



Enabling Plant Performance Benchmarking in a multi-site environment



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Agenda

- Introduction
- Business Challenge
- Solution Description
- Benefits
- Future Plans

VALUE NOW, VALUE OVER TIME



Introduction

- Akzo Nobel Base Chemicals BV
- Atos Origin Nederland BV

Akzo Nobel

- Activities in 80 countries
- Employing 62,000 people
- Consolidated revenues 2004 totals € 12.9 billion
- Headquarter Arnhem, the Netherlands
 - *Market-driven and technology-based*
 - *Serving customers throughout the world with healthcare products, coatings and chemicals*

Akzo Nobel Base Chemicals BV



- Business Unit, headquarter Amersfoort, the Netherlands
- 2,000 employees
- € 800 million sales
- Produces Energy Cogeneration, Bulk Salt, Chlorine-alkali products and derivatives
- Our products play a vital role in a variety of industries and in many day-to-day articles like glass, textile, detergents, paper, plastics, pharmaceuticals and disinfectants.



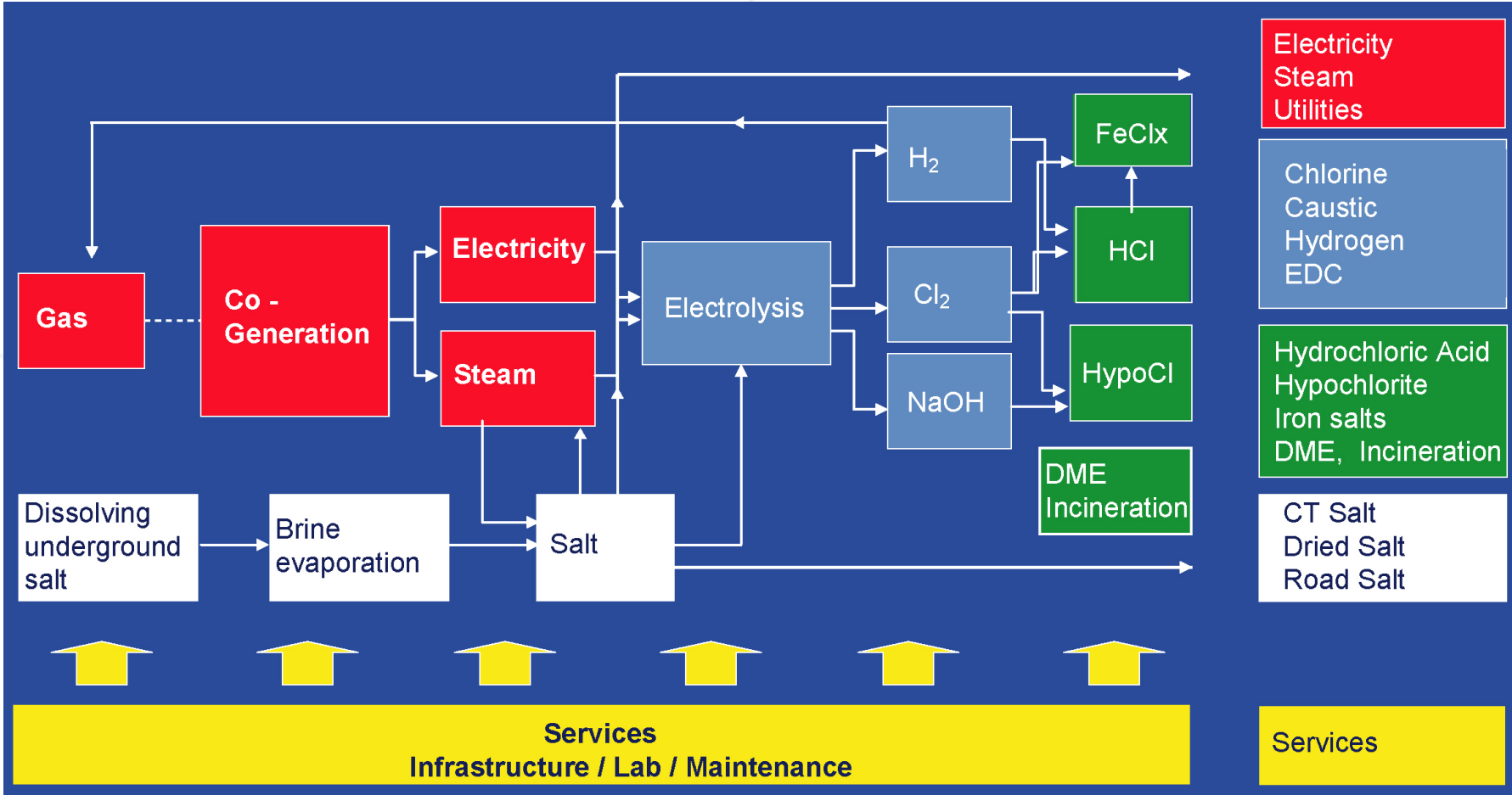
Akzo Nobel Base Chemicals BV

Production sites:

