



Flexible solutions
for your business

2023



Grupa Azoty at a glance

Grupa Azoty, Poland's largest chemical group and a significant chemical industry player in the EU offering a diversified product portfolio – from mineral fertilizers and engineering plastics through OXO products to melamine.

5



main production sites

over

50



companies in the
capital group

approximately

~15 000



employees

no. 2



EU mineral fertilizers producer

no. 3



EU PA6 producer

no. 4



EU plasticizers producer

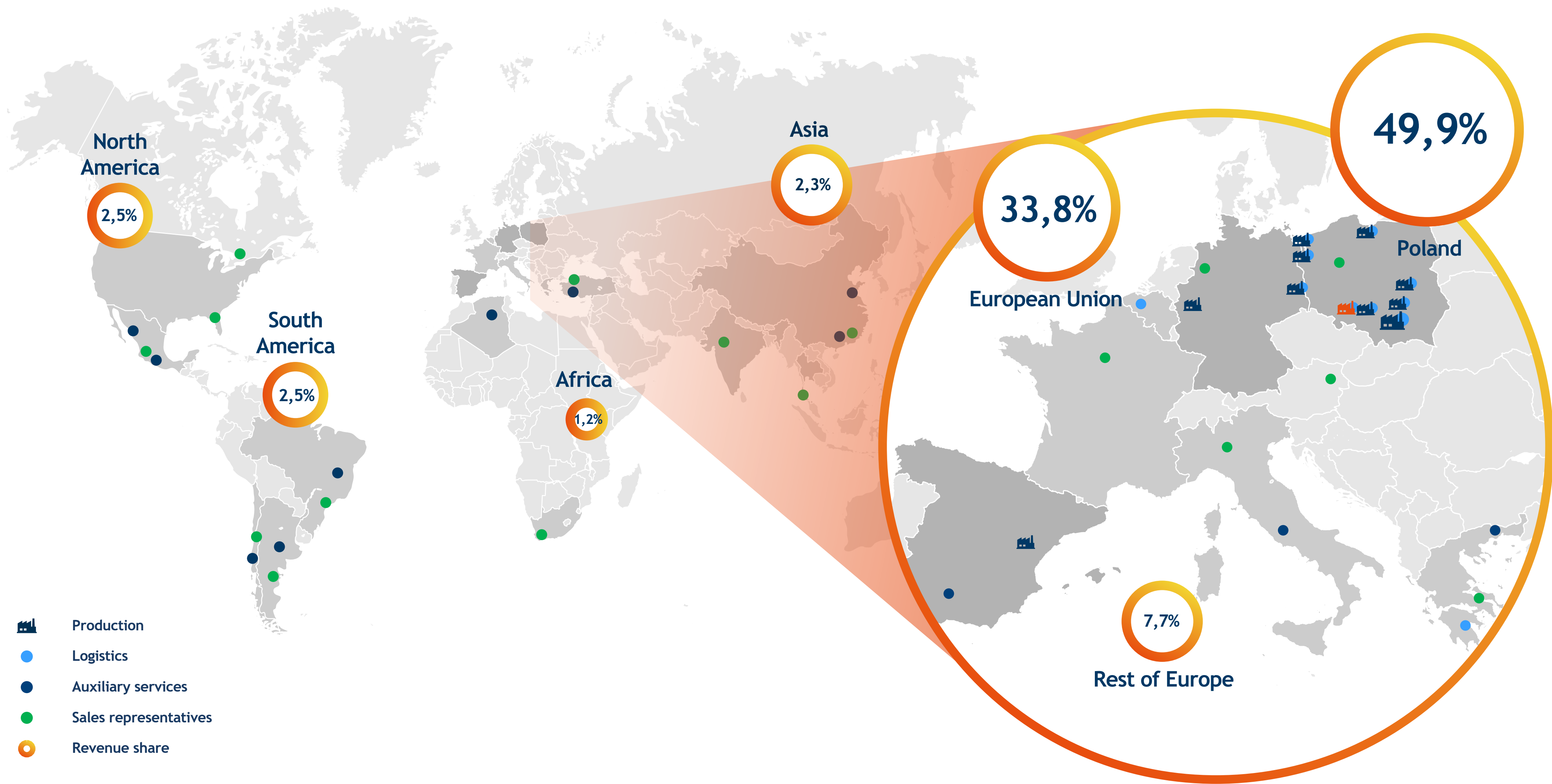
no. 5



EU OXO alcohols producer

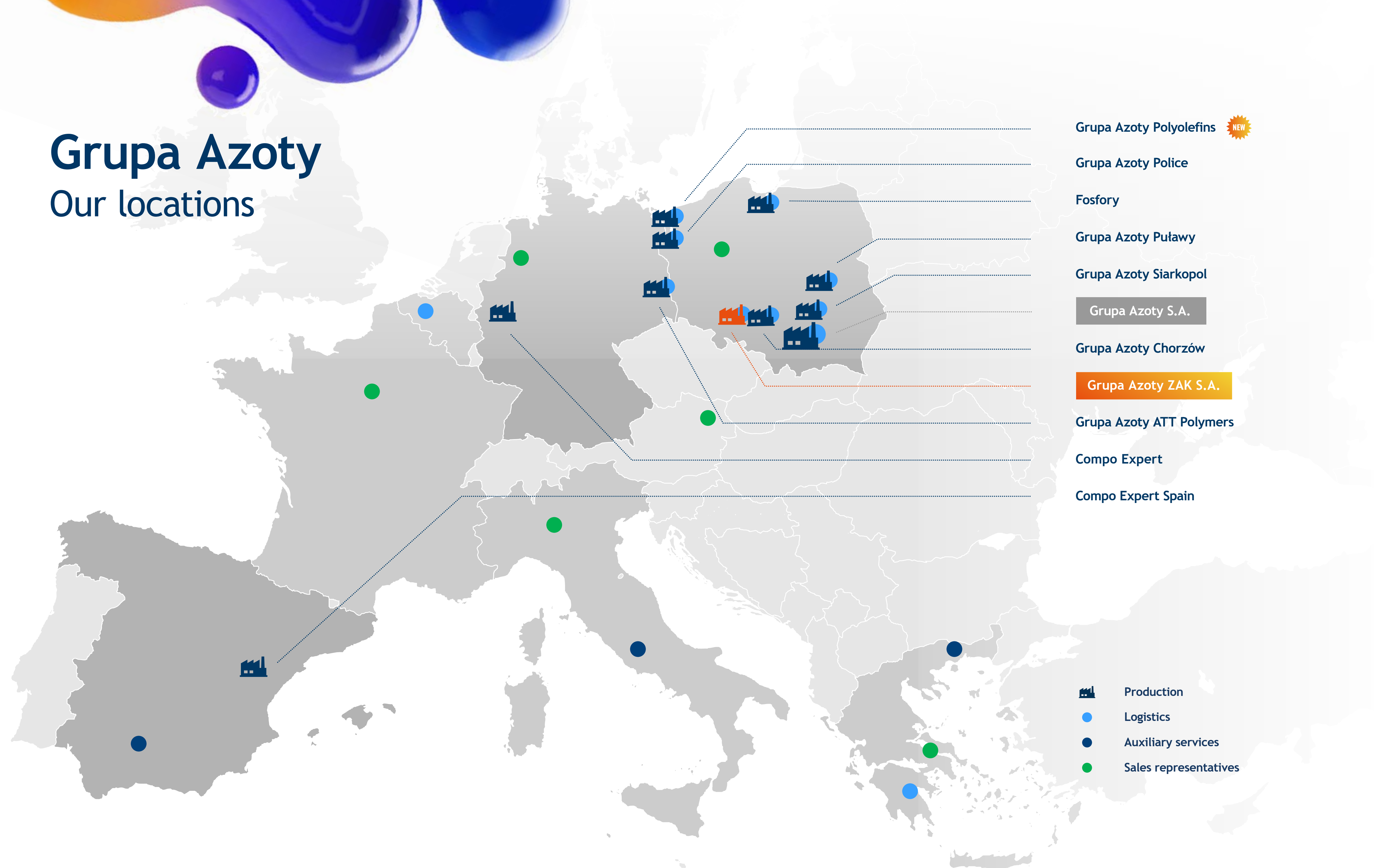
Grupa Azoty

Core Business



Grupa Azoty

Our locations



Grupa Azoty

Business Areas

Business Areas				
	Fertilizers	Chemicals	Plastics	Other
Grupa Azoty S.A. (parent company, capital group)	AN, CAN, ASN, AS		PA6, POM, Compounds, Caprolactam	
Grupa Azoty ZAK S.A. (capital group)	AN, CAN, UAN, CAN+S, urea	OXO alcohols, Plasticizers, Aldehydes		
Grupa Azoty Puławy (capital group)	AN, UAN, urea, NPK, AS	Melamine	Caprolactam	
Grupa Azoty Police (capital group)	NPK, NP, NS, urea	Titanium Dioxide		
Grupa Azoty Polyolefins			Polypropylene 	
Grupa Azoty ATT Polymers			PA6, Compounds	
Compo Expert	Specialty fertilizers, biostimulants			R&D
Grupa Azoty Koltar				logistics
Grupa Azoty Siarkopol		Sulphur based products		mining
Grupa Azoty Polskie Konsorcjum Chemiczne				designing and engineering services, repairs, maintenance, chemical rescue

Grupa Azoty

Business Segments

Business
areas

AGRO

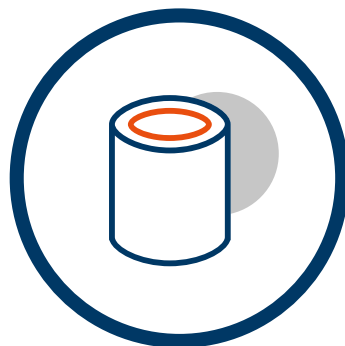
PLASTICS

CHEMICALS

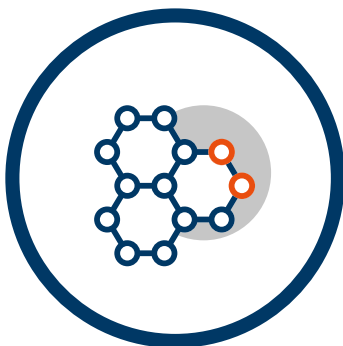
Business
Segments



AGRO



Plastics -
Polyamides



Polyolefins



Pigments



Tech Grade
Urea



OxoplastTM
flexible opportunities

Strategic
