

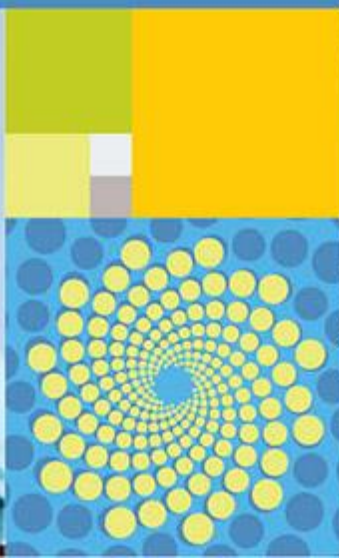


Knowledge grows

Yara Improvement Program

Investor and analyst visit to Sluiskil

12 December 2017



Agenda

Timing	Agenda	Presenter
08:00 AM – 08:15 AM	Welcome & introductions	Thor Giæver / Svein Tore Holsether
08:15 AM – 08:30 AM	Introduction to Model Factory	Hannah Paulson
08:30 AM – 09:15 AM	Model Factory: Round One	
09:15 AM – 09:55 AM	YPS Overall (inc. debrief of model factory)	Kristin Kaggerud
09:55 AM – 10:10 AM	BREAK	
10:10 AM – 10:30 AM	Training: Performance Management	O.J. Siljan
10:30 AM – 10:40 AM	Union perspective on YPS	Geir O. Sundbø / Tom de Smit
10:40 AM – 10:45 AM	Preparation for Model Factory: Round Two	
10:45 AM – 11:35 AM	Model Factory: Round Two	
11:35 AM – 12:15 PM	YPS round up and Q&A	Kristin Kaggerud / O.J. Siljan
12:15 PM – 12:45 PM	Yara Sluiskil & YPS status	Jon Sletten
12:45 PM – 13:15 PM	LUNCH	
13:15 PM – 13:30 PM	Bus to Sluiskil	
13:30 PM – 15:30 PM	Site visit: Yara Sluiskil	Jon Sletten
15:30 PM – 16:00 PM	Wrap up and Q&A	All presenters including Kvidal

Safety

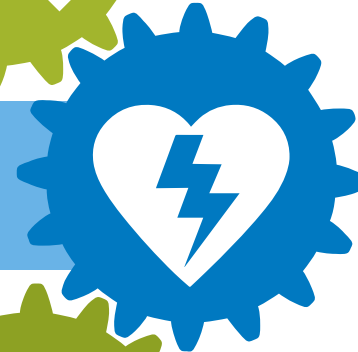
Emergency exit



Evacuation meeting point



Safety station location



Personal protective equipment (PPE) expectations



Productivity video



Overview of JLW Industries



Context

- JLW Industries is a mid-size **producer of beverages** within the JLW group
- Its main products are different variations of **lemonade** and **cola** which require different additional ingredients, e.g. vanilla essence
- These goods are produced in one **batch production line** with both manual and automated processes
- The site has been **operating at a loss** for some time, mainly due to high costs and low production volumes (even though there is demand for the products)
- If we do not become profitable again, our parent company may **reduce our volumes or even shut us down!**



Your role

- You are working as **production operators** on the batch production line
- Also, we will have an experienced **control room operator** and a **production supervisor**
- It is your job to **produce product based on the production demand** created by the supply chain department
- There are genuine safety risks associated with the production processes and therefore our **highest priority is on safety**



How this is going to happen

- We will simulate a **shift of 45 minutes**
- The production team will receive its **production plan** at the beginning of the shift and are required to **fulfill it by the end of the shift**
- All **raw materials will be delivered** to production at the start of the shift

Participants for JLW Industries

- We need eight volunteers to run the factories.
- In each factory, there will be three operators and one supervisor.
- Please put on the coats and PPE provided if you are operating in the factory.
- Those who are not operating the factory will need to act as observers.



Mining video



Review of the first shift

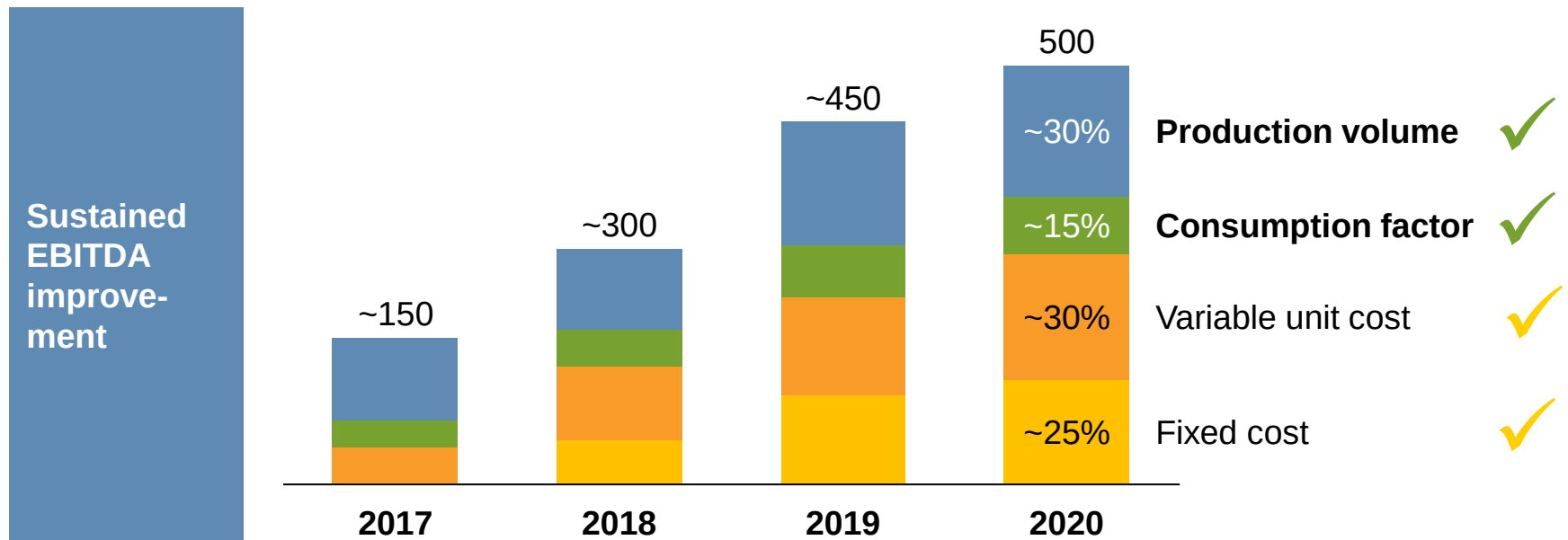
From your observation and/or experience in the last shift

- 1 What went well?
- 2 What challenges did you observe?
- 3 Which improvement ideas do you have?
- 4 How would you go about implementing them?



