



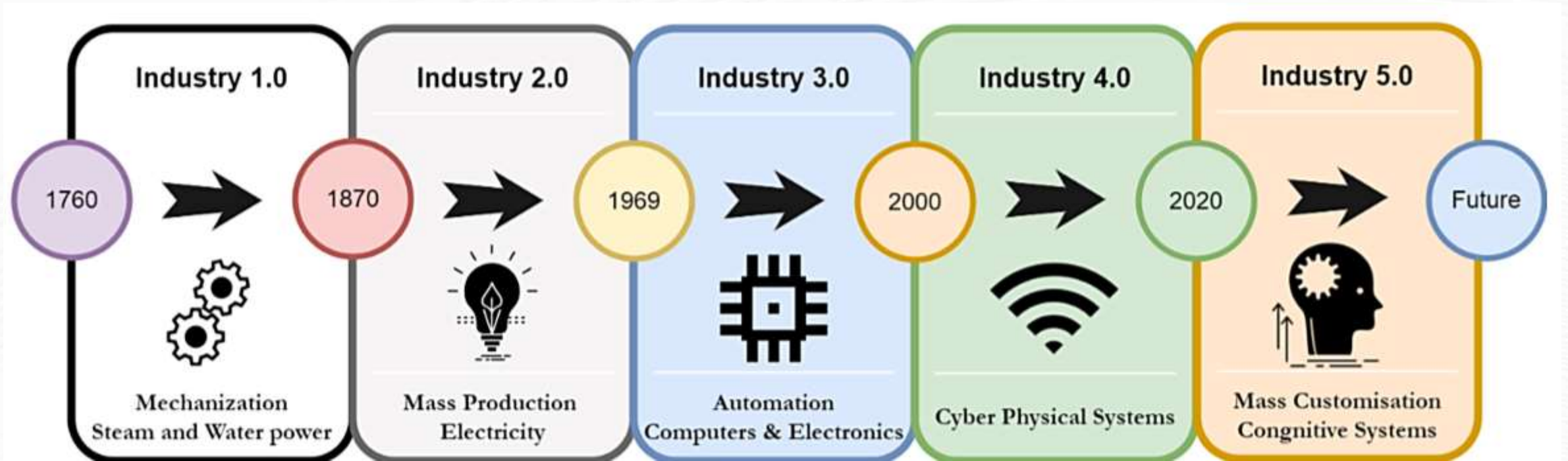
# **KUANTUM'S LEAP IN PAPER INDUSTRY**

*Boosting Productivity and Quality with AI*



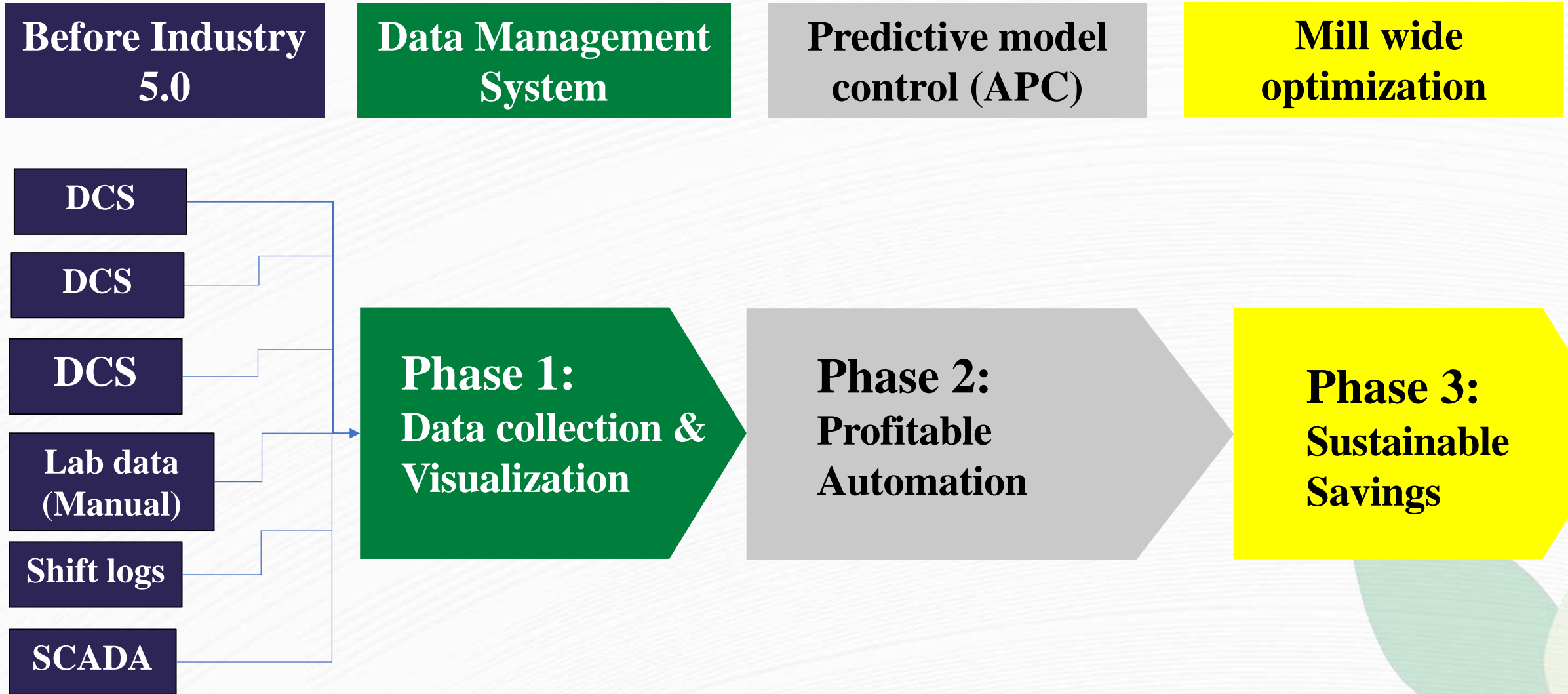
# INDUSTRIAL REVOLUTION

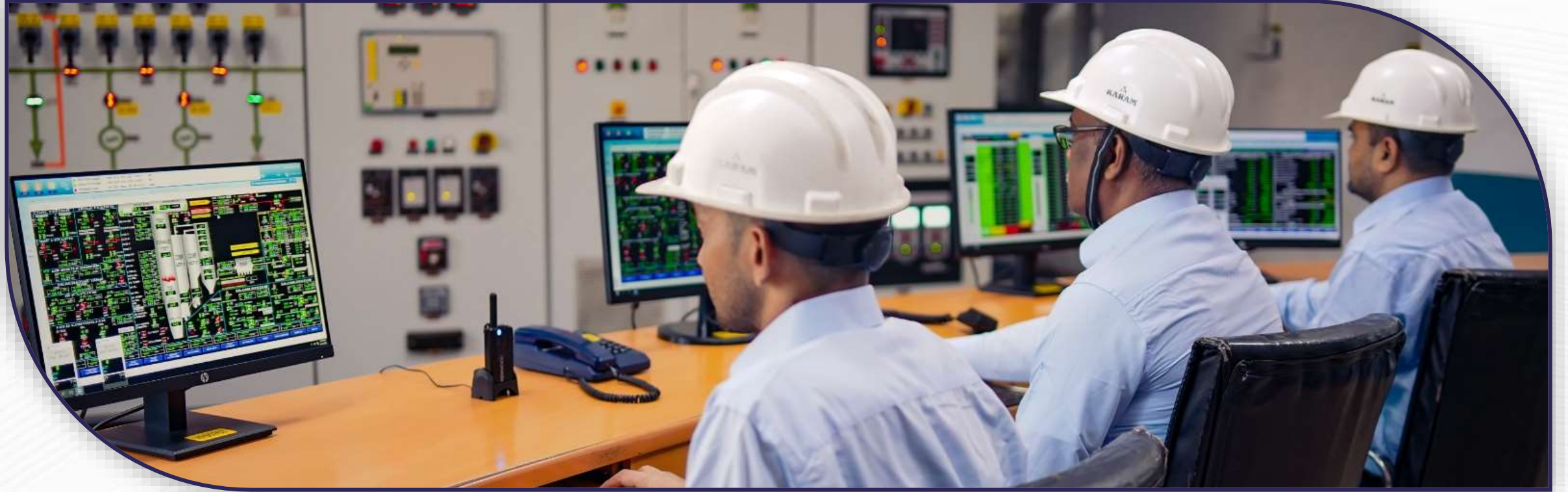
## Industry 1.0 to Industry 5.0





# KUANTUM'S JOURNEY TOWARDS INDUSTRY 5.0





## PHASE 1: FOUNDATION

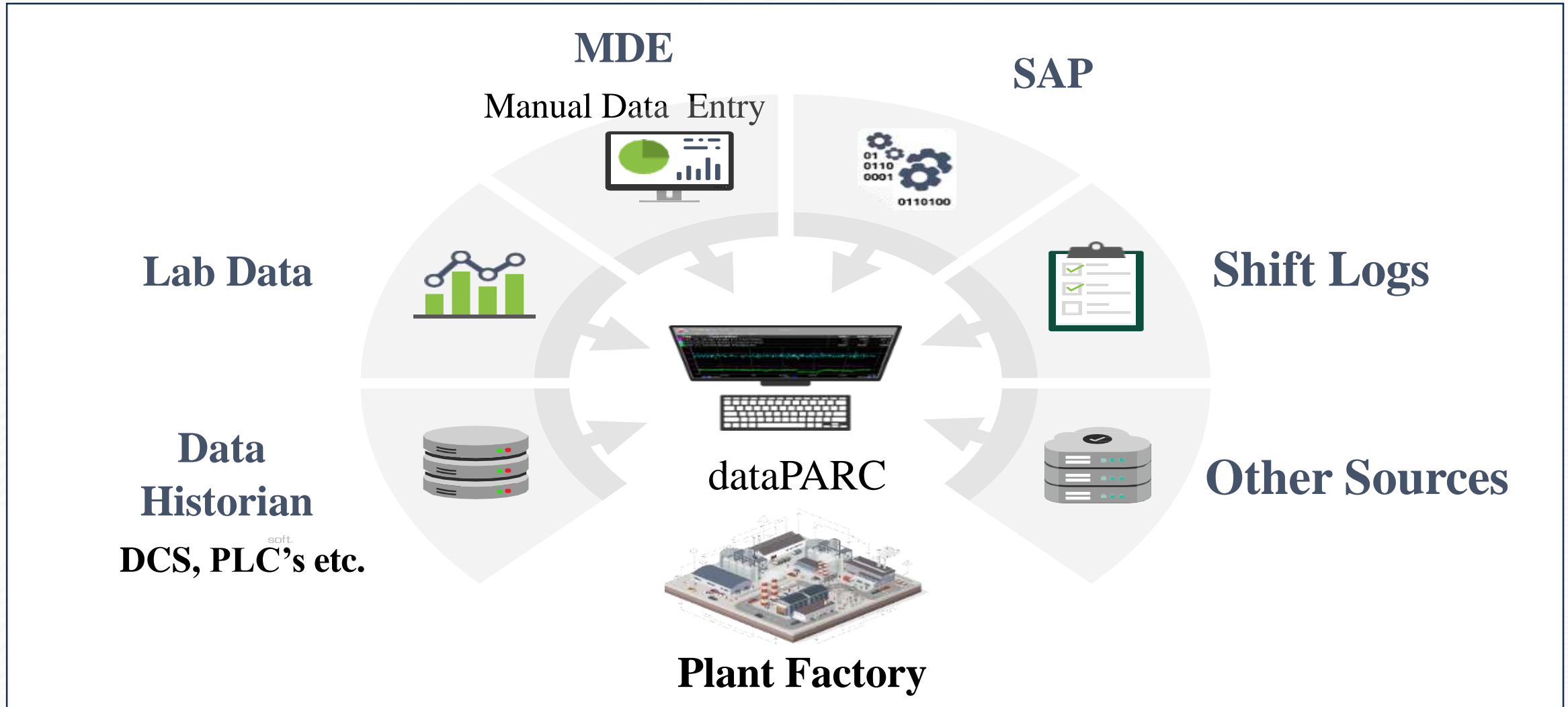
*Data Management - Connect, Visualize, Analyze & Data-based Decision Making*

# INTEGRATED DATA

## Creating a “Single Source of Truth”

- Data from all sources in one place
- Created a shared understanding of data
- Begin with a few critical reports & KPIs

