



CONFERENCE SESSION ONE



# TEESSIDE GAS CRACKING PROJECT AND GIVING AGED ASSETS A NEW LIFE

John Bruijnooge,  
Site Director, SABIC Teesside Site

June 22, 2016

A decorative graphic consisting of two thick, wavy lines, one blue and one orange, flowing from the bottom left towards the right side of the slide.

CHEMISTRY THAT MATTERS™

## AGENDA

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1. About SABIC and our Teesside Site
2. Teesside Gas Cracking Project: Competitiveness in a Global Commodity Market
3. Asset Life Plans: Dealing with Aged Assets
4. The Future of SABIC on Teesside
5. Questions and Answers

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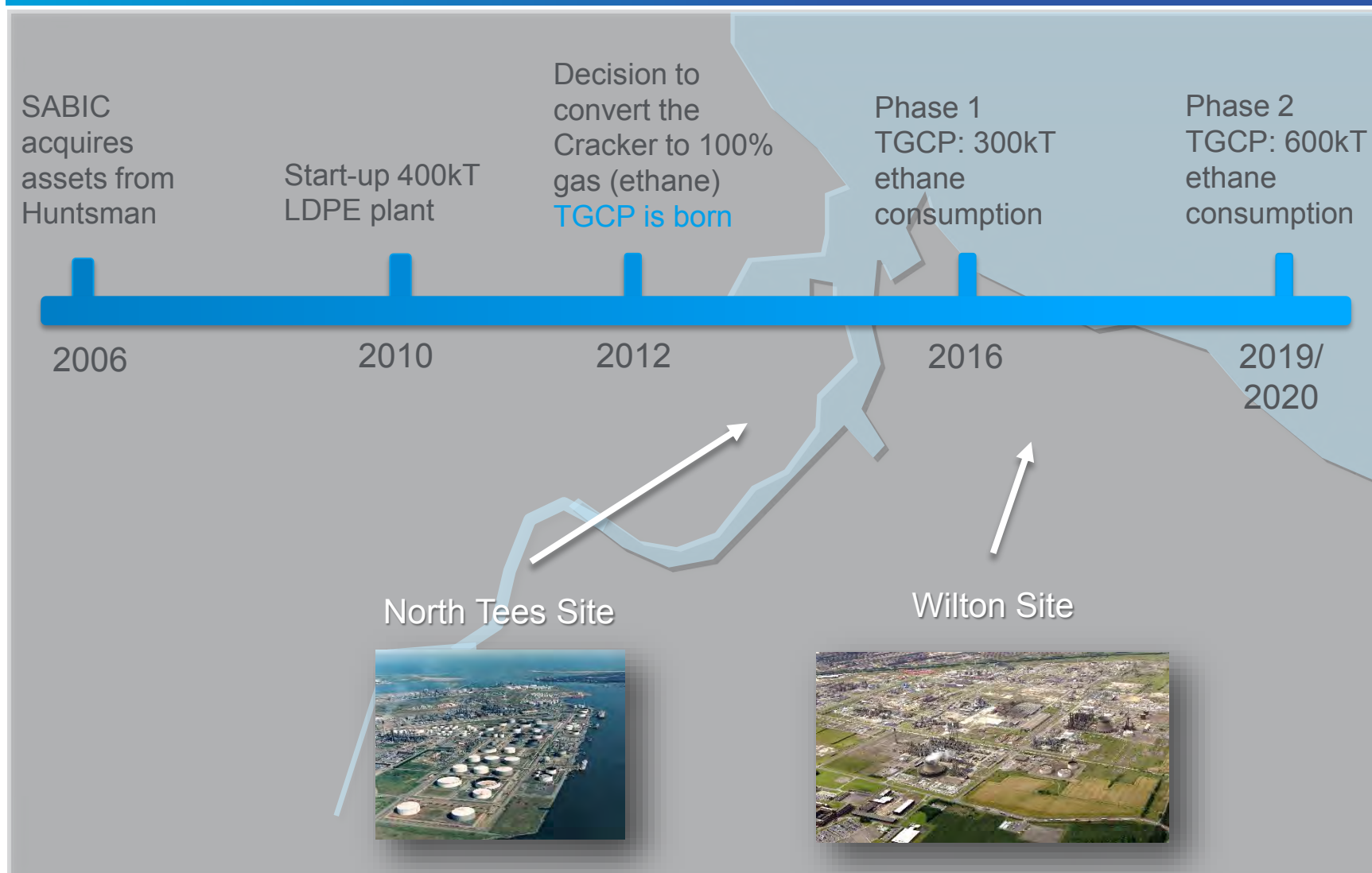
# ABOUT SABIC AND OUR TEESSIDE SITE

## SABIC: SAUDI BASIC INDUSTRIES CORPORATION

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- Established in 1976, aiming to use natural gas emerging at oil wells
- Global leader (top 3-5) in diversified chemicals
- Produces basic chemicals, intermediates, plastics, fertilizers and steel
- Around 40,000 employees
- Operating in more than 50 countries
- Producing in North and South America, Europe, Middle-East and Asia
- Over 10,000 patents and operating eight world-scale R&D facilities
- 2015 Revenue: ~\$40 billion, EBITDA: ~\$12 billion