Business
Area



Strategic Business Area - Energy





Oxoplast™
flexible opportunities

Flexible solutions
for your business

Oxoplast™

flexible opportunities

Grupy Azoty ZAK S.A. is a part of Grupa Azoty.
Oxoplast™ is a Business Unit of Grupa Azoty ZAK S.A.
focused on OXO alcohols, plasticizers and aldehydes.

OXO plant by night

Photo, Grupa Azoty ZAK S.A.





We respond to customers' needs
and challenges of a changing world
with our **specialty products.**

**Production Engineer
at work Esters plant**

Photo, Grupa Azoty ZAK S.A.





Innovation has permanently entered our DNA. We believe that the future lies in better understanding of our partners' needs and working together to create the best solutions.





We develop our products according to sustainable development principles and **environmental care**. This is our goal.





We are proud of Oxoplast™
heritage. We have been producing
plasticizers continuously since 1954,
and OXO alcohols since 1986. ZAK
Quality is our trademark - quality
recognized all over the world!

Revamp of the OXO
plant in 1990s

Photo, Grupa Azoty ZAK S.A.



Mission / Vision



Mission

To deliver chemical products meeting customers needs.



Vision

We will become leading player in our industry. Our company will be a first choice supplier for the customer. We will achieve a highest value added factor in our industry regardless of economic situation.



Strategic aim

Growth of sales and margins through market development, expanding portfolio and product placement.



Activities

To introduce new generation plasticizers. To lengthen value chains. To perfect customer services employing innovative logistics solutions. To utilize new perspective market segments and markets. To optimize production and storage costs.