- 3 Energy Cogen
- 3 Bulk Salt
- 5 Chlorine
- 2 Ferro-Chlorine



Production Outline



Introduction – Akzo Nobel

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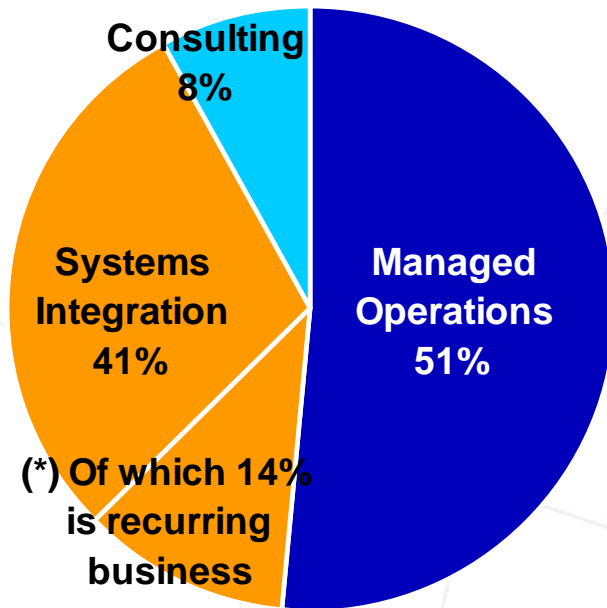


Atos Origin

- A leading IT services company providing business consulting, systems integration and managed operations that improve the effectiveness of its clients' businesses
- 2005 FY revenue € 5.5 bn
- Over 47,000 employees
- Presence in 40 countries
- Industry (Public Sector, Finance, Telecom/Media, Discrete mfg, PILS, Retail)