## TEN YEARS OF SABIC ON TEESSIDE



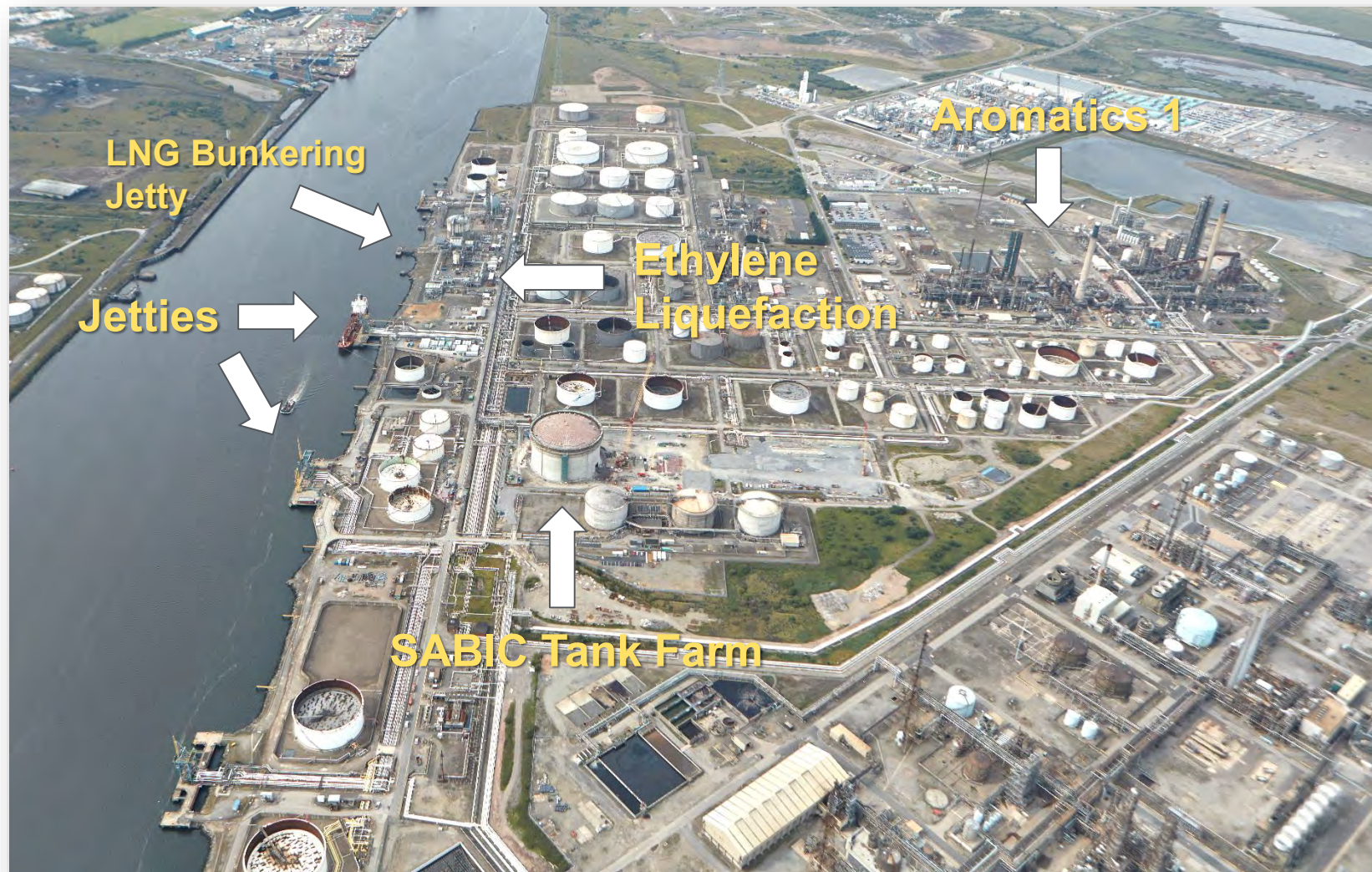


# WILTON SITE OVERVIEW





# NORTH TEES SITE OVERVIEW





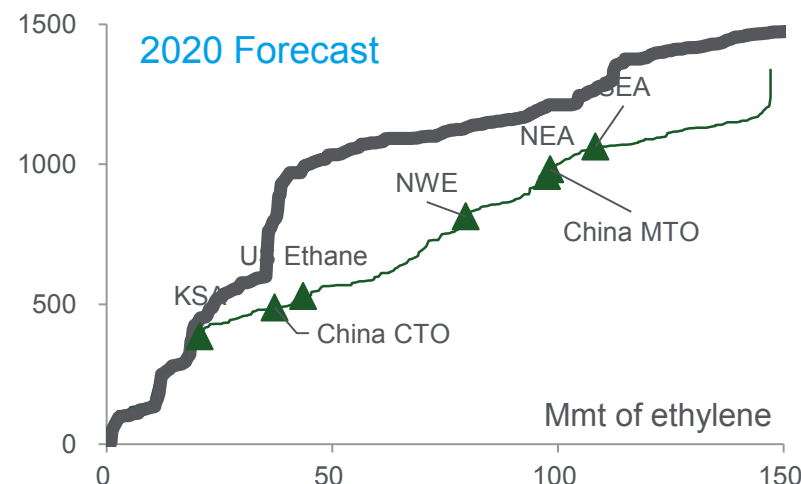
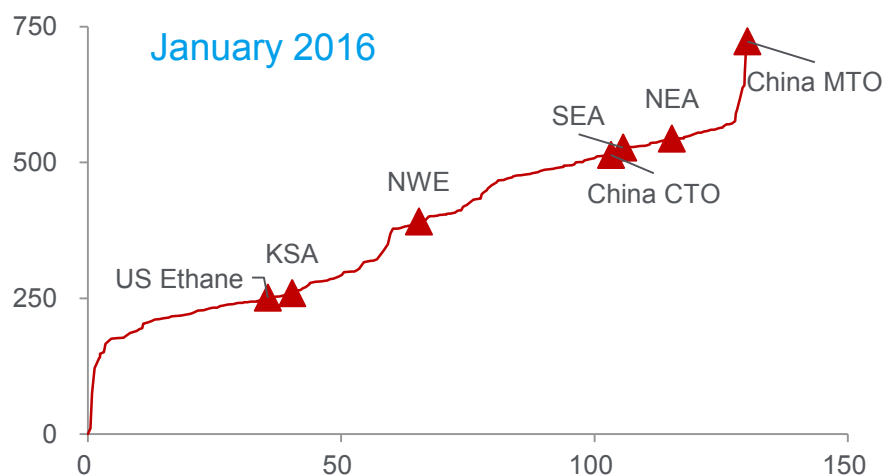
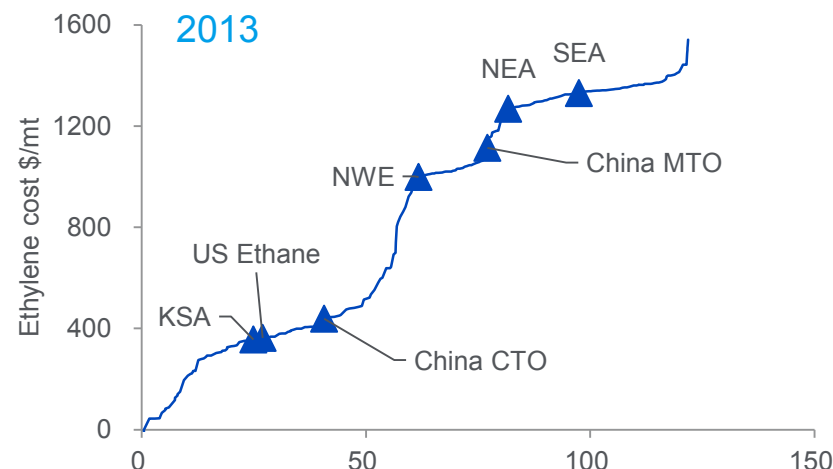
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# THE TEESSIDE GAS CRACKING PROJECT: COMPETITIVENESS IN A GLOBAL COMMODITY MARKET

# ETHYLENE COST CURVES

In the basic chemicals industry, feedstock cost drives competitiveness

- **2013** Lowest cost in Middle-East and US → cheap gas
- **2016** Low oil price: cost curve flattened → oil-based producers can play again
- **2020** Forecast oil price back up, shale gas price not as low anymore



# INTRODUCTION TO THE TEESSIDE GAS CRACKING PROJECT

The Teesside Gas Cracking Project (TGCP) is part of SABIC's wider strategic investment plan. Phase 1 is due for completion at the end of 2016.

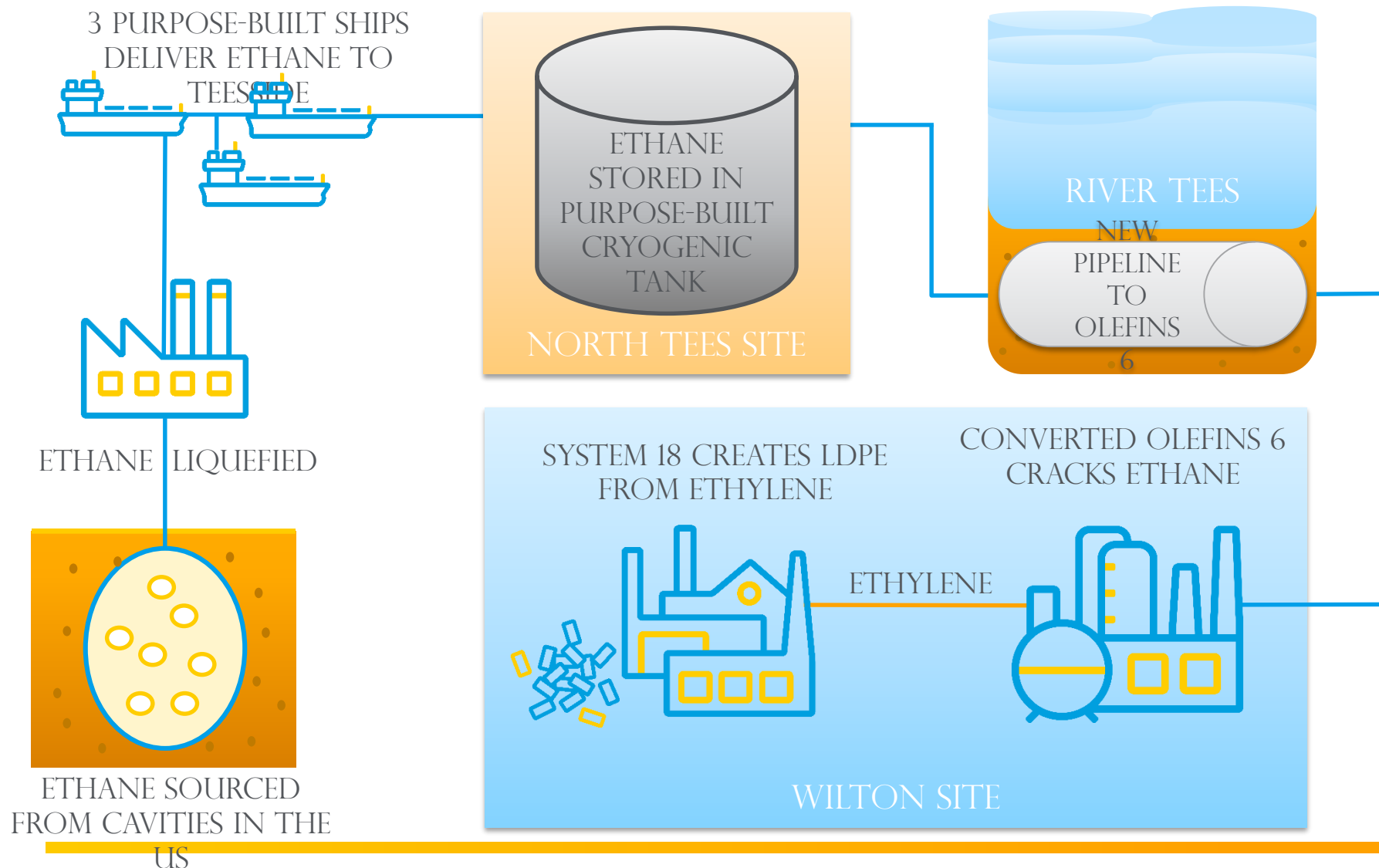
Olefins 6 is already a mixed-feedstock cracker, processing naphtha propane and butane.

TGCP will allow us to switch our primary feedstock to ethane, a cheaper alternative to naphtha, and produce some of the lowest cost-per-tonne ethylene in Europe.





# TEESSIDE GAS CRACKING PROJECT OVERVIEW



# TEESSIDE GAS CRACKING PROJECT: OUTSIDE BATTERY LIMITS

The **Outside Battery Limits (OBL)** scope of the project provides a new ethane import terminal and site utilities, including steam and air.



