

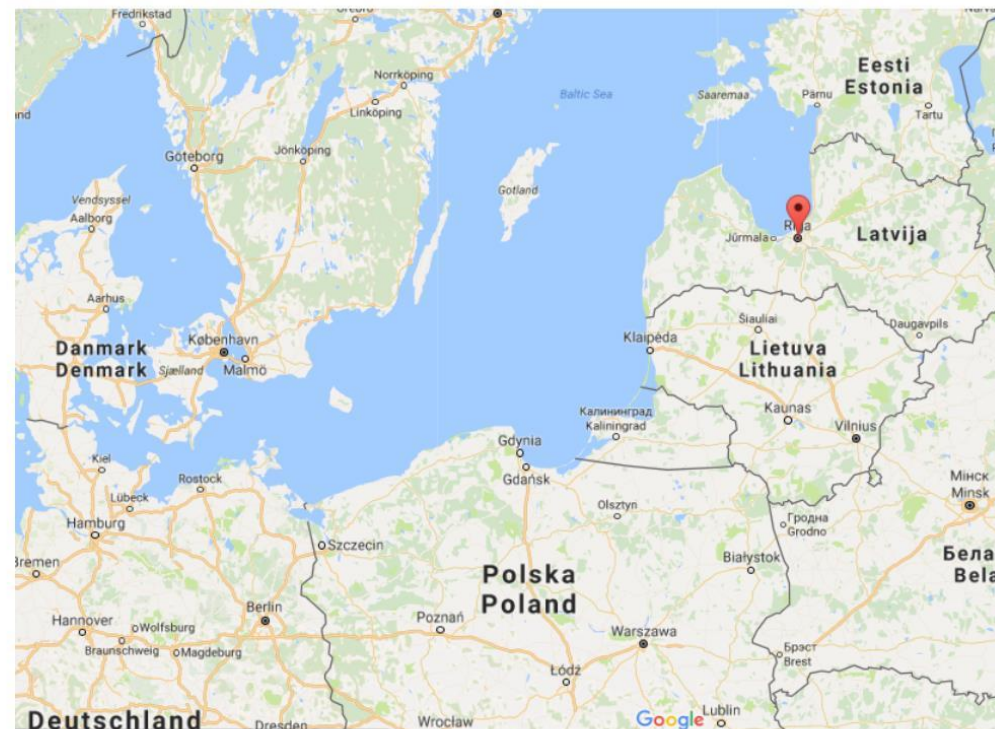
# BIO BASED POLYOLS

for the polyurethane industry



**PolyLabs** is an innovative chemical company established in partnership with scientific **Institute of Wood Chemistry** of Latvia to produce **Bio polyol** for the polyurethane industry.

Manufacture plant of 2500-3000t annual capacity located in Olaine, Latvia provides easy access to Riga port and fast road transport connections across Europe.



# Polylabs Bio polyols

- Our Bio Polyols are high quality bio based polyols synthesized using **renewable** materials (**rapeseed** (canola) and **tall** oils).
- The best use for these polyols is the production of rigid polyurethane foams for thermal insulation application.
- Because of their autocatalytic nature, using our Bio Polyols it is possible to decrease the catalyst amount in a polyol composition. Using our Bio polyols prevents system from phase separation.
- The proportion of renewable materials in our Bio Polyols is **60% - 74%**.
- Hydroxyl groups in our Bio Polyols are up to 100 % primary. Our method of Bio Polyol production insures that all carboxylic compounds in natural oils are transferred into Bio Polyols.



# PRODUCT OVERVIEW



- **BIO POLYOL RD**

- Polyol is synthesized from rapeseed oil by transamidation/transesterification method with polyfunctional alkanolamine. It contains secondary amine and primary hydroxyl functional groups. Polyol is difunctional.



- **BIO POLYOL TT**

- Polyol is synthesized from tall oil by esterification method with polyfunctional alkanolamine. It contains primary hydroxyl functional groups and tertiary amine groups. This polyol is catalytically more active and can be used for spraying PUR formulations. Polyol is difunctional.



