Business review
Growth in revenue and operating profit

— Group revenue increased to EUR 17.9 bn
— Group operating profit increased to EUR 4.1 bn
— Operating cash flow increased to EUR 3.6 bn
— 9.5 percent rise in dividend to EUR 3.45 per share
Optimised CAPEX and OPEX for own assets

Strong competitive position

Solution provider for the customer

2015 Sales: EUR 15.2bn

Risk balancing
- Capture business either as plant sales or outsourcing contracts
- Awareness of decaptivation opportunities

Customer
- Early awareness of new projects
- Strong customer relationships

Operations
- Long track record of executing large-scale projects
- High cost competitive-ness and energy efficiency

Innovation
- Improvement of applications and solutions
- Insights into customer processes

2015 Sales: EUR 2.6bn

Technology leadership geared towards leveraging expertise into Gases business

Four technology fields (Air Separation | Hydrogen & Syngas | Natural Gas | Petrochemicals)

Integrated Gases and Engineering model
Synergies built on strong engineering foundation
### Gases Division
Wide range of products, services and applications

<table>
<thead>
<tr>
<th>Gases</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Gases</strong></td>
<td><strong>Administrative Efficiency</strong></td>
</tr>
<tr>
<td>— Nitrogen ($N_2$)</td>
<td><strong>Process Know-how</strong></td>
</tr>
<tr>
<td>— Oxygen ($O_2$)</td>
<td><strong>Quality and Safety</strong></td>
</tr>
<tr>
<td>— Argon (Ar)</td>
<td></td>
</tr>
<tr>
<td>— Rare Gases</td>
<td><strong>Supply Reliability</strong></td>
</tr>
<tr>
<td>— Krypton (Kr)</td>
<td><strong>Chemistry &amp; Energy</strong></td>
</tr>
<tr>
<td>— Neon (Ne)</td>
<td><strong>Metallurgy &amp; Glass</strong></td>
</tr>
<tr>
<td>— Xenon (Xe)</td>
<td><strong>Manufacturing</strong></td>
</tr>
<tr>
<td><strong>Other Gases</strong></td>
<td><strong>Retail</strong></td>
</tr>
<tr>
<td>— Acetylene ($C_2H_2$)</td>
<td></td>
</tr>
<tr>
<td>— Helium (He)</td>
<td><strong>Food &amp; Beverages</strong></td>
</tr>
<tr>
<td>— Propane ($C_3H_8$)</td>
<td></td>
</tr>
<tr>
<td>— Carbon Dioxide ($CO_2$)</td>
<td></td>
</tr>
<tr>
<td>— Carbon Monoxide (CO)</td>
<td><strong>Electronics</strong></td>
</tr>
<tr>
<td>— Hydrogen ($H_2$)</td>
<td><strong>Other</strong></td>
</tr>
<tr>
<td><strong>Specialty Gases</strong></td>
<td></td>
</tr>
<tr>
<td>— Pure Gases</td>
<td></td>
</tr>
<tr>
<td>— Specialty Gas Mixtures</td>
<td></td>
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<tr>
<td><strong>Medical Gases</strong></td>
<td></td>
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<tr>
<td>— Medical Oxygen</td>
<td></td>
</tr>
<tr>
<td>— Nitric Oxide (NO)</td>
<td></td>
</tr>
<tr>
<td>— Nitrous Oxide ($N_2O$)</td>
<td></td>
</tr>
</tbody>
</table>

Linde gases are used, for example, in the energy sector, steel production, chemical processing, environmental protection and metal fabrication, as well as in glass production, food processing and electronics. The company is also a leading global supplier of premium healthcare products and services for patients with respiratory disorders.
Engineering Division
Leading market position in multiple segments

Air Separation Plants
Hydrogen and Synthesis Gas Plants
Petrochemical Plants
Natural Gas Plants

Providing plants for Linde Gas and third party customers
Providing plants for chemical industry and energy-related industries

With around 1,000 process engineering patents and applications and about 4,000 completed plant projects, Linde Engineering supports the energy and environment megatrend and leverages customer relationships for gas projects.
We manage the full project lifecycle.

We are your one-stop-shop for process plant execution.

Efficient organisation
Clearly structured processes
Competence in execution
4000+ convincing arguments
1. The Linde Ammonia Concept (LAC)™
2. Standardized and Modularized Plants
3. Modularization
4. Project Execution today

THE KEY TO COST EFFECTIVE AND COMPETITIVE (SMALL SCALE) AMMONIA PLANTS
Agenda.

