

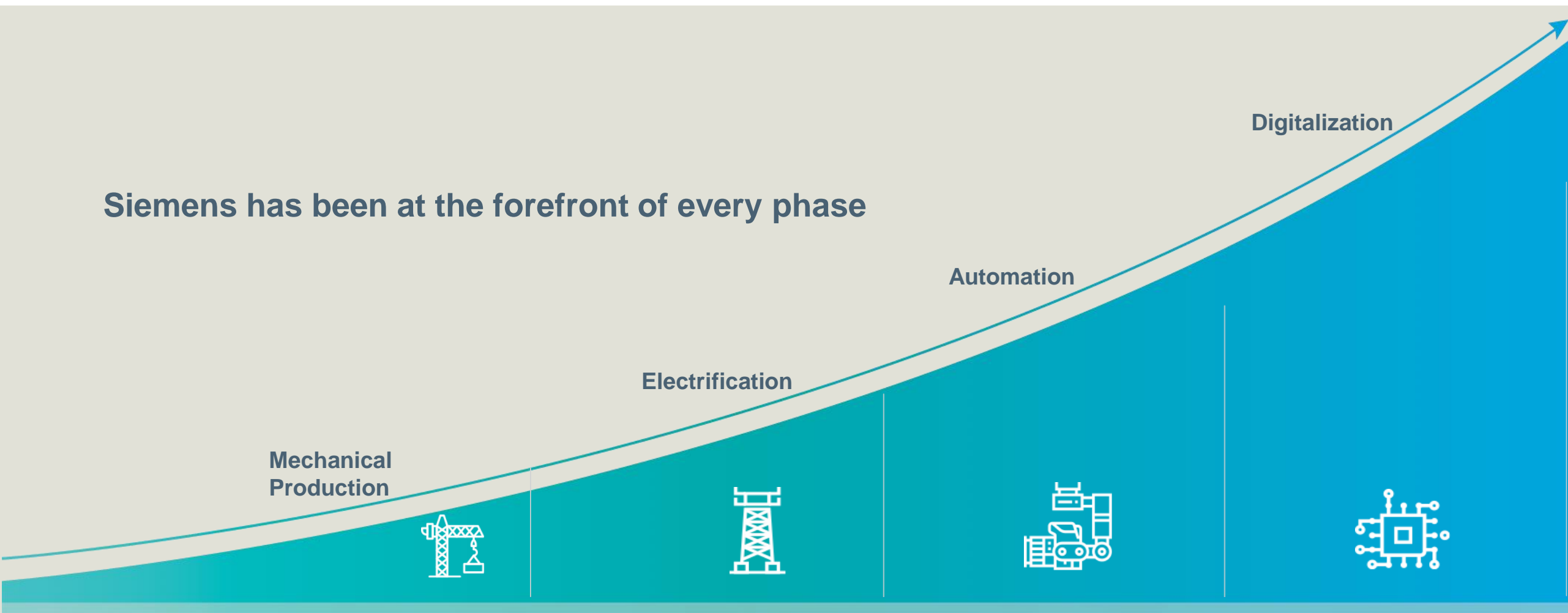


**XHQ Operation Intelligence**



# The Industrial Revolution – Which is level of your maturity is your organization?

Siemens has been at the forefront of every phase



## It is all about Data!

Data is everywhere but do you already make best use of that data?

