IMPROVE PLANT EFFICIENCY BY EFFECTIVELY MANAGING YOUR WATER

TAPPI Webinar
September 15, 2020

Agenda

1. Introduction
2. Common water challenges
3. Solutions to optimize water management
4. Pulp & Paper case study examples
5. Questions & Answers

1.

Introduction

Our speakers & our business

Introduction

OUR SPEAKERS

SCOTT WHITTAKER
MODERATOR & SPEAKER

31 years water treatment experience

FRANCIS VAILLANCOURT
GLOBAL LEADER, SERVICES, P. ENG. M.A.SC. MBA

15 years water treatment experience

JOSEPH WOLKOW
TECHNICAL SALES MANAGER, B.SC.

32 years experience in Pulp & Paper with past 20 years in P&P water treatment at SUEZ

SUEZ – Water Technologies & Solutions

TRUSTED PARTNER. PROVEN RESULTS.

- We’re dedicated to taking on the world’s toughest water and process challenges.
- We work closely with customers to determine and deliver the products, processes and solutions that meet the task at hand.
- 10,000+ employees worldwide
- 50,000+ industrial and municipal customers worldwide
- 10,000+ combined technologies

301 million gallons

of water treated every day

a unique integrated offering

equipment solutions

water
wastewater
desalters
analyzers

on-site services

commissioning
mobile assets
advisory
outsourcing

water chemistry

boiler
cooling
wastewater
membranes

process chemistry

corrosion inhibitors
emulsion breakers
H2S scavengers
fuel additives

+

digital tools

InSight

+

innovation

in-house r&d
industry
partners
training

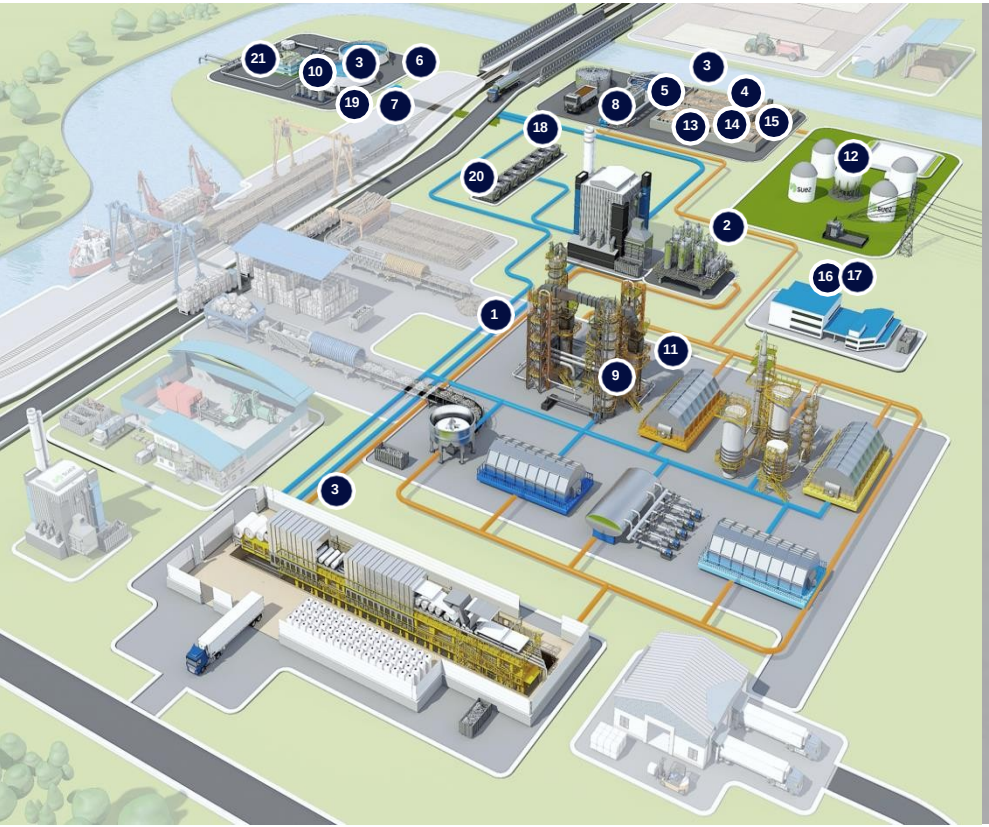
=

references

global customers
local service &
support across
industries

Complete solutions to design, build, and operate
at existing and new production facilities