1. The Linde Ammonia Concept (LAC)™
2. Standardized and Modularized Plants
3. Modularization
4. Project Execution today
Linde Ammonia Concepts
Comparison of LAC.L1 process with conventional scheme

**Linde Ammonia Concept (LAC.L1)**

**Feed Treatment**

**Primary Reformer**

**Isothermal Shift**

**CO₂ Removal**

**PSA**

**Ammonia Synthesis**

**Feed**

**Air**

**ASU** (N₂ Unit)

**Conventional Ammonia Plant**

**Feed Treatment**

**Primary Reformer**

**Secondary Reformer**

**HT Shift**

**LT Shift**

**CO₂ Removal**

**Methanation**

**Ammonia Synthesis**

**Feed**

**Air**

**Inertgas Unit**

**Hydrocarbon conversion**

\[ C_xH_y \rightarrow H_2 + CO \]

**CO Conversion**

\[ CO + H_2O \rightarrow H_2 + CO_2 \]

**CO₂ and CO removal**

\[ 3H_2 + N_2 \rightarrow NH_3 \]
Linde Ammonia Concepts (LAC)
Characteristics

- Generation of an inert-free Ammonia synthesis gas in the right H\(_2\) to N\(_2\) ratio
- Adjustable CO\(_2\)/NH\(_3\) Product Ratios
- Design Feedstock flexibility from Light Hydrocarbon Feedstocks (LAC.L) to Heavy Hydrocarbon Feedstocks (LAC.H)
- Flexibility for valuable by-products, extension, and integration
Linde Ammonia Concept (LAC.L1)
Flexibility in plant design and operational Reliability

- **CO$_2$-Removal is eliminated for pure NH$_3$ production**
  - If CO$_2$ is needed, size of CO$_2$-Removal is adjusted according to CO$_2$-demand
  - CO$_2$-Removal can be integrated at a later stage with no pre-investment

- **Pure Hydrogen and pure Nitrogen** are directly available from process streams
  - Other potential by-products such as oxygen, argon, carbon monoxide, carbon dioxide and methanol can be easily integrated

- **High Flexibility with regard to steam and driver concepts** allows perfect integration into existing sites or downstream units
  - Process Steam System is separated from export and driver steam system

- Provision of a sophisticated **gas purification system by Pressure Swing Adsorption (PSA)**, which has proven and unmatched reliability and even allows NH$_3$ production without shift conversion in operation
Linde Ammonia Concept (LAC.L1)
Cost and Energy savings

– **Elimination of three catalytic process steps**, reducing the total catalyst volume to appr. 50% of that in a conventional plant

– **N₂ is added at the back end** of the process leading to smaller and more efficient syngas cooling

– The generation of an **oxygen and inert free synthesis gas**, giving important **savings in the synthesis loop** and eliminates a purge gas purification step

– The process **condensate treatment is eliminated** by routing the process condensate directly to the isothermal shift reactor for the production of process steam

– The simplified flow sheet also results in a **reduced pressure drop**

– The **LAC is a much more direct route to ammonia resulting in a reduced start-up time and important savings in lifecycle costs**
Linde Ammonia Concept (LAC.L1)
Summary

Overall simplification of the classical process route, resulting in:

- **Savings** in investment, catalyst replacement and spare part costs, construction time, site area, maintenance
- **Flexibility** for extension and integration
- **Reliability** increase
Linde Ammonia Concepts (LAC)
Overview

LAC.L

Feed
- Feed Treatment
- Primary Reformer
- Isothermal Shift
- CO₂ Removal
- PSA
- H₂
- Ammonia Synthesis
- CO₂
- NH₃

Air
- ASU (N₂ Unit)

LAC.L

Feed
- Feed Treatment
- Primary Reformer
- Cat/Non-Cat Oxidation
- Isothermal Shift
- CO₂ Removal
- N₂ Wash Unit
- NH₃-Syngas
- CO₂
- NH₃

Air
- ASU (N₂/O₂ Unit)

H₂-Rich Gas
- ASU
- N₂ Unit

LAC.L

H₂-Rich Gas
- Purge Gas
- CO₂
- COS, H₂S

Air
- ASU

LAC.H

Heavy Feed
- Feed Treatment
- Non-Cat. POX
- Sour Shift
- CO₂ Removal (Rectisol)
- N₂-Wash
- Ammonia Synthesis
- CO₂
- NH₃