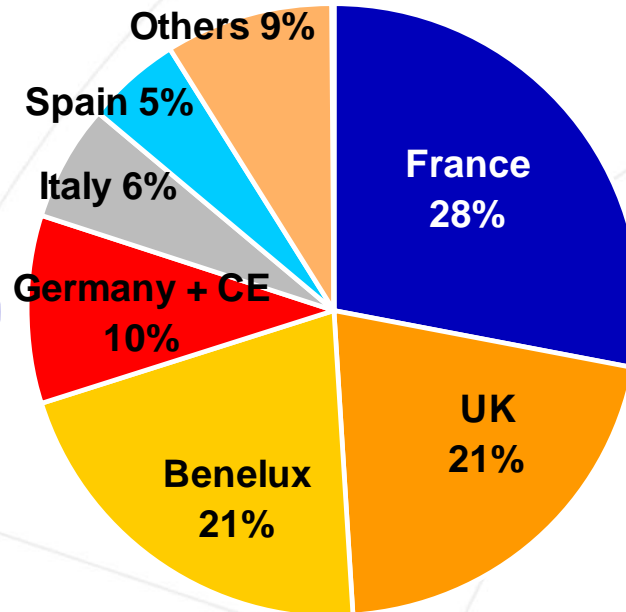
Atos Origin

Business Mix

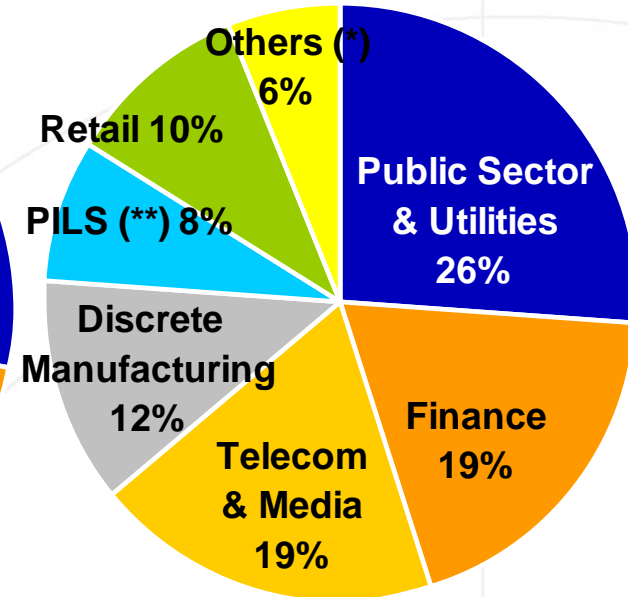


(*) Application Management

Geography



Industry



(*) Including Transport

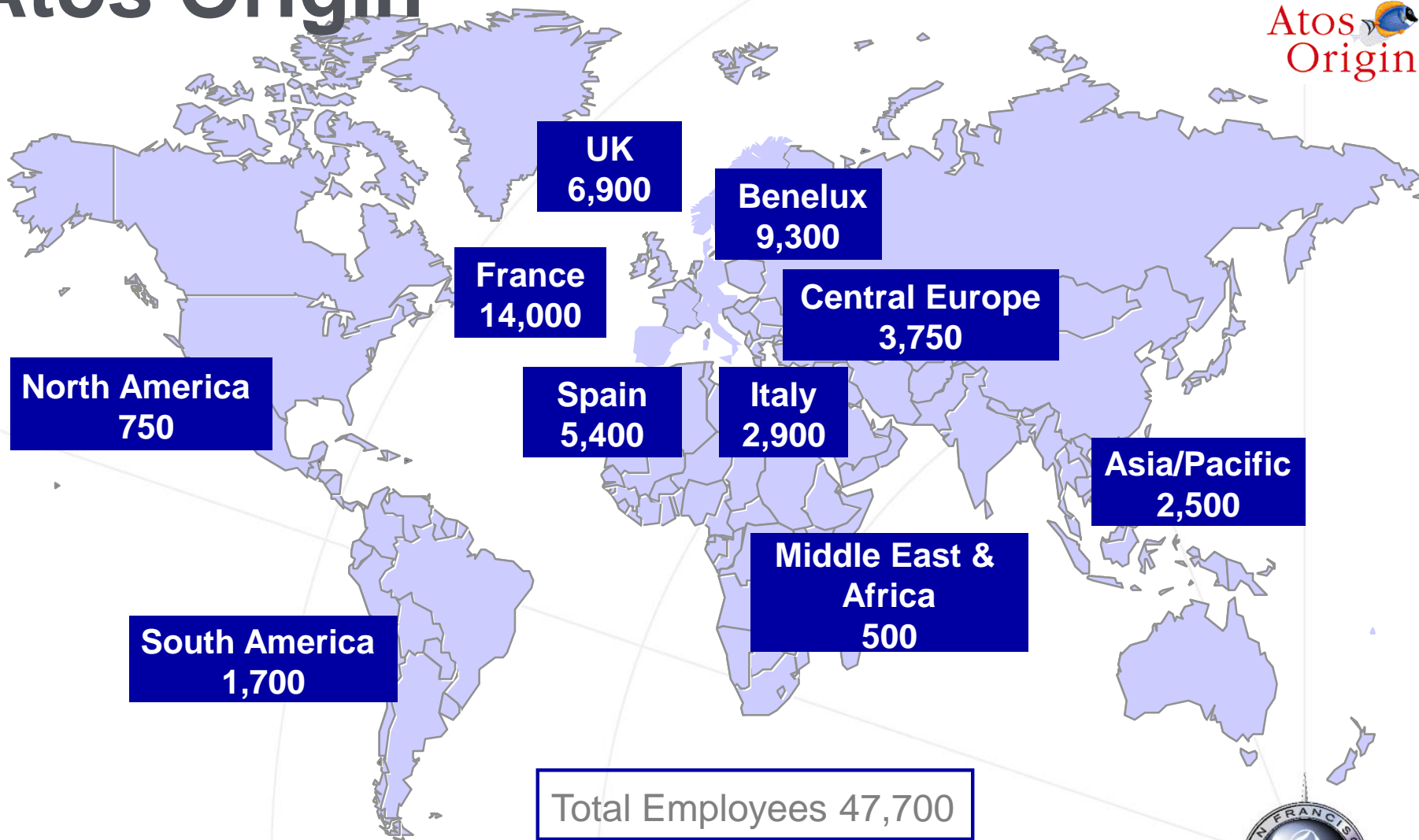
(**) Process Industry & Life Sciences

Introduction – Atos Origin

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Atos Origin



Introduction – Atos Origin

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Business Challenge

- What were our business issues?
- Where did we come from?
- What were our objectives?
- Where do we want to go?

What Were Our Business Issues?

- No harmonized definition of plant data
- Different legacy MES systems or none at all
- No uniformity on Production Accounting
- Manual transfers of production information
- No “bird’s-eye view” on overall performance
- No possibilities for plant benchmarking
- No common “manufacturing language”

Business Challenge – Business Issues

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Where Did We Start From?

ERP

SAP

Navision

2002

MES

Progres

Excel

Excel

DCS

Fox-com

Fox-com

PI3

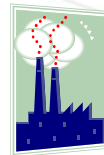
ABB

Emerson

Emerson
DeltaV

Emerson
RS/3

Plant



Chlorine
DZL

Chlorine
HGL

Chlorine
RDM

Chlorine
BIT

Chlorine
IRN

Chlorine
SHL

Netherlands

Germany

Sweden

Business Challenge – Point of departure

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What Were Our Objectives?

- Replace Progres in NL (3 plants)
- Replace Navision in GE (2 plants)
- Harmonize all 6 chlorine plants on plant information level (MES)
- Take into account:
 - 2 old plants will be shutdown within 2 years
 - 1 new plant will be started up within 1,5 years

Why Did We Choose PI?

- Already present at 1 plant
- Used at other plants within Akzo Nobel
- Commercially available standard product
- Proven technology
- Numerous and proven interfacing possibilities
- Lowest TCO of alternatives
- Core business for supplier

Business Challenge – Why PI?