Yara Productivity System (YPS): A significant part of overall Yara Improvement Program target

USD million, vs. 2015 baseline and 2015 prices



Yara Productivity System: Six interdependent and interlinked improvement workstreams

Strategic response

Description

- 1 YPS Rollout Address safety, customer responsiveness, reliability, cost, productivity and quality on our sites as well as the ability to assess and integrate acquired assets

-Focus today-

- 2 PoF Develop a portfolio of short and long term technology projects with the aim of zero emissions and low capex and opex

- 3 BCF Ensure we build Better, Cheaper and Faster than anyone else

- 4 Learning org. Improve our leadership and competence development at all levels

- 5 PRO² Professionalize Production by reducing complexity and improving governance

- 6 Sustainable portfolio Enable new world class plants and take relevant action for non-profitable ones

Selected highlights from the YPS roll-out

YPS roll-out will have reached 50% of the sites by year end

- YPS will be rolled out at 27 sites by completion
- YPS roll-out completed at seven sites, eight sites are currently being transformed
- First mining site being transformed
- Diagnostic completed at all sites

Diagnostics has identified a base potential that far exceeds the initial expectations

- Higher potential mainly driven by opportunities in higher production volumes

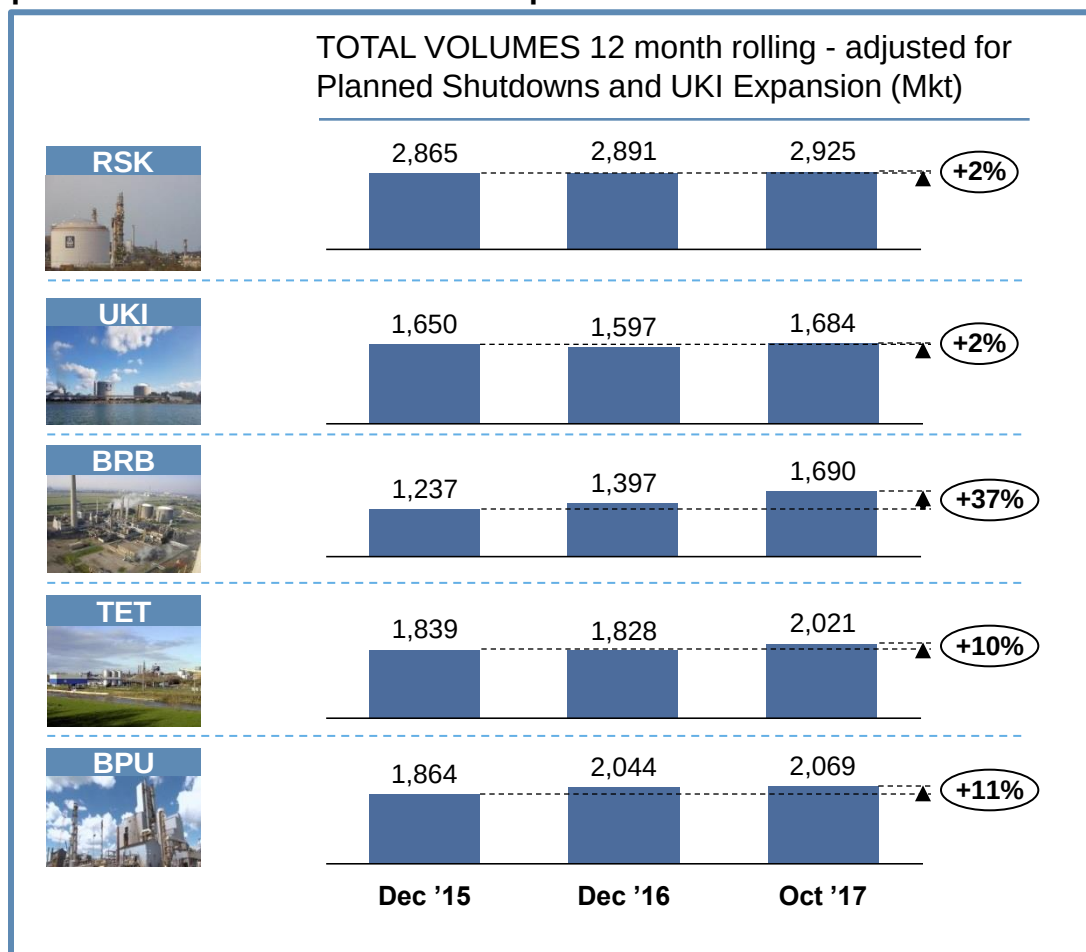
The program is starting to deliver results

- CRC improvements observed for all rolled-out sites
- New production records in UKI and BPU
- Reduced contractor spend
- Introduction of a new/upgraded six step maintenance tool has given improved wrench time and reliability



Yara Productivity System: Results being delivered in practice

Five out of seven plants since initial rollout completed, with 12MR production RECORDS either in September or October '17



In addition, several monthly production records in November '18



BRB

Monthly record in Urea production (65 172 t)



GLO

Monthly record in NPK production (57 500 t)



SVI

Monthly record in Phosphoric acid production (28 900 t)

YPS: One of the largest operational transformations in Norwegian industrial history

To date ...

3,700 man-days
of rollout support

1040 hours
of bootcamps and
leadership training

800 man-days of
diagnostics to identify
potential

15,180 bottles
capped ...and
uncapped

By the time rollout complete ...

