IMPROVED

industrial water use

INTEGRALE
MOBIELE
PROCESWATERVOORZIENING
VOOR EEN
ECONOMISCHE
DELTA

Interreg
Vlaanderen-Nederland
Europees Fonds voor Regionale Ontwikkeling
EUROPESE UNIE

CONTENT PRESENTATION

Introduction: General presentation

- Safety
- History
- Product & processes
- Innovation and sustainability

Goals IMPROVED Yara

SAFETY PRINCIPLES

- All injuries are preventable and safety is the common basis for our 'license to operate‘
- Working safely is everyone's responsibility and is a condition of employment.

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’**

In case of evacuation

- Stay always as a group and listen to the evacuation leader of the building where you are.
- Pay attention on windvanes or plumes of the plants for indication of the wind direction.

HISTORY YARA

Head Quarter = Oslo

Employees ± 15,000

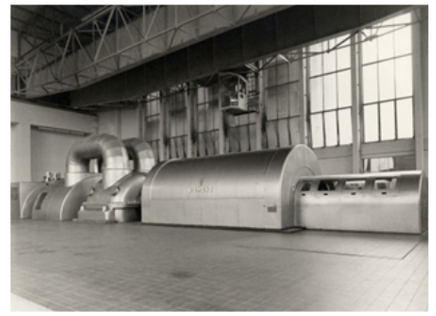
Production: 29 plants, present in 52 countries

Sales: 160 countries

HISTORY YARA SLUISKIL

1929	Start production Ammoniumsulphate
1938	Nitric Acid and Calcium Ammoniumnitrate production
1940	During World War II huge destructions by bombings
1950	Restart plants after period of rebuilding
1958	Urea production (46%N)
1966	Switch from cokes gas to natural gas

Haber Bosch: $N_2 + 3\,H_2 \rightarrow 2\,NH_3$



HISTORY YARA

1968	UAN production
1977	Ammoniumnitrate (33,5%N) production
1979	Development and practice of fluidized bed granulator technology
1979	Aquisition by Norsk Hydro
’80 –’90	Big investments in ammonia, nitric acid and nitrate production
2004	Demerger of fertilizer activities under trademark ‘Yara’
2011	Start of Urea 7 plant
2017	Commissioning of Urea 8 granulation plant and loading building