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Surprises During The Project

- Reorganization within Akzo Nobel:
 - 3 BU's (Energy, Salt and BC) were merged
 - Scope became more extensive
- MCA plants of Functional Chemicals want to join the Base Chemicals MES program

New Challenge

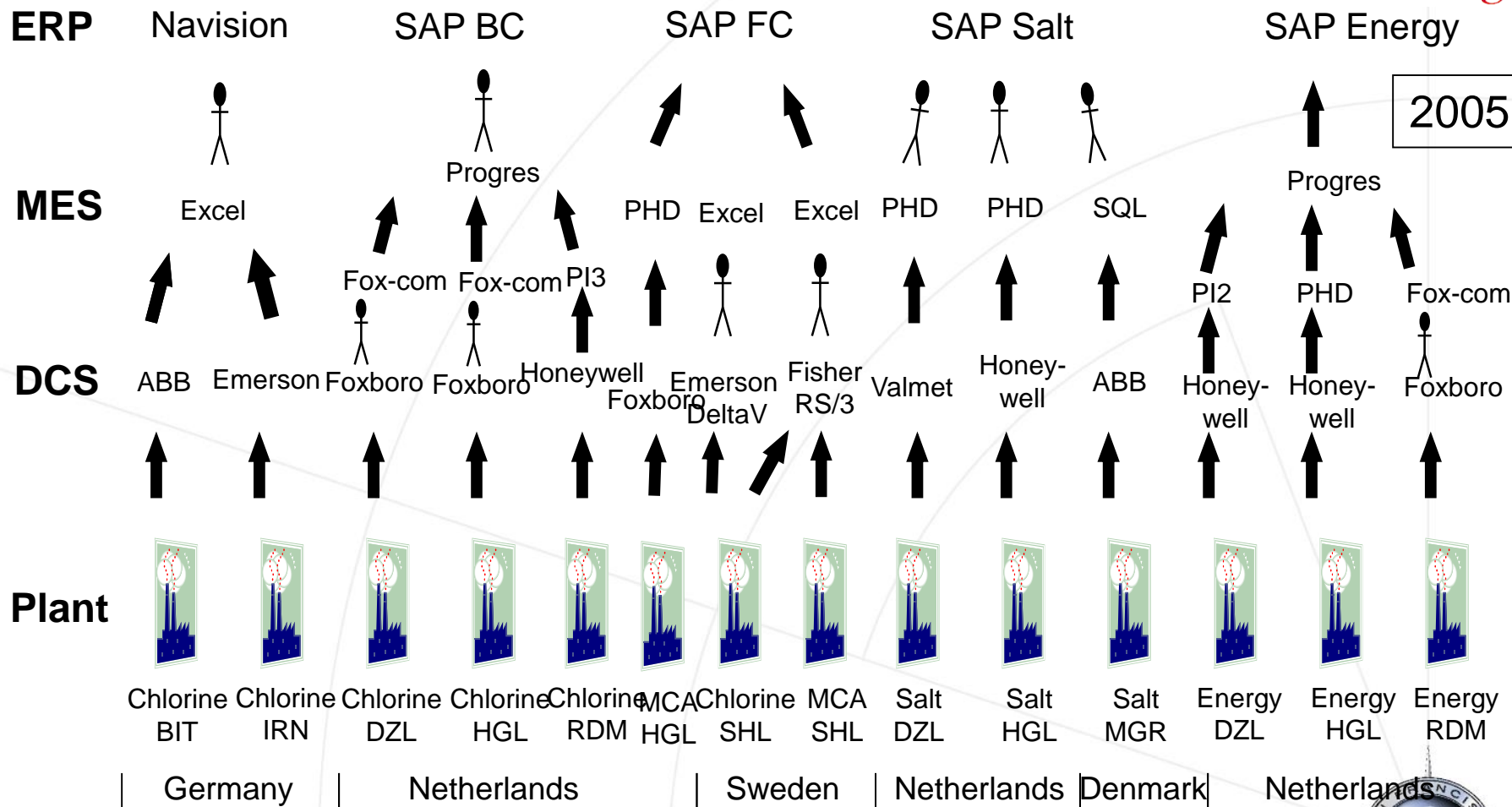
- 3 Bulk Salt plants to add
- 3 Energy Cogeneration plants to add
- 2 MCA plants to add
- 2 additional SAP systems to merge
- 6 additional DCS systems to connect
- > 10 additional third party systems to connect
- 8 additional legacy systems to replace
- 1 additional country to take into account

Business Challenge – New Challenge

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Now Where Are We Starting From?