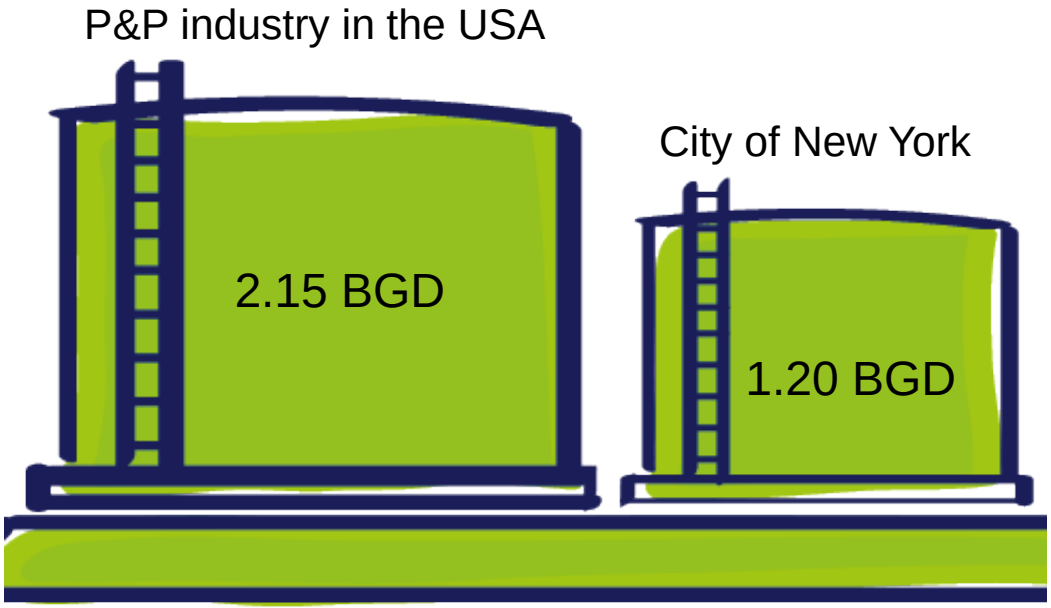
Our solutions at a glance



1. Cooling circuit water treatment & chemical services
2. Boiler feed water treatment & chemical services
3. Process water treatment
4. Hard COD & micropollutants removal
5. Advanced waste water treatment
6. Design & build of water plants
7. Temporary mobile water solutions
8. Ecoflow asset sharing / effluent collection
9. Digital water monitoring / Memboard
10. Water filtration units
11. Water chemical services for process (foam, corrosion, scale, fouling control)
12. Sludge reuse and recovery
13. Color removal
14. Pulp bleaching
15. Water reuse / ZLD
16. Waterlily, water footprint assessment
17. Laboratory services
18. Smart metering for water
19. Operation & Maintenance / EDO
20. Network management
21. Well management

Making paper is **water intensive**

5,500 P&P facilities in the USA

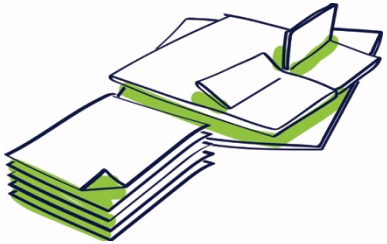


In 2017, Water intake of 2.15 billion US gallons per day for the Pulp and Paper Mills of USA while the New York water system provided over 1,2 billion US gallons (4,500,000 m^3) per day of drinking water to more than eight million city residents, and another one million users in four upstate counties bordering on the system

2.

Common water challenges

Some of **the challenges**



Changes in the
industry

environmental
constraints

Production
continuity & safety

Industry is **changing**

Growth in the P&P industry is largely driven by the packaging and tissue paper segments.

Decline in graphic paper due to growing trend in digital communications.

As a result, many companies have shifted production into other areas; causing oversupply in packaging

Turbulent market expected for the short to medium term.