- **BIO POLYOL TD**

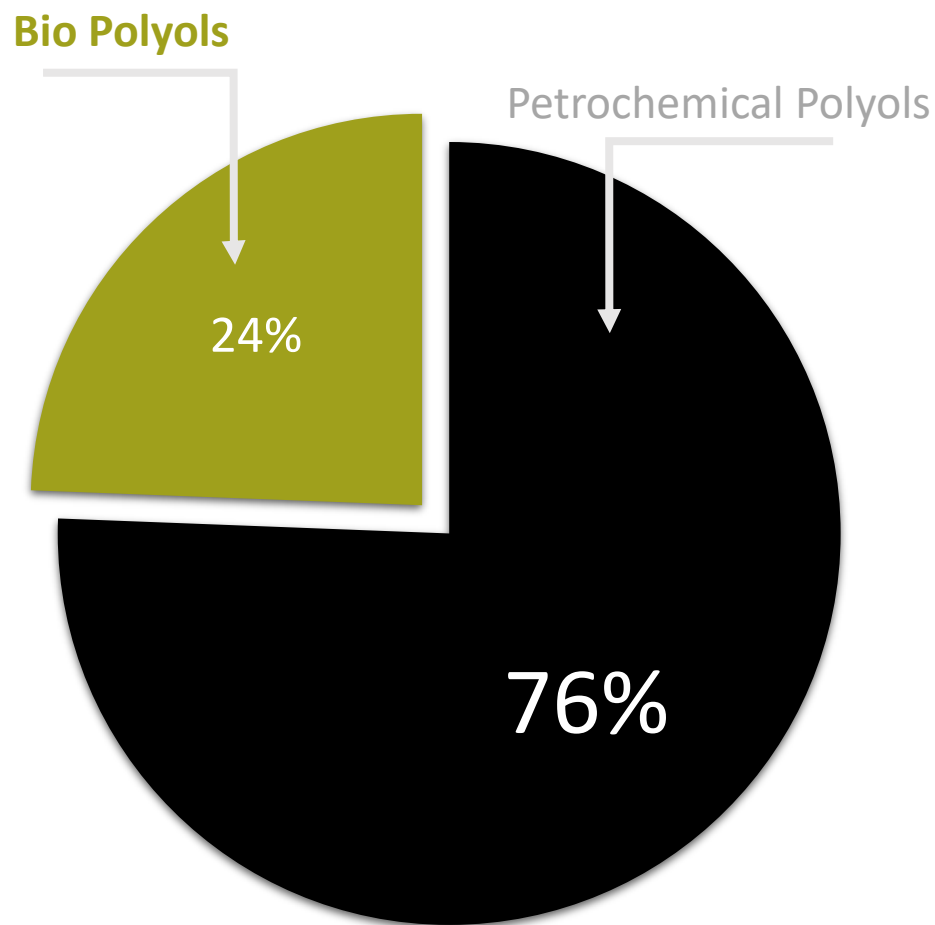
- Polyol is synthesized from tall oil by amidation/esterification method with polyfunctional alkanolamine. It contains secondary amine and primary hydroxyl functional groups. Polyol is difunctional.

# Application example

- Closed cell structure (91 % – 96 %)
- Hydrophobicity (absorbed water amount after 7 days is below 2% vol.)
- Heat transfer coefficient up to 0,019 W/m·K
- Lower polyurethane foam fragility
- High reactivity
- Stability against hydrolysis
- Good adhesive properties
- Good chemical resistance
- Reduced environmental footprint



# INDUSTRY PROBLEM



## Bio Polyols can't keep up with industry demand

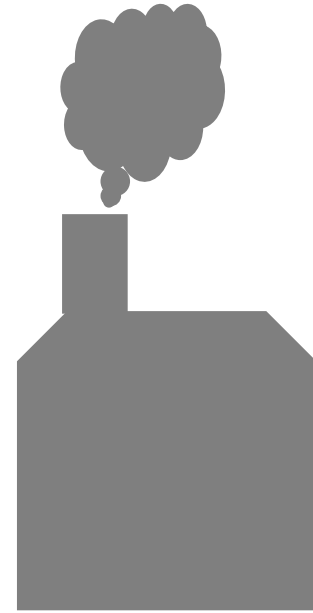
- ↑ Production costs
- ↑ Bio polyol price
- ↓ No access to green insulation market
- ↓ High CO2 footprint
- ↓ NON compliance with eco certification
- ↓ Unstable petro polyol price
- ↓ Dependence of crude oil price