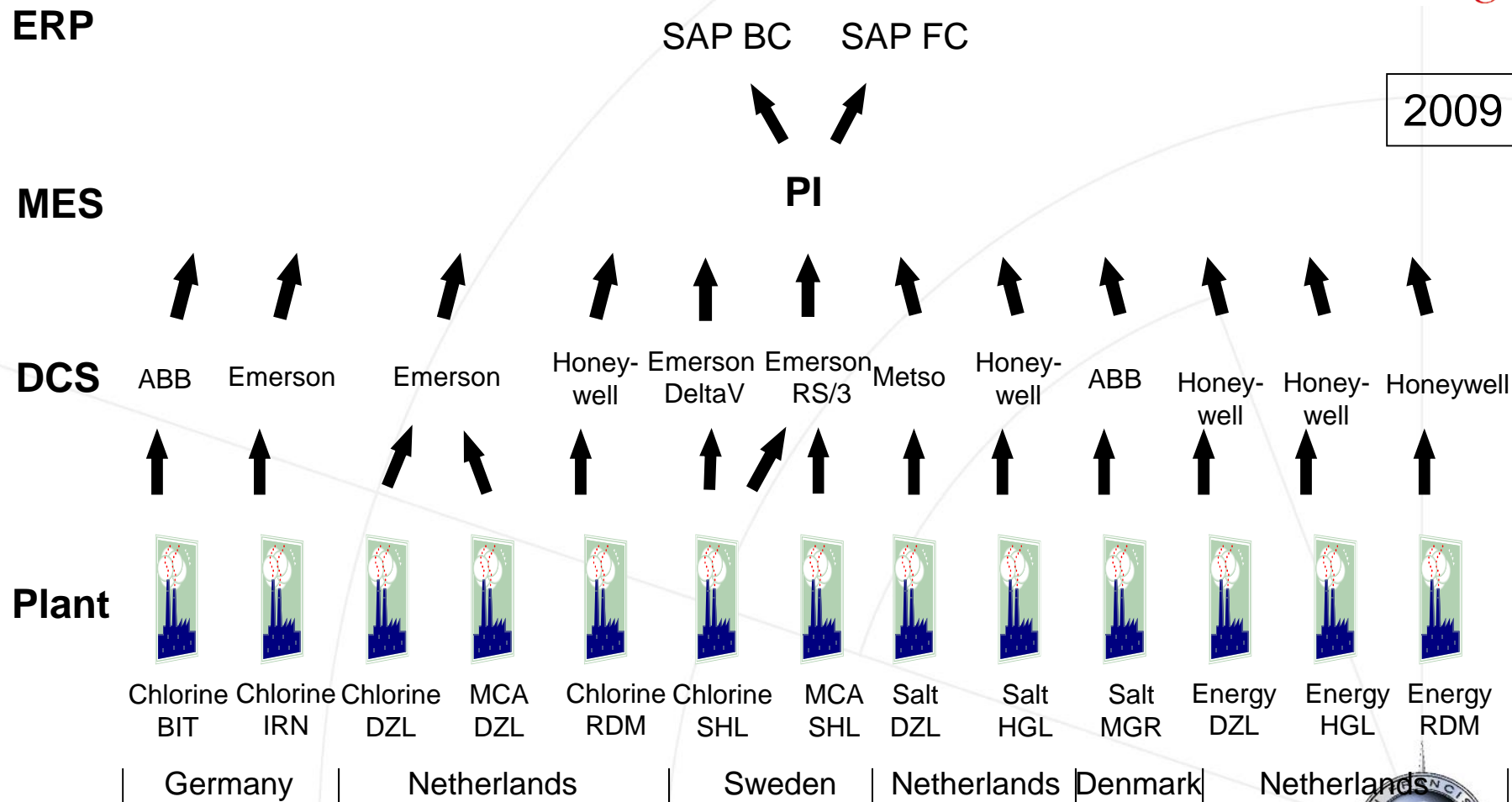


Business Challenge – New point of departure

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Where Do We Want To Go?



2009

Business Challenge – Goal

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Solution

- Central PI Server with high availability
- Local PI Interface Nodes (high availability)
- Local, but uniform, Production Accounting
- Local, but uniform, reporting
- Scripted (WXP) client software (PB, DL)
- As much as possible standard PI software

Issues

- Finding a suitable solution for Production Accounting
- Multiple plants on 1 PI system
- Differences in language and culture
- Availability Akzo Nobel employees for MES projects
- Network load vs. capacity
- Connecting Process Control Layer to office LAN
- Parallel processing can take long
- What is the real truth: the old system or the new one?

Solution – Issues

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Issues

- Finding a suitable solution for Production Accounting

Issues – Finding A Suitable Solution For Production Accounting



- Production Accounting consists of
 - Daily and monthly calculations for:
 - Consumed utilities and raw materials
 - Produced chemicals
 - Delivered chemicals to customers
 - Inventory (tank levels → tonnes of product)
 - Daily and monthly reporting on the above
 - Updating SAP with the above



Issues – Finding A Suitable Solution For Production Accounting



- **PI ACE:**

- Too complex programming for end-users
- Too much work-arounds needed
- Calculation sequence is not automatically managed

- **PI Analysis Framework:**

- Too much configuration needed for this purpose
- Too high TCO for this purpose
- But, still evaluating PI AF benefits for other purposes