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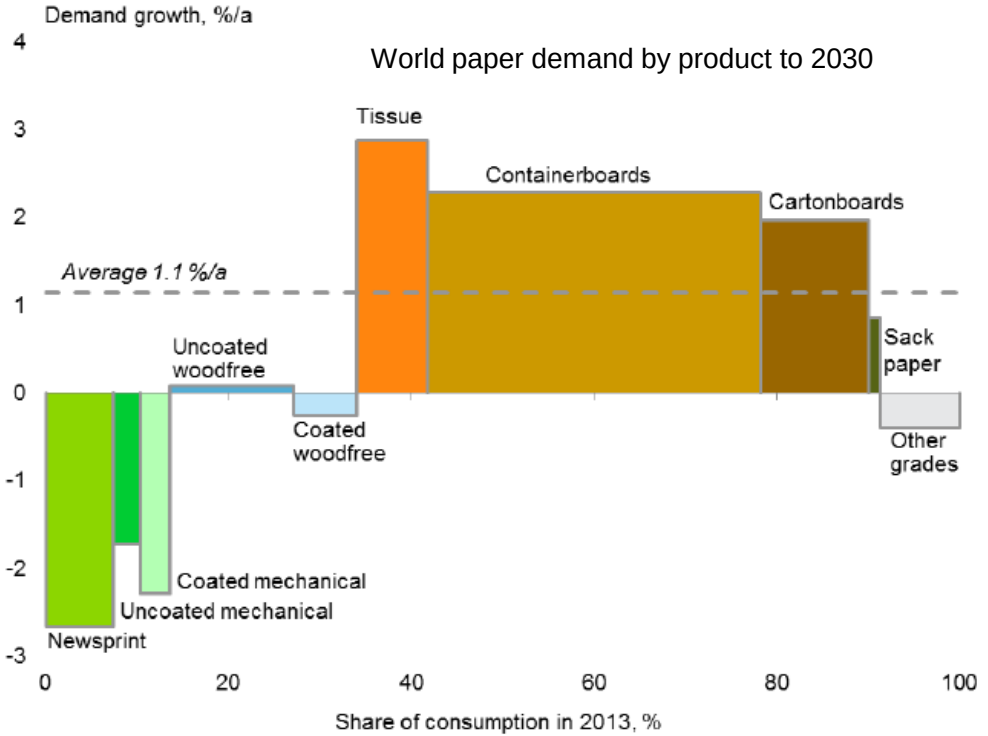
World paper demand by product to 2030



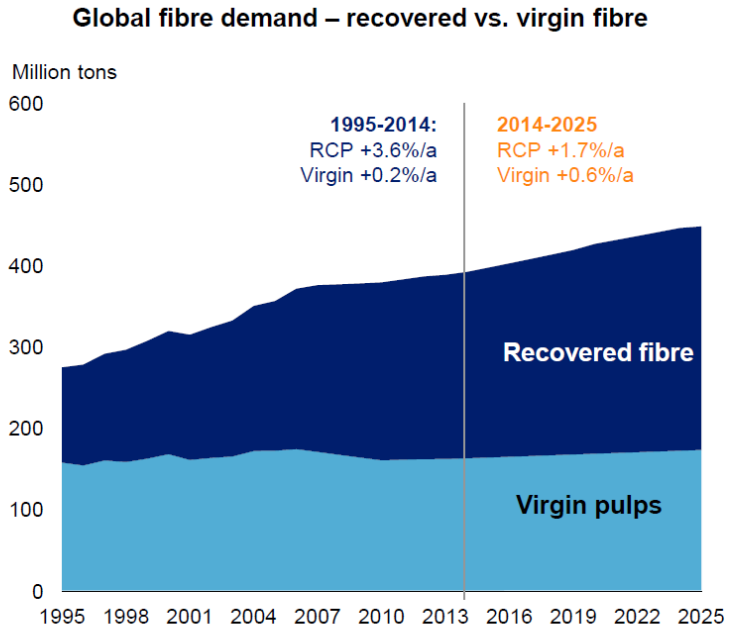
Source: graph by POYRY 2016

Industry is changing

Macroeconomics are influencing fiber sourcing:

- **Asian countries restricting import of recovered fiber**
- **Uncertainties about supply chain in southern hemisphere**

Resulting in a push towards changing from Virgin pulp to recycled.



Cheap fiber source needed to remain competitive.

Source: Graph by POYRY 2016

Environmental constraints

Changing feed water quality due to Climate change

Deteriorating raw water quality can impact equipment output.

Stronger regulations & Environmental discharge restrictions

New Challenging parameters & reduced limits on others

Production continuity & safety

Older infrastructure not adequate for current challenges

- Risk of downstream impact & non-compliance
- Risks of shutdown & breakdown

Long transition period when new equipment is installed

- Commissioning new equipment, removal of older
- Ramp up of new process

Did you know?

Monadnock Paper Mills, Inc.
Bennington, New Hampshire

Monadnock is the **oldest** continuously **operating paper mill** in the US.

Founded in 1819, the mill **celebrated 200 years** of papermaking in January 2019.

201
years of paper making

How old is your plant?

Production continuity & safety

Knowledge & Technology Transfer

- **New technologies added to address emerging problems**
  - Preventative maintenance instead of troubleshooting
  - Less intuitive, data driven operation

- **Knowledge transfer with changing workforce.**
  - Digital tools and monitoring
  - “On the fly” adjustment
  - Tacit and hard to articulate experience-based knowledge
  - Employee’s health and safety around new equipment.

3.