**350 change
leaders**
trained and active

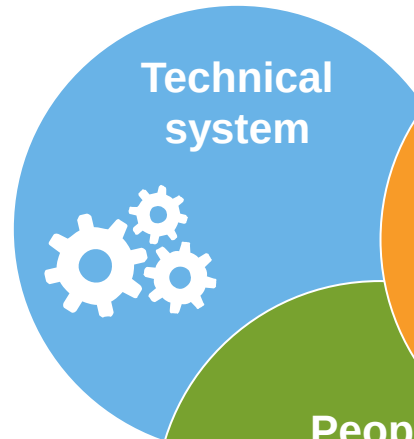
1,000 managers
directly involved

7,000 employees
with new way of
working

27 plants and mines
in 14 countries transformed

YPS is our framework for continuous improvement – Developed across three dimensions

The way **physical assets and resources** are **configured and optimized** to create value and minimize losses



Management system



The **formal structures, processes, and Systems** through which the operating Systems are managed to deliver the business objectives

People system



The way people **think, feel, and conduct themselves** in the workplace, both individually and collectively

For all dimensions we have a YPS standard tool box, all helping to eliminate waste

	Performance management
	Standard operating procedures
	Workplace organisation
	Root cause problem solving
	Maintenance execution
	Production planning and scheduling
	Resource utilization (e.g. workforce scheduling, SMED)
	Leadership, team and people development
	Transformation management

How?

Engaging all employees to identify improvement opportunities and eliminate waste

Identifying the “best” way to execute a task, minimizing the impact of all wastes

Improved 5s and Visual Management through engaged and empowered people

Eliminating defects, through systematically addressing the true Root Cause

Systematic Work Process, designed to address all wastes in the maintenance process

Limiting overproduction by only producing what is required at the right time

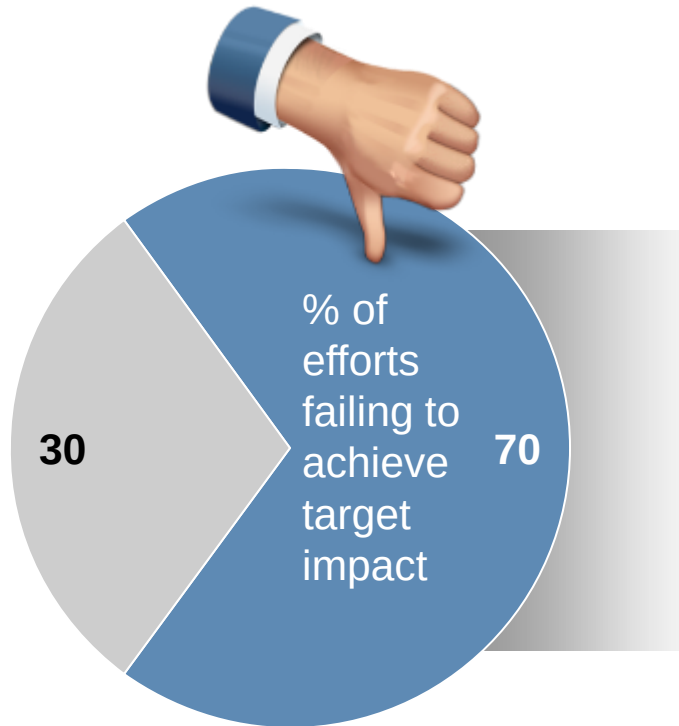
Optimizing the working day to reduce Waiting & Motion

Understanding how to constantly engage and empower all employees people

Utilising skills, experience & ideas

Most transformation efforts fail to deliver full impact

70% of change programs fail ...



... mainly because culture change is not addressed fully

Other obstacles

14

Inadequate resources
or budget

14

Management
behavior
does not
support change

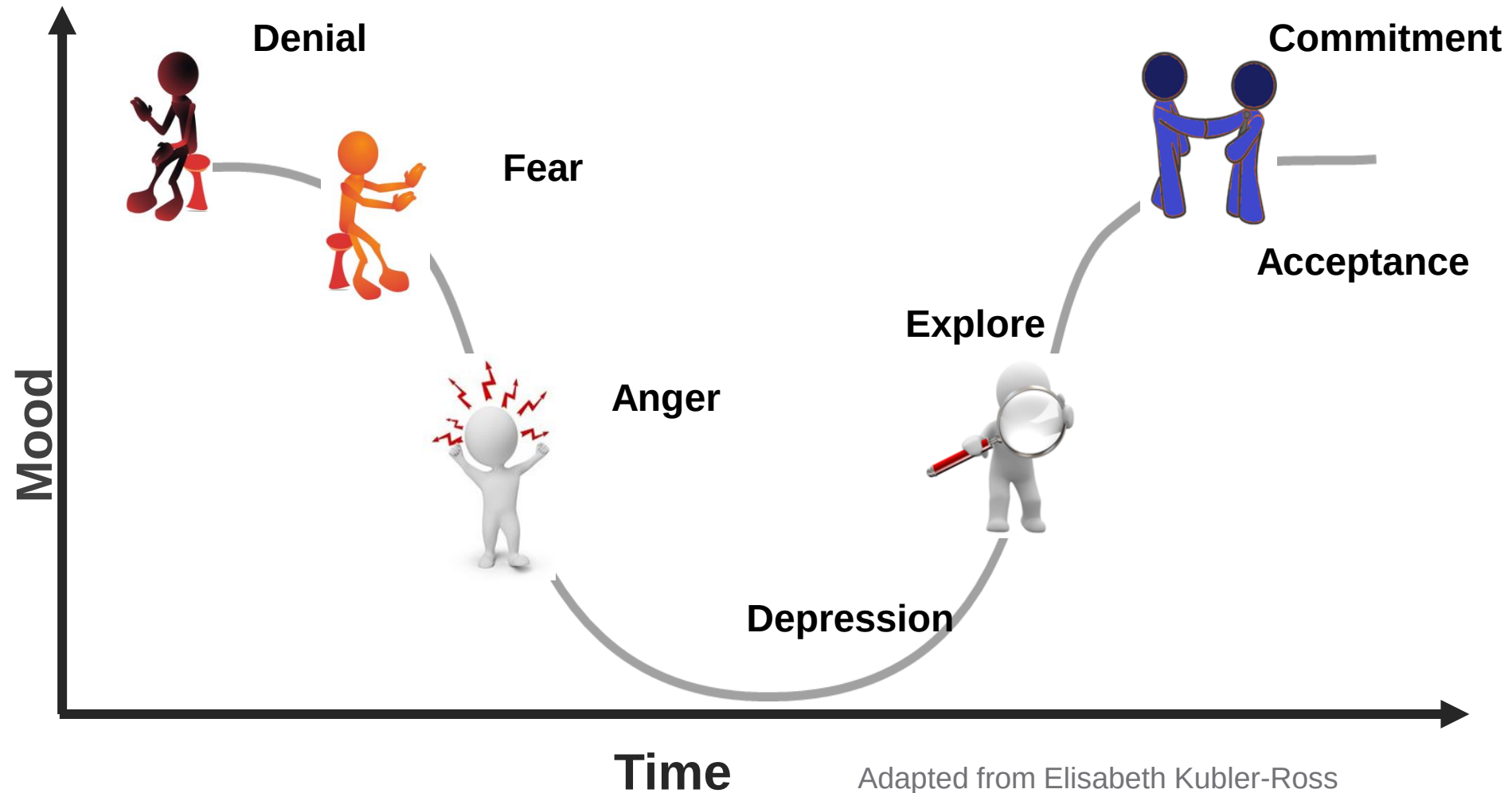
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Employee resistance
to change