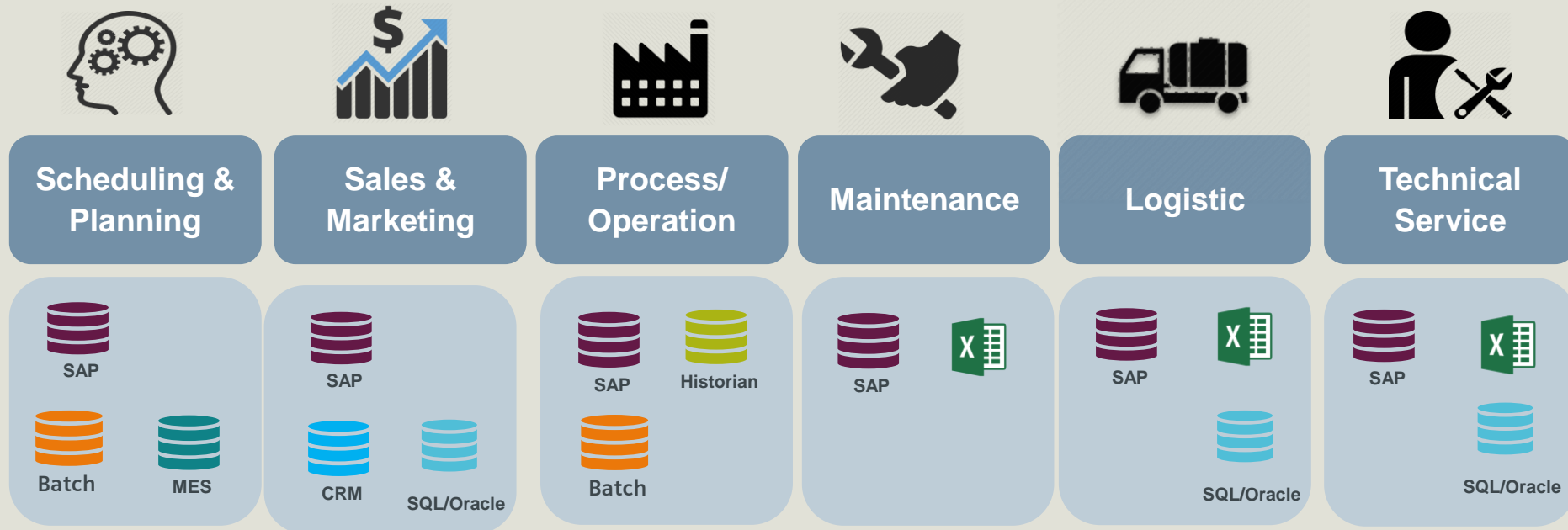


# Data Integration is fundamental for your Digital Journey

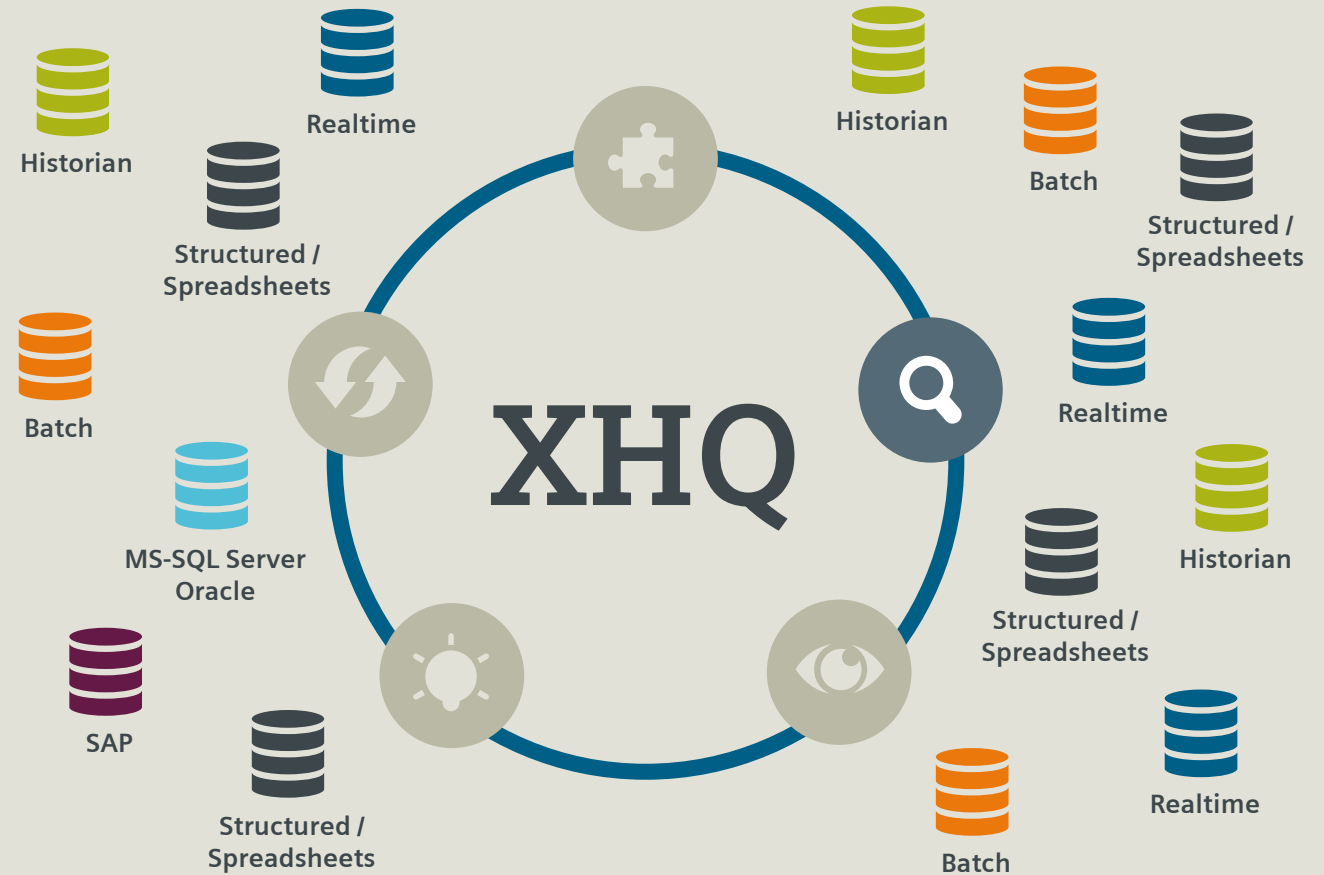
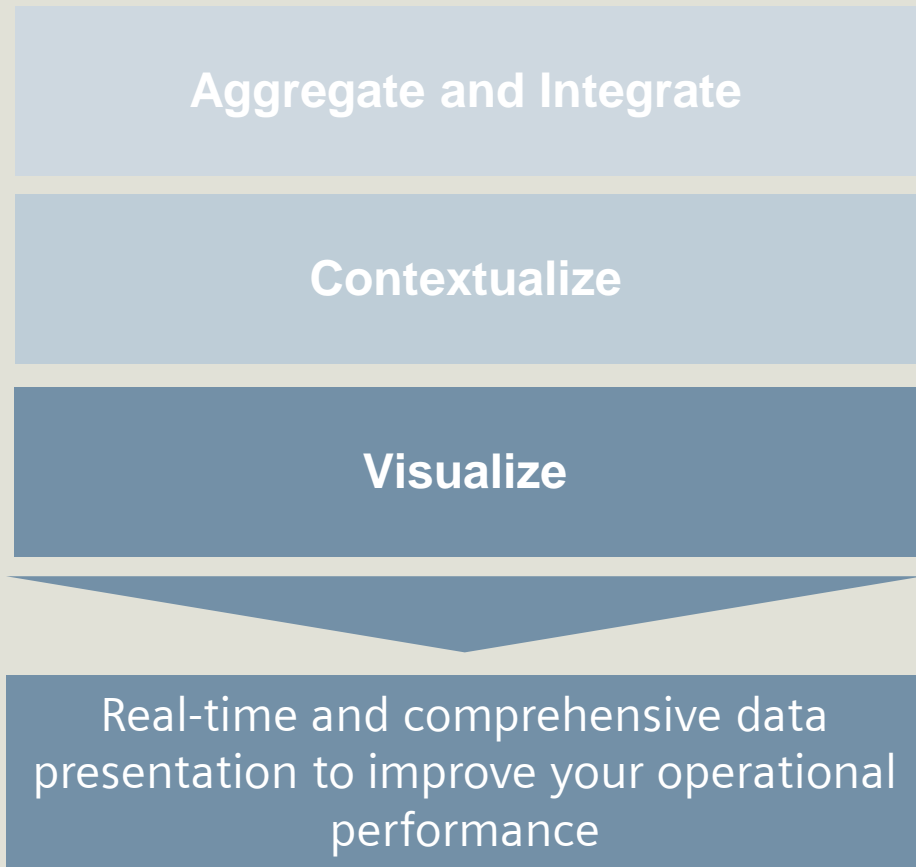
## XHQ as Digital Enablement Platform

Technical Disruption

Market Competition



# Introduction of XHQ enable your Digital Journey



## How data will be presented to you?

- Data can be viewed through multiple platforms:
  - Command and Control Center (CCC)
  - Traditional Desktop/ Laptop (Web based)
  - Mobile (Phone and Tablets)
  - Helmets and Glasses