Oxoplast™ Aldehydes



n-Butyralde-
hyde



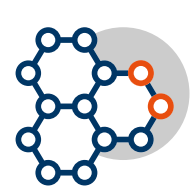
Isobutyr-al-
dehyde



solvents



plasticizers



alcohols



pharmaceuticals



crop protection
products



fragrances



synthetic resins



Oxoplast™

OXO Alcohols



2-Ethylhe-
xanol



n-Butanol



Isobutanol



Octyl
alcohol F



solvents



paint additives



fuel additives



plasticizers



acrylates



acetates



Oxoplast™ Plasticizers

General Purpose
Plasticizers

Oxoviflex™
(DOTP, DEHT)

>99,5%
DOTP
Superior
Purity


**Phthalate
Free**


**EU 10/2011
Compliant**

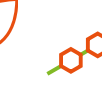

**Pharmacopoeia
Approved**

Specialty Plasticizers

Oxofine™ TOTM

Oxofine™ Poly2K

Oxofine™ DOA

>99,5%
DOA
Superior
Purity



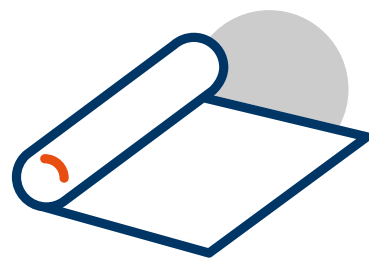
Main Applications Oxoplast™



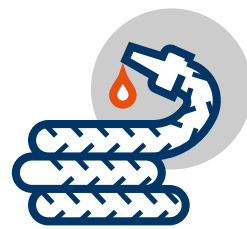
medical
devices



wires &
cables



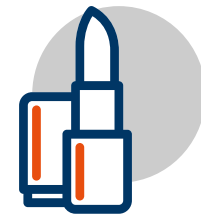
wallpapers



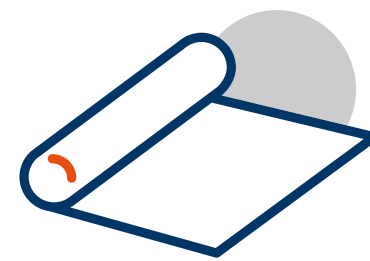
garden
hoses



fabrics



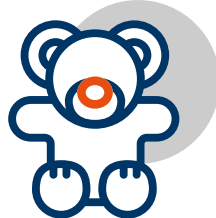
cosmetics



pvc flooring



paints and
varnishes



toys



footwear



automotive



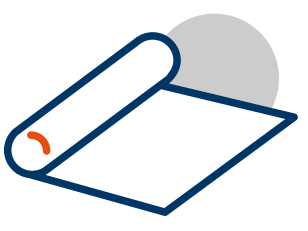
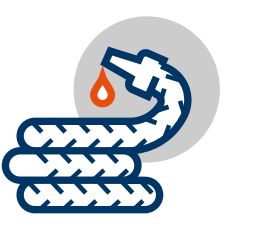
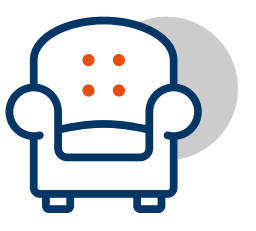
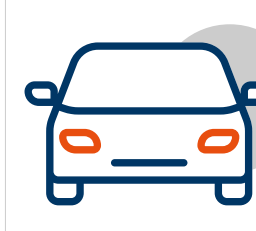
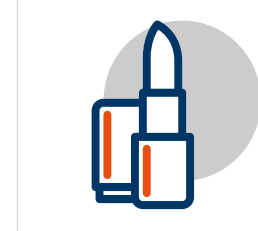
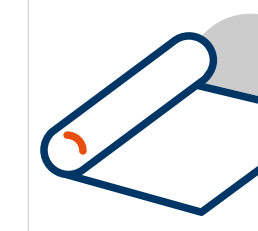
fuel
additives



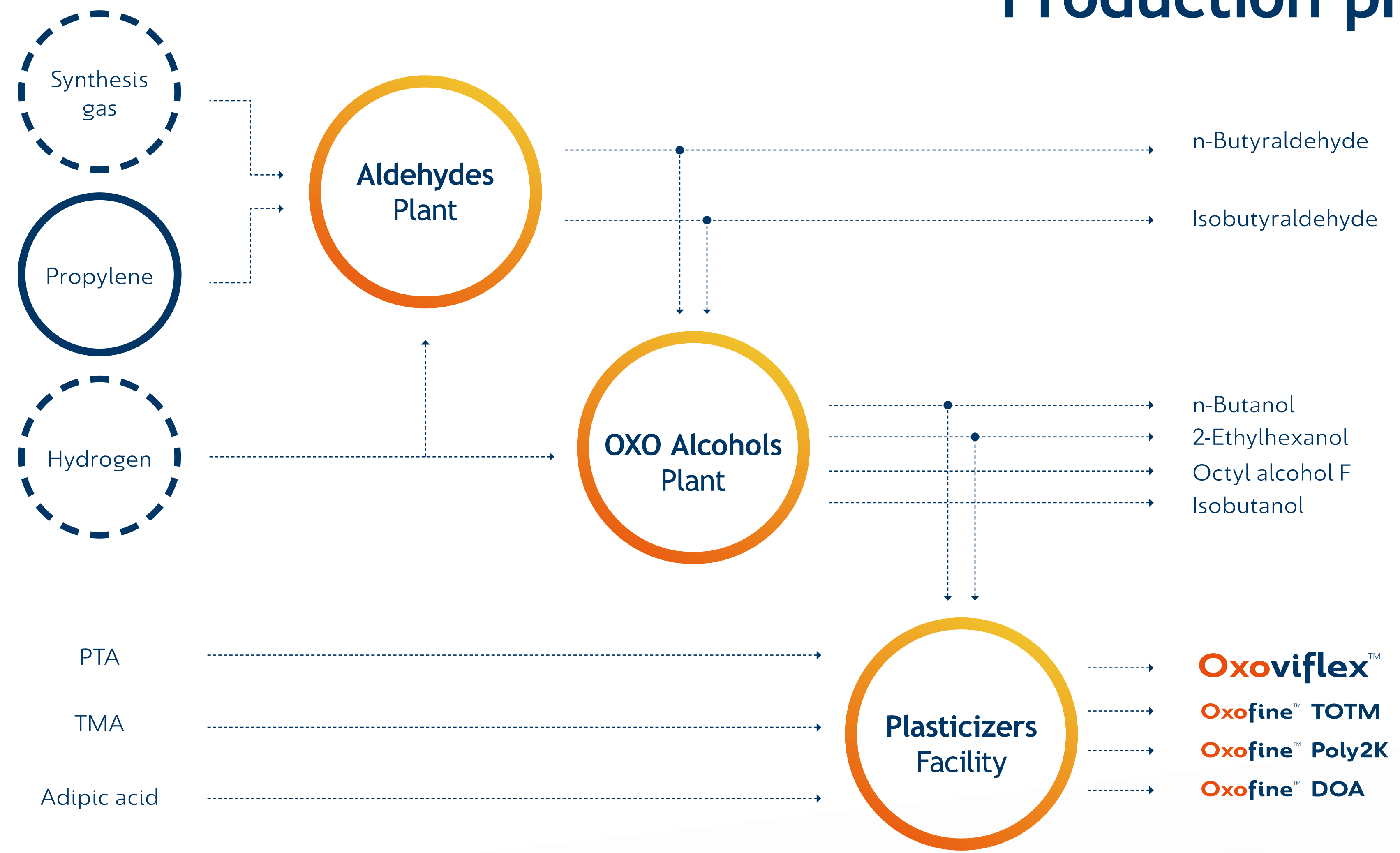
food contact
materials



Plasticizers applications

												
	medical devices	wires & cables	wallpapers	garden hoses	fabrics	paints and varnishes	toys	footwear	automotive	cosmetics	pvc flooring	food contact materials
Oxoviflex™	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Oxofine™ TOTM	✓	✓							✓			
Oxofine™ Poly2K	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
Oxofine™ DOA	✓	✓	✓	✓	✓	✓		✓		✓		✓