Air
- ASU (N₂/O₂ Unit)

O₂
Linde Ammonia Concepts (LAC)
A combination of proven Technologies

Linde Owned Technologies

<table>
<thead>
<tr>
<th>Air Separation</th>
<th>Rectisol Wash unit</th>
<th>Isothermal Shift Conversion</th>
<th>Nitrogen Wash Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Air Separation Image" /></td>
<td><img src="image2" alt="Rectisol Wash unit Image" /></td>
<td><img src="image3" alt="Isothermal Shift Conversion Image" /></td>
<td><img src="image4" alt="Nitrogen Wash Units Image" /></td>
</tr>
</tbody>
</table>

Reforming Technologies
Pressure Swing Adsorption
Catalytic Oxidation
Linde Ammonia Concepts (LAC)
A combination of proven Technologies

Licensed Technologies/Equipment

- Partial Oxidation/Non-Catalytic Oxidation
- Activated amine based CO₂ removal system
- Ammonia Synthesis Converter
Linde’s recent Experience in LAC.L Projects:
HyCO + NH₃ Plant for the Sadara Complex

Linde’s largest HyCO facility and first NH₃ supply scheme in the Middle East
Products supplied to Sadara Chemicals Company LLC (Saudi Aramco/Dow JV)

Technology
– 2 x 65% SMR HyCO trains
– 1 x Ammonia Loop
– 20kt storage tank

Capacity
– Syngas: ~ 130,000 Nm³/h
– CO: ~ 21,320 Nm³/h
– H₂: ~ 91,000 Nm³/h
– NH₃: ~ 615 tpd

Feedstock
– Natural gas

Design and EPC of the plant executed by Linde Engineering
Facility owned and operated by Linde with successful start up in first half of 2016
Linde's recent Experience in LAC.L Projects:
HyCO + NH\textsubscript{3} Plant for the Sadara Complex
Agenda.

1. The Linde Ammonia Concept (LAC)™
2. Standardized and Modularized Plants
3. Modularization
4. Project Execution today
Linde’s Standardized and Modularized (Hydrogen) Plant Portfolio

Degree of Standardisation

- Container
- Highly Modularized
- Highly Modularized
- H₂ plant
- HyCO plant
- Large scale NH₃ plant
- POx plants
- High Efficiency/Flexibility

Pre-Assembled Multi Skid & Can Reformer
Pre-Assembled Multi Skid & BOX Reformer
Modularized & Stick-built & Box Reformer

H₂-capacity

330 Nm³/h
16,000 Nm³/h
28,000 Nm³/h

Range for 150 MTPD – 350 MTPD NH₃ plants based on the Linde Ammonia Concept (LAC™)

12/07/2016
Modularized plant concepts „HydroPrime® MID/MAX“. 

CAPEX/OPEX optimized PSA

Can or Box Reformer

Design of all Key-Equipments is based on well proven Technology from LINDE

Balance of the Plant
Modularized plant concepts.
Can reformer plants “HydroPrime MID”.

H2-Capacity:
- 650 to 8,000 Nm³/h  single can reformer
- 8,000 to 17,000 Nm³/h twin can & single

WHRU

Can Reformer Design:
- UP – FIRED
- UP – FLOW

- easy access to burner
- easy maintenance (refilling)
- easy control
- low investment cost

12/07/2016
Modularized plant concepts.
Box reformer plants “HydroPrime MAX”.