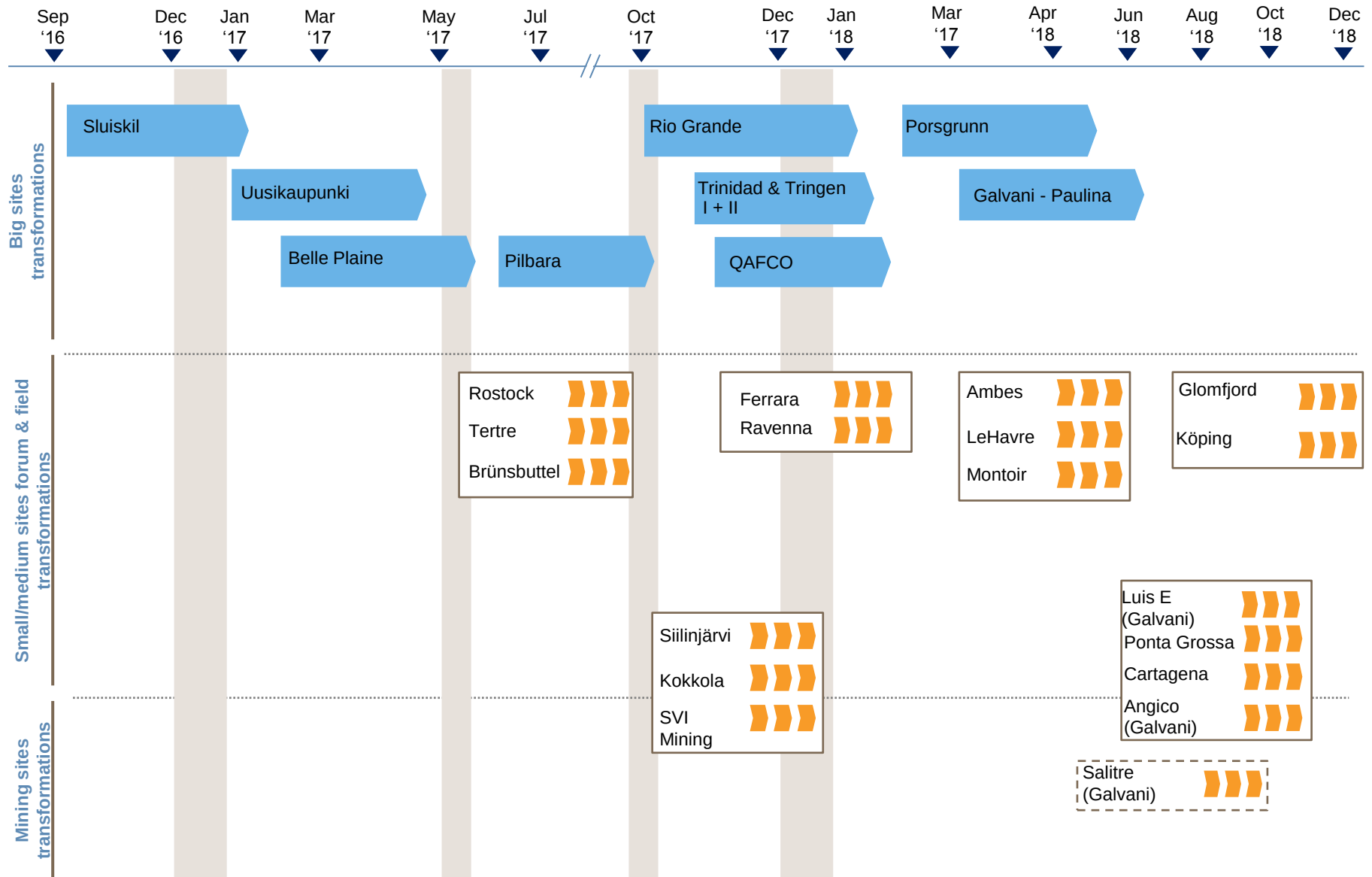
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Organizational
Health factors

Mindset and cultural change is the real challenge, but is what ultimately determines success



YPS roll-out



Note: Hull and Marsa el Brega, not yet reflected in roadmap.