Solutions to optimize water treatment

Customer purchasing options

Options	Owner Buys Equipment & Operates
Scope for owner	Equipment + optional installation, labor & engineering.
Operation & Maintenance	Owner
Payments	Up front + ongoing
Guarantees	Performance test
Reason to buy	Customer's expertise, supply chain & engineering is sufficient

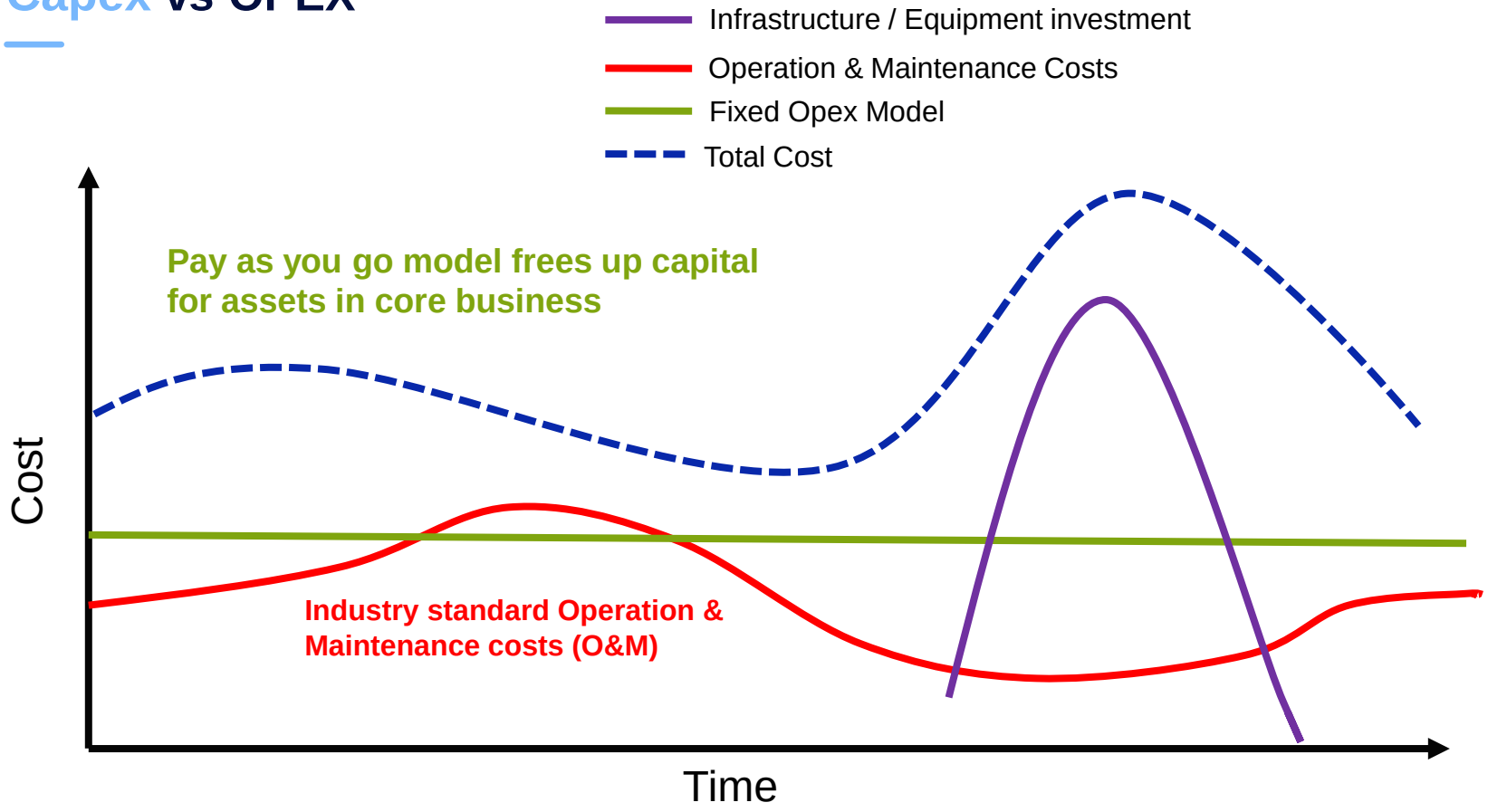
*Not every supplier takes on Performance Guarantee

Customer purchasing options

Options	Owner Buys Equipment & Operates	Owner Buys Equipment & Supplier Operates	Supplier Builds, Owns & Operates	Owner Buys Equipment & Operates with Supplier guidance
Scope for owner	Equipment + optional installation, labor & engineering.	Equipment + optional installation, labor & engineering.	Long-term commitment	Equipment + optional installation, labor & engineering.
Operation & Maintenance	Owner	Supplier	Supplier	Owner
Payments	Up front + ongoing	Up front + ongoing	1. Up front + ongoing 2. Ongoing	Up front + ongoing
Guarantees	Performance test	Performance Guarantee for contract duration*	Performance Guarantee for contract duration	Performance Guarantee for contract duration*
Reason to buy	Customer's expertise, supply chain & engineering is sufficient	Peace of mind	Peace of mind + Return on Experience	Process & KPI guarantees along with asset protection.