# DATA MANAGEMENT SYSTEM



**Real time data sharing across plant**



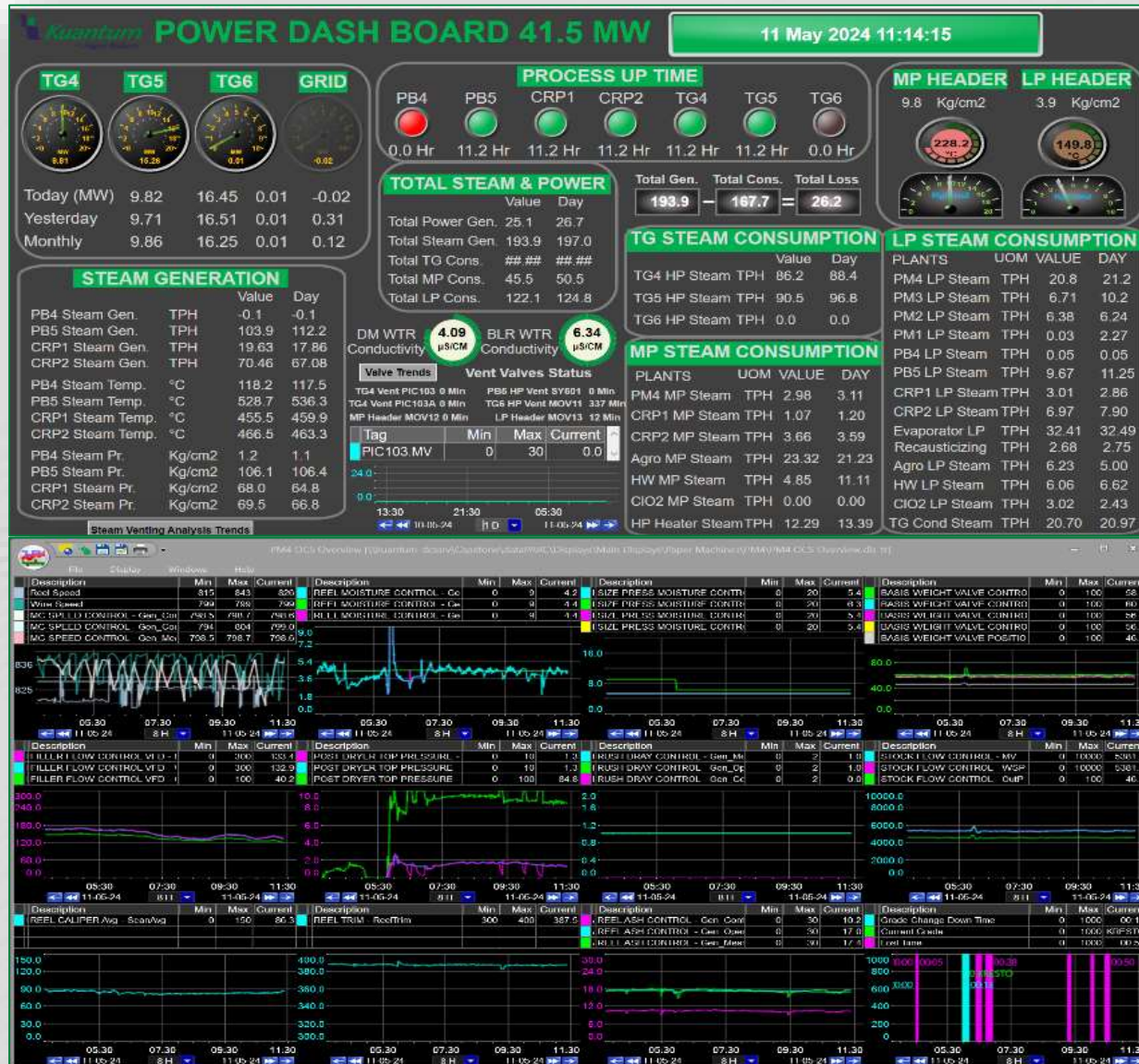
# FEATURES – PARC GRAPHICS



PM-4 Overview - Integrates live process data with visuals, providing a real-time operation view