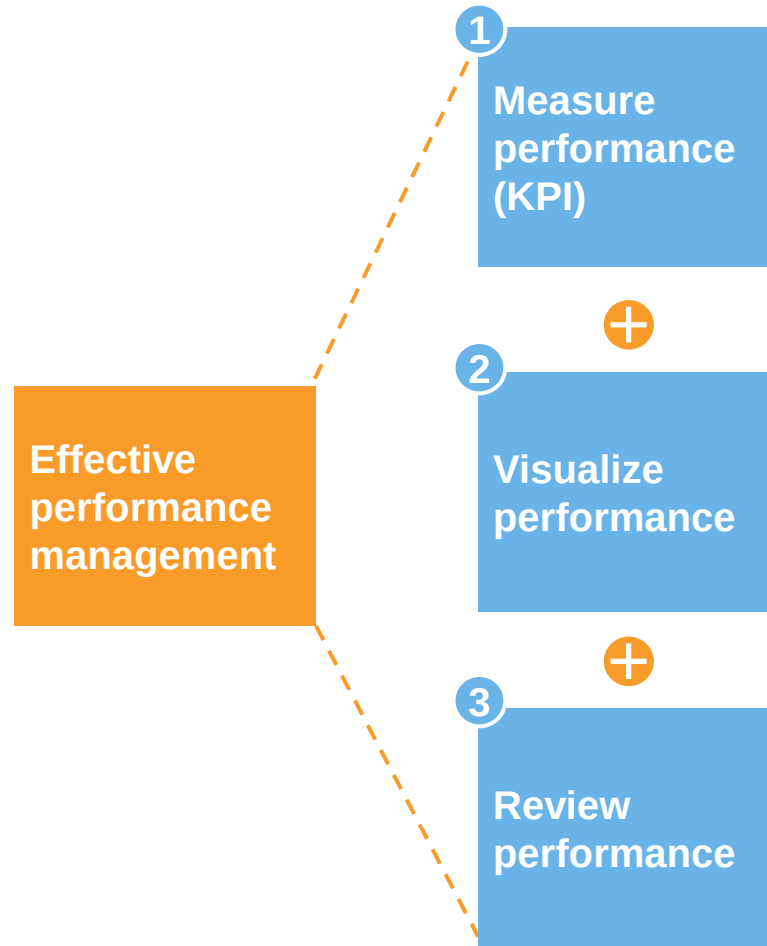
Belle Plaine Performance Review Video



Performance management cycle



An effective performance management system is driven by 3 interlinked elements



Frontline performance reporting is visibly displayed and easy to maintain

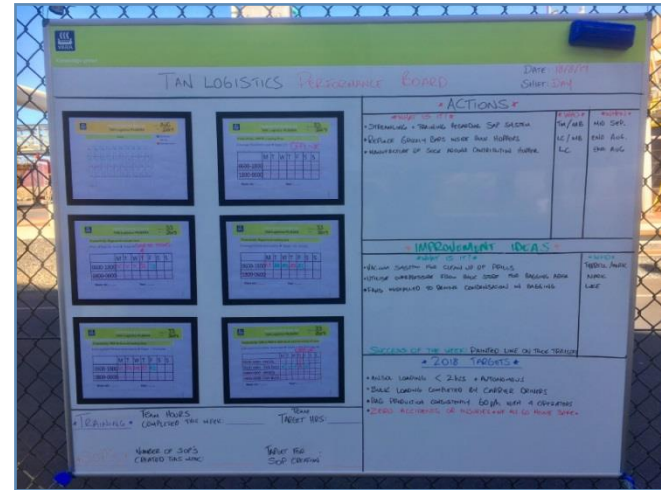
Accessible

Clear

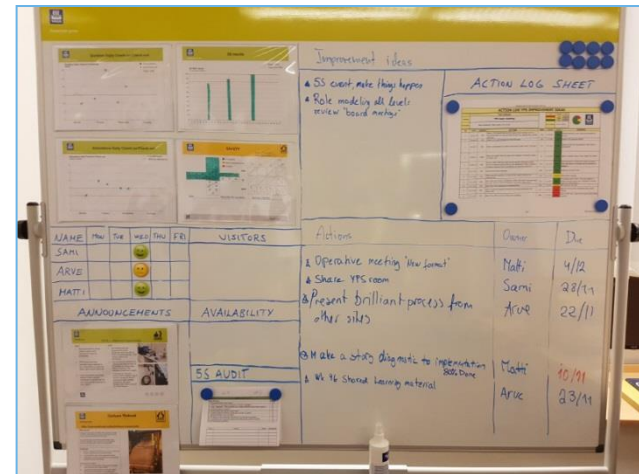
Target driven

Simple

Recordable



Pilbara



Kokkola

Performance is reviewed with the mindset of continuous improvement

Review

① Are any KPIs off target?

Improve

② What is causing this?

③ How can we fix this?

Implement

④ Who will do it?

⑤ When will they complete it by?



Brunsbüttel



Pilbara

Silinjarvi: Taking a step back prior to standard operating procedure definition cuts time to cool down of hot electrostatic precipitator by up to 65%



Performance board at Silinjarvi Sulphuric Acid plant

BCF-in-a-box video



Review of the second shift

From your observation and/or experience in the last shift

- 1 What went well?
- 2 What challenges did you observe?
- 3 Which improvement ideas do you have?



For all dimensions we have a YPS standard tool box – All helping to eliminate waste

Management system
Technical system
People system

How?

	Performance management
	Standard operating procedures
	Workplace organisation
	Root cause problem solving
	Maintenance execution
	Production planning and scheduling
	Resource utilization (e.g. workforce scheduling, SMED)
	Leadership, team and people development
	Transformation management

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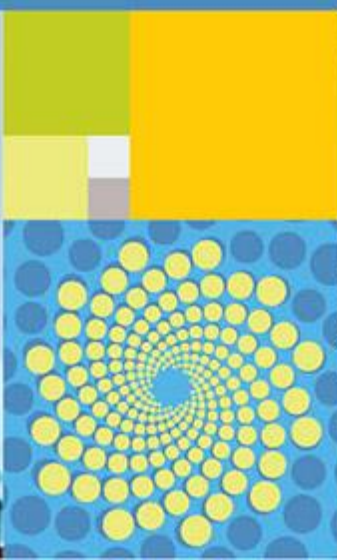
Utilising skills, experience & ideas



Knowledge grows

Yara Sluiskil

General presentation



History



*A company with a rich history,
rooted in the region*

Yara Sluiskil 1929 - 2016

- 1929** Start production Ammoniumsulphate
- 1940** During World War II huge destructions by bombings. Restart 1950
- 1966** Switch from cokes gas to natural gas
- 1979** Development and practice of fluidized bed granulator technology
- 1979** Aquisition by Norsk Hydro
- '80 –'90** Big investments
- 2011** Start of Urea 7 plant
- 2017** Commissioning of Urea 8 granulation plant and loading building