Issues – Finding A Suitable Solution For Production Accounting



- Solution: Build something yourself
 - Production Accounting Calculation Engine (PACE)
 - Based on Microsoft tools and OSIsoft PI SDK
 - Formulas stored in local database (MS Access)
 - Using Access as a calculator
 - Calculation results stored in PI Archives
 - Reporting with Excel and DataLink



Issues – Finding A Suitable Solution For Production Accounting



- Benefits:

- Easy management of calculations by end-users
- Automatic management of calculation sequence
- Simple validation of results
- Easy manual changes and additions of data
- Simple possibilities for recalculations
- Free to change functionality
 - (like adding Formula Change Management)



Issues – How Were Other Issues Solved

- Short PB + DL reference manuals in local languages
- Agree upon tag naming convention and stick to it
- Implement PI security on tags and data (proxy)
- Prioritize network traffic for PI and improve band width
- Implement hardware firewalls to connect Process Control Layer to office LAN (but, still a burden)
- Fixed core project team for all rollout projects
- Workload shift from Akzo Nobel to Atos Origin

Solution – Other issues solved

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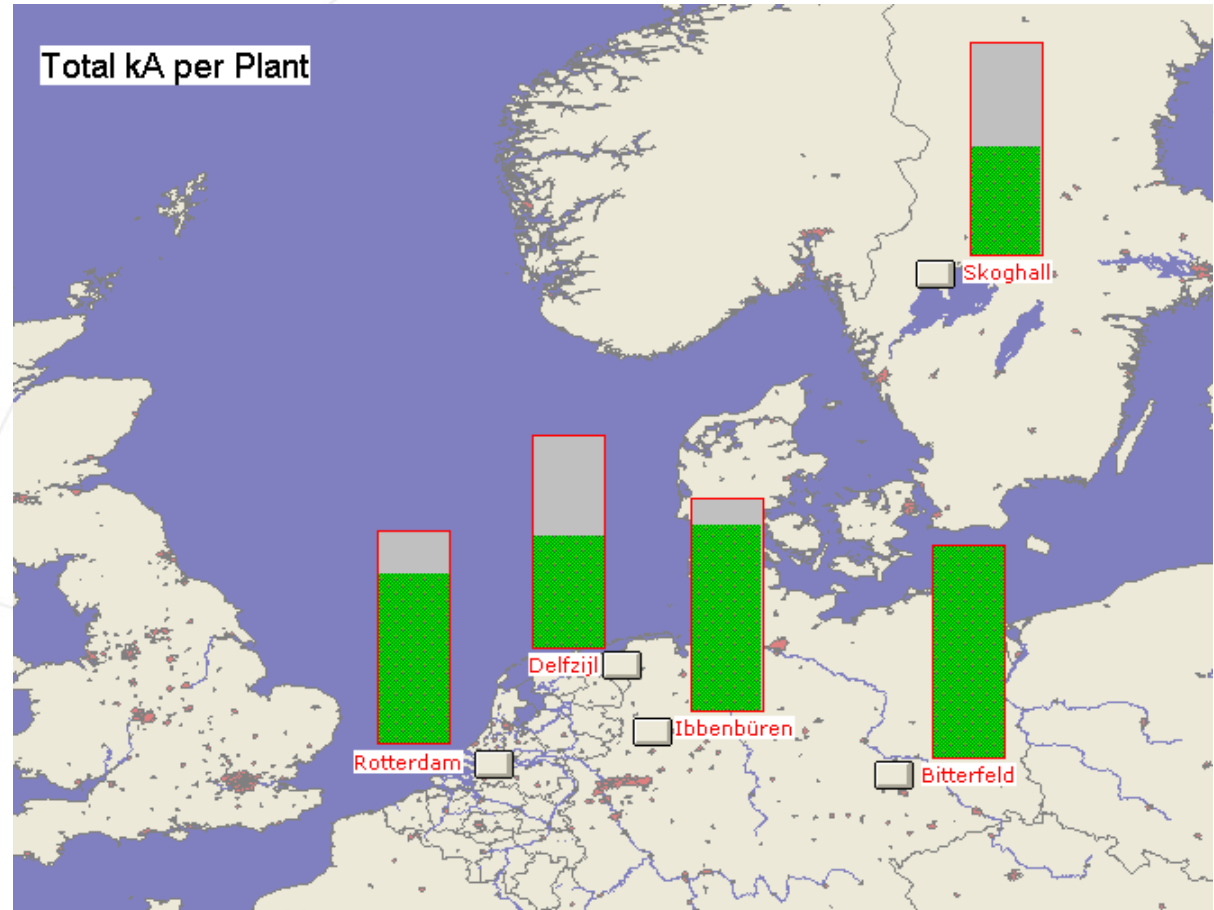


Products Used

- PI server software, including DAP
- PI interfaces: OPC (2), PI-to-PI (4), PHD (2), RNI, DDE, ABB-IMS
- ProcessBook, DataLink, SDK
- Custom build interfaces: File Transfer, legacy systems
- Custom build applications: PACE, Manual Input