Production process



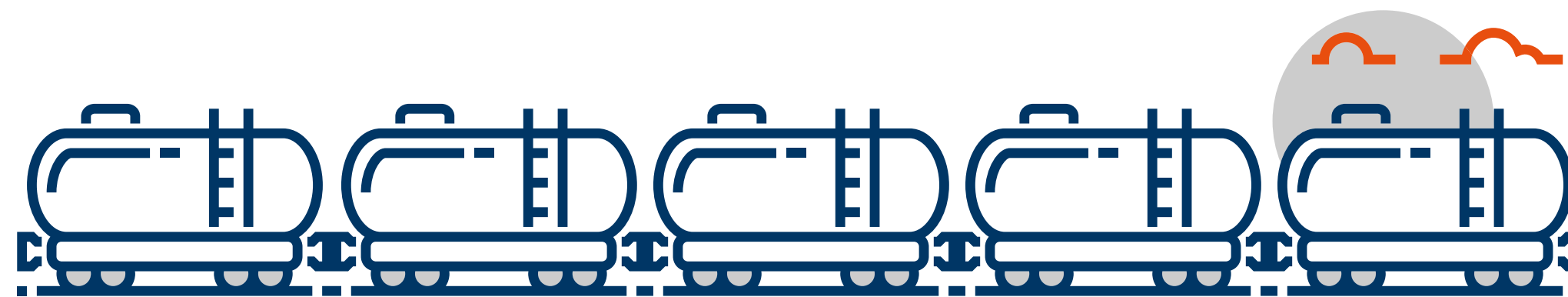
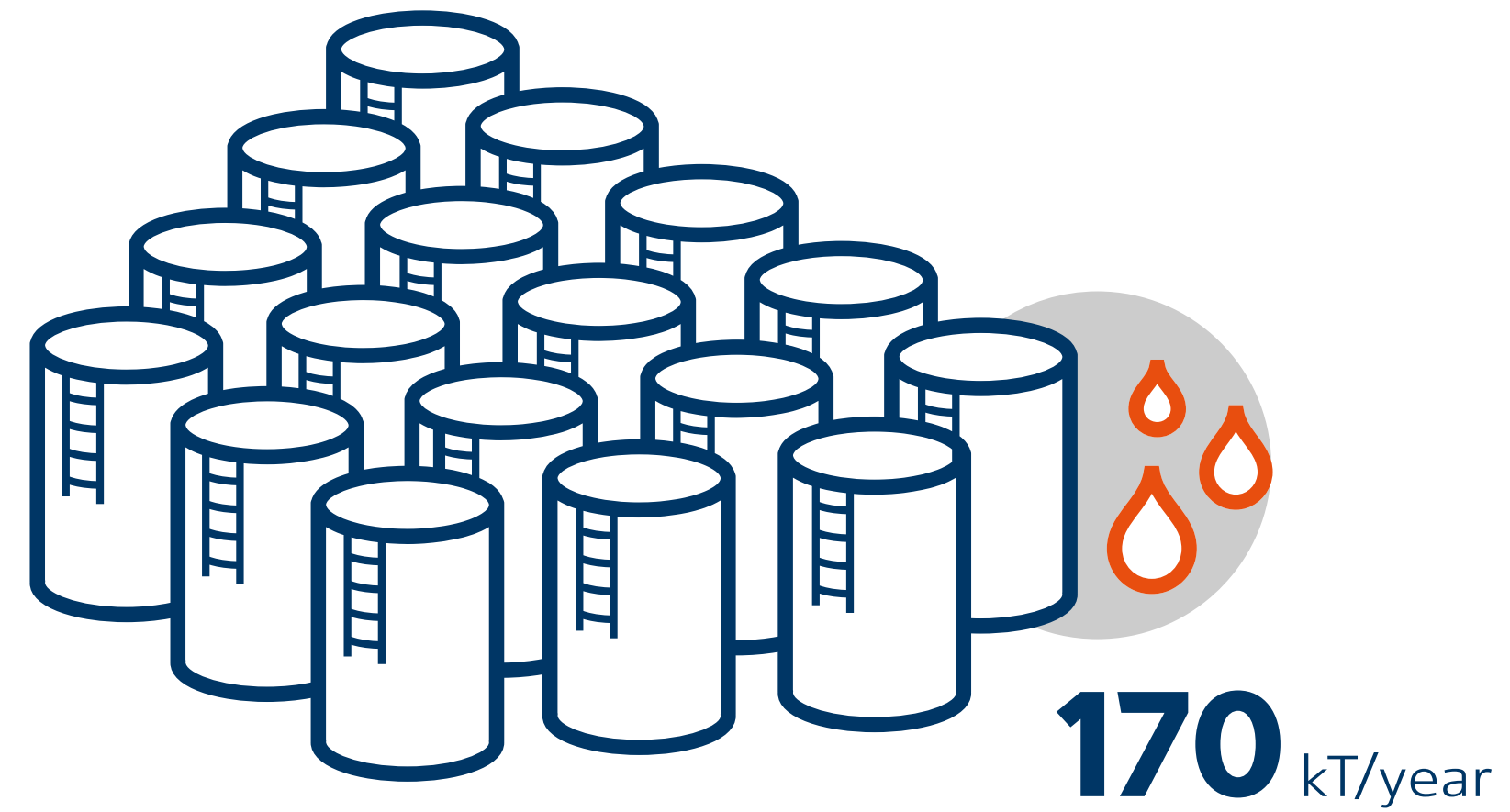
Capacities