**H2-Capacity:**
16,000 to 28,000 Nm³/h

<table>
<thead>
<tr>
<th>Reformer Box</th>
<th>Standardization:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-row layout concept</td>
</tr>
<tr>
<td></td>
<td>fixed diameter/length of reformer tubes</td>
</tr>
<tr>
<td></td>
<td>fixed reformer tube pitch</td>
</tr>
<tr>
<td></td>
<td>fixed burner configuration (2 burners / 4 cat. tubes)</td>
</tr>
<tr>
<td></td>
<td>variable number of tubes (48/60/72)</td>
</tr>
<tr>
<td></td>
<td>variable tube wall thickness</td>
</tr>
<tr>
<td></td>
<td>4 horizontal box and 2 penthouse modules</td>
</tr>
<tr>
<td></td>
<td>harped reformer tubes installed at site</td>
</tr>
<tr>
<td></td>
<td>cold header installed in two pieces</td>
</tr>
<tr>
<td></td>
<td>All modules truckable (&lt; 4.2m x 4.2m x XXm)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>WHRU</th>
<th>Modularization:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 self-supporting modules incl. structural steel</td>
</tr>
<tr>
<td></td>
<td>Castable refractory preinstalled</td>
</tr>
<tr>
<td></td>
<td>All modules truckable (&lt; 4.2m x 4.2m x XXm)</td>
</tr>
<tr>
<td></td>
<td>Maintenance platforms dressed at site</td>
</tr>
<tr>
<td></td>
<td>Customized Convection Section</td>
</tr>
<tr>
<td></td>
<td>Retractable bundles (optional)</td>
</tr>
</tbody>
</table>
Linde Engineering Modularization Experience

7.11 AlJubail10 - H₂ & Ammonia Plant

Overview Modules:

8 x PAU
- max. 18m x 24m x 26m (WxLxH)
- max. weight 1054tons

13 x PAR
- max. 8m x 58m x 7.4m (WxLxH)
- Max. weight 245tons

21 Modules in total
5375tons overall weight modules
Agenda.

1. The Linde Ammonia Concept (LAC)™
2. Standardization
3. Modularization
4. Project Execution today
Modularization

Why?

DE-RISKING

COST REDUCTION & SCHEDULE ATTAINMENT & HSE

DRIVERS

<table>
<thead>
<tr>
<th>Environmental Conditions on Site</th>
<th>Labor Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled environment in yard or workshop</td>
<td>Access to skilled labor</td>
</tr>
<tr>
<td>Weather conditions</td>
<td>Low labor cost in yard or workshop</td>
</tr>
<tr>
<td>Better quality, less rework</td>
<td>No allowances to be paid</td>
</tr>
<tr>
<td>Safety! controlled working environment</td>
<td></td>
</tr>
<tr>
<td>Parallel construction work possible instead of sequential</td>
<td></td>
</tr>
<tr>
<td>Pre-commissioning work partially done in</td>
<td></td>
</tr>
</tbody>
</table>
Modularization
Effect on Project Execution!

TRADE-OFF’s

- Additional expenditures for investigation and or preparation of transport ways
- Module size restricted by general conditions of transport ways (max. height, max. weight…)
- Additional costs for Module Transport & Insurance (& poss. marine warranty surveyor MWS)
- Influence on static engineering to withstand transportation and erection stresses
- Additional steel structure
- DESIGN TO MODULE ; Engineering to be frozen earlier
- Installation sequence fixed
- Higher cost for bigger cranes or SPMTs on site
- Higher complexity due to limited space
Linde Engineering Modularization Experience
Linde Engineering Modularization Capabilities
Linde (T-EPC) has Technology

- able to influence the front end engineering (Process Design, Equipment Design, System Engineering, etc.)
- optimized modularization layout design and arrangement.
# Linde Engineering Modularization Experience

## Modules Types

### Overview

**Description of Module Types at Linde Engineering**

Linde Engineering’s modularization is available and composed of documents E42X, MOD 1, P02243, and LINDE-021. The modularization process at Linde Engineering includes the following steps:

1. **Module Identification:**
   - **Linde Engineering Modularization Experience:**
     - **Overview:**
       - Linde Engineering modularization is available and composed of documents E42X, MOD 1, P02243, and LINDE-021.
   - **Description of Module Types at Linde Engineering:**
     - **Overview:**
       - **Description of Module Types at Linde Engineering:**
         - Linde Engineering’s modularization is available and composed of documents E42X, MOD 1, P02243, and LINDE-021.