# THE DEAL



POLYLABS produces bio polyols

Bio polyols  
1500 €/Mt



Polyurethane systems manufacturer  
- The system house

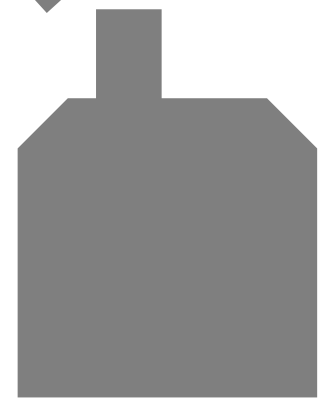
Bio polyol system (formulation)  
3000-6000 €/Mt



Polyurethane product manufacturer

Bio polyurethane product  
e.g. sandwich panel

€

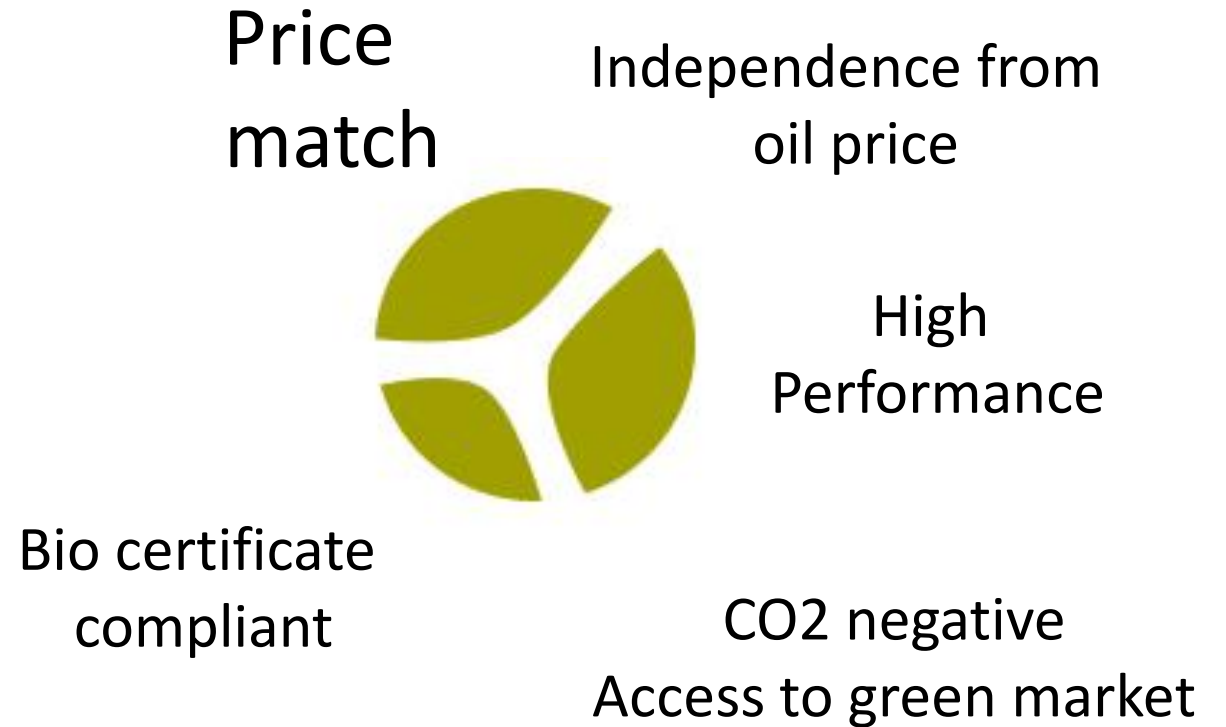
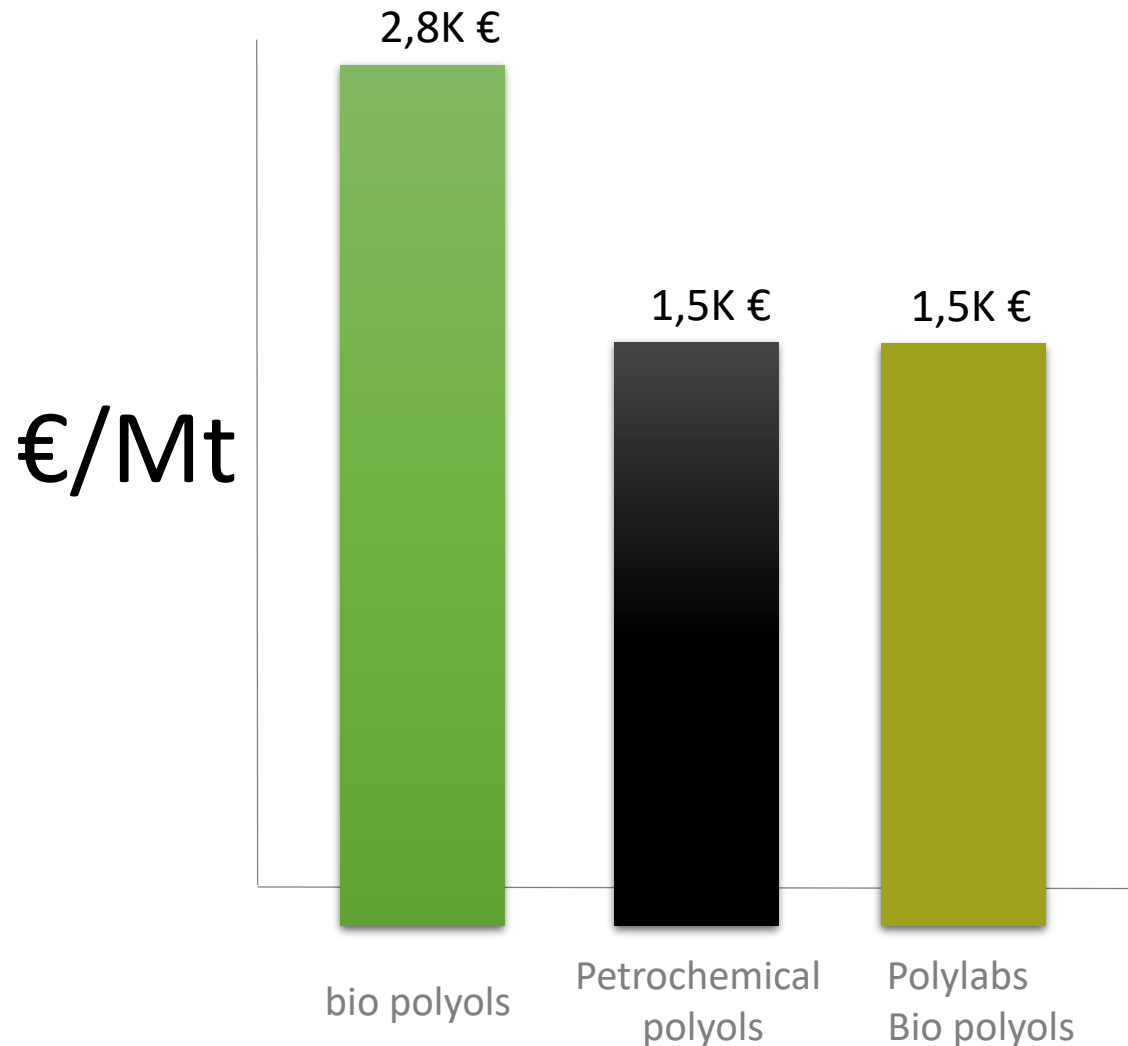


End customer  
e.g. construction company

The global **polyols** market in 2015 reached almost \$ **19,5 billion**.