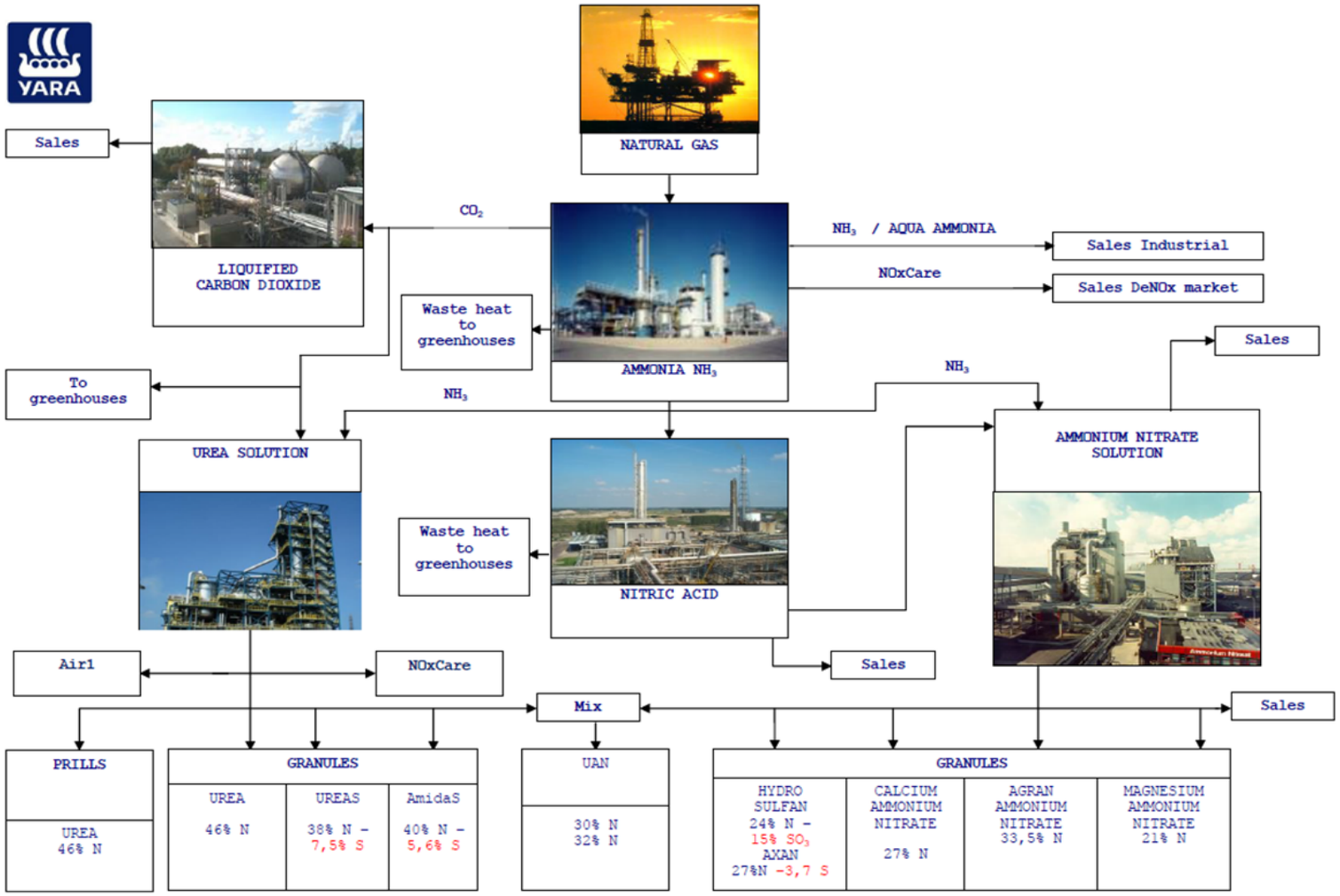


PRODUCT & PROCESSES

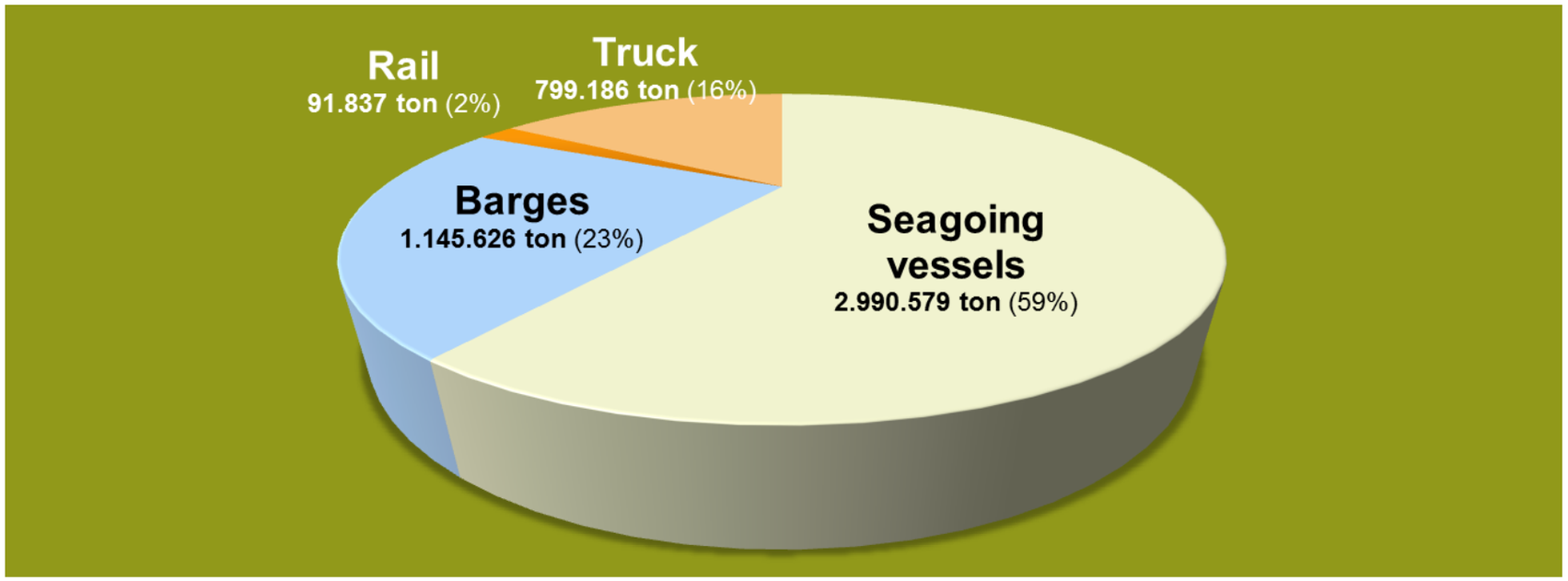
Overview of production location

PRODUCT & PROCESSES

Ammonia, the backbone for fertilizers and nitrogen based chemicals



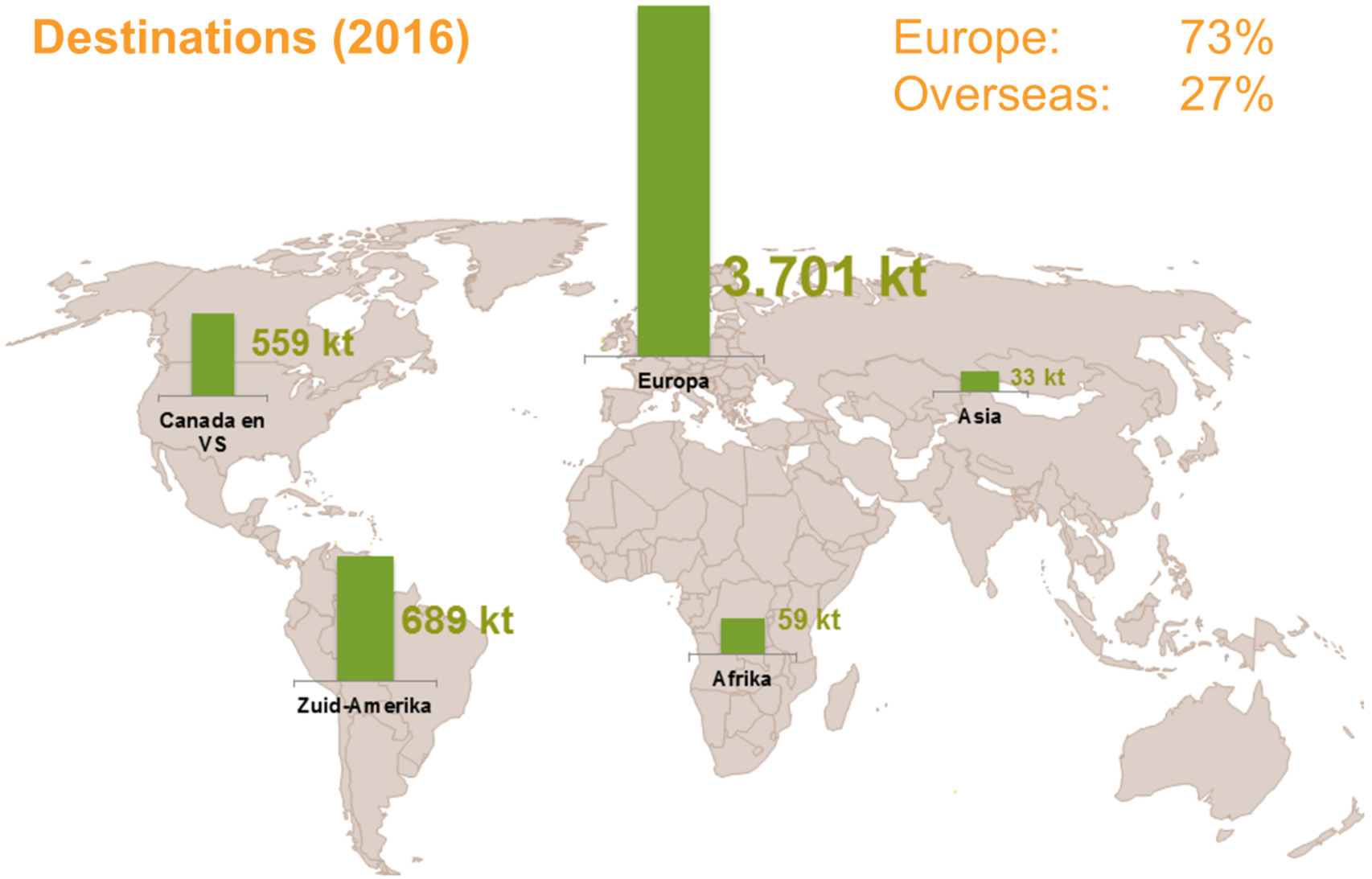
PRODUCT & PROCESSES



947
barges
627
seagoing vessels
1.232
rail wagons
31.087
trucks

PRODUCT & PROCESSES

Destinations (2016)



Europe: 73%
Overseas: 27%

INNOVATION & SUSTAINABILITY

WarmCO2

-55.000.000
Nm^3 natural gas/yr

-135.000
ton CO_2/yr

1.000
New jobs created

INNOVATION & SUSTAINABILITY

40.000 ton

CO_2 reduction

Green

Ammonia

Strong industrial clustering

INNOVATION & SUSTAINABILITY

Air-1®

926.000
ton

-85%
NOx emissie

3%
Fuel saving