### Modules for Pipeline

**Modules for Pipeline**

**PAR**

- **Overview:**
  - **Pre-assembled rack—transfer rack**

**PAB**

- **Overview:**
  - **Pre-assembled back—transfer rack**

**PAL**

- **Overview:**
  - **Pre-assembled back—transfer rack**

### Modules for Process Units & Sections

**Modules for Process Units & Sections**

**PAR**

- **Overview:**
  - **Pre-assembled rack—transfer rack**

**PAB**

- **Overview:**
  - **Pre-assembled back—transfer rack**

**PAL**

- **Overview:**
  - **Pre-assembled back—transfer rack**

### Short Description

**PAR**

- **Overview:**
  - **Process/transfer rack—transfer rack**

**PAB**

- **Overview:**
  - **Process/transfer rack—transfer rack**

**PAL**

- **Overview:**
  - **Process/transfer rack—transfer rack**

### Long Description

**PAR**

- **Overview:**
  - **Process/transfer rack—transfer rack**

**PAB**

- **Overview:**
  - **Process/transfer rack—transfer rack**

**PAL**

- **Overview:**
  - **Process/transfer rack—transfer rack**

### Conclusion

- **Overview:**
  - **Process/transfer rack—transfer rack**

---

**Note:**

- The diagrams and descriptions are based on the modularization process at Linde Engineering. The images and text are designed to provide an overview of the modularization process and the types of modules used in their engineering projects.
Pre-Commissioning achievements:
- Assembly completely apart from the actual plant site
- Hot testing and drying of the brickwork at the assembly site before the transport
- Provisional supply lines and mobile compressors allow pre-commissioning
The challenge:
- Tricky conditions on plant site in Hammerfest (weather, space, labor costs)
- Overall weight of cold box: 3500t
- Height: 65m

The solution:
- Assembly of Cold Box in Antwerp close to harbor
- Utilization of SPMTs under whole footprint of cold box for transport to barge
- Shipping of assembled Cold Box to Hammerfest

Advantages of modularization:
- Assembly of Coldbox off site (lower labor costs)
- Use of assembly area with fewer restrictions concerning space
The challenge:
- Tricky conditions on plant site in Hammerfest (weather, daylight, space, labor costs)
- Availability of skilled personnel in Hammerfest

The solution:
- Assembly of process plant/barge unit in Cadiz (ES)
- Shipping of the barge/plant unit to Hammerfest
- Utilization of a floating barge as foundation for the process plant
- Parking of the barge in a flooded slot
- Drying of slot and fixing the barge as foundation
- Use of multiple yards location

Advantages of modularization:
- Assembly of plant off site (lower labor costs)
- Use of assembly area with few restrictions concerning space
- Reducing of heavy equipment for module installation at site
Linde Engineering Modularization Experience
Hammerfest (NOR) – Cadiz (ESP) Process Barge

Heerema
- MEG-Modules: 4,800 tons

Heerema
- SC-Modules: 9,300 tons

Tanko Italia
- MEG-Tanks: 1,300 tons

Fabricom
- Cold Box: 3,500 tons

Fabricom
- PAUs+PARs: 10,600 tons

Dragados
- Process plant 35,000 tons

Linde Engineering Modularization Experience
Hammerfest (NOR) – Cadiz (ESP) Process Barge

Heerema
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Linde Engineering Modularization Experience
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Fabricom
- Cold Box: 3,500 tons

Fabricom
- PAUs+PARs: 10,600 tons

Dragados
- Process plant 35,000 tons
The challenge:
- Integration of LNG plant on ship hull
- Minimization of fixed capital
- Restricted spatial conditions on ship

The solution:
- High degree of modularization instead of stick-built elements
- Parallel assembly of ship hull and process modules

Advantages of modularization:
- Minimization of the required space on deck
- Reduced duration of assembly → minimum of fixed capital
- Assembly in area with fewer spatial restrictions and well-rehearsed assembly processes
The challenge:
- Remote location of site with poor connection to any infrastructure
- Climate and weather conditions at site
- Existing plant has to be dismantled

The solution:
- Shift of maximum workload from site to Module Yard

Advantages of modularization:
- Big modules reduces connection works
- Max. reduction of construction activities at site

LNG Process Plant:
- approx. 25,000 tons
- 6 PAUs (pre-assembled units)
- 4 PARs (pre-assembled racks)
- 1 Module E & I

British Columbia (CAN) – LNG Plant
Linde Engineering Modularization Experience
Karratha (AUS) – Rayong (THA) NRU and Cold Box

Key Figures:
(Dimension & Weight)

Proc. Module:
35.0 x 20.5 x 27.0 (m) (L/W/H)
Weight: 1400 tons

Load out Process Module Thailand

"Sail away" Process Module

Erected Process Module Karratha (AUS)
Agenda.