# XHQ Operations Intelligence Software

## Key Benefits

Improve your business performance with fact-based decision making platform

Increase your productivity by high data transparency to all users / stakeholders

Maximize your operational efficiency through real time data access

Drive your Operational Excellence



Faster information access



Higher transparency

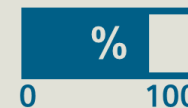


Empowered decisions



**8%**

Reduction in the operating costs



**9%**

increase in facility utilization



**2.5%**

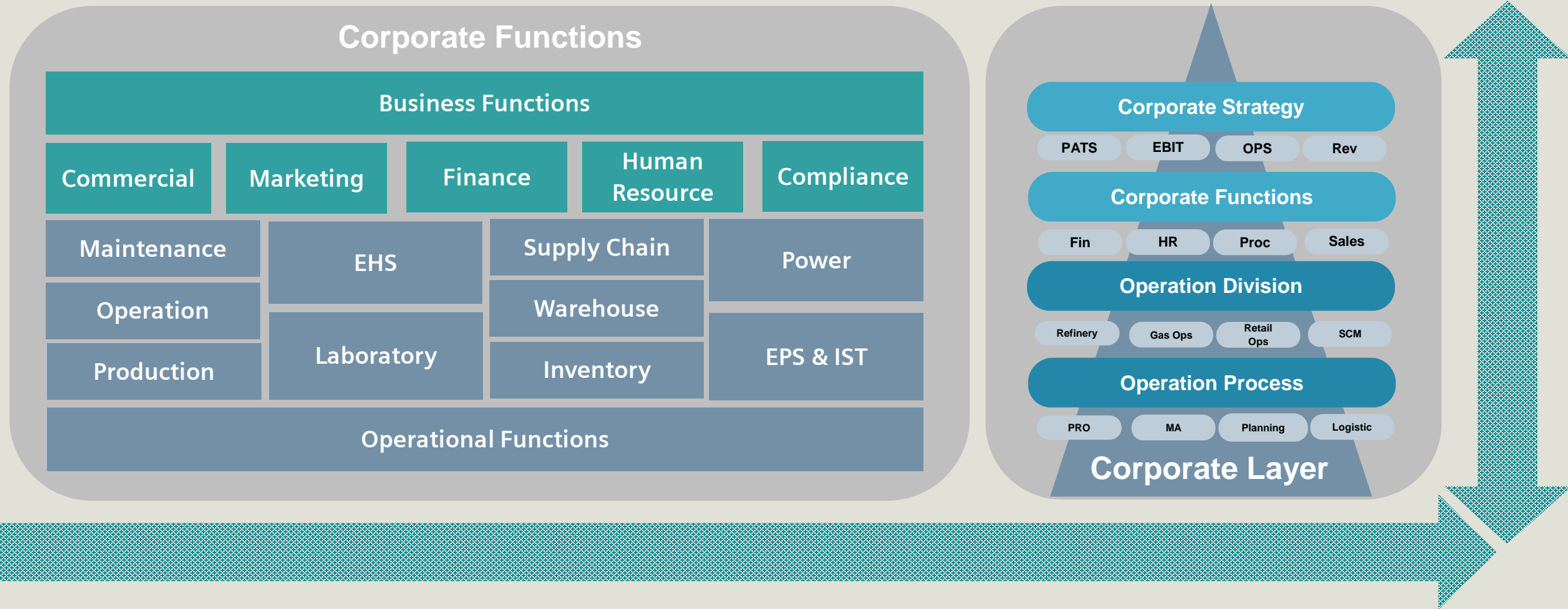
increase in operational availability



**11%**

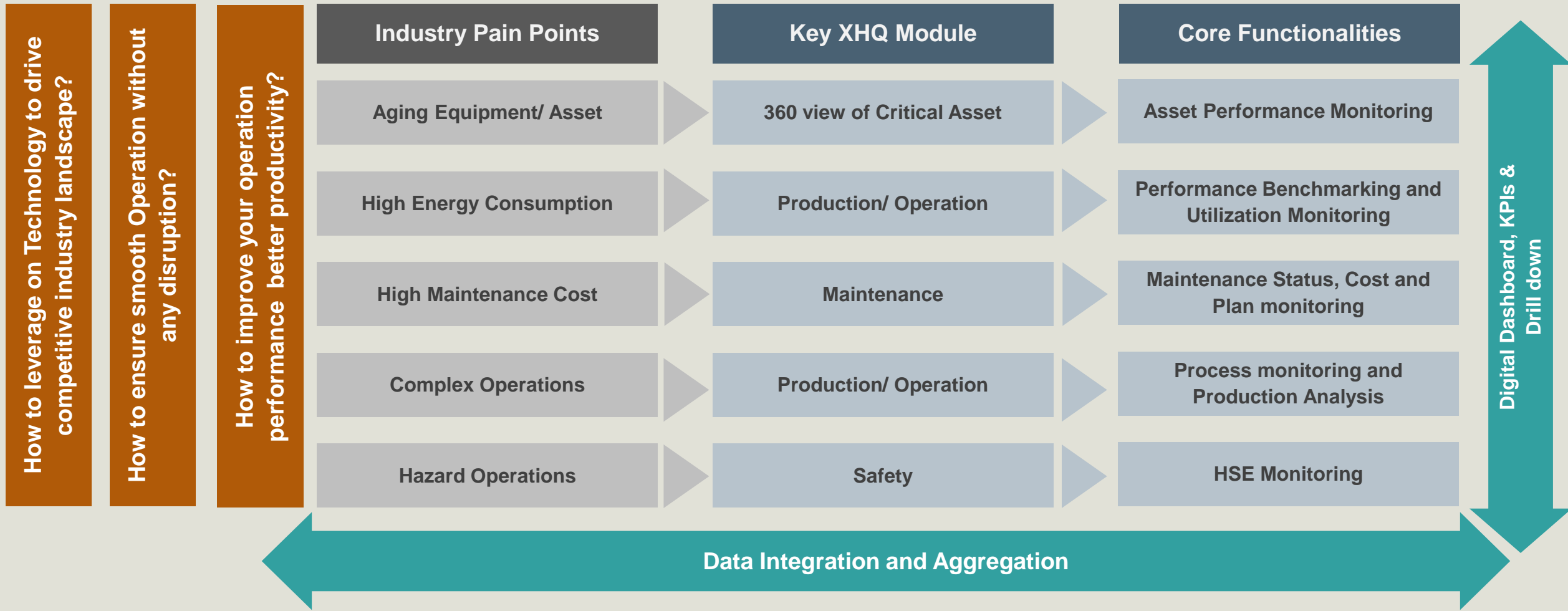
increase in production

# Full Capabilities for horizontal and vertical Data Integration across organization





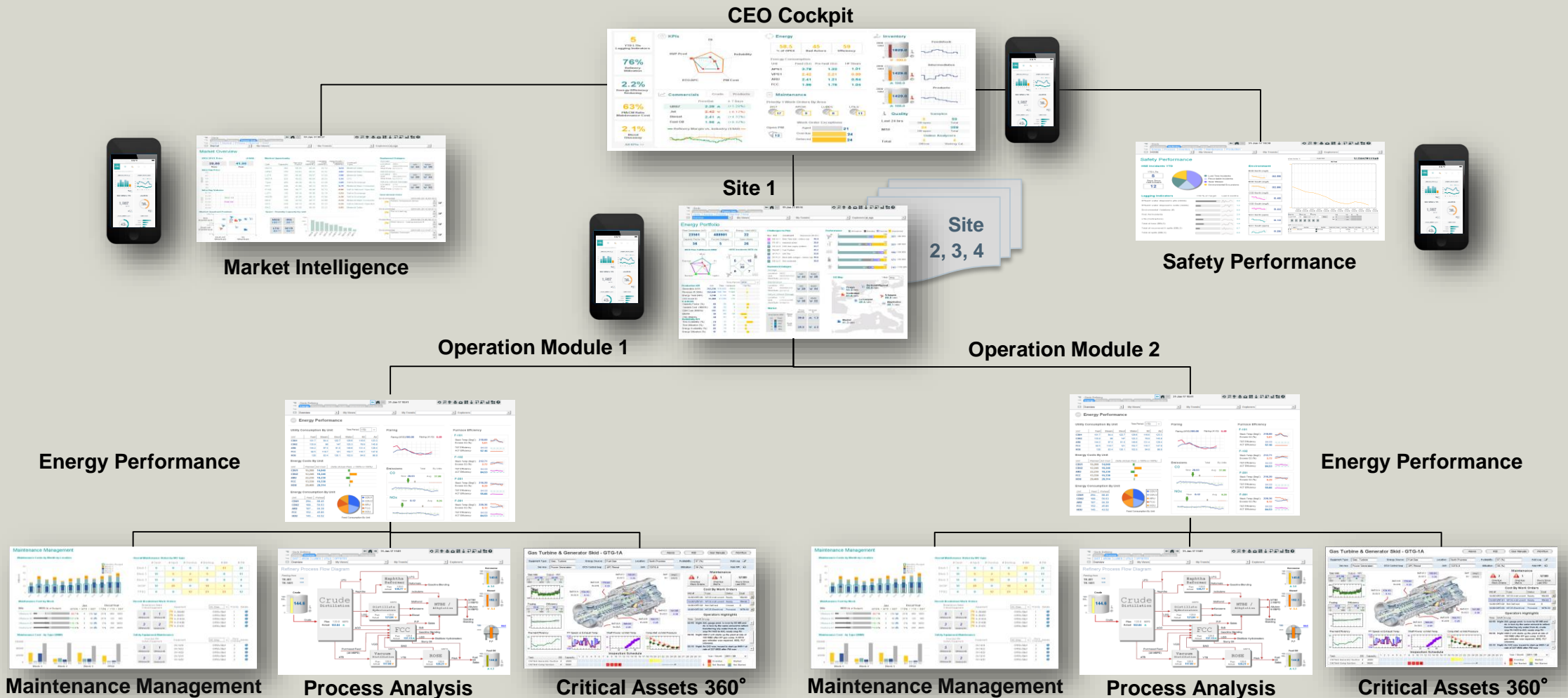
# XHQ addressing Industry pain points



# How to build XHQ Use Case?

	Module	Key data	Key KPIs	Key Data Sources				
Identify Business and Operation Module	Production Performance	<ul style="list-style-type: none"> <li>Production Data</li> <li>Batch Data</li> <li>Safety Data</li> <li>Utility Data</li> <li>Maintenance Data</li> <li>Planning &amp; Scheduling</li> <li>Quality Data</li> <li>Financial Data etc.</li> </ul>	<ul style="list-style-type: none"> <li>Plant Production Plan vs Actual</li> <li>History Plan vs Actual Trending</li> <li>Utilization</li> <li>Production Cost</li> <li>Maintenance Cost</li> <li>Unplanned Outage</li> <li>HSE Metric</li> <li>Rejects and waste etc.</li> </ul>	<ul style="list-style-type: none"> <li>PLC/DCS/SCADA/ Batch</li> <li>Process Historian</li> <li>SAP PM/ Maximo</li> <li>Prod Planning- SAP PP</li> <li>MES / LIMS</li> <li>ERP system/SAP SD</li> <li>Excel Spread Sheets</li> <li>Manual log data etc.</li> </ul>				