Solution – Examples

Overall
performance
overview



Solution – Example

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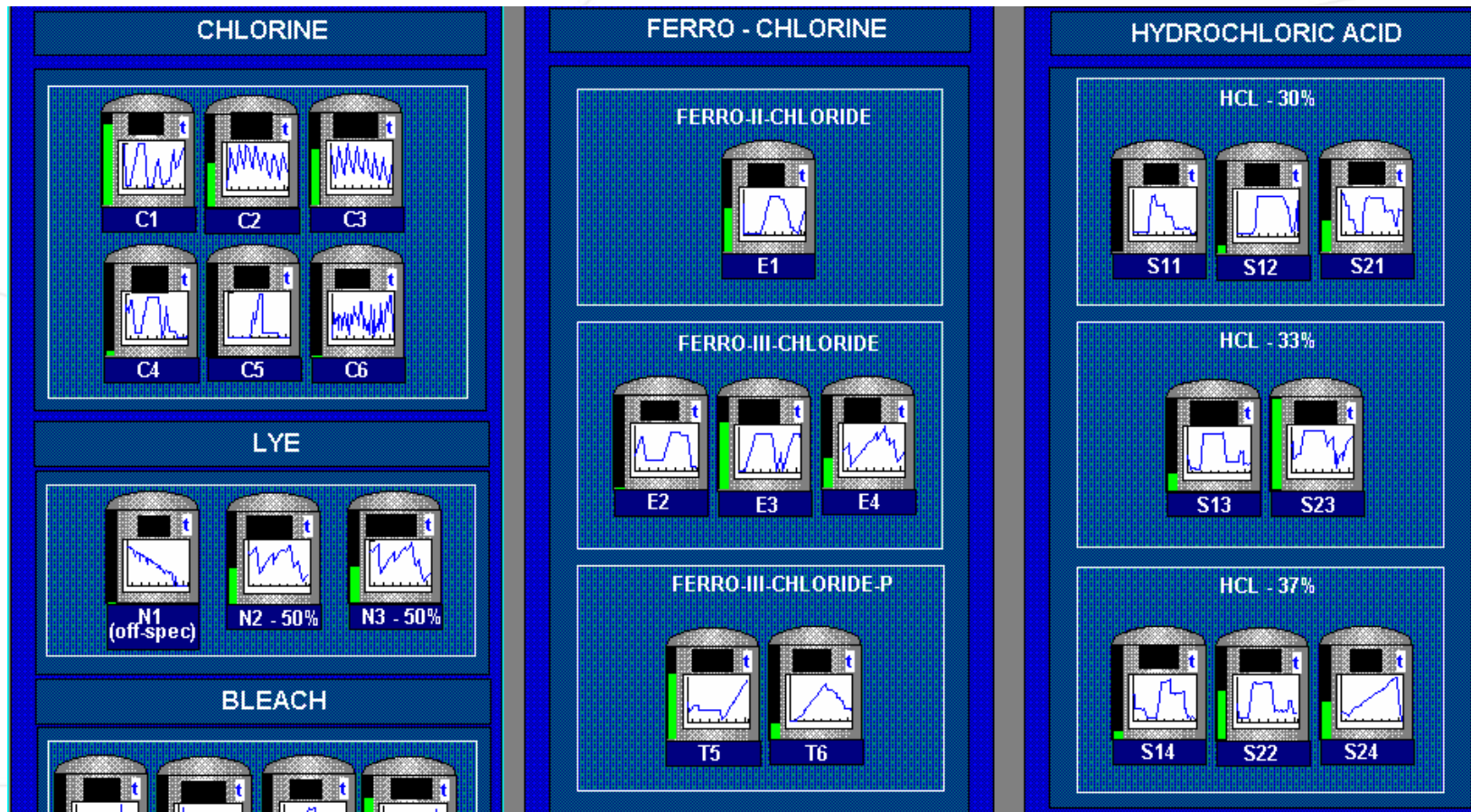
Solution – Examples

- Insights in consumptions, production and




Solution – Examples

- Insights in stocks



Solution – Examples

- Production Accounting, Formulas

Formula	<input type="text" value="BIT-1101"/>	<input type="button" value="Test date ..."/>	Active <input checked="" type="checkbox"/>
Tag	<input type="text" value="BIT-1101"/> 	Frequency	<input type="text" value="Day"/>
Description	<input type="text" value="Gesamtlast Elektrolyse 24 h"/>		
Expression	<input +="" bit-1101a-c1")="" tval("bit-1101b-c1")="" tval("bit-1101c-c1")="" tval("bit-1101d-c1"))"="" type="text" value="(TVAL("/>		
Result	<input type="text"/>	<input type="button" value="Test"/>	<input type="button" value="Close"/>



Solution – Examples

- Production Accounting, Calculation

Diagram illustrating the configuration options for the Production Accounting, Calculation process.