*Not every supplier takes on Performance Guarantee

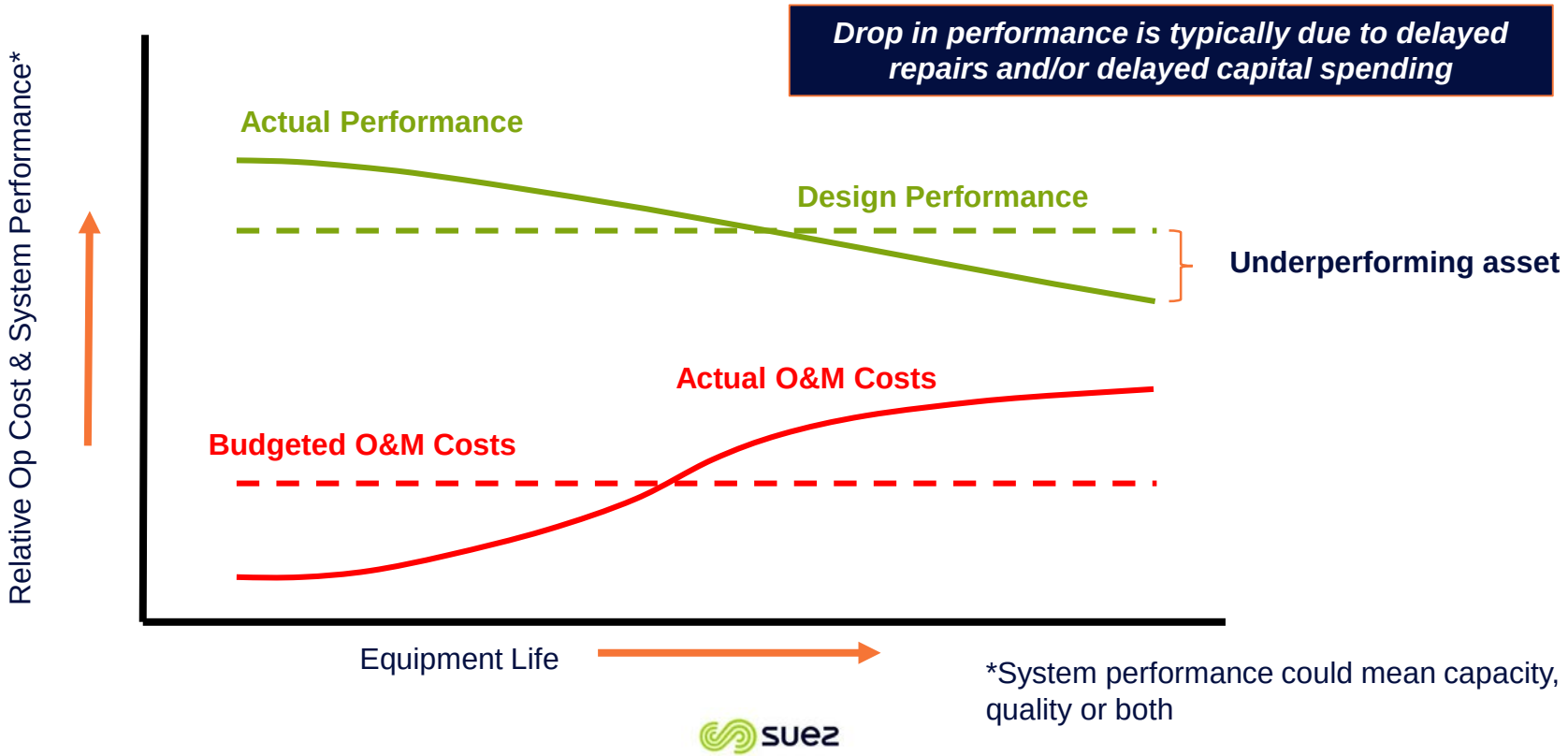
Capex vs OPEX



suez

Capital system lifecycle

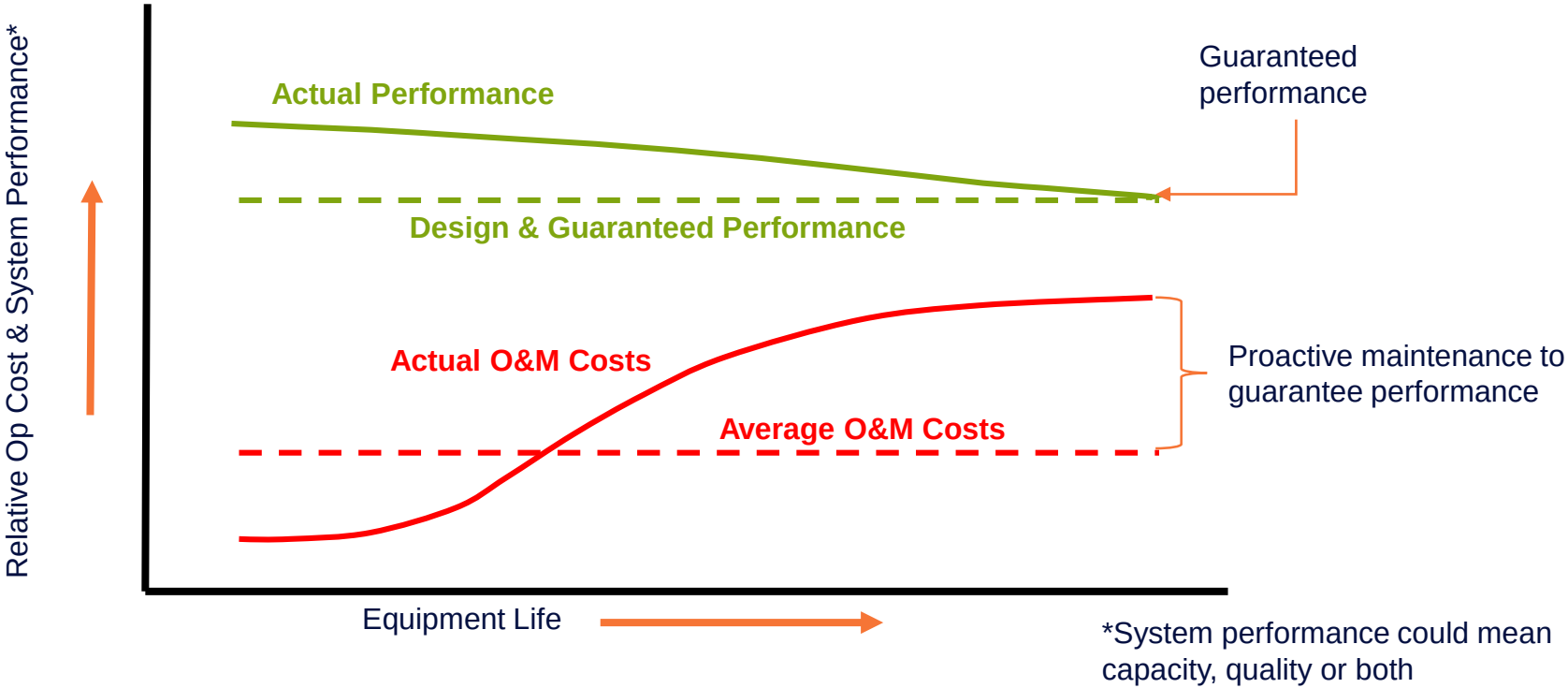