Identify Key Data					360 view of Critical Asset	<ul style="list-style-type: none"> <li>Production Data</li> <li>Maintenance Data</li> <li>Inventory Data etc.</li> </ul>	<ul style="list-style-type: none"> <li>OEE (Overall Equipment Efficiency)</li> <li>Critical Process Parameters monitoring</li> <li>Equipment Availability</li> <li>Inspection Schedule</li> <li>Maintenance Work Order tracking</li> <li>Maintenance cost etc.</li> </ul>	<ul style="list-style-type: none"> <li>PLC/DCS/SCADA</li> <li>Process Historian</li> <li>ERP system/SAP PM/ MM/ WM</li> <li>SAP PM/ Maximo / CMMS</li> <li>Excel Spread Sheets</li> <li>Manual log data etc.</li> </ul>
Identify KPI								
Identify Data Sources					Maintenance	<ul style="list-style-type: none"> <li>Maintenance Data</li> <li>Production Data</li> <li>Inventory Data etc.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance Cost Plan vs Actual</li> <li>Work Order Tracking</li> <li>Critical Parts Monitoring</li> <li>Spare alerts by equipment etc.</li> </ul>	<ul style="list-style-type: none"> <li>PLC/DCS/SCADA</li> <li>Process Historian</li> <li>ERP system/SAP PM</li> <li>Maximo / CMMS</li> <li>Excel Spread Sheets</li> <li>Manual log data etc.</li> </ul>
Answering key Business and Operation strategy to mitigate industry pain points								

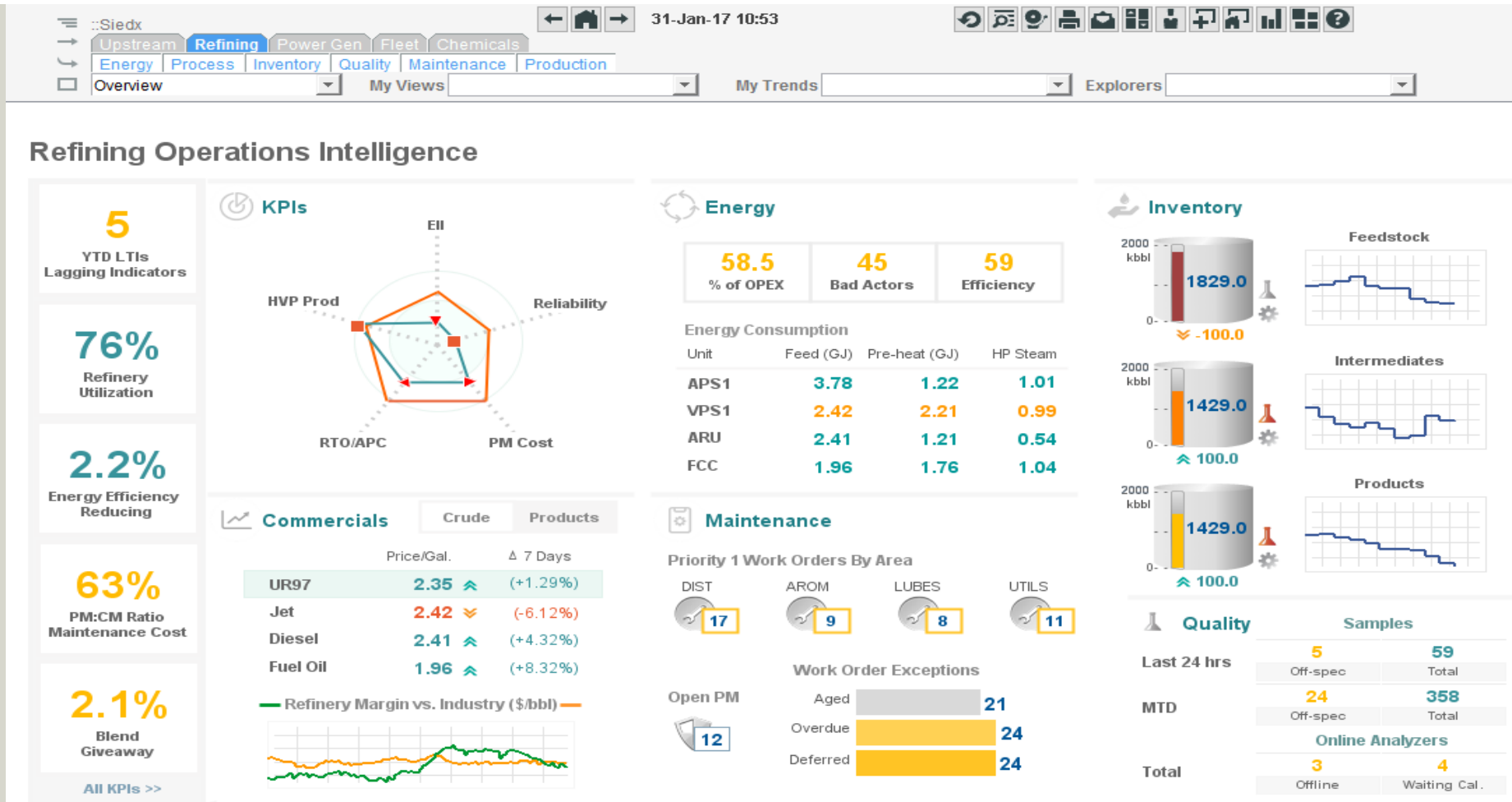
# Digital Operation (Sample Use Case)