OXO Alcohols

n-Butanol
Isobutanol
Octyl alcohol F



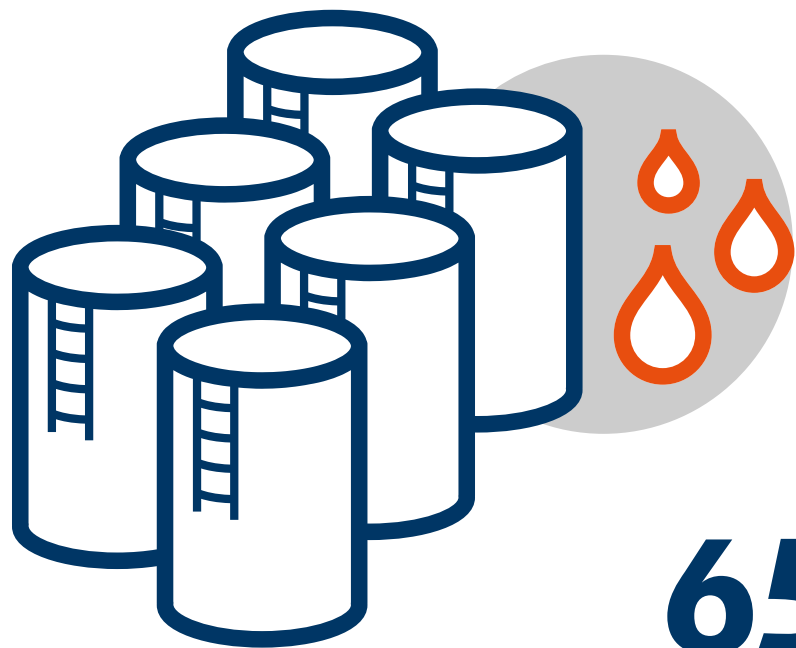
2-Ethylhexanol



Capacities Plasticizers

General Purpose
Plasticizers

Oxoviflex™



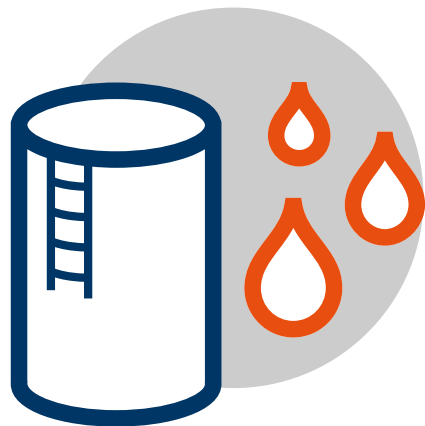
65 kT/year

Specialty
Plasticizers

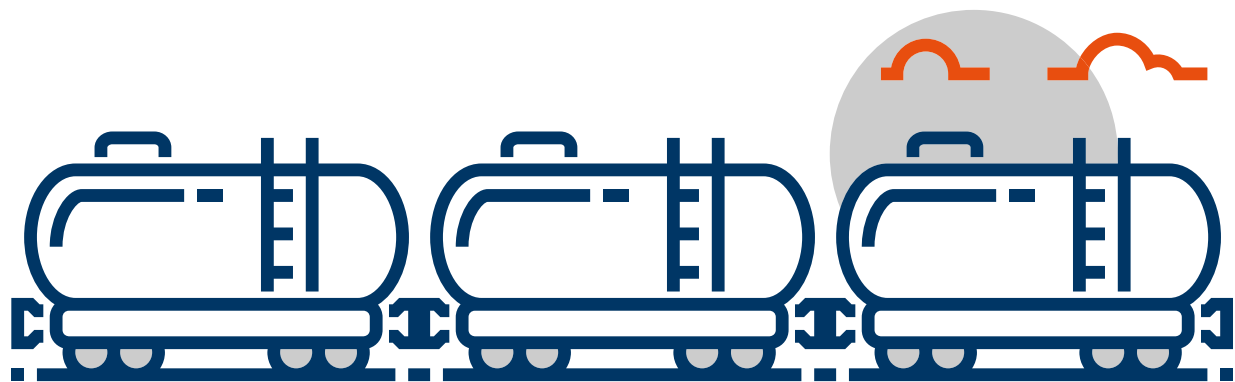
Oxofine™ TOTM

Oxofine™ Poly2K

Oxofine™ DOA



10 kT/year

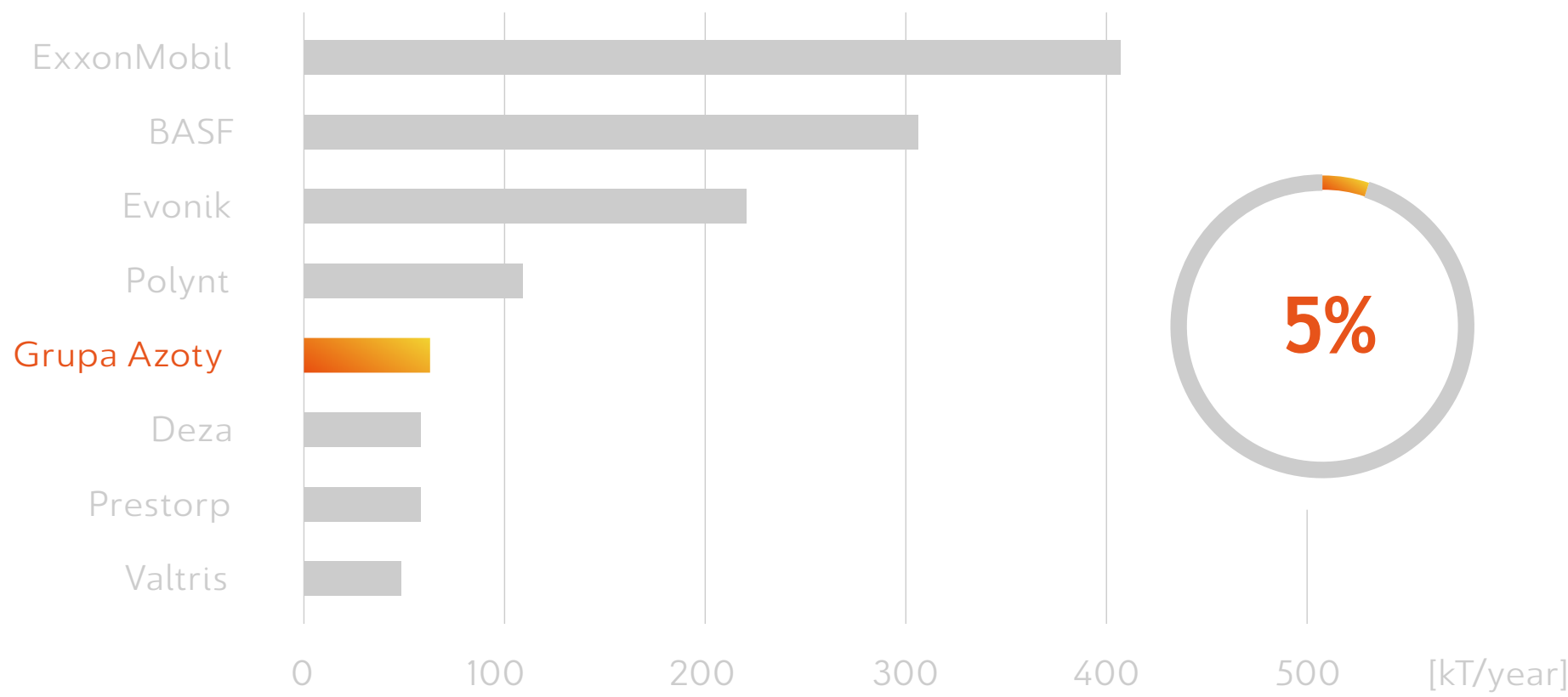


2,4 million
tons of plasticizers
produced since 1954



Plasticizers

- **1954** start of production of the first PVC plasticizers
- **1963** Oxoplast™ O (DEHP)
- **1999** Oxoplast™ IB (DIBP)
- **2010** Oxoplast™ PH (DPHP)
- **2014** Oxoplast Medica™
- **2015** Oxoviflex™ (DOTP) - start up of 50 kT/year plant
- **2018** phase out of phthalate plasticizers and increase of Oxoviflex™ production capacity by an additional 15 kT / year