Typical performance & maintenance cost trends



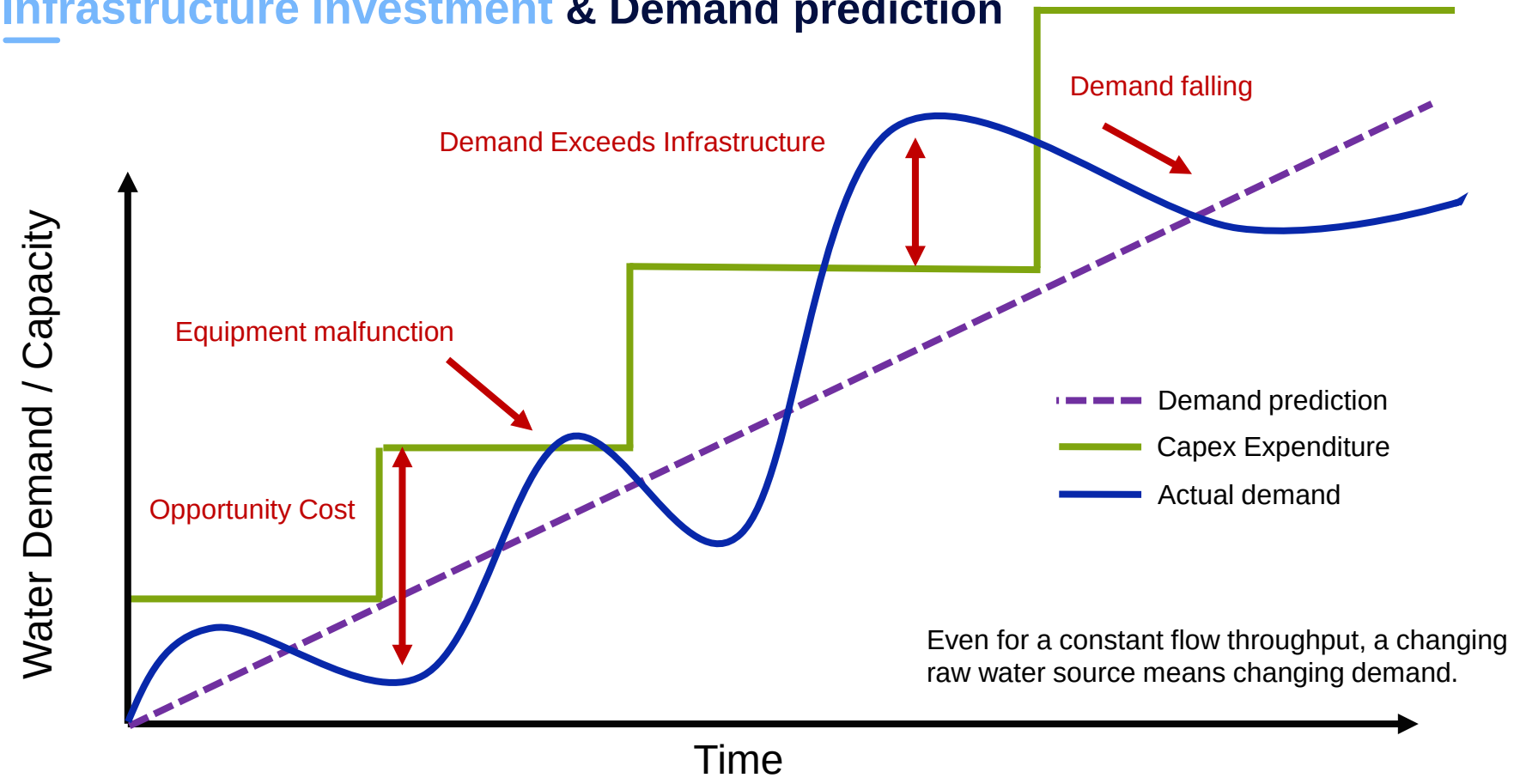
*System performance could mean capacity, quality or both