# CEO Cockpit (Sample Use Case)

Overview

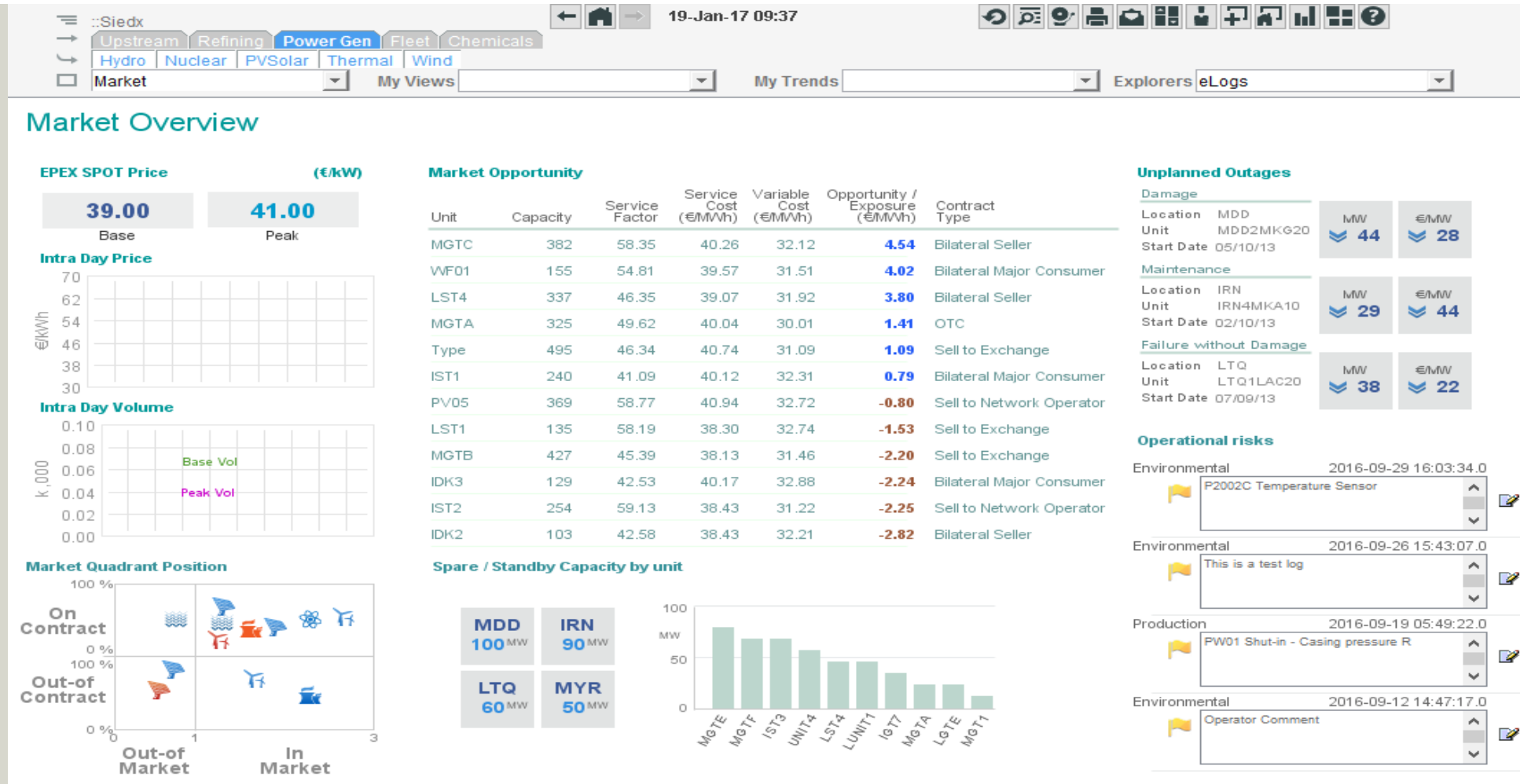
- All KPIs at one glance
- Drill into details
- Customizable
- Visual templates
- Real-time
- Internal & external



# Market Intelligence (Sample Use Case)

Overview

- KPIs
- Real-time
- Benchmark





# Safety Performance (Sample Use Case)

Overview

- HSE at one glance
- Drill into incidents
- Real-time

31-Jan-17 10:30
31-Jan-17 10:31

Upstream Refining Power Gen Fleet Chemicals
Energy Process Inventory Quality Maintenance Production

HSSE
My Views
My Trends
Explorers

### Safety Performance


#### HSE Incidents YTD

YTD LTIs

5

Days Since Last Incident

12




- Lost Time Incidents
- Recordable Incidents
- Near Misses
- Environmental Excursions

#### Lagging Indicators

	YTD % of Target	Last 6 months	
Effluent water disposal to pits (mbbls)	<div style="width: 80%;"></div>		5.0
Effluent water disposal to wells (mbbls)	<div style="width: 20%;"></div>		1.2
Environmental Violations (#)	<div style="width: 10%;"></div>		0.0
First Aid Incidents	<div style="width: 40%;"></div>		2.0
LTIs (Contractors)	<div style="width: 60%;"></div>		3.0
Total oil loss (BBLS)	<div style="width: 50%;"></div>		1.9
Total oil recovered fr spills (BBLS)	<div style="width: 30%;"></div>		6.7
Total oil spills (BBLS)	<div style="width: 15%;"></div>		0.0

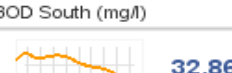
#### Environment

BOD North (mg/l)



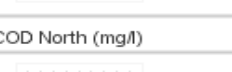
32.59

BOD South (mg/l)



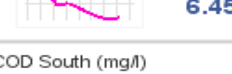
32.86

COD North (mg/l)




6.45

COD South (mg/l)




9.44

NOX North (ppm)



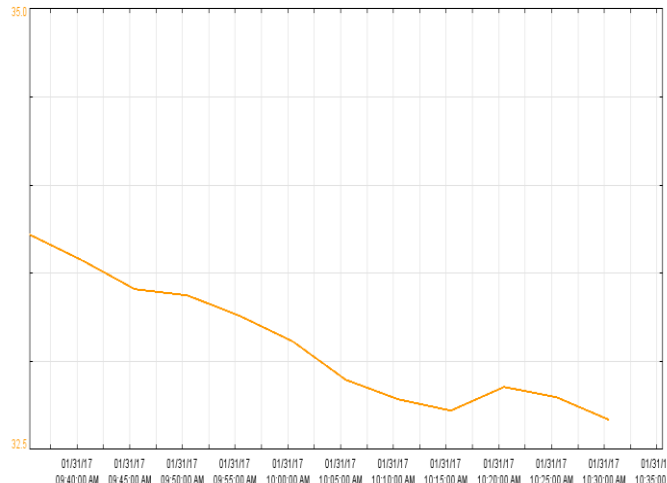
0.13

NOX South (ppm)



0.26

#### XHO Trend



Start Time: 31-Jan-2017 09:35 | Span: 1.00 Hours | End Time: 31-Jan-2017 10:35 | Retrieve