- **2019** start-up of 10 kT/year specialty plasticizers plant
- **2021** introduction of Oxofine™ specialty plasticizers brand



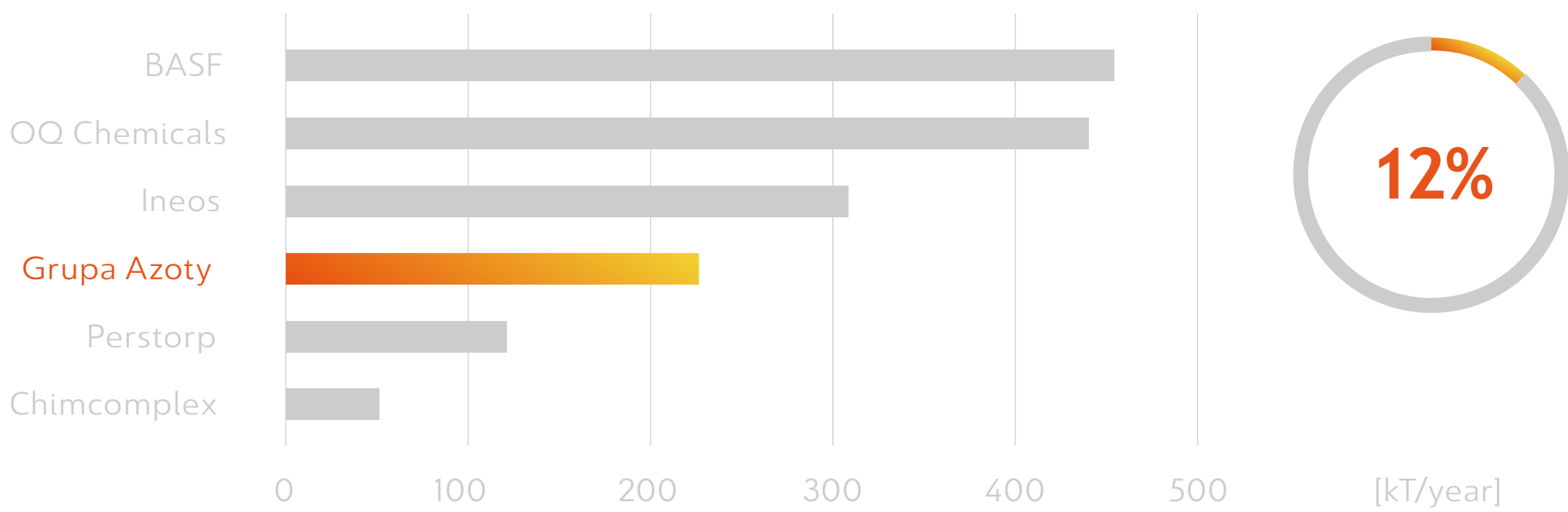
with reference to DEHT, DINCH, DINP, DPHP

no. 1 in EU's DOTP capacity

Market share in
European Union

OXO Alcohols

- **1986** start-up of OXO alcohols plant (2-Ethylhexanol, n-Butanol, Isobutanol)
- **1998** OXO plant revamp aimed at increasing its capacity up to 225 kT/year



with reference to 2-EH and butanols

no. 2 in EU's 2-EH capacity

Efficient logistics

Geographical barriers do not exist for us, we operate globally. We provide our clients with comprehensive service and in-time deliveries. We adapt to the most demanding needs and use innovative logistics solutions.