1. The Linde Ammonia Concept (LAC)™
2. Standardized and Modularized Plants
3. Modularization
4. Project Execution today
Linde Engineering Project Execution
A central function

- Efficient organisation
- Clearly structured processes
- Competence in execution
- 4000+ convincing arguments
### Linde Engineering  Project Execution
**Our competitive advantage in project execution**

<table>
<thead>
<tr>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Efficient organisation</td>
</tr>
<tr>
<td>2) Clearly structured processes</td>
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<tr>
<td>3) Competence in execution</td>
</tr>
<tr>
<td>4) 4,000+ convincing arguments</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
</tr>
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<tbody>
<tr>
<td>▪ We know the clients’ perspective because Linde Gas is a major operator</td>
</tr>
<tr>
<td>▪ Global project execution setup</td>
</tr>
<tr>
<td>▪ Globally spread procurement centers guarantee top notch quality</td>
</tr>
<tr>
<td>▪ Different engineering hubs ensure highest level of competitiveness</td>
</tr>
<tr>
<td>▪ EPC services with focus on own technology</td>
</tr>
<tr>
<td>▪ Numerous partnering options</td>
</tr>
</tbody>
</table>
### Linde Engineering  Project Execution

Our competitive advantage in project execution

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<tr>
<td>2) Clearly structured processes</td>
<td>- Integrated Management System</td>
</tr>
<tr>
<td></td>
<td>- Pre-defined work split models</td>
</tr>
<tr>
<td></td>
<td>- Clearly defined Division of Responsibility</td>
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<td></td>
<td>- Structured change management</td>
</tr>
<tr>
<td></td>
<td>- Focus on quality and safety</td>
</tr>
<tr>
<td>3) Competence in execution</td>
<td></td>
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<td>4) 4,000+ convincing arguments</td>
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## Linde Engineering  Project Execution
Our competitive advantage in project execution

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<tr>
<td>1) Efficient organisation</td>
<td>▪ Top project managers developed within our own organization</td>
</tr>
<tr>
<td></td>
<td>▪ Proprietary equipment/ own manufacturing of key components</td>
</tr>
<tr>
<td></td>
<td>▪ State-of-the-art tools</td>
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<tr>
<td></td>
<td>▪ Standardised gate reviews</td>
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<td></td>
<td>▪ Continuous risk management</td>
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<tr>
<td>2) Clearly structured processes</td>
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<td>▪ Continuous risk management</td>
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**Our competitive advantage in project execution**

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<tr>
<td>1) Efficient organisation</td>
<td>Over 4,000 reference plants</td>
</tr>
<tr>
<td>2) Clearly structured processes</td>
<td>Flawless transition from sales to execution</td>
</tr>
<tr>
<td>3) Competence in execution</td>
<td>Standardised and customised plants</td>
</tr>
<tr>
<td>4) 4,000+ convincing arguments</td>
<td>Tailored export financing</td>
</tr>
</tbody>
</table>
Linde Project Execution
Structured Processes: Project gate reviews

Sales Phase
- R0 Bid/no-bid decision
  - Bid/no Bid Decision
  - within proposal approval meeting

Execution Phase
- R1 Proposal challenge & approval
  - within 4 weeks after execution start
- R2 Contract award/Execution start
- R3 Basic completed
  - after PID D2/E2 release *1
- R4 Ext. basic/30% model completed
  - after 30% review
- R5 60% model completed
  - after 60% review
- R6 90% model completed
  - after 90% review
- R7 Ready for commissioning
  - after mechanical completion
- R8 Plant handover/project close out
  - after plant performance confirmed

Phase Gates
- (0) Evaluation
  - (1) Strategy
  - (2) Definition
  - (3) Estimating
  - (4) Challenge
  - [A] Concept 1
  - [B] Concept 2
- (5) Negotiation
  - (6) Mobilization
  - (7) Organization
  - [C] Concept 3
- (8) Execution
  - [D] Basic 1
  - [E] Basic 2
- (8) Execution
  - [F] Extended basic
- (8) Execution
  - [G] Detail 1
- (8) Execution
  - [H] Detail 2/Construction 1
- (8) Execution
  - [I] Detail 3/Construction 2
  - [K] Construction 3
  - [L] Mechanical completion
- (9) Closure
  - [M] Commissioning
  - [N] Start-up
  - [P] Initial operation
  - [Q] As-built

Project review (milestone)
- [X] Project management gate
- [X] Engineering gate

1) To be decided by Project Manager

Efficient organisation | Clearly structured processes | Competence in execution | 4000+ convincing arguments
Thanks for your attention.