Supplier Build, Own & Operate

Typical performance & maintenance cost trends



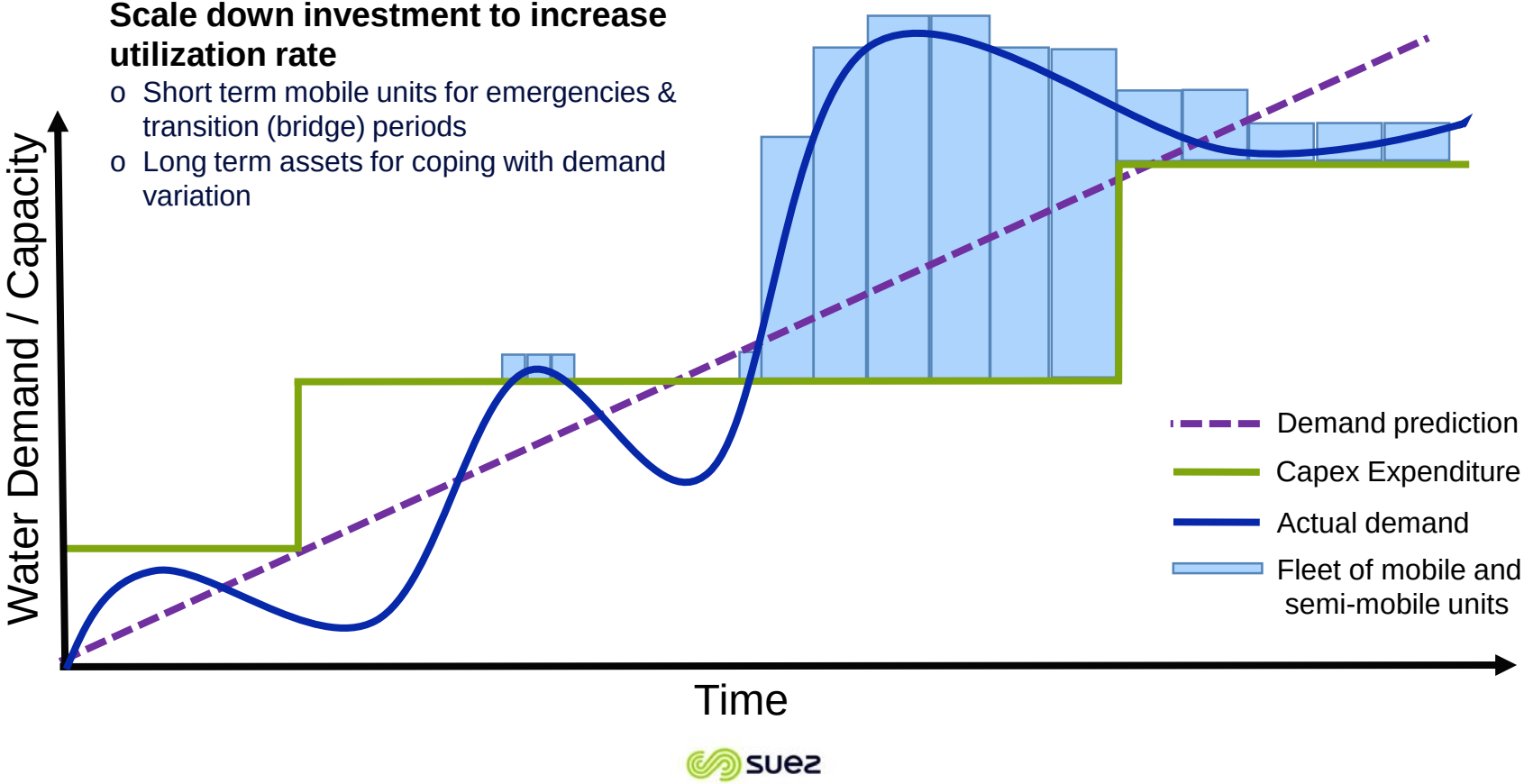
Infrastructure investment & Demand prediction