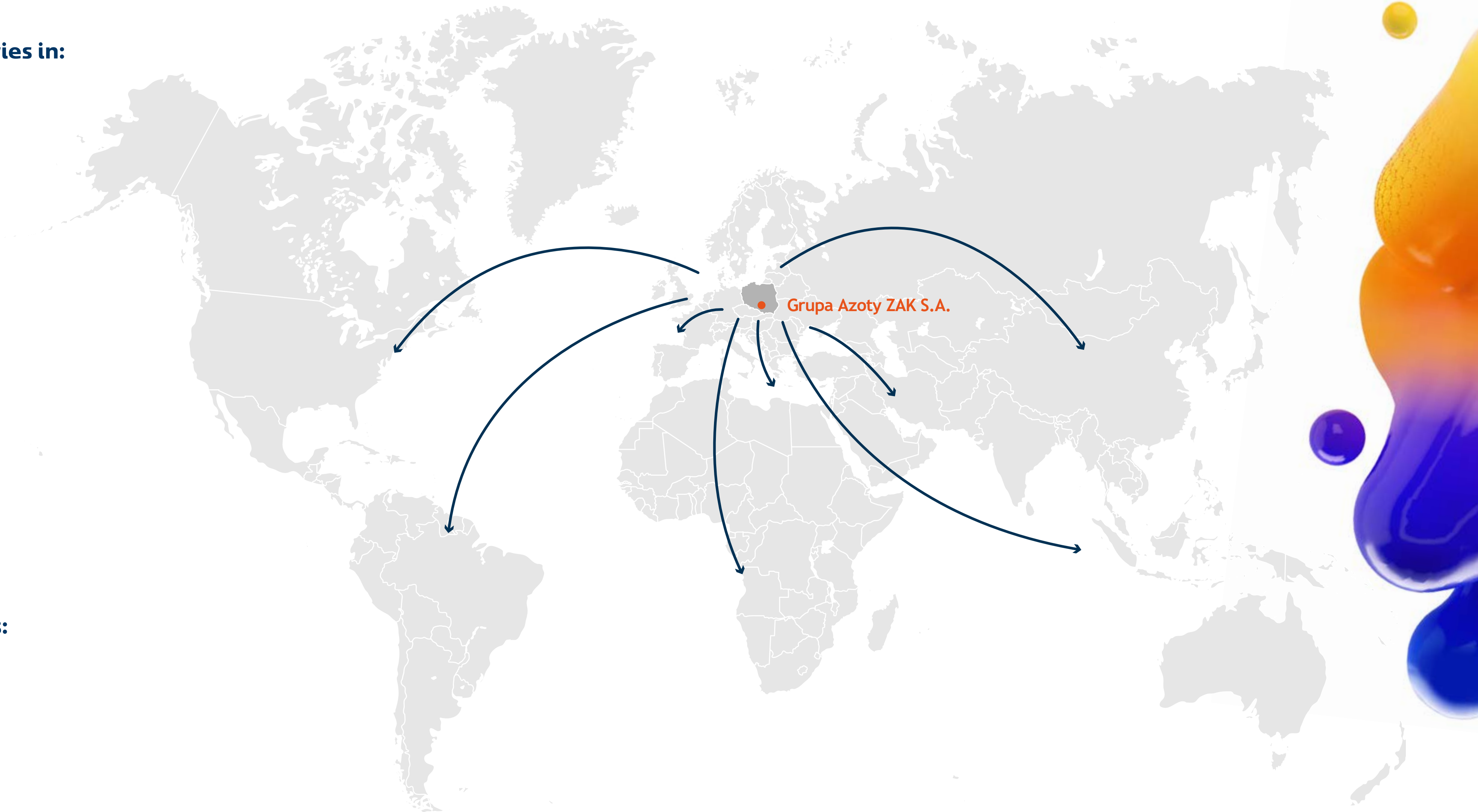
IN-TIME deliveries in:



Proven logistics:

- land
- marine
- intermodal

Logistics options



Research and Development Center

The main purpose of our experimental installation, known as quarter-technical installation is to develop the synthesis of new plasticizers obtained through the esterification and transesterification methods. Efforts have also been undertaken to continually optimize the current plasticizer manufacturing technology and research new technologies. With the possibility of changing the parameters for running the process, we are able to select such conditions for conducting the synthesis to obtain a product with specific properties, tailored to the customers' specifications. The technology for manufacturing plasticizers is verified at the Research and Development Center of Grupa Azoty ZAK S.A.

The Research and Development Center (Polish: CBR) is a significant boost to our company's research and development capabilities. As such, it allows us to replicate on a laboratory scale the manufacturing process, produce test materials and conduct advanced application research. With extensive equipment facilities at our disposal, we are able to offer our customers tailor-made products.

The Research and Development Center features 10 research laboratories divided into condensation, pressure, polymer

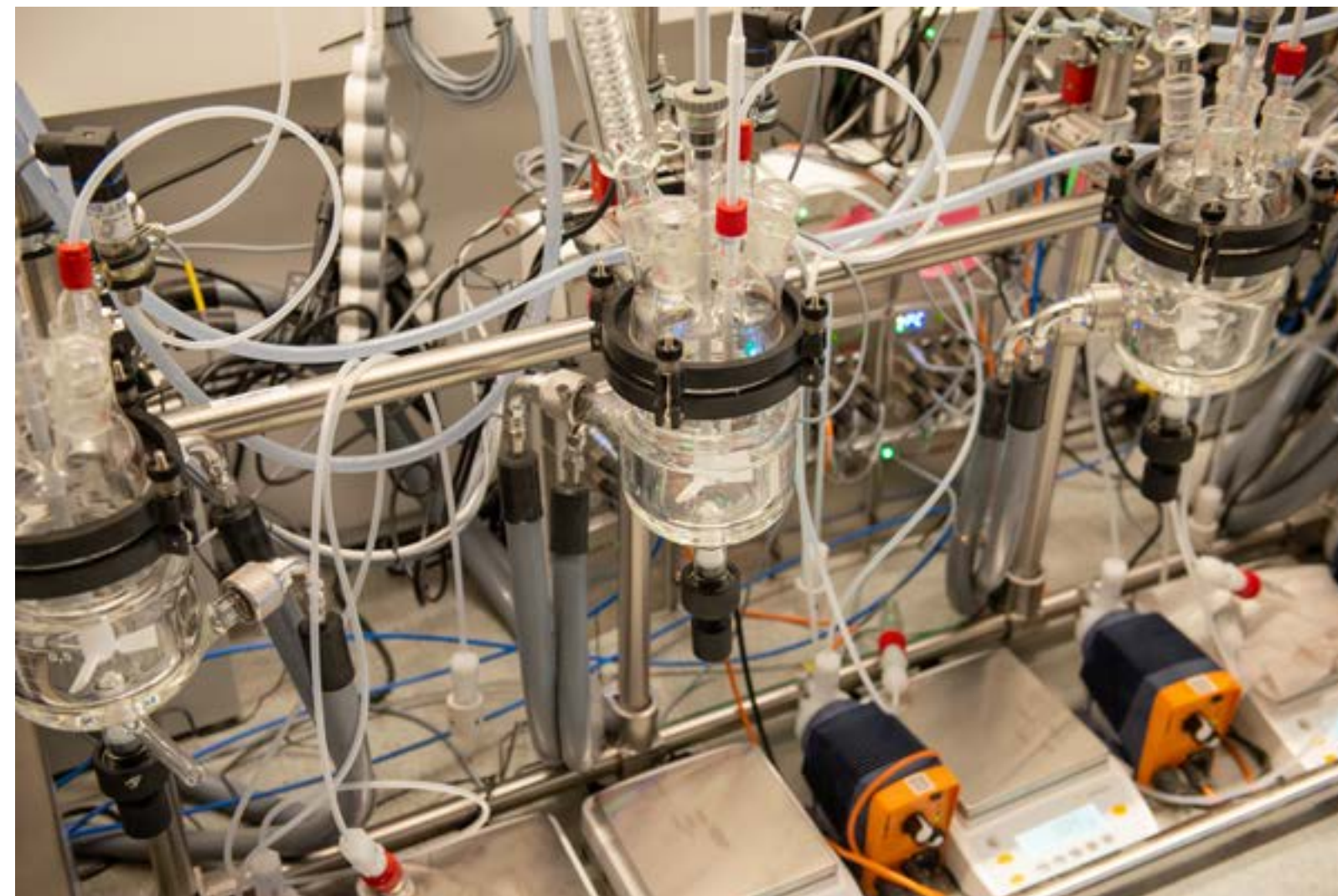
Research and Development Center
Photo, Grupa Azoty ZAK S.A.