Scale: All | Type: Linear | Min: | Max: | Left: All | Right: All

Legend	Value Name	Description	Default Units	Precision	Current Value	Display Units	Units Category	Min	Max	Scale
<span style="color: orange;">●</span>	BOD_Areal1	BOD in Areal1	mg/L	2	32.86 mg/L	Density	All	32.50	35.00	Left
<span style="color: green;">●</span>				0	None	All	All			Left

# Site Consolidated Performance View (Sample Use Case)

Overview

- Site KPIs
- Real-time
- Benchmark against other Sites

### Energy Portfolio

Fleet Generation (kW)

23561

CO2 Avoid (€/d)

488901

Energy Yield (MW)

22

Capacity Factor (%)

56

Forced Outages

5

Open Alerts

26

MTD Plan Fulfillment (MW)

HSE Incidents MTD (#)

Production KPI	Act	Plan	Variance	Var(%)
Generation (kW)	312,236	316,920	-4684	
Revenue (€ ,000k)	252,646	235,150	17496	
Energy Yield (MW)	3,140	3,112	28	
CO2 Avoid (t)	31,400	31,230	170	
<b>O &amp; M KPI</b>				
Capacity Factor (%)	69	59	10	
Variable Cost (€/MWh)	36	32	4	
O&M Cost (€/MWh)	191	191	1	
BM:PM	39	65	-26	
COE (€/MWh)	44	51	-7	
<b>Availability KPI</b>				
Time Availability (%)	24	17	7	
Time Utilization (%)	67	76	-9	
Energy Availability (%)	66	74	-8	
Energy Utilization (%)	47	40	7	

#### Challenges to Plan

Sev	Unit	Constraint	Exposure (€/k/hr)
1	DE.LU.1	Boiler Tube leak - reduce cap	35.4
2	FR.NT.1	Industrial action	39.8
3	UK.LU.4	UGS Gas supply problem	33.7
3	RM.WF.1	Fuel Problem	41.2
3	SP.PV.1	Unit Trip	32.8
2	SP.PV.3	Block wide outages - reduce cap	41.6
3	DE.LU.3	Grid constraint	39.8

#### Unplanned Outages

Damage	Location	MDD	Unit	MW	€/MW
	MDD		MDD2MKG20	44	28
	IRN		IRN4MKA10	29	44
	LTQ		LTQ1LAC20	38	22

#### Market

Available MW	Base (hrs)	Price (€/MWh)	Change %
100 Total		39.8	1.3
21 MDD			
18 ANT			
19 ERL			
22 IRN			
Peak (hrs)		29.0	4.3

#### Performance

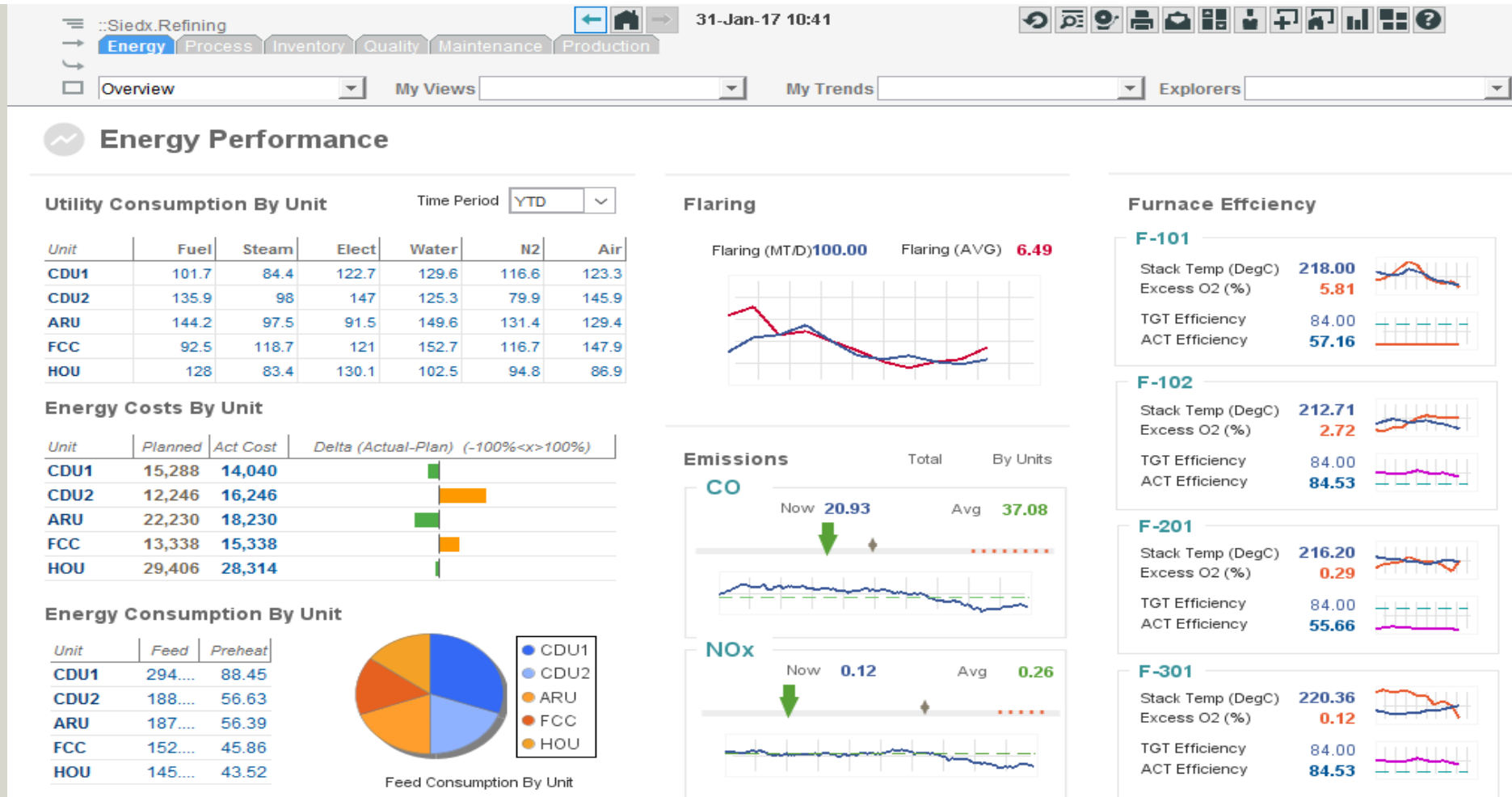
Utilization	Standby	Planned	Unplanned	Total
67	8	25	0	321 / 468 MW
40	13	8	39	321 / 468 MW
70	7	17	6	150 / 268 MW
42	25	18	15	171 / 200 MW
60	7	8	25	743 / 1180 MW

#### GIS Map

# Plant Energy Performance (Sample Use Case)

Overview

- Production KPIs
- Real-time
- Benchmark against other Production Areas



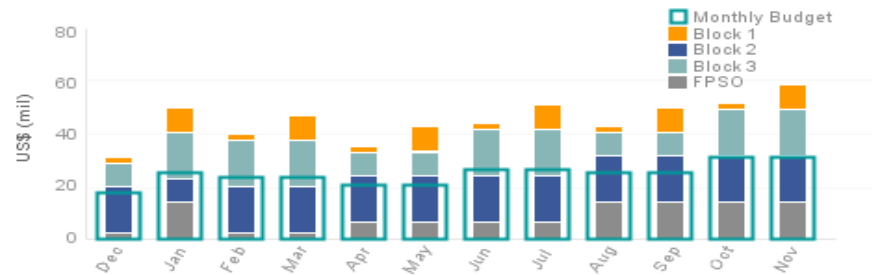
# Plant Operations: Maintenance Management (Sample Use Case)