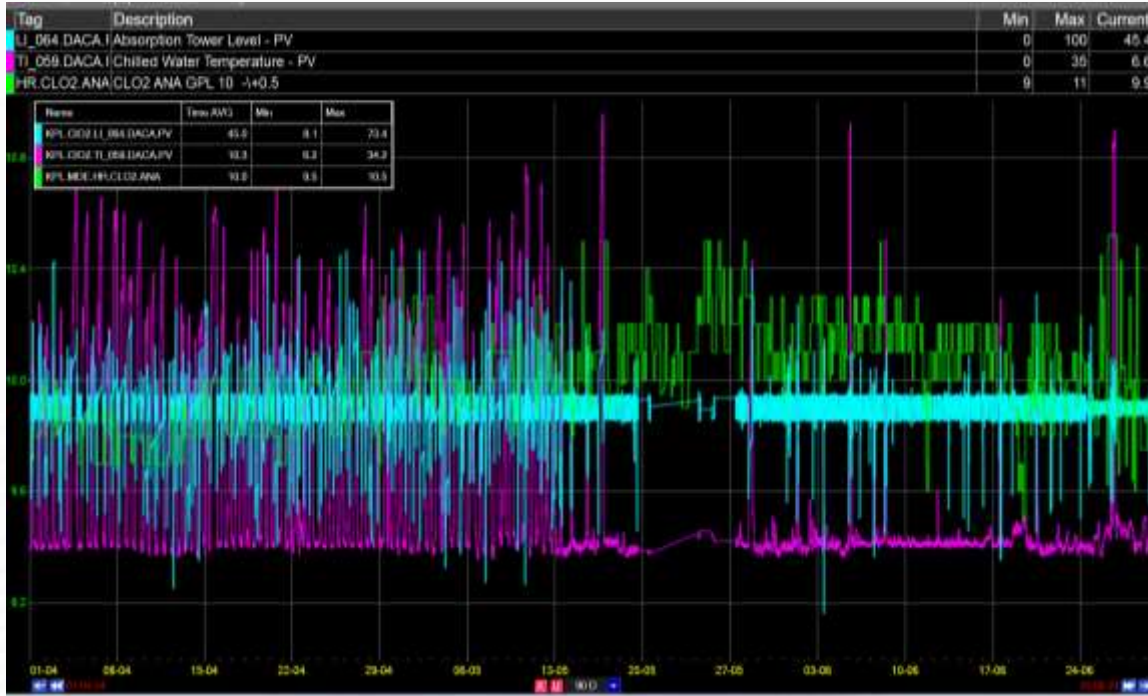


# CASE STUDY-1: DIGITALIZING OPERATIONS

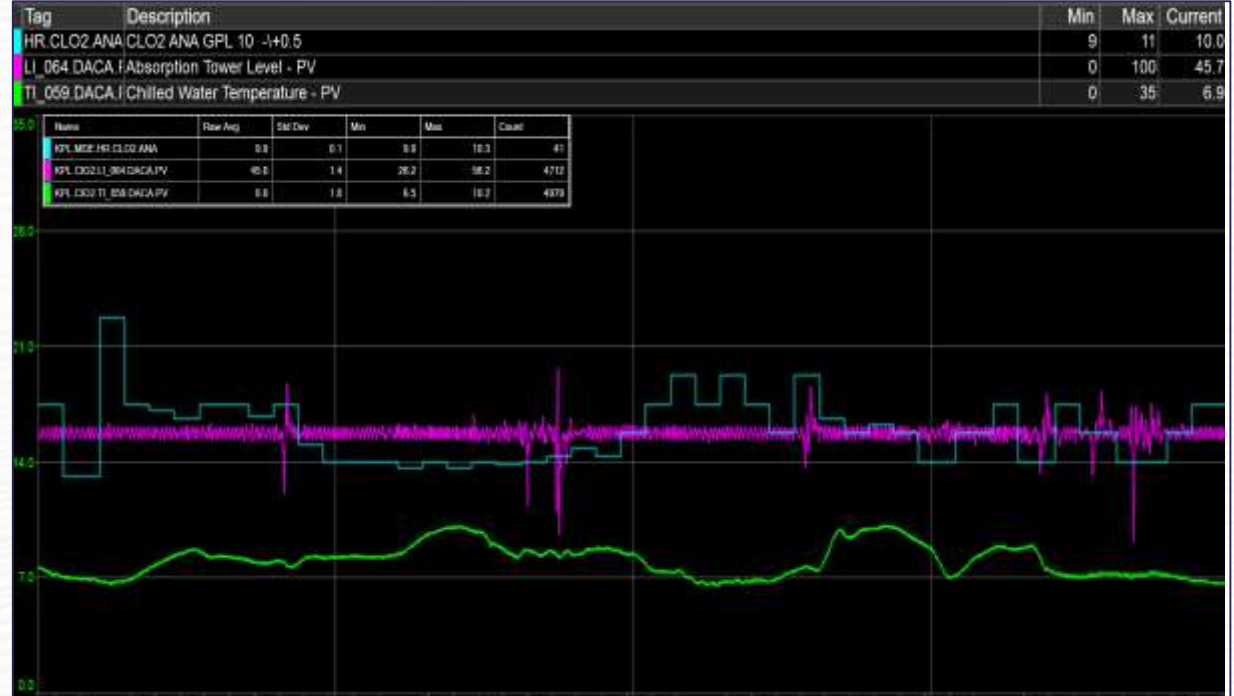




# CASE STUDY-2: CLO2 GPL VARIATION ANALYSIS

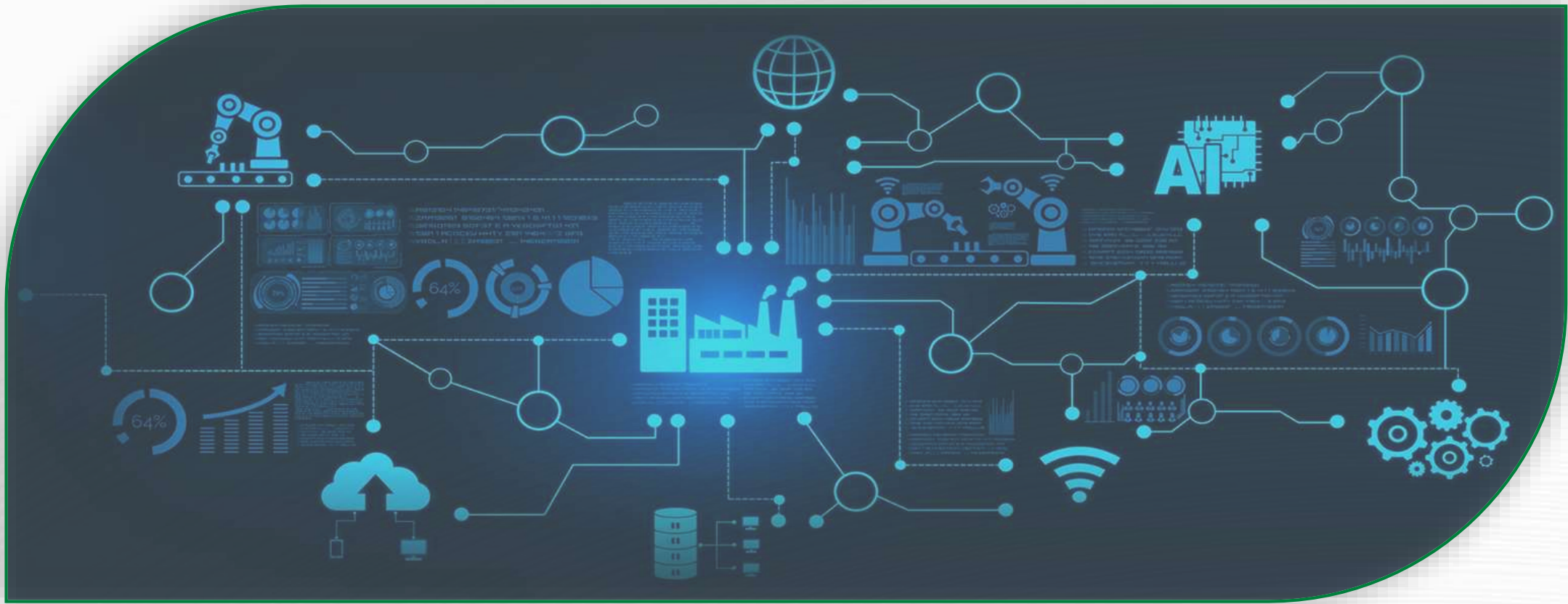


**Initial: ClO<sub>2</sub> gpl variation  $\pm 0.5$**



**Final result : ClO<sub>2</sub> gpl variation  $\pm 0.3$**

- The ClO<sub>2</sub> gpl variation has been reduced from  $\pm 0.5$  to  $\pm 0.3$  through real-time trend analysis, pareto chart, instant alerts of DMS-based tools.