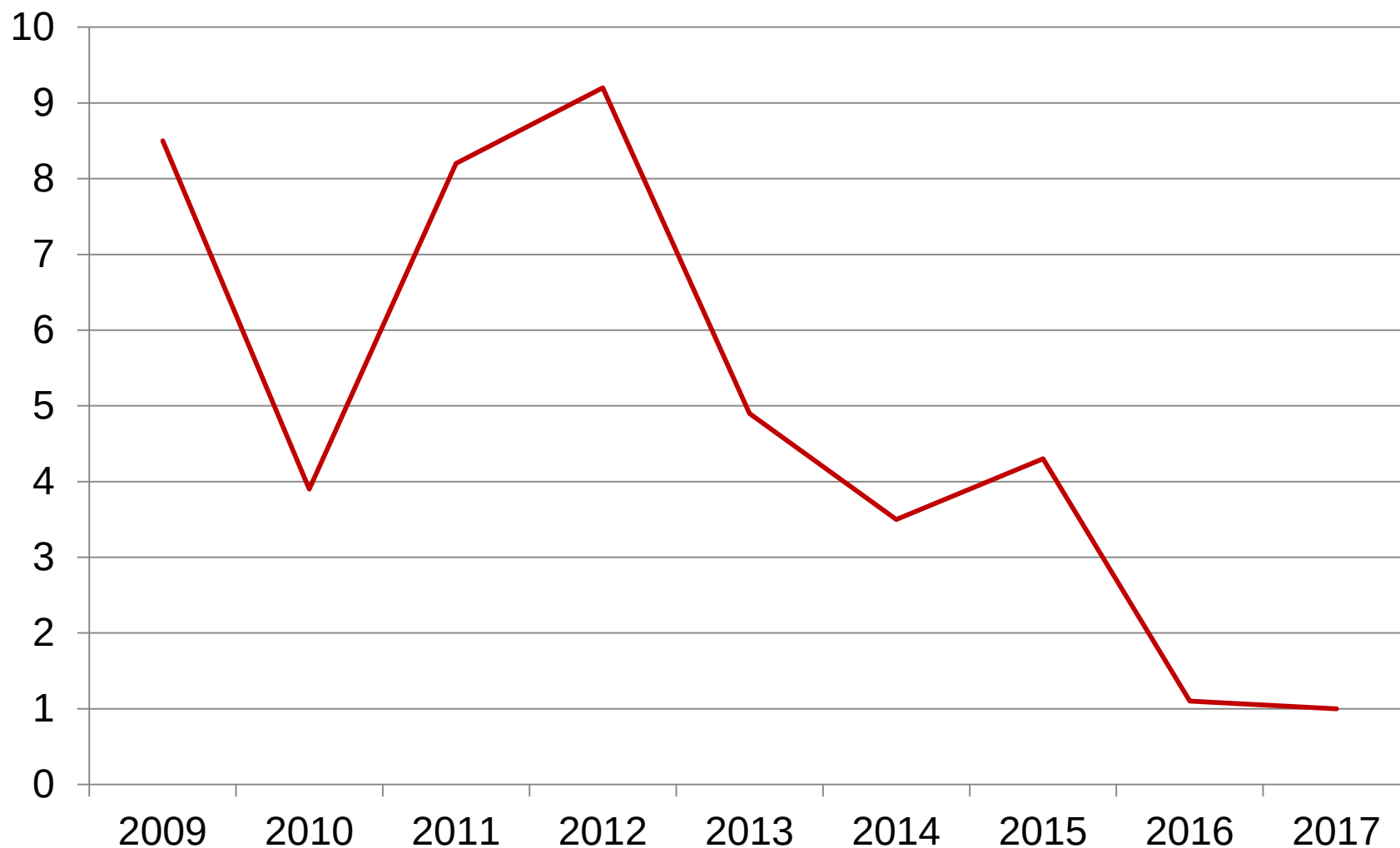


Key-indicators



Knowledge grows...

Yara Sluiskil. TRI-rate 12 months rolling.