Overview

- Maintenance KPIs
- Real-time

## Maintenance Management

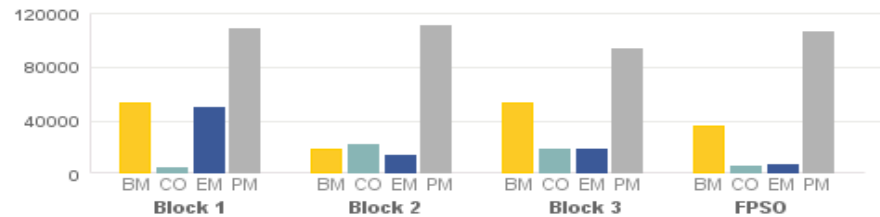
Maintenance Costs by Month by Location



Maintenance Cost by Block

Site	MTD (% of Budget)	Jan		Fiscal Year		
		MTD% / MTD / BGT	YTD% / YTD / BGT			
Offshore-S1	64.7%	4	150	25%	459	1800
Offshore-S2	107.6%	2	40	26%	125	480
Offshore-S3	115.1%	3	60	5%	189	3600
Onshore-S1	113.8%	4	80	5%	256	4800

Maintenance Cost - by Type (\$MM)



Overall Maintenance Status by WO Type

	# Open	# Aged	# Overdue	# Backlog	# BM	# PM
Block 1	9	0	0	0	13	24
Block 2	12	5	4	5	0	11
Block 3	11	0	12	0	0	9
GOSP	12	24	0	19	4	6
FPSO	6	0	12	21	23	12

Recent Breakdown Work Orders

Breakdown Maint Critical Equipment		Equipment	All Sites	Priority	Details
5	1	K-3044B	OffSh-Site1	1	<a href="#">i</a>
Offshore-S1	Offshore-S2	K-3045C	OffSh-Site1	1	<a href="#">i</a>
		K-3143A	OffSh-Site1	1	<a href="#">i</a>
3	2	K-3143B	OffSh-Site1	1	<a href="#">i</a>
Offshore-S3	Onshore-S1	K-3143C	OffSh-Site1	1	<a href="#">i</a>

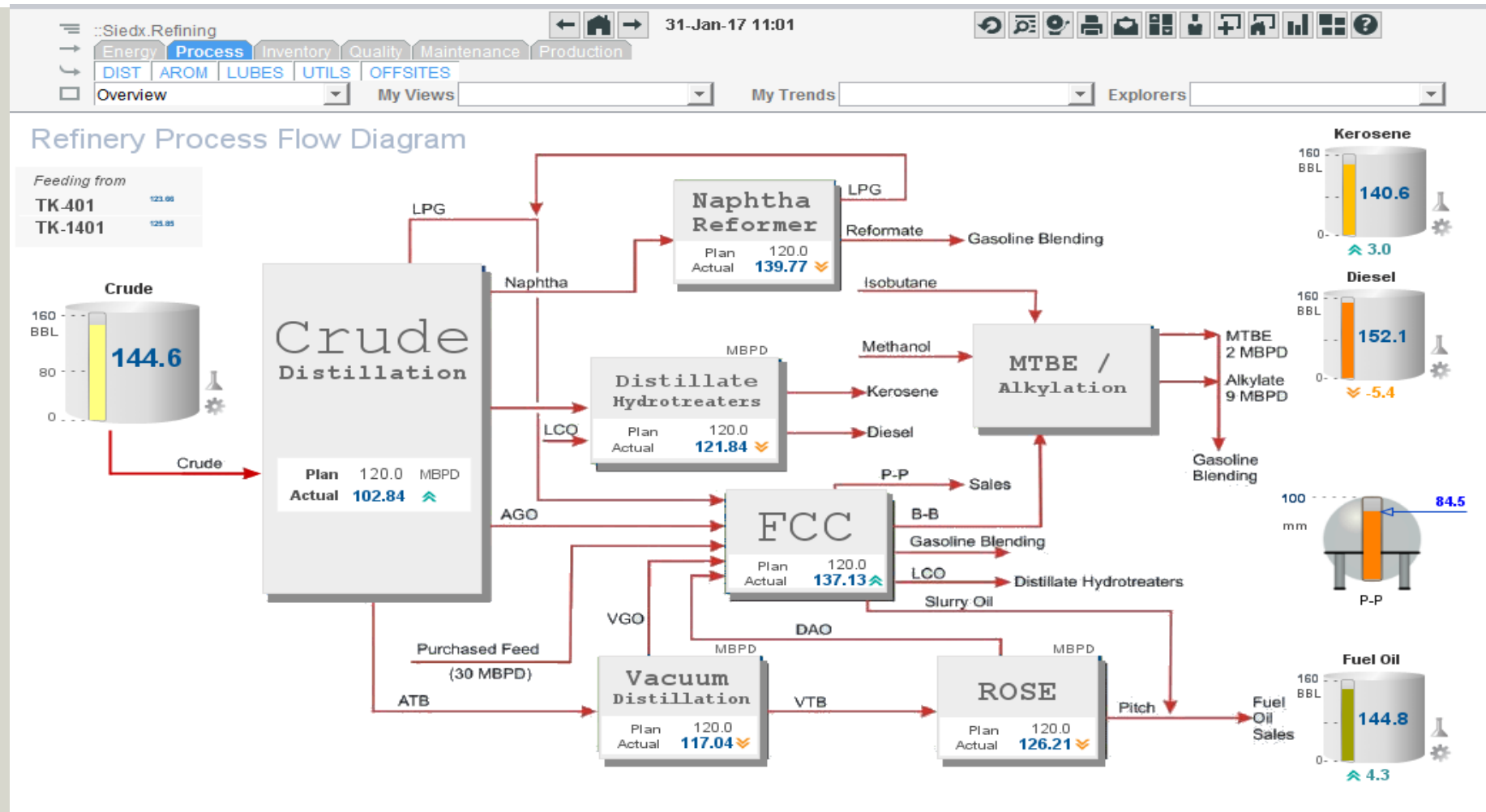
Safety Equipment Maintenance

Overdue PM Safety Equipment		Equipment	All Sites	Days Overdue	Details
5	1	W-1424	OffSh-Site1	2	<a href="#">i</a>
Offshore-S1	Offshore-S2	W-1422	OffSh-Site1	2	<a href="#">i</a>
		W-1429	OffSh-Site1	2	<a href="#">i</a>
3	2	W-1419	OffSh-Site1	2	<a href="#">i</a>
Offshore-S3	Onshore-S1	W-1420	OffSh-Site1	2	<a href="#">i</a>

# Plant Operations: Process Analysis (Sample Use Case)

Overview

- Analysis with Benchmarking
- Maintenance & Reliability Analytics
- Early warning Predictive Analytics
- Root cause Analytics





# Plant Operations: Critical Assets Conditioning Monitoring (Sample Use Case)

Overview

- 360° view on key assets
- Performance / Maintenance / Costs
- WO Tracking
- Inspection Scheduling