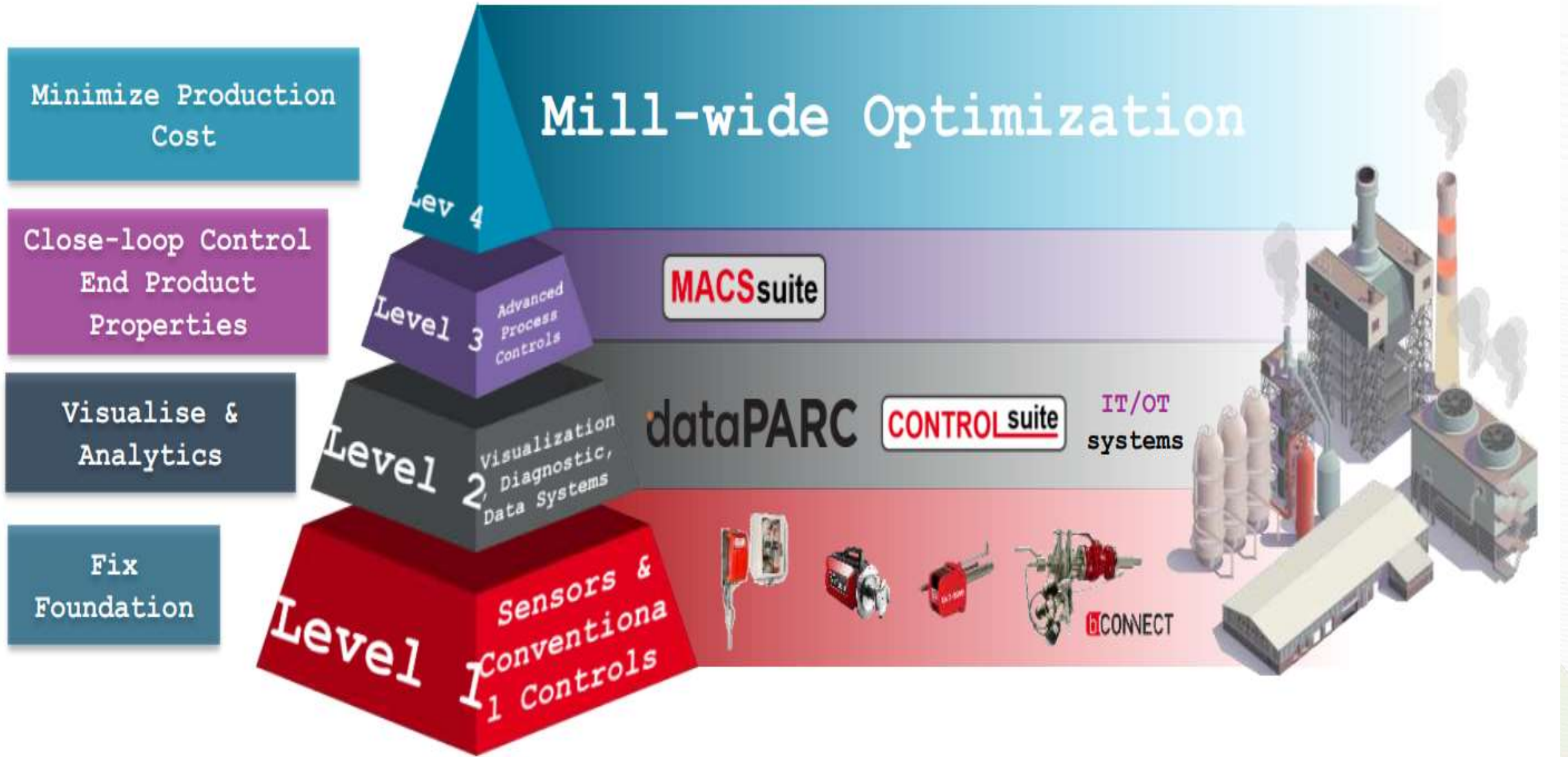
## PHASE 2: PROFITABLE AUTOMATION

*Advance Process Controls - Less Manual Effort & More Precision*





# APC – DIGITAL TRANSFORMATION



## **CASE STUDY–3: PULP BRIGHTNESS IMPROVEMENTS**

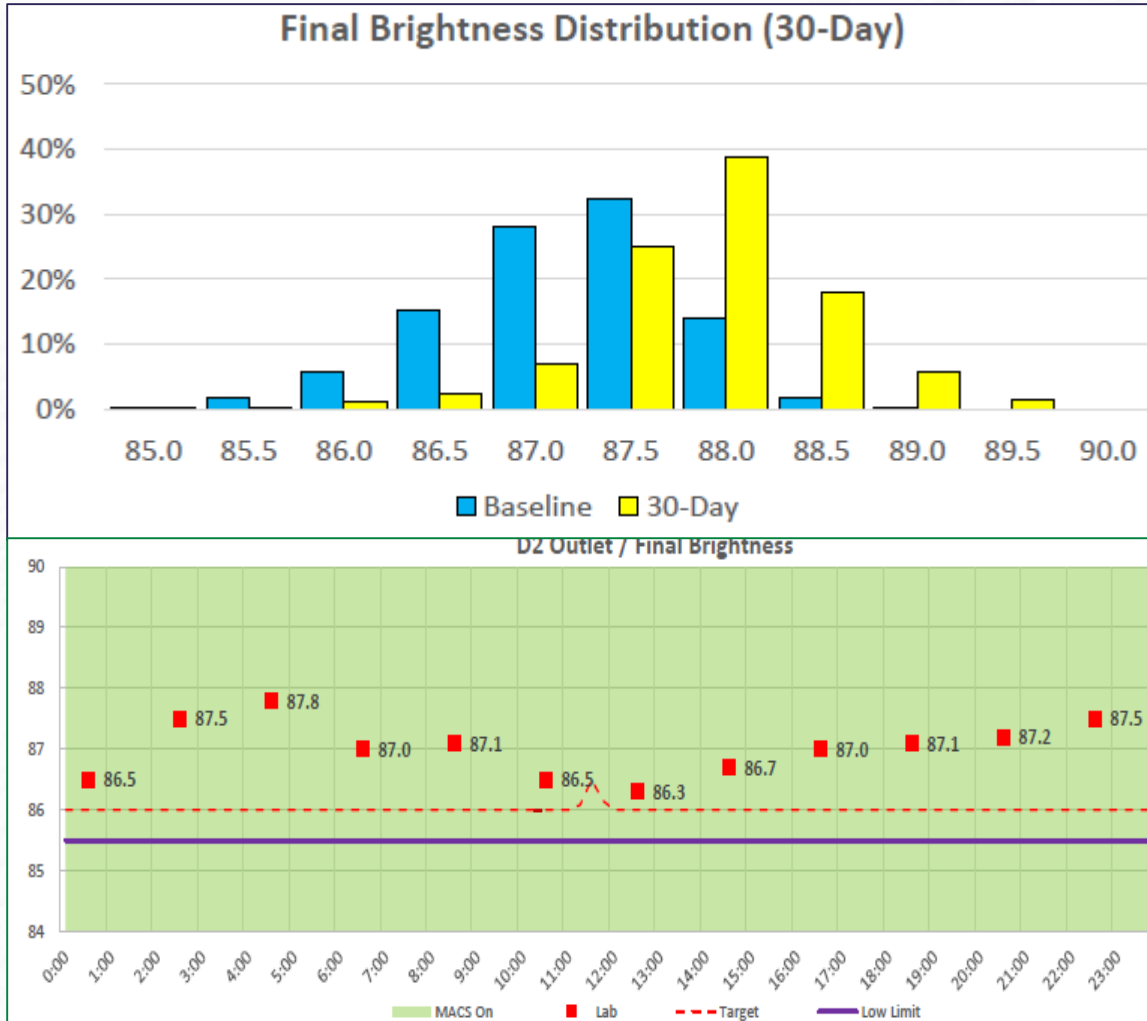
**Adopting AI Model Predictive Control and dataPARC (DMS) has resulted:**

- **1.49% increase in pulp brightness**
- **2.94% increase in whiteness**
- **Brightness variability reduction by 70%**
- **Real-time monitoring and AI-driven adjustments ensure consistent & improved quality**