*New flare stack*



*Ethane tank*



*New boiler*

# TEESSIDE GAS CRACKING PROJECT: INSIDE BATTERY LIMITS

The **Inside Battery Limits (IBL)** scope of the project covers the conversion of Olefins 6, including furnace modification, an ethane support structure and new DCS.



*Ethane structure*



*Olefins 6 furnaces*



*Inside a converted furnace*



3

# ASSET LIFE PLANS: DEALING WITH AGED ASSETS

# DISINVESTMENT AND DEMOLITION



*Olefins 5 Demolition*



*Central Control Disinvestment*



*Redundant pipework*



*Butadiene 2 Demolition*

## ASSET LIFE PLANS: DEALING WITH AGED ASSETS

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- Life-Cycle-Management
  - Asset Life plans → APT tools
  - Fit-for-Purpose assessments
  - Risk-Based Inspection / Risk-Based Maintenance
  - Replace versus Fix and Continue
- System Level Reliability simulations → Monte Carlo Simulations
- Process Reliability Studies
- Redundancy management
  - Whole assets
  - In-between live assets



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# THE FUTURE OF SABIC ON TEESSIDE

## OPTIONS BEYOND GAS CRACKING: INNOVATION

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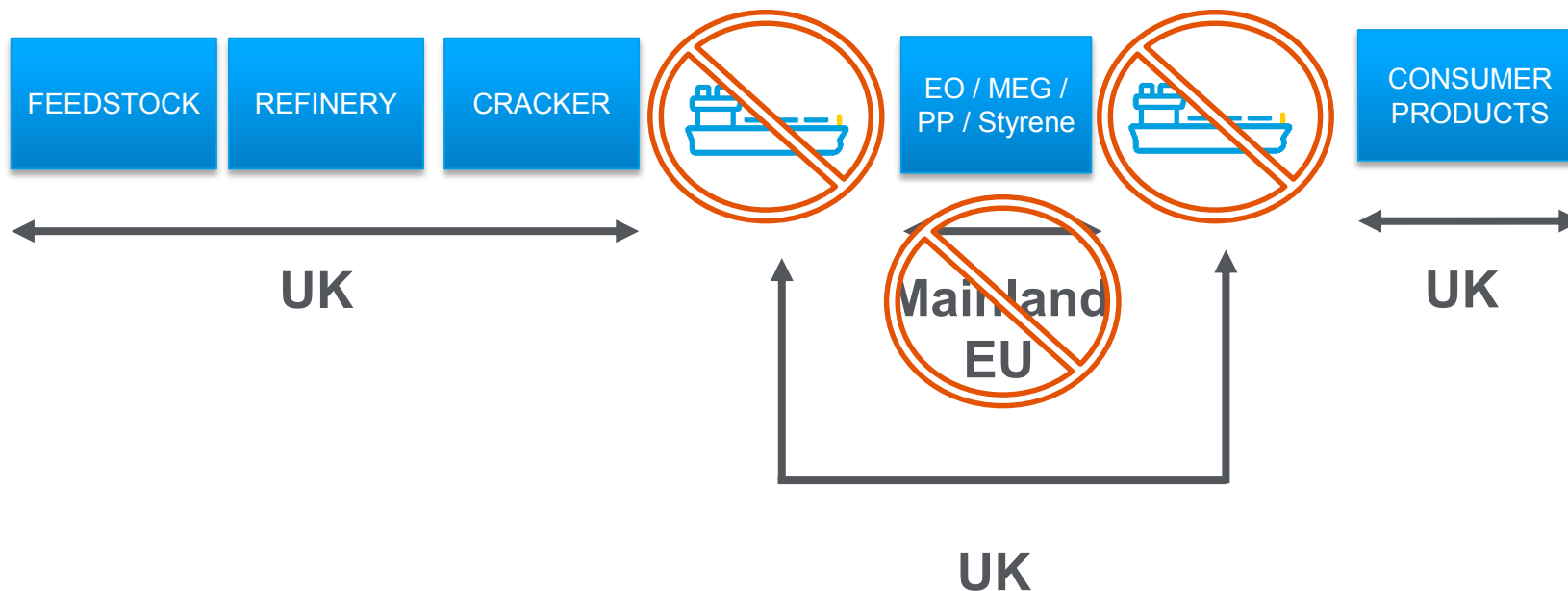
### 1. Underground Coal Gasification → Syngas to Olefins

- Shale gas may become more expensive
- Huge reserves still available in UK
- New technology ready to gasify underground
- Developing routes to move from CO to C2-C3 cheaply and cleanly

### 2. Waste to feedstock

- UK still sends large volume of waste to landfill
- 'Classic' recycling of waste = waste to energy → down-cycle
- Higher value option: waste to feedstock
- Corporate cooperation towards circular economy

## OPTIONS BEYOND GAS CRACKING: VALUE CHAIN REBUILD



- Value Chain optimisation
- Sustainability, Energy efficiency
- Employment, direct and indirect



## QUESTIONS AND ANSWERS

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Thank you!

Any questions?

# Amec Foster Wheeler Our Journey with Sabic

NEPIC Conference 22<sup>nd</sup> June



سابك  
sabic



[amecfw.com](http://amecfw.com)

# Agenda

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- Brief Introduction
- Our journey with Sabic
- Opportunities
- Close – key messages

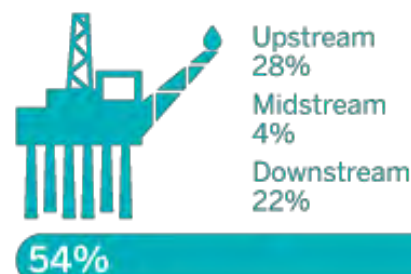


# Who we are

## Amec Foster Wheeler at a glance

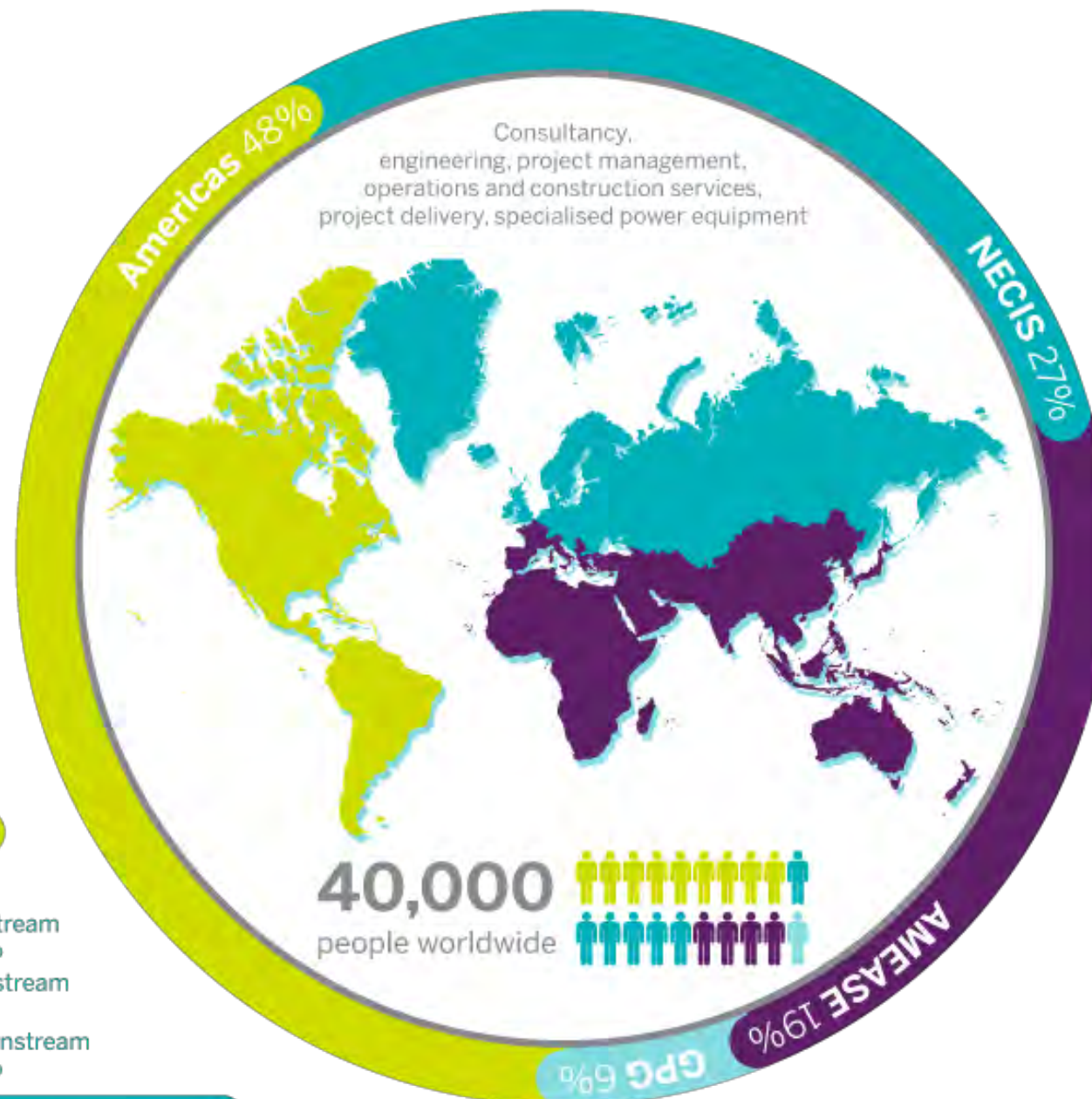
### Market mix by revenue

⚒ Mining, 🌿 Environment & Infrastructure,  
💡 Clean Energy, 🛢 Oil & Gas



### Business units

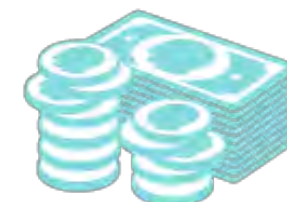
Americas, Northern Europe & CIS (NECIS),  
Asia, Middle East, Africa & Southern Europe (AMEASE),  
Global Power Group (GPG)