Key-indicators

677

million euro
Turnover in 2016

575

FTE

5,027

kiloton product
loaded in 2016

World record in
reliability

2.0

BCM
natural gas/yr

80%
as feedstock

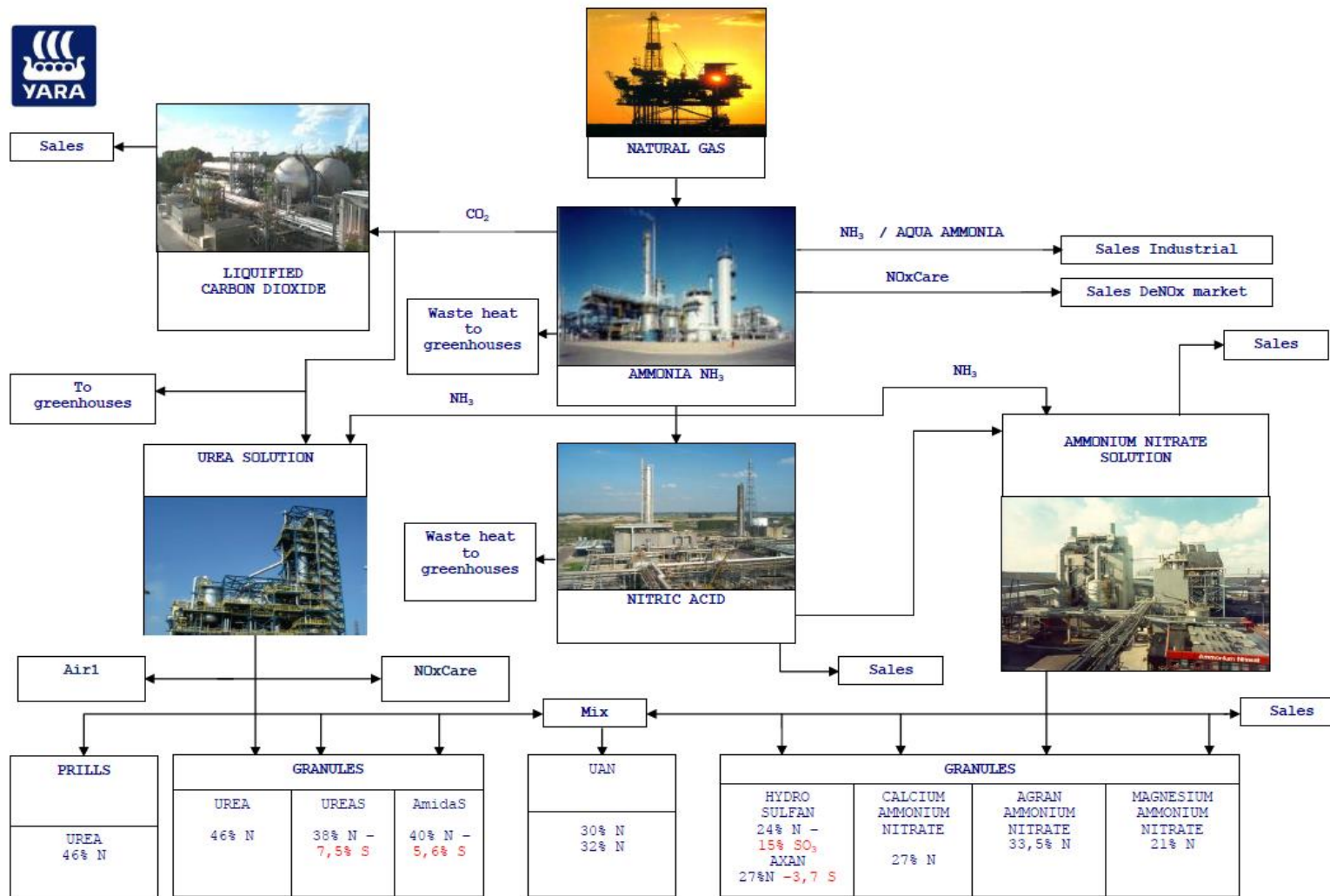
15% TOTAL PRODUCTION VOLUME OF YARA



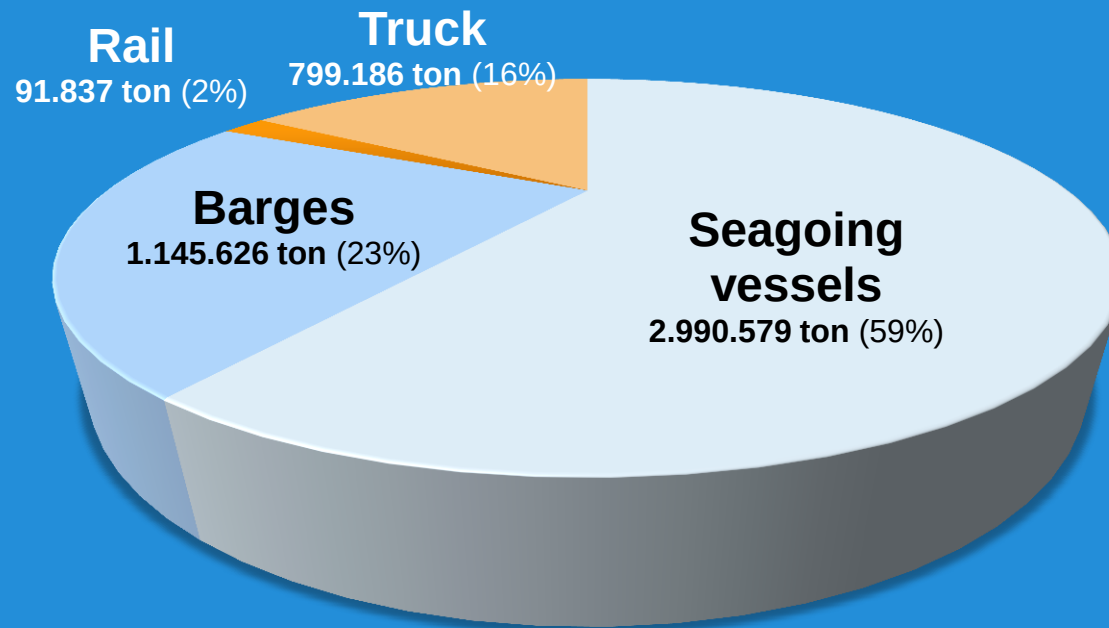
Products and processes



Our production system at Yara Sluiskil



Modal split (2016)



947
barges
627
seagoing vessels
1,232
rail wagons
31,087
trucks

Innovation and sustainability





WarmCO2

-55.000.000 Nm³ natural gas/yr

-135.000 ton CO₂/yr

1.000 New jobs created



Smart Delta Resources (SDR)

Cooperation DOW, ICL, national authorities and Yara

40.000 ton CO₂ reduction

Strong industrial clustering



Algae Biocleaning

Pilot installation for cleaning of waste water. Cooperation with local authorities