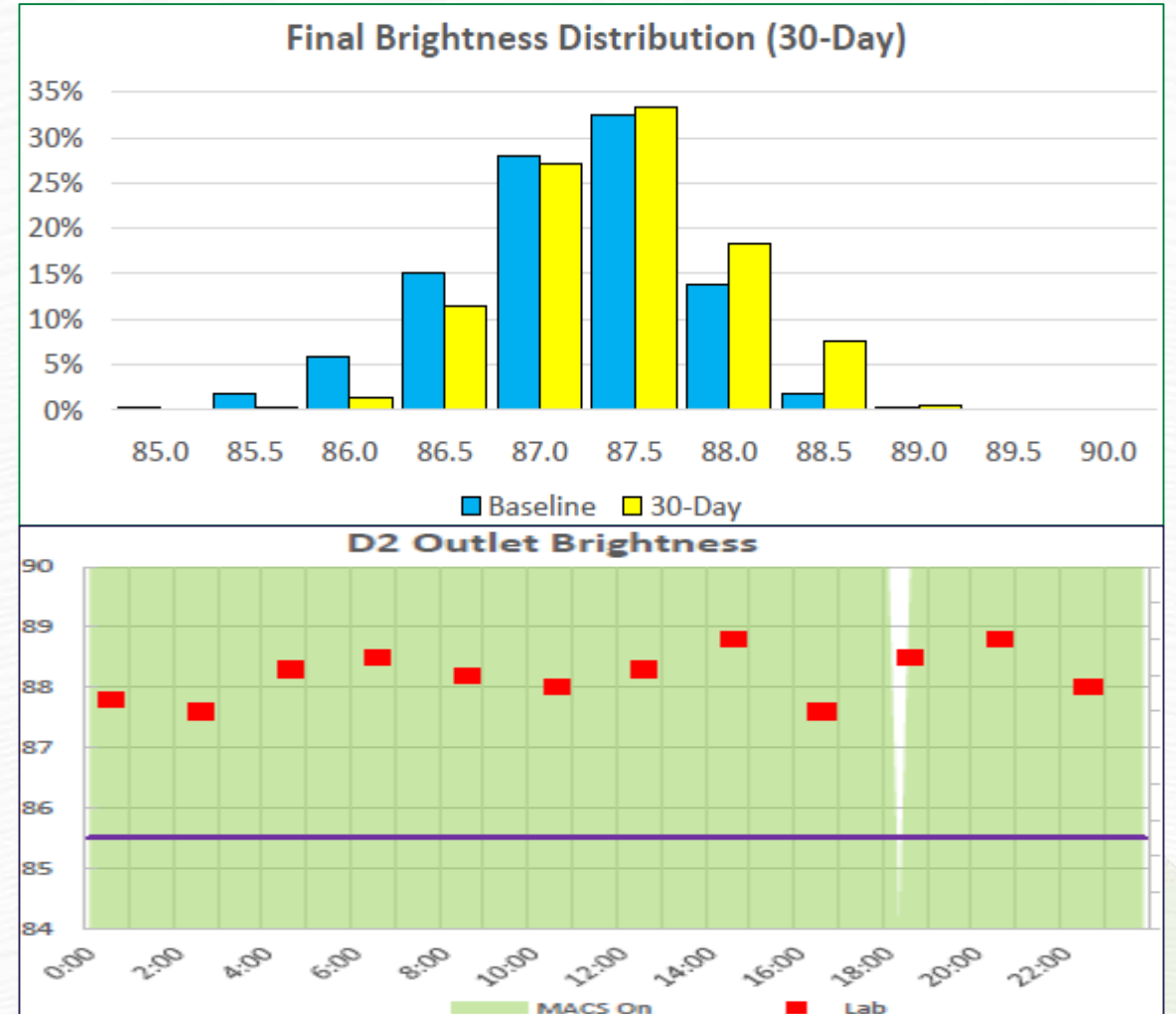


# QUANTIFIED RESULTS

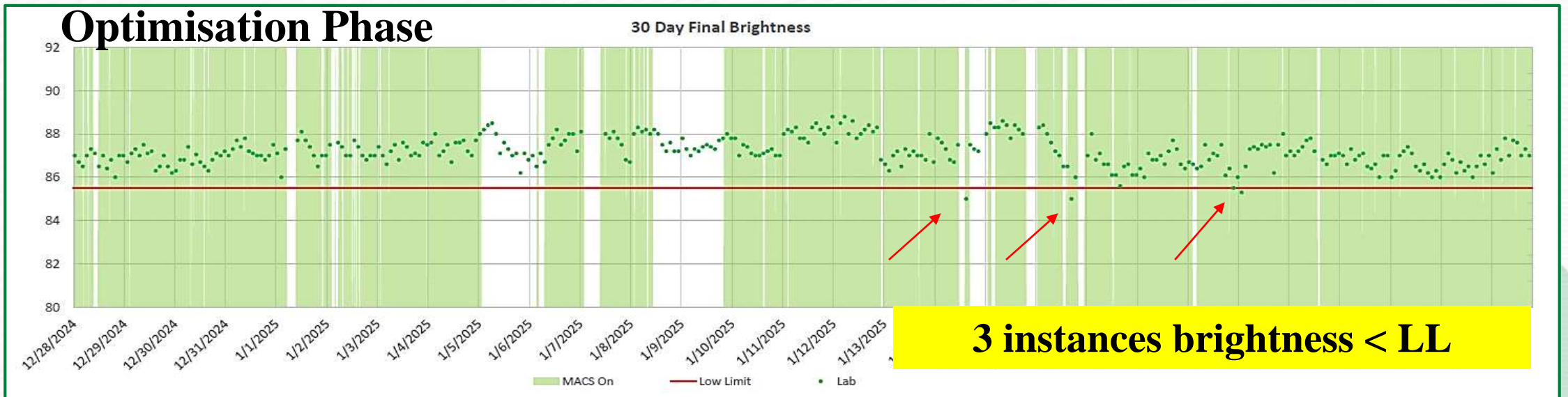
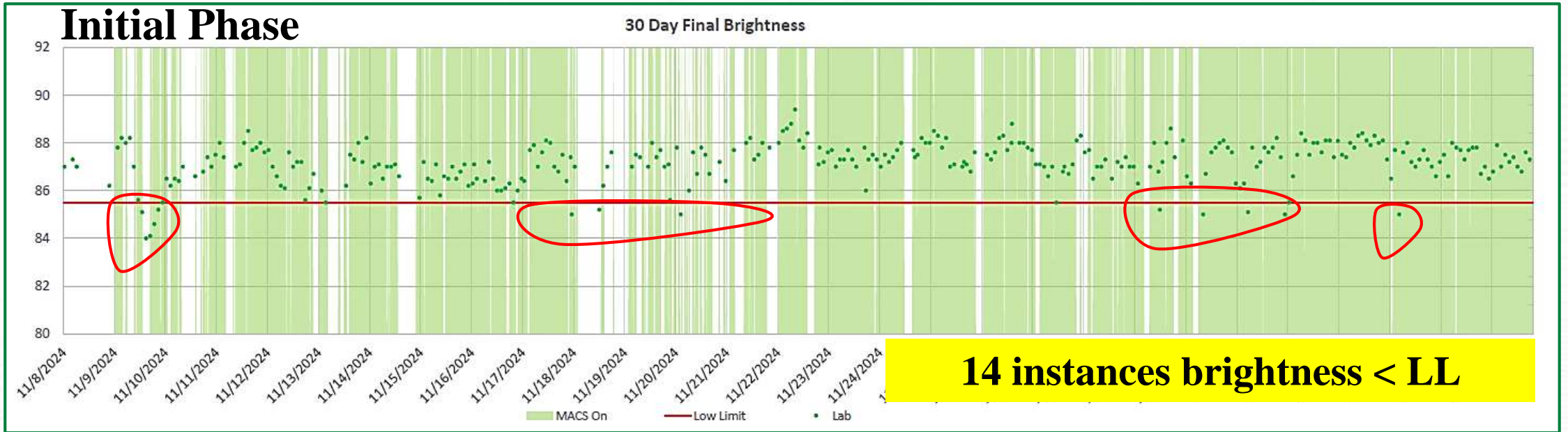
## Initial Phase – Pulp Brightness



## Optimisation Phase – Pulp Brightness



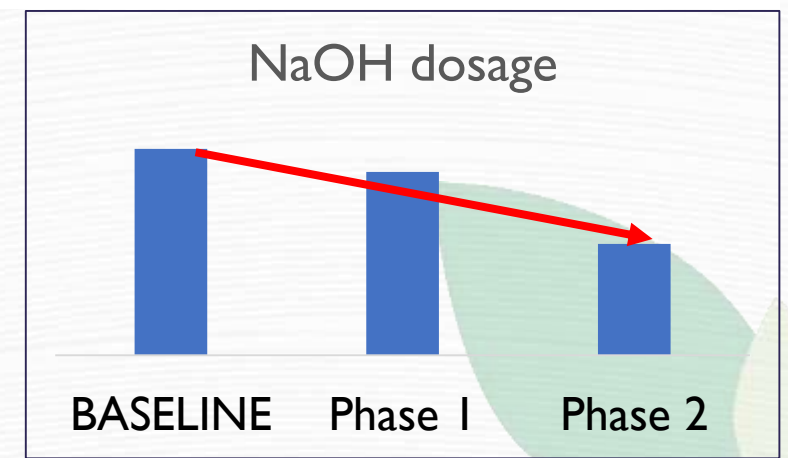
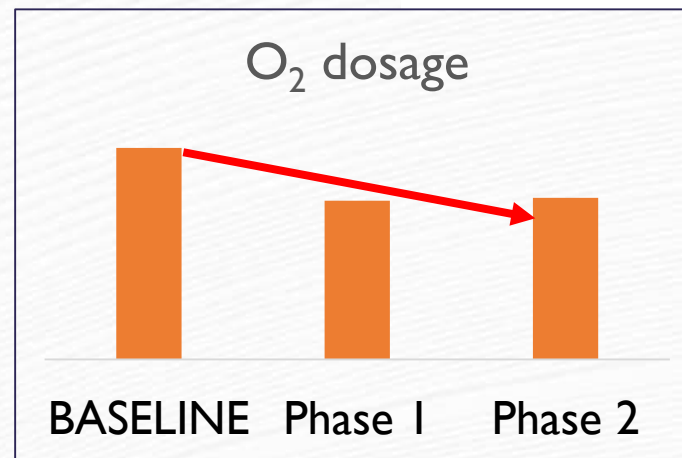
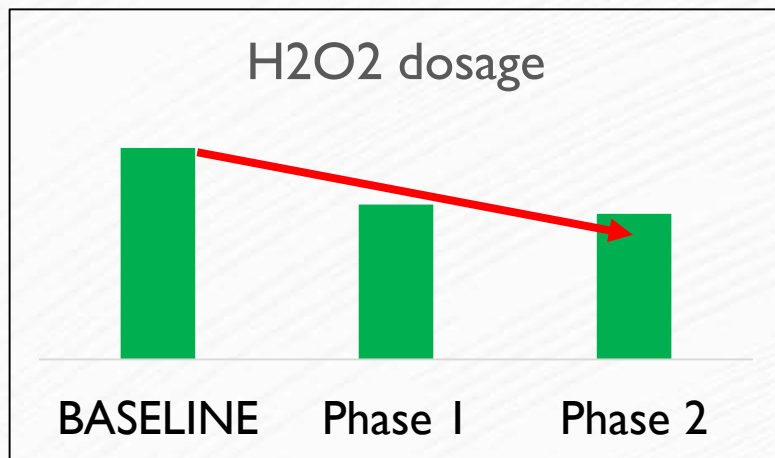
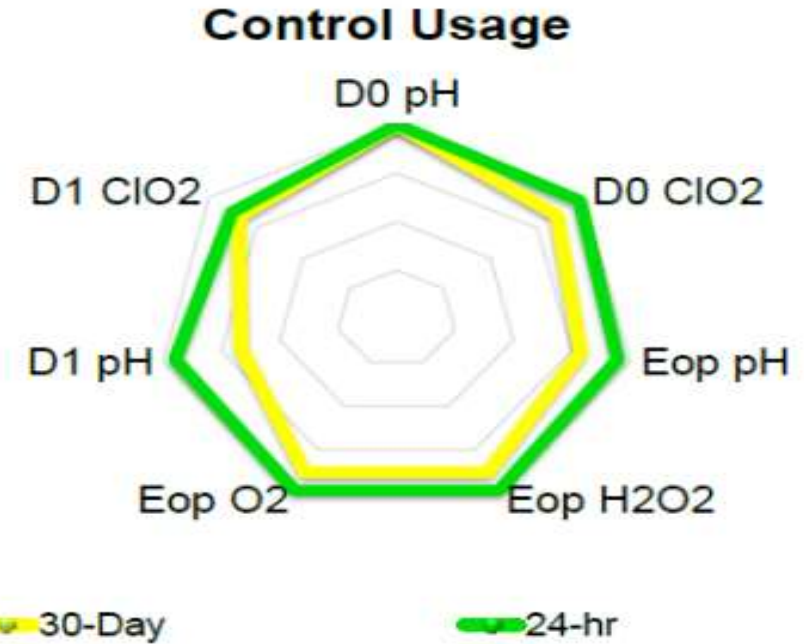
# QUANTIFIED RESULTS