160+  
year history



Operating in over  
55 countries



Revenue  
£5.5bn




Trading symbol



# Who we are

## Our vision

- ▶ We have a clear vision which encompasses our ambitions for the future



“Our vision is to be the most trusted partner for our customers by consistently delivering excellence – bringing together the knowledge, expertise and skills of our people from across our global network.”

**Jonathan Lewis**  
Chief Executive Officer

# How we do it

## Our values and behaviours



# BEYOND ZERO





# Local Delivery

## Our history on Teesside

amec 1954



FW 1967



2014

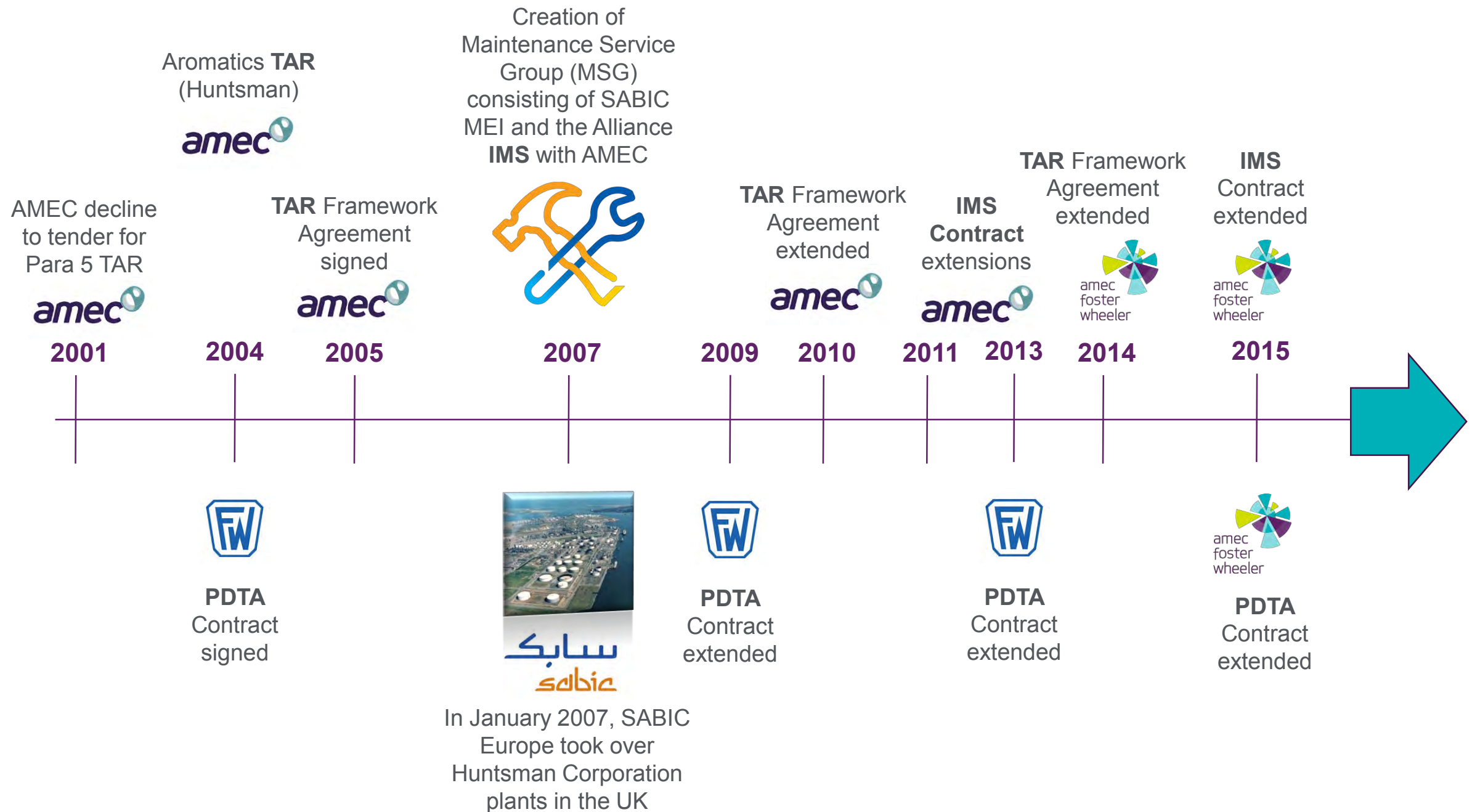


2015



# Local Delivery

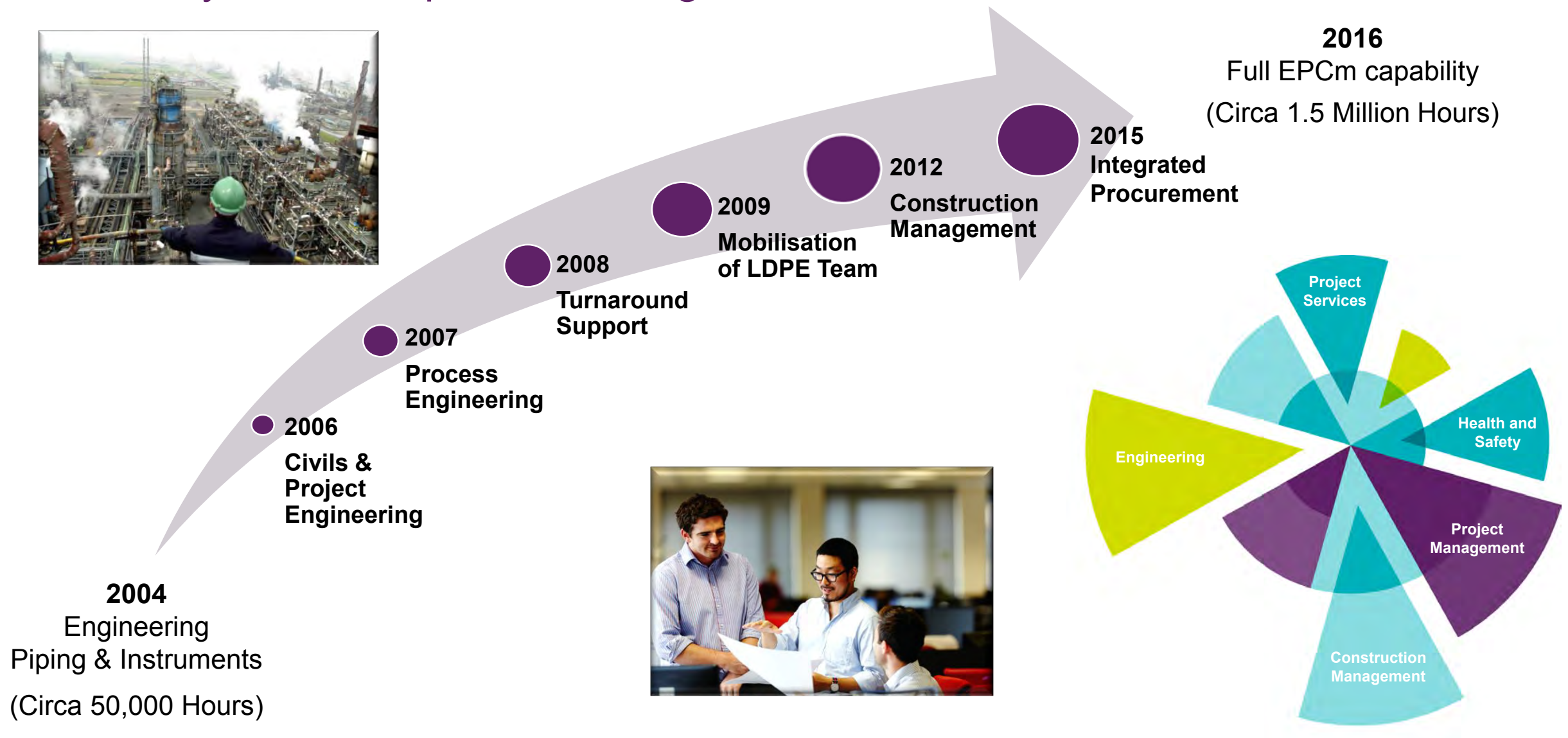
## Our history on Teesside



# The Journey with Sabic

## PDTA evolution...

Year on year development to bring added value to SABIC



Annual continuous improvement to meet the SABIC Evolution Strategy



# The Journey with Sabic

## IMS evolution...

Year on year development to bring added value to SABIC



**2007**  
IMS  
Contract  
signed

**2007**  
Maintenance  
& Minor  
Project  
Delivery

**2008**  
Critical  
Event  
Management

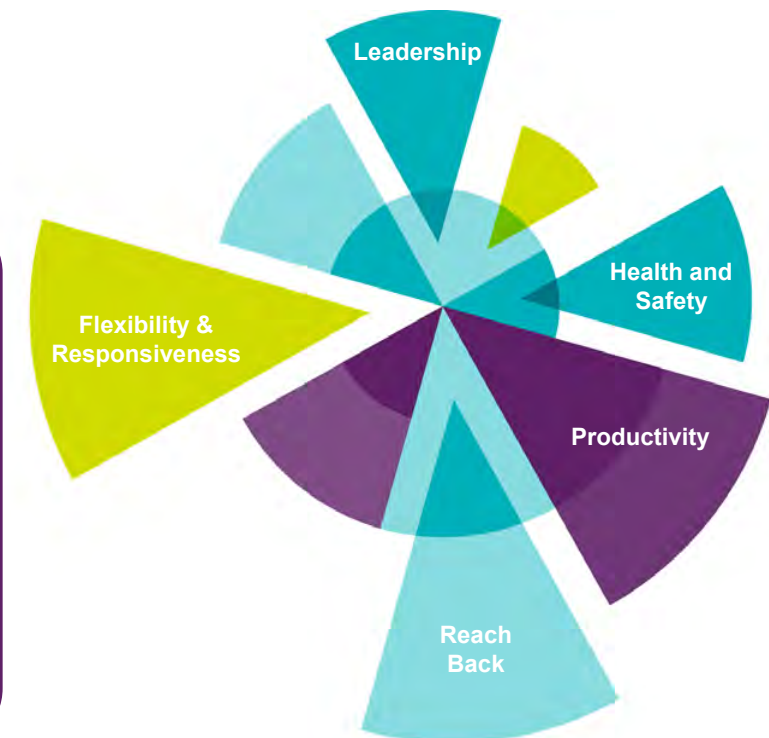
**2009**  
Mobilise  
LDPE  
Team

**2009**  
Mobilise  
Remediation  
Team

**2015**  
Facilities  
Management

**2016**  
Triage Project  
Delivery

- ▶ 2015 SABIC Europe Contractor EHSS Award – Gold
- ▶ 2014 SABIC Europe Contractor EHSS Award – Gold
- ▶ 2014 SABIC EHSS Global Award – Silver
- ▶ 2013 SABIC Europe Contractor EHSS Award - Silver
- ▶ 2012 SABIC Europe Contractor EHSS Award – Bronze
- ▶ 2010 SABIC EHSS Global Award - Gold
- ▶ 2009 SABIC Certificate of Commendation
- ▶ 2008 SABIC EHSS Global Award – Silver
- ▶ 2008 SABIC Europe Contractor EHSS Award - Bronze



Annual continuous improvement to meet the SABIC Evolution Strategy



## Annual continuous improvement to meet the SABIC Evolution Strategy

# Opportunities...

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Approved Vendor / Approved Sub-Contractor process...

- Questionnaires (HSEQ / QA)
- Code of Business Conduct
- Standard rules
- Terms and conditions

Contact : [amy.clay@amecfw.com](mailto:amy.clay@amecfw.com)



# Close – key messages

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- Amec Foster Wheeler has over 60 years experience of working on Teesside
- Our greatest success stories come from long term relationships with key clients
- Success is built on trust
- Listen
- Continuous improvement – investment
- Teesside has “*an exciting future*”