Action

- ☐ Collect
- ☐ Calculate
- ☐ Collect & Calculate
- ☒ Collect, Calculate & Report

Selection Start

Tuesday, March 07, 2006

☐ Collect, calculate or report more than one day

Selection End

Frequency

- ☒ Day
- ☐ Month

Logfile

c:\test.txt

☒ Show logfile after calculation

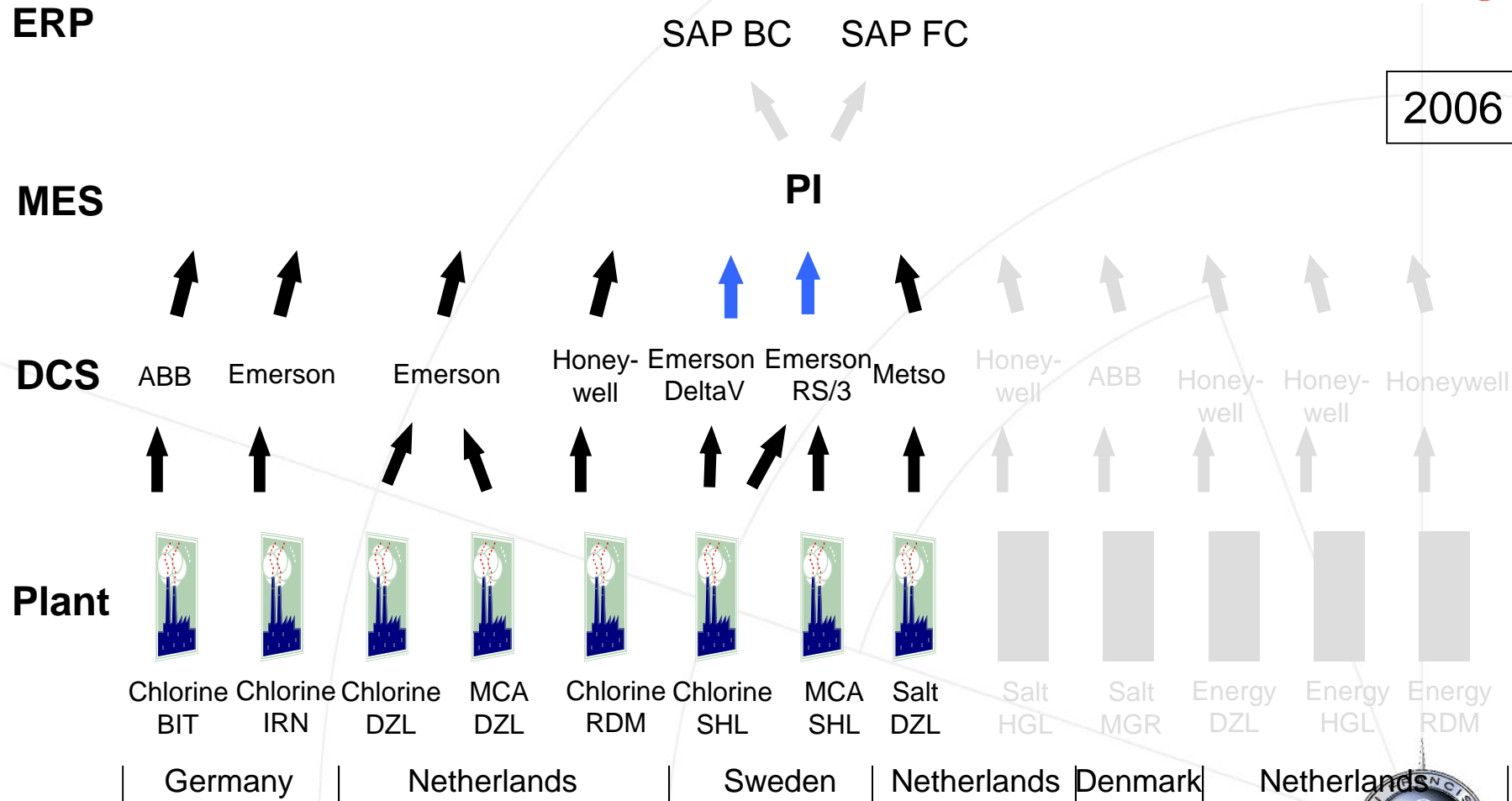
☒ Show results after calculation

Application Mode

- ☒ Production
- ☐ Test

Buttons: Execute, Reports, Browse ..., View Log ..., Apply, Cancel, Close

Where Are We Now?



Business Challenge – Current Status

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Benefits, So Far

- Harmonized definition of plant data
- Uniformity on Production Accounting
- Common “manufacturing language”
- Excellent possibilities for plant benchmarking
- Better view on overall performance
- Better view on consumptions, stocks and deliveries
- Improved Production Planning

Benefits – Current Status

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Opportunities

- First step for improvements is made
- People are experiencing the power of PI
- New possibilities will be discovered

Future Plans

- RtWebParts to make PI data available from every seat at every site
- PI Batch
- PI SQC within ProcessBook
- Investigate feasibility of integrating PI with SAP Plant Maintenance
- Investigate feasibility of other opportunities still to be found

Conclusion

- We have certainly reached **value now**
- We expect to get more **value over time**