## Gas Turbine & Generator Skid - GTG-1A

Alarms

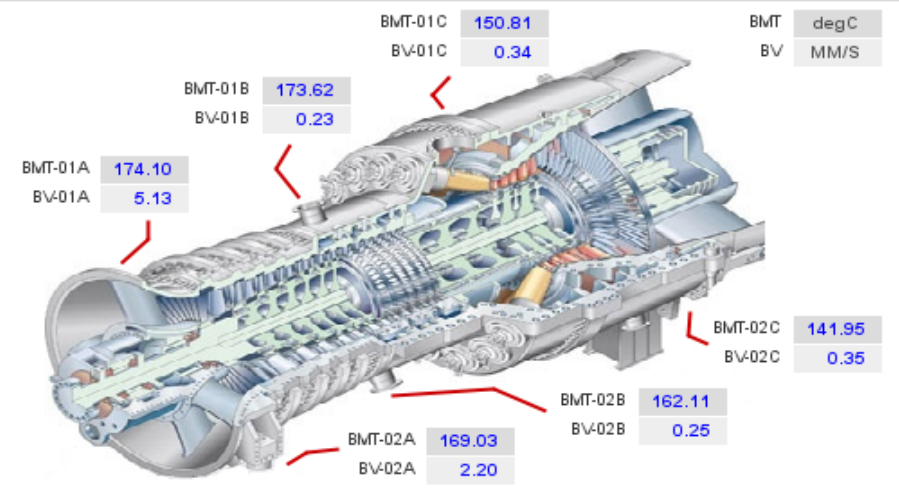
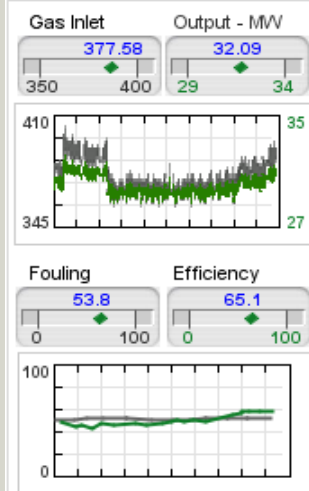
HSE

User Manuals

Workflow

Equipment Type : Gas - Turbine    Energy Source : Fuel Gas    Location : North Process    Availability : 67 (%)    Add Log :

Service : Power Generation    DCS Control loop : APC Remot    Unit : CGTG-9    Utilization : 58 (%)    Add WR :



### Maintenance

2 Overdue Work Orders

1 Overdue MoC's

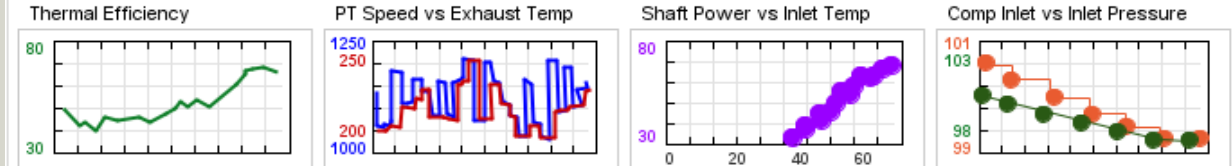
57389 Hours Since Last ESD

### Cost By Work Orders

WO #	Type	Status	Cost
12-001257-00	MTCE-Instrument	Ready	154.63
12-001257-01	MTCE-Instrument	Ready	154.63
12-001257-02	Not Defined	Closed	0
12-001257-03	MTCE-Electrical	Processi	1078.33

### Operators Highlights

Time	Shift	E-Log
02:55	Night	AXL gauge prod. is over by 65 MB and AL is less by the same amount to reflect transferring oily water from AL crude sloop TK-1433 to AXL crude sloop TK-
06:06	Night	HAR-2 will start up the plant at rate of 180 MBD after HP gas comp. K-001A gas reheater was repaired. ABQ. PLT informed.
03:10	Night	An O/O was issued to start up HAR-1 at rate of 327 MBD after PM was



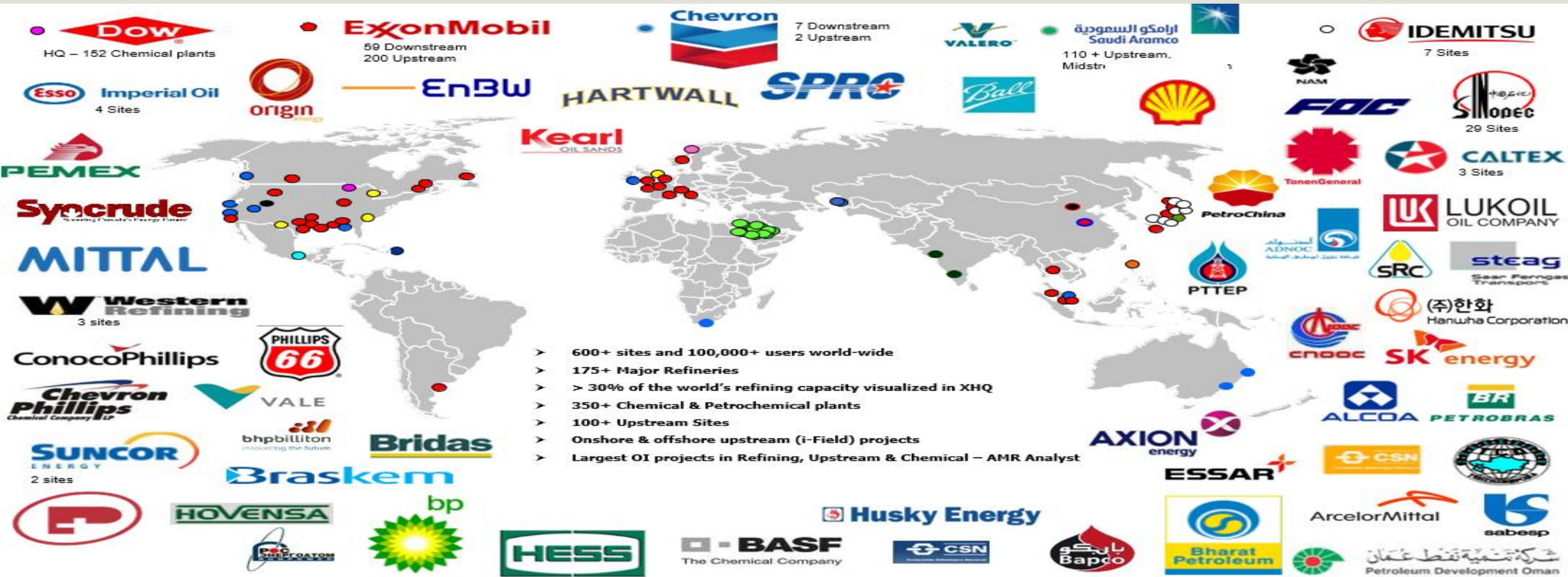
### Inspection Schedule

Task	EIS	Capacity	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
CGTG-9 Generator Section	3	2000																																	
CGTG-9 Comp Section	4	5000																																	

Year / Month: 2011 / 09

Legend: Overdue (Red), Not Started (Orange), Started (Yellow), Not Started (Green)

# Customer References



Thank you



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**siemens.com**