*“There are those who never stretch out the hand for fear it will be bitten. But those who never stretch out the hand will never feel it clasped in friendship”*

*Rt Hon the Lord Heseltine of Thenford CH*

- Collaboration trumps competition every time







amec  
foster  
wheeler

[amecfw.com](http://amecfw.com)



connected excellence in all we do



# NORTECH

Integrated Engineering Solutions



**ZERO to \$1m sales in 12 months**  
**DIVERSIFICATION SUCCESS**

22<sup>nd</sup> June 2016



What is this presentation about?

**Giving solid practical advice to help  
attendee delegates & member companies  
increase sales and diversify into new  
sectors.**



Steve Pugh  
Group Business Development Manager  
[Steven.Pugh@nortech-group.com](mailto:Steven.Pugh@nortech-group.com)  
Tel: 01740665457      Mob: 07518492982



- Our business is built on adding value.
- Within the next 15 minutes, how can I best add value to your business?

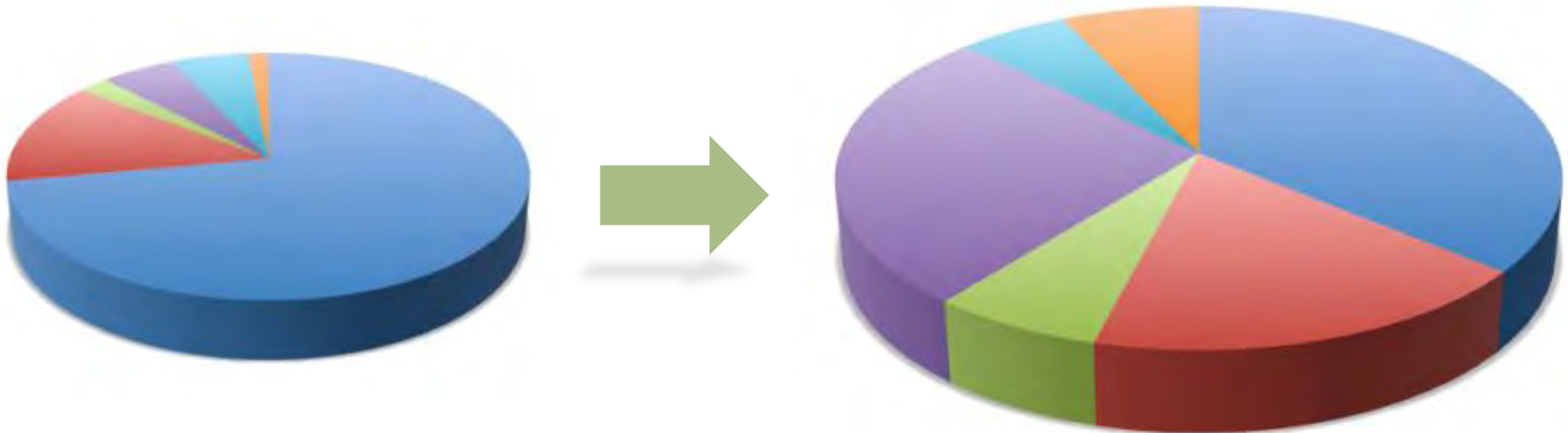


**“Selling is simply the effective communication of an idea.”**

# Why Diversify?

## Business Strategy

- Spread turnover (reduce risk)
- Increase number of clients and sectors
- Increase geographic split
- Growth
- Survival?





**Case Study**

**ZERO to \$1m sales  
in 12 months:**

**DIVERSIFICATION SUCCESS**



# Nortech: Who are we?

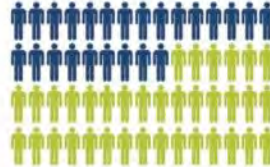
# NORTECH



One of the UK's fastest growing engineering service providers.



Independent SME.  
Flexible, responsive, efficient. Strong Values.



We pride ourselves on experience, capability and trust.



Quality of Service, Quality of Delivery  
ISO 9001, ISO 14001  
OHSAS 18001, ISO 29001



Multi Award  
Winning Business



International Business  
Multiple Office Locations



Boutique  
EPC

Engineering, Procurement and Construction (Onshore & Offshore).  
Full Multi-discipline Service Offering



Flexible and Professional  
Management & Consultancy  
Services

Sectors: Oil and Gas, Chemicals, Petrochemicals, Utilities, Energy, Infrastructure, Marine, Rail, Decommissioning, Iron & Steel.



Industry  
Leading  
Search &  
Selection  
Division.

Nortech Staffing Solutions.

92%  
FPAL Rating

\*Independent assessment of quality and service.



Financially Secure.  
No debt. Privately Owned.

5%

Nortech are members of the 5% club, investing in the next generation of engineers and young people in the UK.

[www.5percentclub.org.uk](http://www.5percentclub.org.uk)



NORTECH  
*Cares*

Our CSR programme supporting the local community

ZERO  
ACCIDENTS

Continued commitment to Health and Safety (HSE) across all projects.