Urea 7 solution, 2011

420 mEuro investment

4.200 t/d (20% above design)
-35%energy consumption



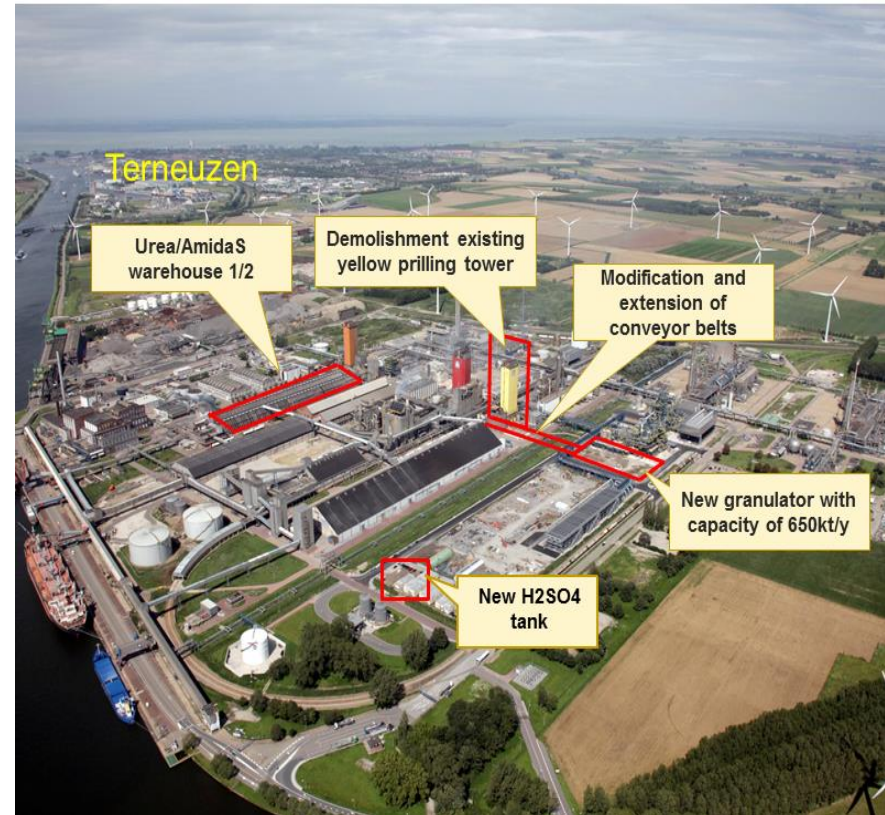
Urea 8, 2017

240 mEuro investment

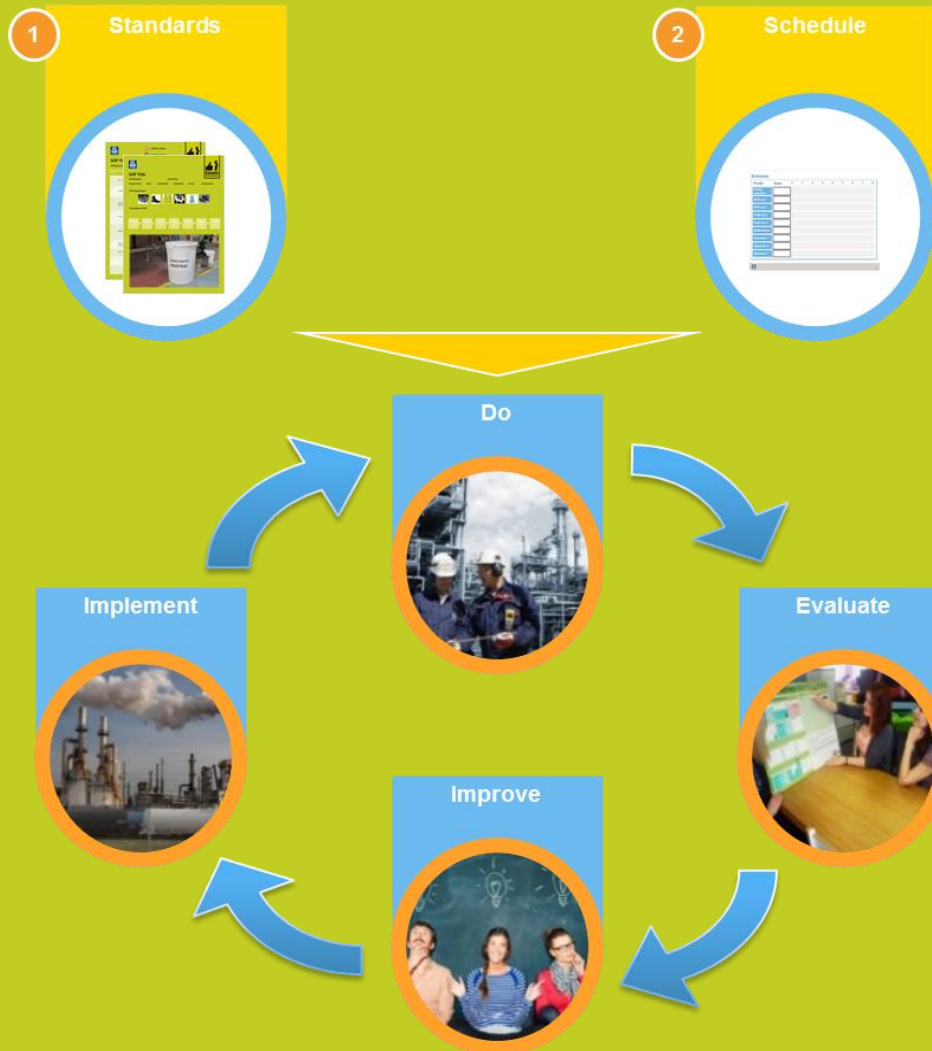
S-urea specialities
-50% dust emission

Urea 8 expanding value-add production capacity in Sluiskil

- New urea granulator with capacity of 660 kt per year, replacing old prilling unit with capacity of 400 kt per year
- Granulator will produce urea with sulphur, a product sold with a premium to regular urea
- Granulation will be done in a fluidized bed granulator, considered as best available technology
 - Emission reduction
 - Energy consumption
 - Product quality
- UAN production will reduce by 230 kt per year, while investment frees up nitric acid enabling 130 kt of additional CAN production
- Total capex of USD 263 million
- Construction to be finalized 1Q 2018



YPS implementation and status





Knowledge grows

Plant visit

Safety introduction for visitors



Do's and don'ts



(only allowed in
specific smoking
room/area)



(where indicated)



Obligated on whole plant area
(wear also **long sleeves**)



Extra during works



Extra PPE needed when pass by
production zones indicated by '**blue lines**'

Alarm



EMERGENCY NUMBER:

+31 (0)115 474 100
INTERNAL: 100

ALARM SIGNAL AND ANNOUNCEMENT:

Loud note during 3 seconds, silent during 1 second etc.
[... 3 ...] 1 [... 3 ...] 1 [... 3 ...] 1 [... 3 ...]
Information in Dutch language

End alarm: 20 seconds horn tone.
[.....20.....]

IN CASE OF EVACUATION :

- In case of toxic cloud use escape hood.
- Go to a safe assembly point (see map).
- Walk in transverse direction to the wind.
- Check at the assembly point if all your colleagues are present.
- Report yourself with emergency phone.
- Follow the instructions on the emergency broadcasting carefully.

- Be calm and stay with your yara guide
- **Tuesday 10:00 o'clock weekly test**



Knowledge grows

Many thanks for your attention

More information: www.yara.com or www.yara.nl