INNOVATION & SUSTAINABILITY

Urea 8

240.000.000
Euro

S-urea
specialities

-50%
dust emission

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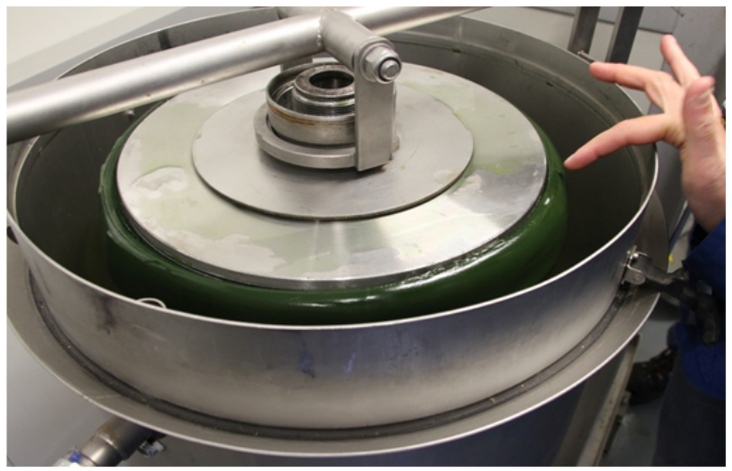
INNOVATION & SUSTAINABILITY

Water projects

Interreg Vlaanderen-Nederland
Europees Fonds voor Regionale Ontwikkeling

Provincie Zeeland



Algae
Biocleaning

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Efficiency & Re-use

GOALS IMPROVED YARA

Short term (during the project):

- Test innovative water treatment techniques
- Develop water treatment strategies by analyzing data

Long term:

- Increase reuse of both water and nutrients
- Reduce need of incoming water

GOALS IMPROVED YARA

Removal of NH_4 and NO_3

Characteristics water	Unit	Average
Discharge	m^3/h	50
Temperature	°C	40-50
NH4	mg/l	70
NO3	mg/l	70
Conductivity	µS/cm	225

PLANNING

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Train 1	1. ED															
Train 2	2. RO															
Train 3									4. MD-distillation							

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Europees Fonds voor Regionale Ontwikkeling

UNIVERSITEIT GENT

BASF
We create chemistry

DOW

YARA

Vlakwa
VLAAMS KENNISCENTRUM WATER
FLANDERS KNOWLEDGE CENTER WATER

SKIW
kennisuitwisseling

IEC

UNIVERSITY OF APPLIED SCIENCES

i-CLEANTECH VLAANDEREN
enabling the future

Evides
waterbedrijf

Provincie Oost-Vlaanderen
Voor ieder van ons

Provincie Zeeland

west-vlaanderen
de gedreven provincie

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