shutdown services

Facts

- 5000 on-site projects annually
- 40 on-site service agreements
- Maintenance outsourcing agreements for 11 production lines

Results

- More uptime
- Lower operating costs
- Energy savings
- Improved paper quality
- Improved efficiency through well-organized maintenance



Success Cases of Rebuilds

Multi-Year Mill Maintenance Agreement

The agreement includes:

- Recruitment of all maintenance personnel prior to start-up
- Establishment of Total Productive Maintenance (TPM) and condition-based maintenance procedures
- Full responsibility for mill maintenance operations for all production facilities
- Focus on improving reliability and maximizing availability
- Several additional long-term service agreements covering e.g. roll service and paper machine clothing



Digester Rebuild

The project includes:

- Energy optimization pack with new heat exchangers
- New Radial Wash Duo system
- Digester screen area increase

Project Target:

- Reduce steam consumption (~30%)
- Reduce COD
- Reduce ClO₂ consumption

Confidential mill

Brazil
Pulp Mill

Case

Boiler Rebuild

The project includes:

- Conversion to Single-Drum
- Partial superheater replacement
- Flue gas air heater replacement

Project Target:

- Reduce maintenance costs
- Reduce operational risks
- Reduce shutdown time for drum replacement

Arauco, Constitución mill
Constitución, Chile
Power Boiler

Case