# Sectors



**Oil and Gas**



**Chemicals / Petrochemicals**



**Nuclear**



**Waste to Energy**



**Renewables**



**Major Build Projects**



**Subsea**



**Rail**



**Superyachts**



**Biomass**



**Infrastructure**



**Iron & Steel**



# Selection of Clients:



# Office Locations

**NORTECH**



Riverside Drive, Aberdeen



5th Floor, Riverside House, Riverside Drive,  
Aberdeen AB11 7LH Tel: 0044 (0)1740 665 451

Wynyard Park, Teesside



Evolution 6B, Wynyard Park, Wynyard Ave,  
Stockton-on-Tees, Billingham TS22 5TB, UK  
Tel: 0044 (0)1740 644 283

Dhabi Nortech, Abu Dhabi



Dhabi Nortech, Sh. Hamdan Street, Dhabi Tower, 2nd Floor  
Suite No. 201 & 202, PO Box No. 34801, Abu Dhabi. UAE  
Tel : (971-2) 627 4733

Mumbai, India



Detailed Design Office Tel: 0044 (0)1740 644 283



# Video – UKTI visit to UAE

NORTECH



## Exciting New Partnership

- Two Strong, Trustworthy, Successful Companies partnering to support Abu Dhabi's future success.



NORTECH



H.H. Sheikh Nahayan Mabarak Al Nahayan

H.E. Sheikh Mohammed Nahayan Mabarak Al Nahayan

## Case Study

# What are we selling?



# Springboard for the Region.

**NORTECH**



# Lessons Learned?



- Including 10 Top Tips to help your company!

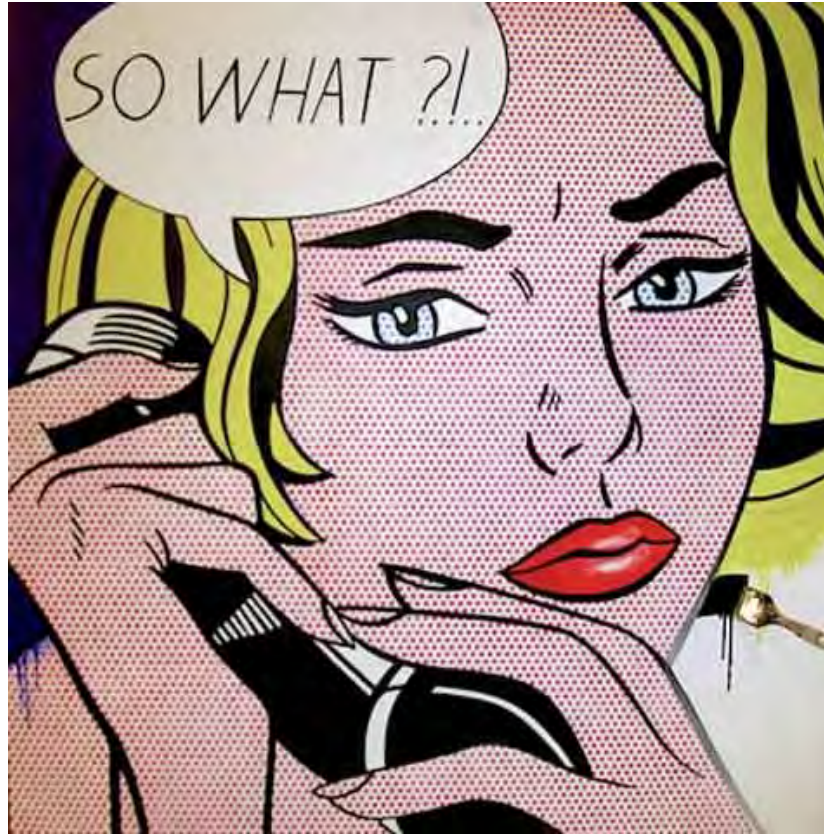


# Expect Challenges



- There will be a huge wall, but there is a way through.

# Hard Lesson #1



- You need to be able to pass the “So What?” test
- Our company sells engineering design...

# Address the elephant in the room.

**NORTECH**



- If you ignore it, it will kill you. Embrace it!
- You need to overcome the emotional barriers in the buyer.



# An example?

**NORTECH**

## Sharing Best Practice

At Nortech we appreciate the art of listening. Listening is the only way for us to remain the best in our field, continually reacting to what the market needs, however we also like to share.

Sharing best practice across all of our sectors and geographic markets better supports our clients in the challenges they face and also helps us predict what might happen next, adding value.

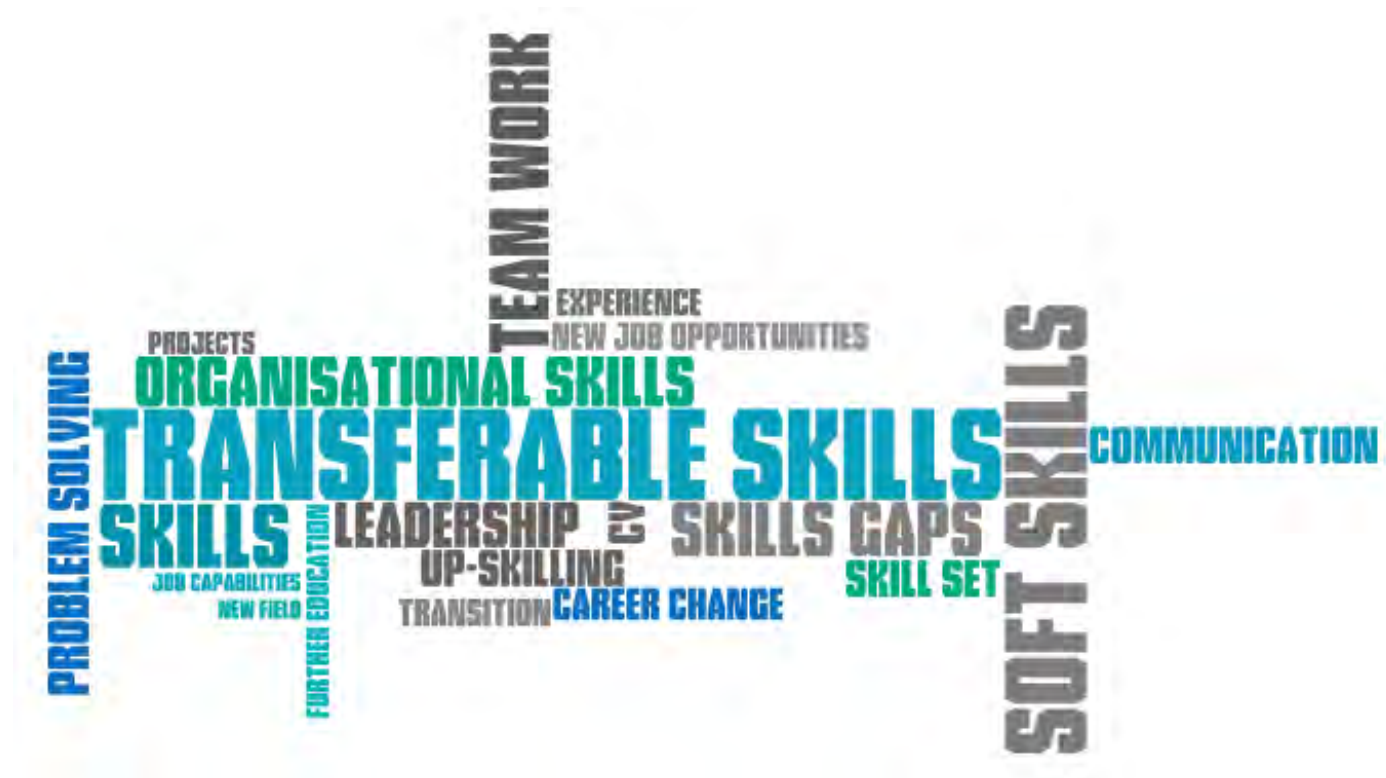
[www.nortech-group.com](http://www.nortech-group.com)

Artwork: Janet Echelman (<http://www.echelman.com>)