and physicochemical research laboratories, providing facilities for organic synthesis, application testing of plastics, as well as analytical and physicochemical research. The amenities of the processing section are supplied with a range of equipment and devices used in processing and research into the physicochemical properties of plastics. The equipment used in the processing includes a set of mixers, a granulation line with a twin-screw extruder and a granulator, a planetary extruder, a laboratory injection molding machine and a hydraulic press. Equipment for testing the physicochemical properties of plastics includes a plasticization time tester, a testing machine and a thermal stability test machine.

The processing of plastics starts with the preparation of dry-blend mixtures. The data obtained at this stage provide an opportunity to compare the processing conditions of PVC blends using different plasticizers. The next step involves producing pellets from the previously prepared blends. With extrusion parameters, we are able to determine the optimal processing parameters. The next stages include the preparation of plastic samples for testing the physical and chemical properties of the plastic (pressing and injection molding). Samples prepared in this way are then tested for migration, plasticization time and thermal stability, and are subjected to strength tests (tensile strength, elongation at break).

Condensation laboratories at CBR (Eng. RDC) are equipped with sets of glass reactors with capacities ranging from 0.2 to 5 liters. The laboratory equipment facilitates research and development work in the formulation of new esters-bio esters-which can serve as plasticizers. The reactors provide the opportunity to carry out syntheses under complete control of reaction time parameters. Physicochemical research laboratories feature five laboratory rooms. The laboratory equipment supports advanced work in chemical analytics, structural analysis, thermogravimetry, as well as basic studies of physicochemical properties that are essential in the course of research and development.



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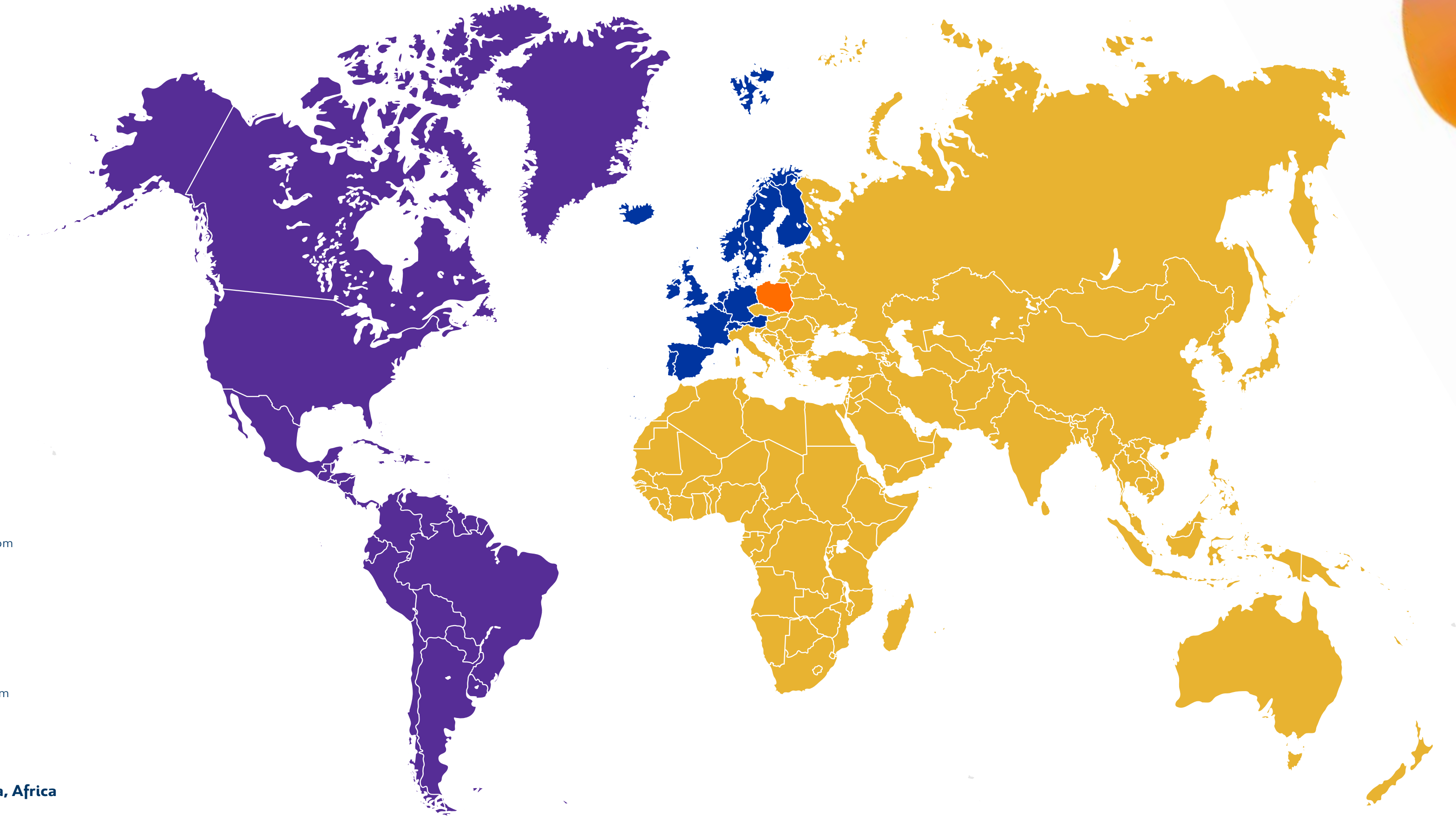
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Thank you

for attention

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