**Bio polyol market is currently worth \$ 5,03 billion, with annual growth of 8,5%.**

# VALUE PROPOSITION



# PROPRIETARY TECHNOLOGY

designed for Bio Polyol production

NATURAL OILS

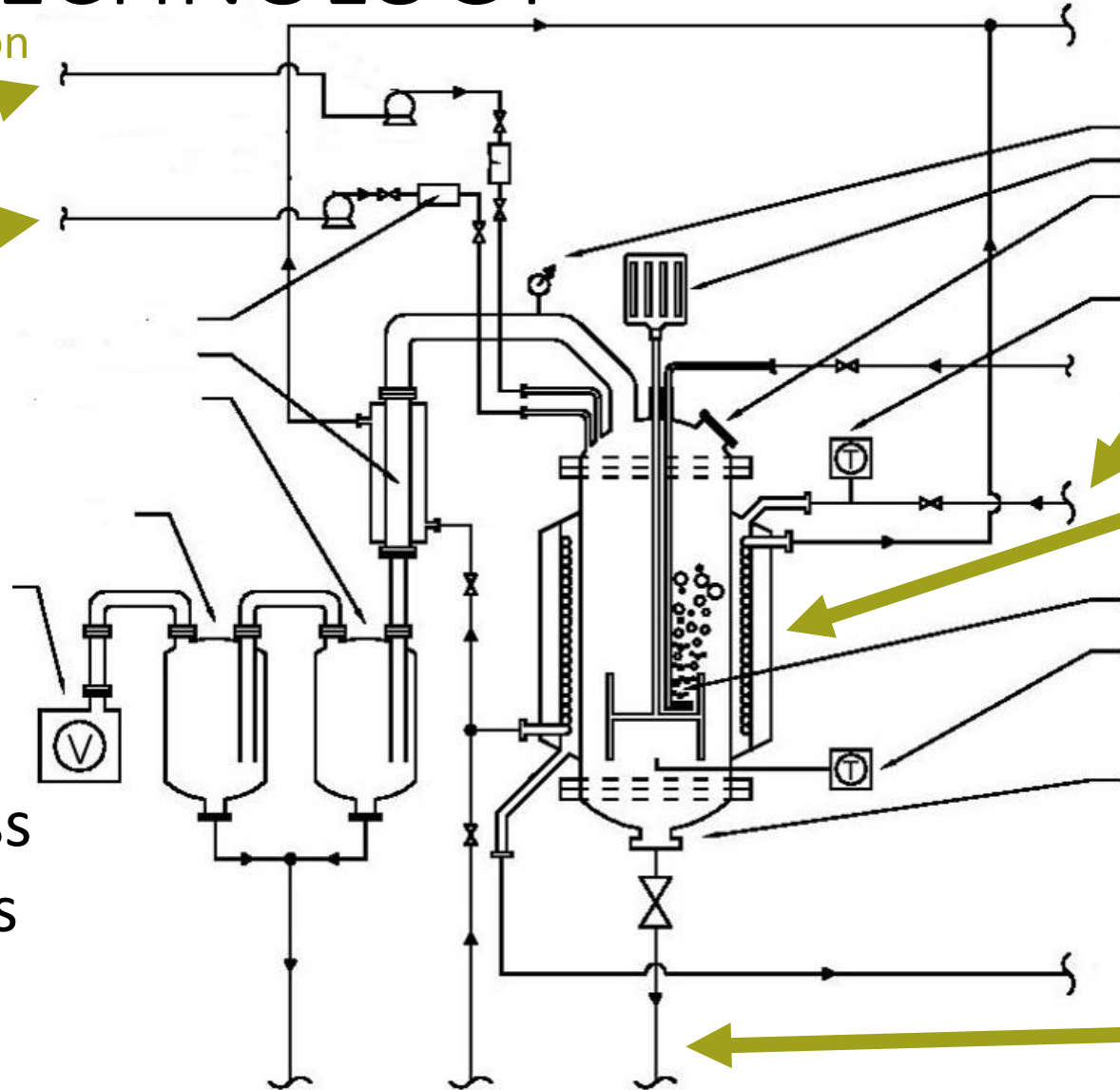
AMINES

PRESSURE

HEAT

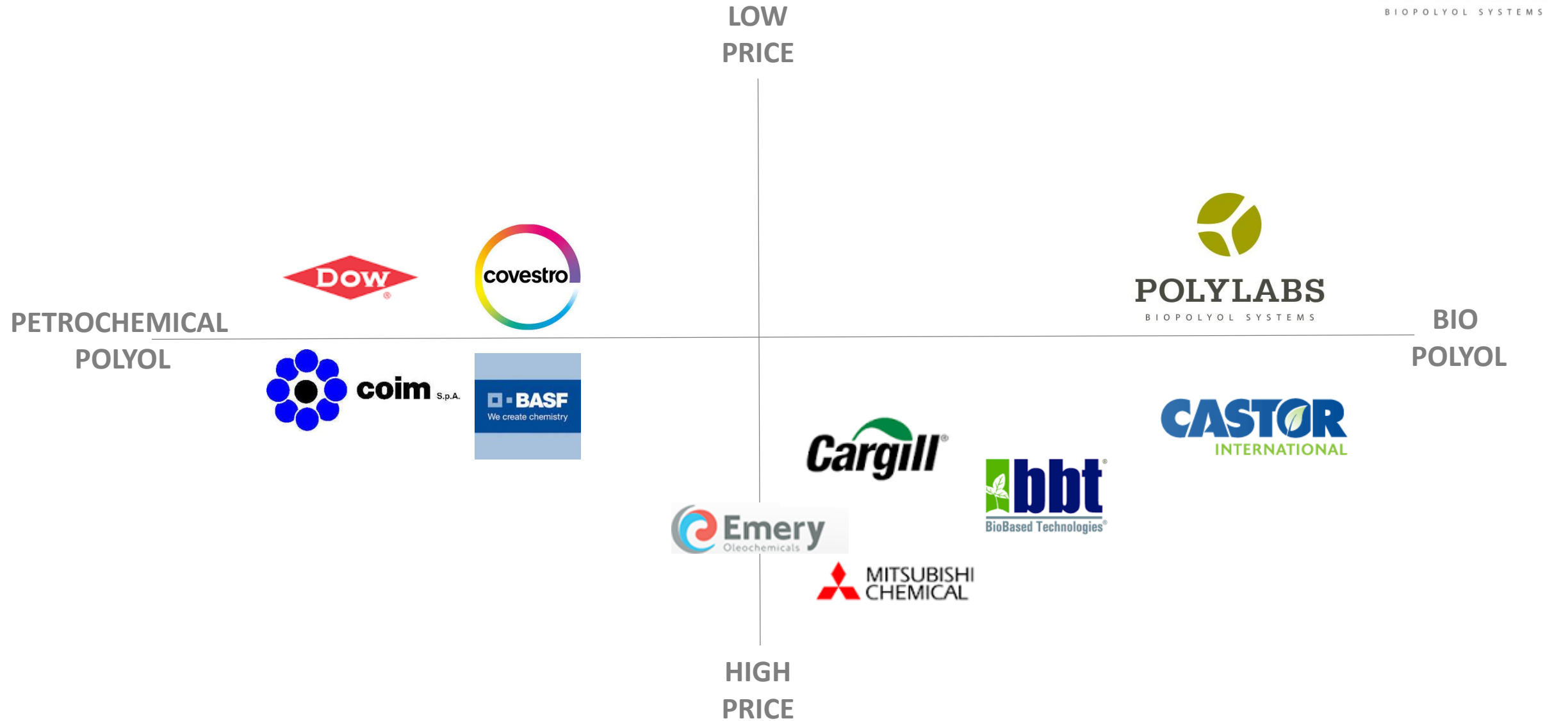
CHEMICAL  
REACTOR

POLYOLS



- Unique, one step process
- No waste, no emissions
- Local resources

# POSITIONING

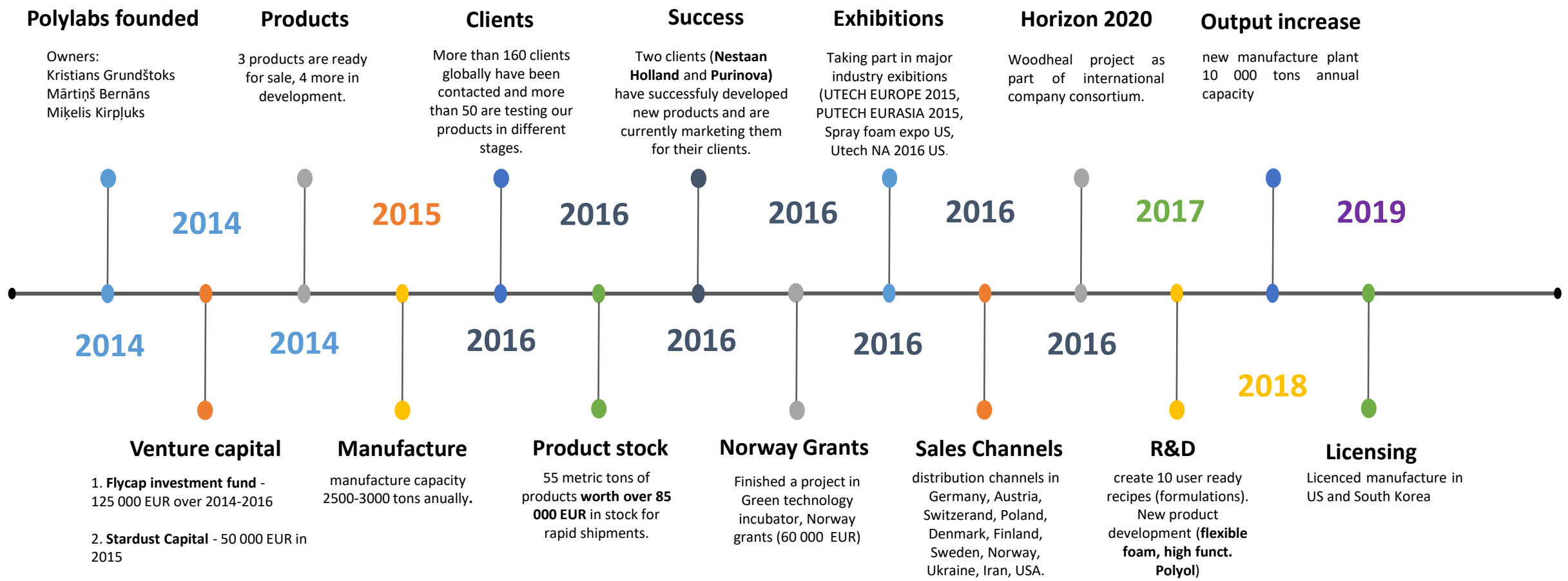