**NORTECH**  
Integrated Engineering Solutions

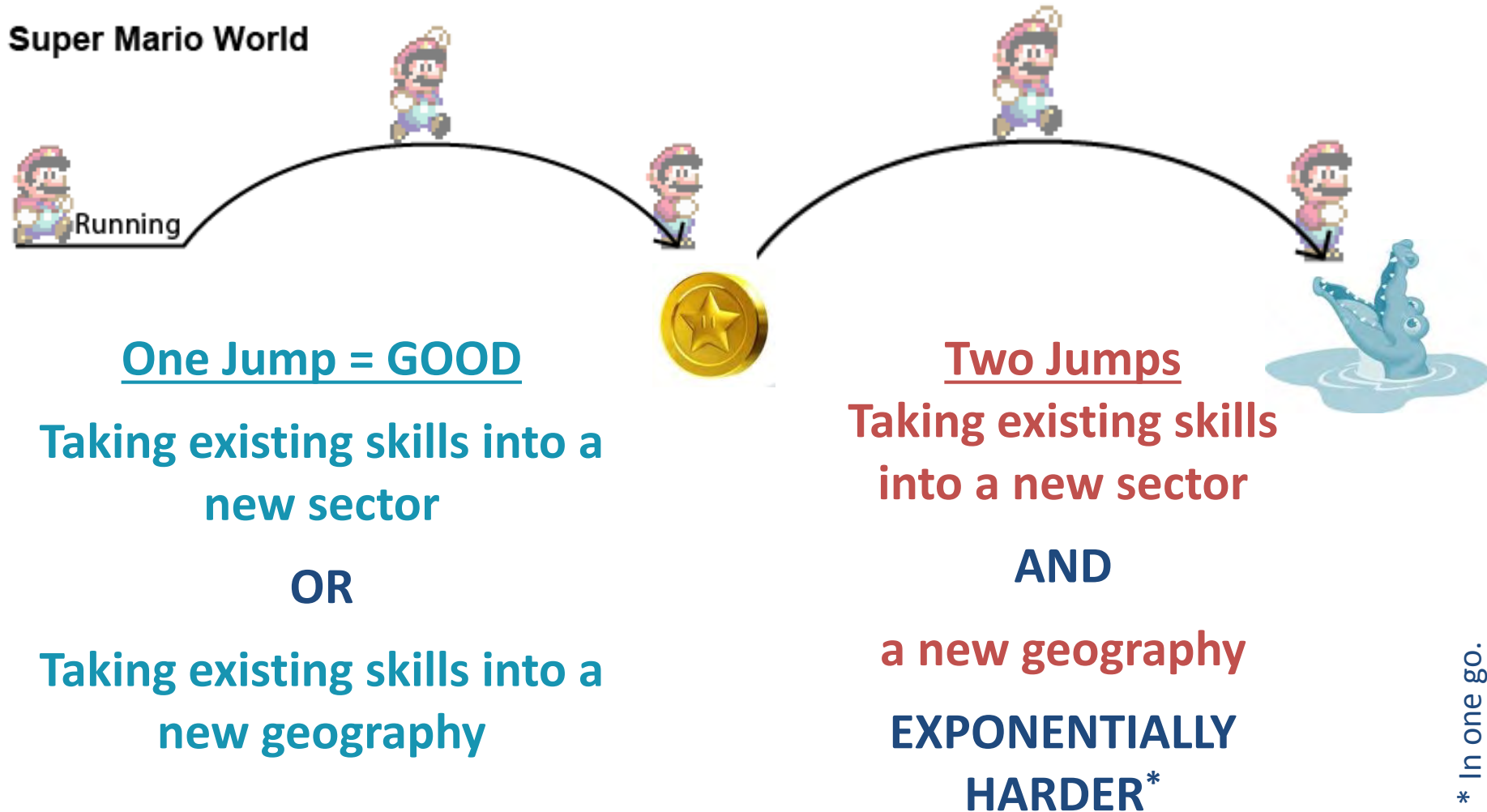


# Transferable Skills / Products?



- Which other sectors require your skills (or products)?
- Project Management – Petrochem to Mining to Super Yachts

# One Jump or Two?



# The Importance of Networks & Partnerships



- More than ever you need to be flexible
- Your next project might come through an unexpected route
- Huge value in being part of NEPIC

# Share your Visions & Values



- Do the right thing in the community
- Corporate Social Responsibility (CSR)
- STEM + support for schools and colleges
- £32,000 raised so far



# Have a Passion for Safety



**ZERO  
ACCIDENTS**

**Continued commitment to  
Health and Safety (HSE)  
across all projects.**

## Shared Visions and Values:

- No Harm
- Protect the Environment
- Use material and energy efficiently
- Contribute to the Societies we operate
- Promote Best Practice
- HSSE and Quality – Top Priority
- Promote ethical business behaviour

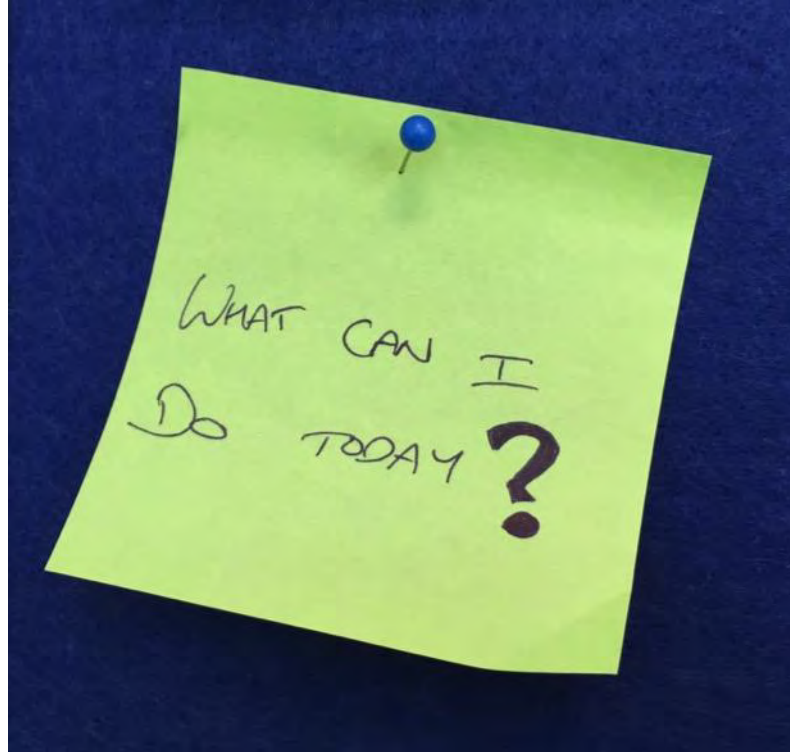
# Quality Shines Through in Any Sector!



ISO 9001: 2008  
ISO 14001: 2004  
OSHAS 18001: 2007  
ISO 29001: 2010

Quality Management System  
Environmental Management System  
Occupational Health and Safety  
Oil, Gas and Petrochemical Quality Management System

# Inshallah?

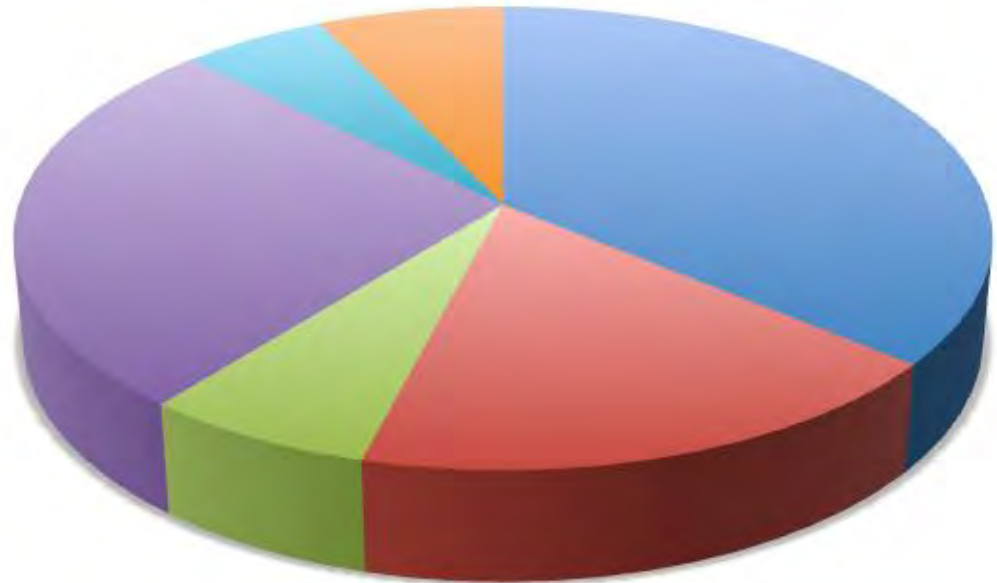


- Procrastination will kill you.
- Indecision will kill you.

# The future for us?

## Business Strategy

- Increase client turnover (UK and Overseas)
- Increase number of clients
- Increase number of sectors
- Increase geographic split
- Growth!





**Engineering.  
People.  
Support.**

**One Group  
One Vision  
One Integrated Service**

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PROCESS &  
CLEANROOM  
TECHNOLOGY

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tel: 44 (0)191 460 9295

## Bridging the Gap between Research & Commercialization



PROCESS &  
CLEANROOM  
TECHNOLOGY



# Introduction to WHP



- Privately-owned UK-based company with £20m + turnover
- More than 30 years experience in designing and building facilities in the UK and overseas
- Successful projects completed in:
  - Biotechnology
  - Pharmaceutical
  - Healthcare
  - Food & Beverage
  - Industrial Containment
  - Various industrial products





# Some of our Clients



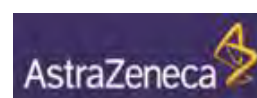
Design and construction of a new multipurpose biological API cGMP production facility with associated support laboratories, complete with cGMP warehousing.