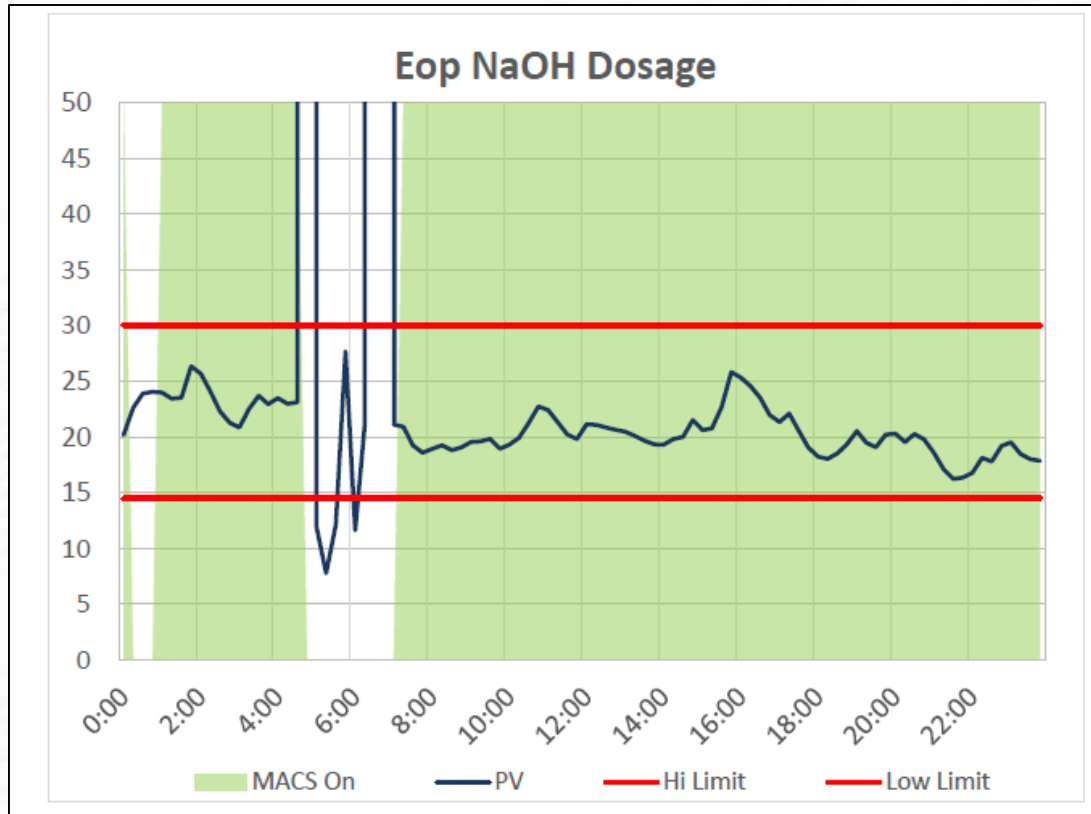
# CASE STUDY - 4: OPTIMIZING BLEACH CHEMICALS

- Reduced NaOH by 26% & O<sub>2</sub> by 24%
- Reduced H<sub>2</sub>O<sub>2</sub> dose by 10%
- ClO<sub>2</sub> consumption decreased by 7%
- Acid consumption increased by 10%
- Overall savings in chemical cost