# FACTS ABOUT POLYLABS

- PRODUCTS DEVELOPED BY INSTITUTE OF WOOD CHEMISTRY OF LATVIA AFTER MORE THAN 45 YEARS OF EXPERIENCE IN POLYMER INDUSTRY
- POLYLABS COMPANY FOUNDED 2014
- MANUFACTURE CAPACITY 2500-3000 TONS PER YEAR
- MANUFACTURE PLANT LOCATED IN OLAINĒ, LATVIA
- OFFICE AND R&D LOCATED IN RĪGA, LATVIA
- STAFF OF 5 PEOPLE
- IN MANUFACTURE PROCESS UP TO 10 MORE PERSONS ARE EMPLOYED
- IN R&D PROCESS UP TO 100 SCIENTISTS AND TECHNICAL RESOURCES OF THE INSTITUTE ARE AVAILABLE
- R&D CAPACITY TO DEVELOP COMPLICATED PU SYSTEMS (e.g. cryogenic for space industry)



# TIMELINE AND FUTURE MILESTONES



# ADVANTAGES



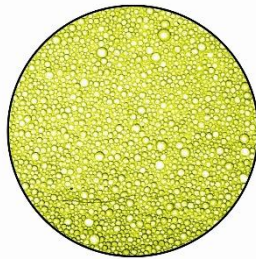
**RENEWABLE SOURCE**



**COMPETITIVE PRICE**



**GREEN PROCESS**



**BETTER CHARACTERISTICS**



**BIO BASED ALTERNATIVE**

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