Design and construction of a Japanese Encephalitis vaccine facility, designed and constructed as a turn key project



Specials manufacturing facility designed with ISO class 7 Cleanrooms c/w Analytical, microbiology and chemistry laboratories



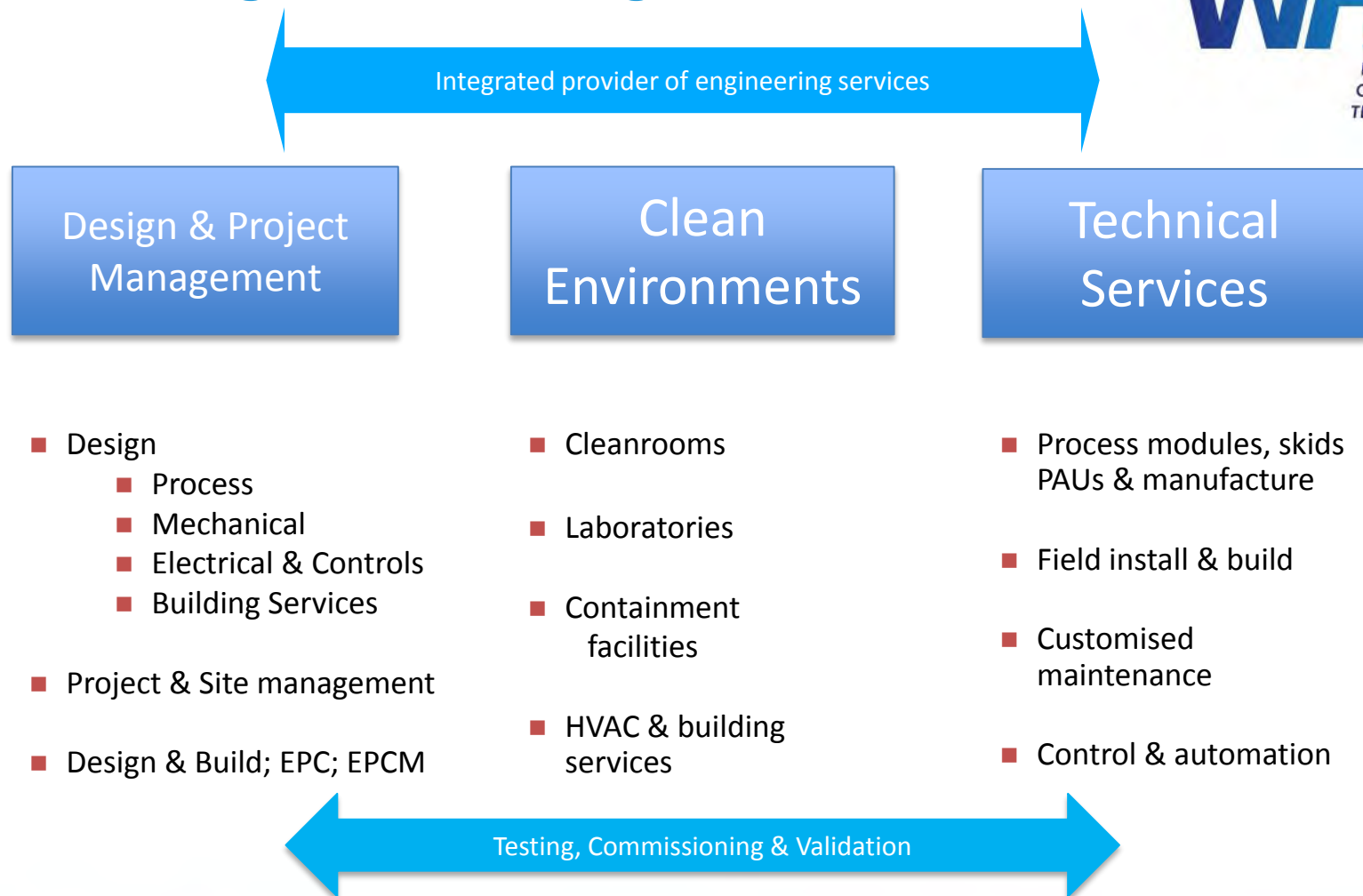


# Experience influences our operations

- In the 1980's WHP with GRC Consultants attempted to establish a fully integrated service to the clean industries
- The opportunity presented itself in 2009 to integrate the process plant capability of WHP with Bassaire North East 's clean room capability
- This enabled WHP to offer a completely integrated service which did not depend on external design or management to deliver complete plant in the sectors in which it works
- This capability is often most valued by research and development companies that neither have the resources or the experience to manage the design and build of integrated facilities



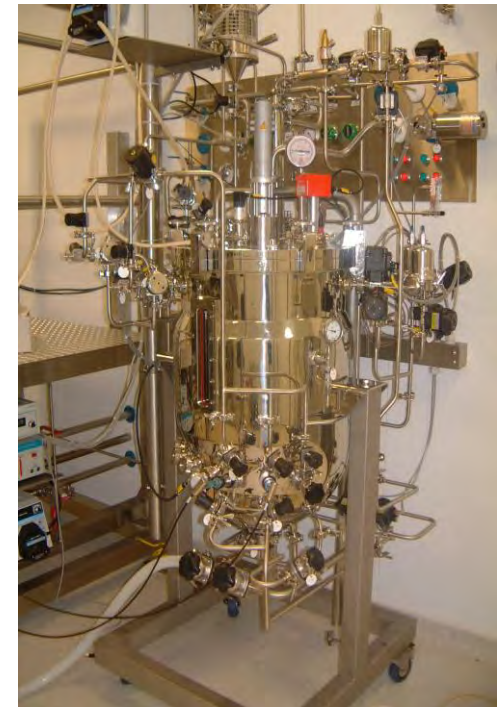
# How we organize for integration



# Our experience in the R&D Sector



- Early involvement in UK's biotechnology boom 1980s
- Collapse in investment in mid-1990's due to lack of investor confidence
- Causes mainly scientific over optimism and unrealistic times to commercialisation
- Those that succeeded had adopted mainstream pharma and chemical industry practices e.g. Genzyme, Serilogicals, Avecia etc.



# Common problems

- Poor estimating leads to cost overruns
- Poor User Requirement Briefs
- Business Plan developed without in-depth project execution plan
- Lack of detailed project scheduling leads to delays
- Lack of peer review can lead to failure in scale-up and commercialisation
- Overall loss of investor confidence and subsequent investor disinterest





# Lessons Learned

- Need for early experienced engineering input
- Recognising the end product requirements and ensuring all disciplines are in-place
- Business Plan linked to a detailed User Requirement Specification and Project Plan
- Establish a phased development – we use a proven stage gate process to establish funding requirements and technical & engineering/construction targets
- Involve the regulators once the basic processes & designs are established



# Common causes of project failure

- Current funding methods lack linkage between:
  - Finance
  - Legal
  - Engineering
  - Project Management
  - Regulatory
- Lack of ability of the parties to communicate or understand each other



WH Partnership (WHP) and NCL Innovations (NCL) have recently formed an association based on the following:

- Both parties recognised the difficulties being encountered by start-up and small developing enterprises
- Both had independently been involved with a wide range of development projects
- NCL considered that the funding market was essentially broken
- WHP had financially supported some of its developing clients
- NCL realised it needed early engineering involvement to underpin technical and financial due diligence

## WHP – NCL Association

### Our aims

We aim to provide:

- An holistic approach to novel development projects
- We start from early stage process development where we work closely with the R&D teams
- We aim to bring early integrated project management and financial controls based on sound engineering and realistic estimating
- We assist with scale up, infrastructure and regulatory input
- We support the project from concept to start-up and follow through with maintenance if required





## Project profile



- Novel anti-cancer treatment
- Client approached WHP at the concept stage needing a fast programme and equally fast regulatory approval
- WHP supported TC Bio pre-contract and with some financial input
- WHP & TC Bio worked together as one team
- Project was completed in 12 weeks
- Operating licence from MHRA in 12 weeks
- We are now engaged in considering the next phase of expansion well ahead of TC Bio's programme needs



**manufacturing**  
**CHEMIST PHARMA**



“Built to comply with UK Good Manufacturing Practice (GMP) regulations, the multi-million pound facility took 12 weeks to build from start to finish.



“The facility has also been granted a licence to produce human cell therapy products by the UK's Medicines and Healthcare products Regulatory Agency (MHRA).



“The team has done an amazing job building and commissioning our facility in record time.

“Not only has WHP built an impressive GMP facility in the heart of Scotland, it also ensured that costs were managed in a supportive and proactive manner. WHP & TCB will jointly evaluate logistics of facility expansion on a geographical basis, using a combination of modular and mobile cleanroom systems.”

Angela Scott, Operations Director, TCB

# Concerns for the Future

- The process sector seems to be importing attitudes and methods from the building industry
- Procurement often seems to be based on cost alone rather than the total service required
- Payment terms are deteriorating which can often catastrophic impact on the small to medium contractors
- Lack of adequate training and experience is putting the industry at risk
- This will lead to the potential loss of a quality supply chain which could severely undermine the process industries and the hoped for Northern Power House