Elastic Capacity

Scale down investment to increase utilization rate

- Short term mobile units for emergencies & transition (bridge) periods
- Long term assets for coping with demand variation



Additional benefits

STAFFING
- **Gain expertise** from experts worldwide
- Secure production continuity with **knowledge transfer**

OPERATIONS
- **Eliminate risk of downstream impact & non-compliance**
- Partner to help for unforeseen problems

COST
- Reduces overall cost of ownership
- **Fixed Opex**

ASSETS
- **Protect asset life and prevent unplanned downtime**

Capex

Opex

Capex vs Opex

4.

Pulp & Paper case studies

Challenge – white water clarification/ wastewater treatment

Solution – Poseidon* Dissolved Air Flotation

*Trademark of SUEZ; may be registered in one or more countries.

SUEZ’s POSEÏDON DAF Clarifiers

Pulp & Paper applications

- Mill water
- Deinking and recycling plant process water
- Paper Machine White Water for water/fiber recovery and/or energy savings
- Primary effluent clarification
- Secondary effluent clarification after biological treatment (examples: activated sludge, MBBR, aerated lagoon, etc.)
- Tertiary clarification
- Any application requiring clarification of water from fiber or other suspended solids
- Close to 700 P&P DAF installations worldwide

SUEZ’s POSEÏDON DAF Clarifiers – PPM Model

White water treatment, deinking, paper machine

SUEZ’s POSEÏDON DAF Clarifiers

Biotreatment DAF Installation

SUEZ’s POSEÏDON DAF Clarifiers – Saturn Model

White water treatment, primary effluent treatment

SUEZ’s POSEÏDON DAF Clarifiers

Mobile Rental DAF Service

Secure, continuous operation / production

Temporary water treatment bridge solutions

OBJECTIVES

Mobile solutions to replace or complement permanent water treatment facilities in case of emergency, schedule maintenance operation, or specific long-term need

BENEFITS

- Secure safe water production continuity
- Guarantee water quality and quantity
- Cover temporary or seasonal needs
- Minimise installation & commissioning time: plug & play technology

EXAMPLE – bridge system deployment at Customer Manufacturing Dissolved Grade Pulp

The 4 Mobileflow pressure filters were used to supply the mill with 2300 gpm process feed water as well as boiler feed water. The pulp mill was able to complete the necessary gravity filter repairs in 4 weeks while keeping the mill operational saving millions of dollars in lost pulp production.

The right water at the right time.

Reduce water footprint

Industrial long term service agreement (LTSA)

OBJECTIVES

Customers focus on their core business while SUEZ owns, operates and maintains their water treatment facilities

EXAMPLE – LTSA, 10-year service contract at Customer Manufacturing Containerboard

Scope: Softener / RO / EDI / MB / Pumps/ CIP/ Instruments / FSR

Capacity: 1800 gpm, <0.1 μS/cm, <10 ppB Si02

Customer solution needed:

- Design & supply 1800 gpm system capable to replace current SUEZ's equipment and customer's cation/anion/mixed bed IX systems.
- Reduce water demand to increase condensate return, which reduced the water demand and improved heat recovery.
- Eliminated acid/caustic storage along with labor costs associated with chemical handling.

Guaranteed quantity and quality of water needed.

BENEFITS

By offering LTSA contracts, SUEZ assists customers with their plant's daily water operations

- SUEZ ensures that the required quantity and quality of product water is delivered to customers water tank or process
- SUEZ's offerings are backed up with the most comprehensive set of mobile equipment that is digitally enabled to help manage and optimize water resources while overcoming any pressing challenges
- Partnering with industry leader. SUEZ owns and successfully operates hundreds of industrial plants ranging from 20 to 160 MGD

THANKS – QUESTIONS?