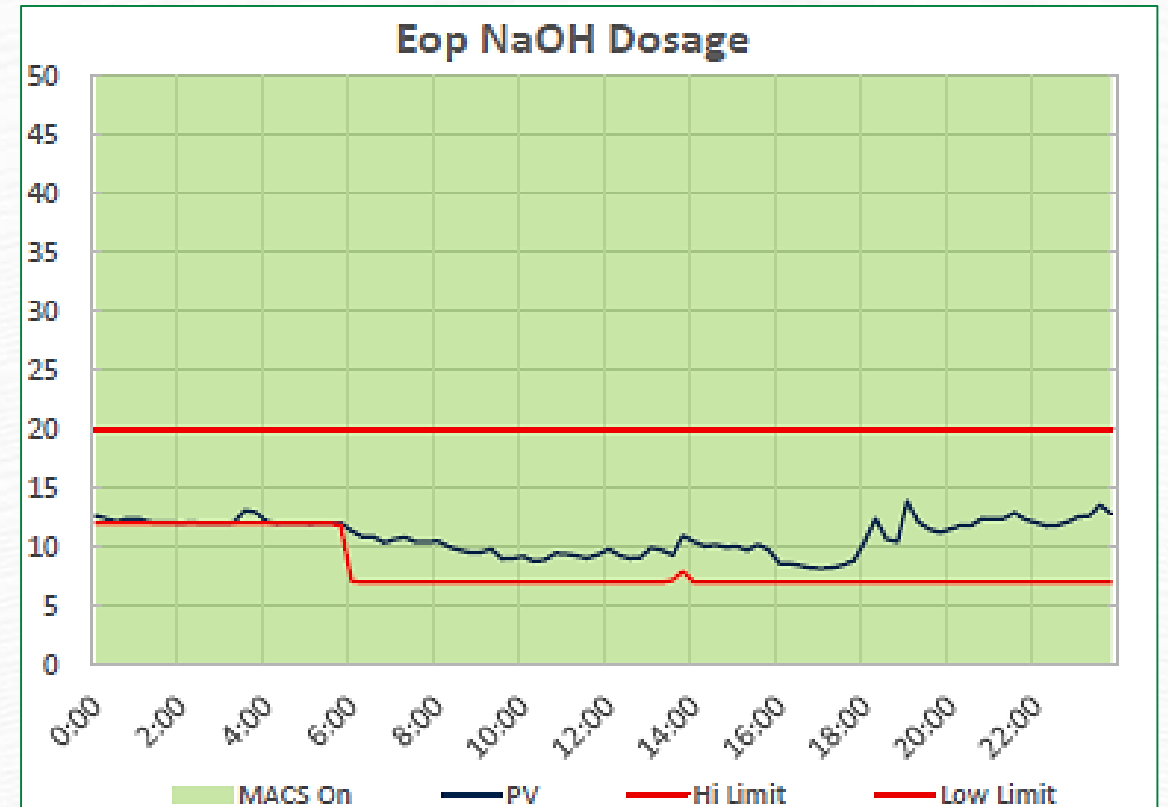


# QUANTIFIED RESULTS

## Initial Phase – Caustic Dosage



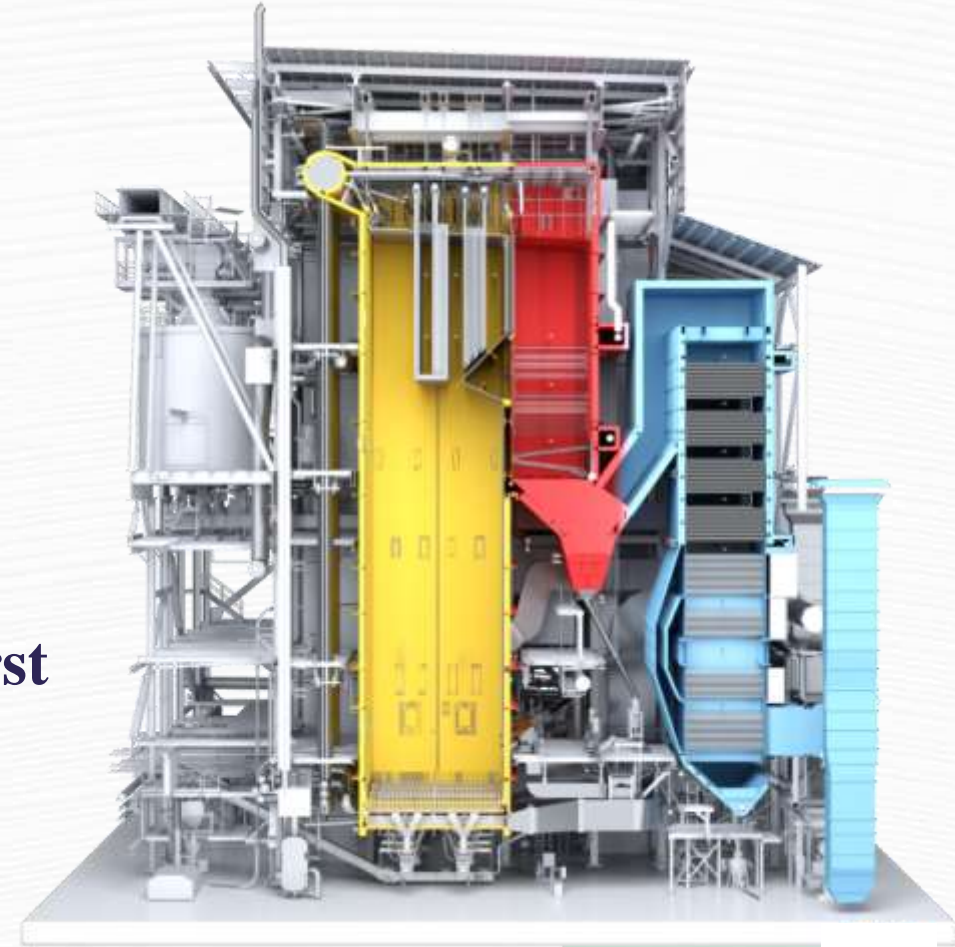
## Optimisation Phase – Caustic Dosage





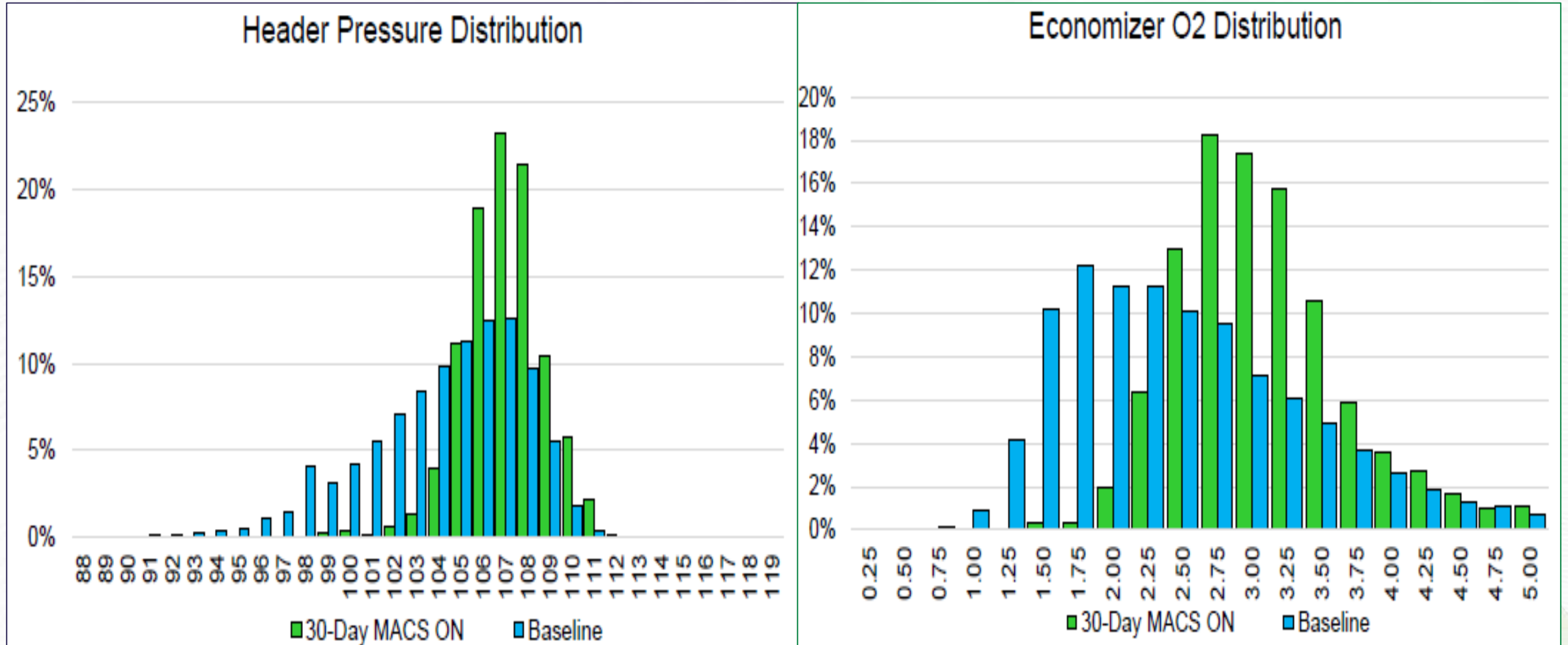
# CASE STUDY-5: BOILER EFFICIENCY ENHANCEMENTS

- **Faster control action**
- **Advanced Process Control (APC) and AI for real-time monitoring.**
- **APC Boiler system optimizing oxygen level and header pressure.**
- **Efficiency improvement by ~0.25% so far in the first phase of optimization.**



# QUANTIFIED RESULTS

## Optimisation Phase- Boiler





# KUANTUM'S AI EVOLUTION: THE ROAD AHEAD

- **Agro Cooking** – Currently under Implementation
- **Agro Bleaching** – Stabilization Phase
- **Hardwood Bleaching** – Sustainable stage
- **PM4 Quality & Cost Savings** - Installation stage
- **Boiler operations** – Optimisation stage
- **Steam header** – Currently under Implementation



**Journey continues.....**

# SUMMARY

- **Profitable Digitalization**

- Transforming the operations to predictable and quality focused operating environment

- **Environment and sustainability**

- **Cultural Transformation**

- Organization using data to drive decision-making

- **Enhancement of skill level of the workforce**

- **Transformation of Meetings to Work sessions**

- Focused discussion & analysis

- Identify trends and prevent issues before they impact quality







THANK YOU

