



UniCRE

UNIPETROL Centre of Research & Education

Datum
Autor
Projekt



Výzkumný ústav
anorganické chemie, a.s.
ČLEN SKUPINY UNIPETROL



EVROPSKÁ UNIE
EVROPSKÝ FOND PRO REGIONÁLNÍ ROZVOJ
INVESTICE DO VAŠÍ BUDOUCNOSTI



OP Výzkum a vývoj
pro inovace

What is UniCRE?

Unipetrol Centre of Research & Education

- a new regional **research centre**
- focusing on **industrial chemistry**
- a part of **VÚAnCh, a.s.**





UniCRE – Mission

Providing solutions for competitive and environmentally friendly technologies

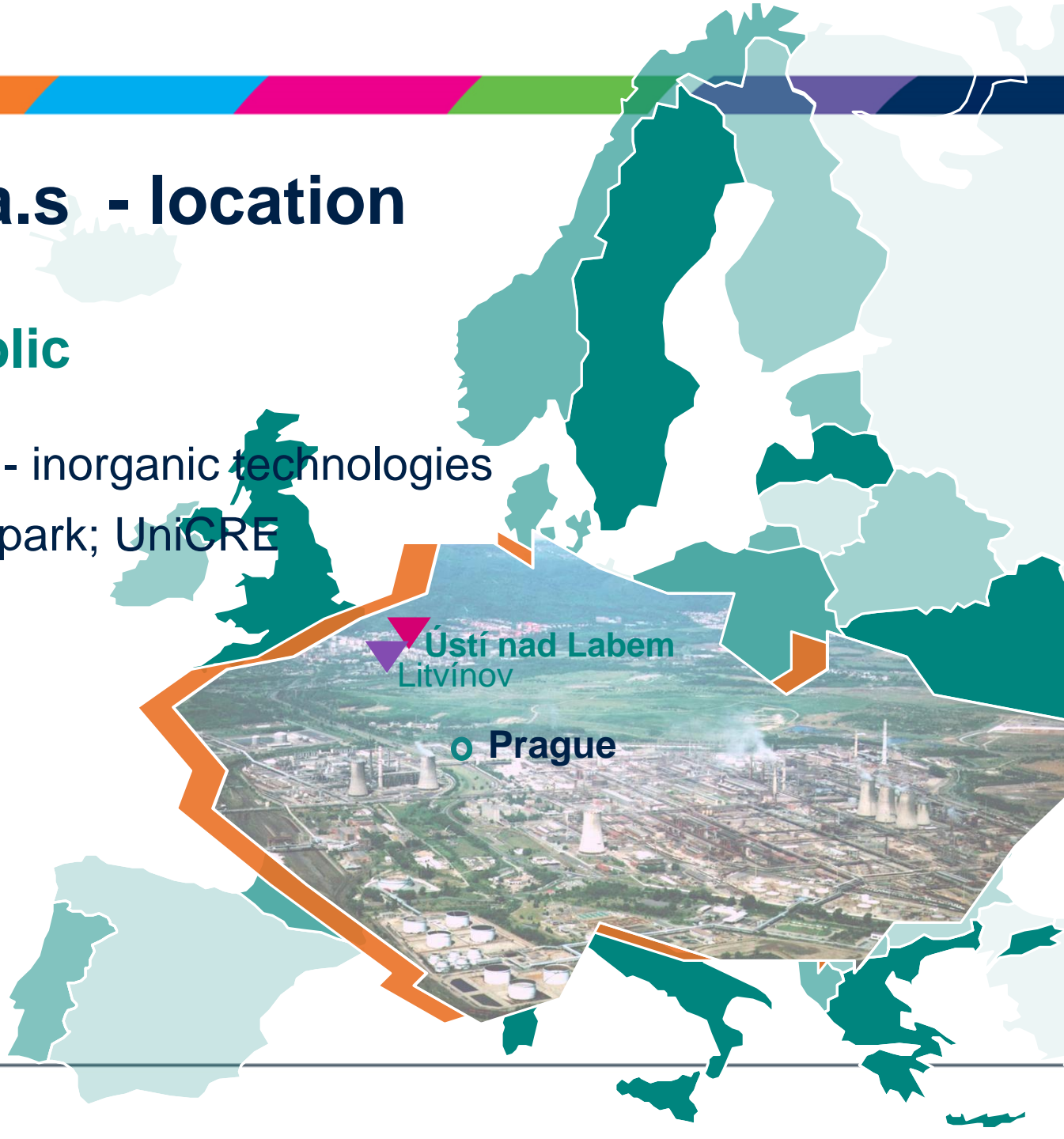


Bridging fundamental research and needs of industry

VÚAnCh, a.s - location

Czech Republic

- ▼ Ústí nad Labem - inorganic technologies
- ▼ Litvínov – Chempark; UnicRE



Ústí nad Labem
Litvínov

Prague



Main activities

VÚAnCh

Applied research	Refining and petrochemical processes Chemical utilization of biomass Aluminosilicates Utilization of humic substances Environmental technologies
Services	Analytical chemistry Catalyst activity testing
Other	Audits Studies Intellectual property service, etc.



VÚAnCh, a.s. – main activities

UnicRE

Applied research	Refining and petrochemical processes Chemical utilization of biomass Aluminosilicates Utilization of humic substances Environmental technologies
Services	Analytical chemistry Catalyst activity testing
Other	Audits Studies Intellectual property service, etc.

Key milestones

1952 ▼ VÚAnCh founding

1989 ▼ leaving Chemopetrol Group

1995 ▼ stock company

1997 ▼ joining Unipetrol Group

1999 ▼ centralization of research activities

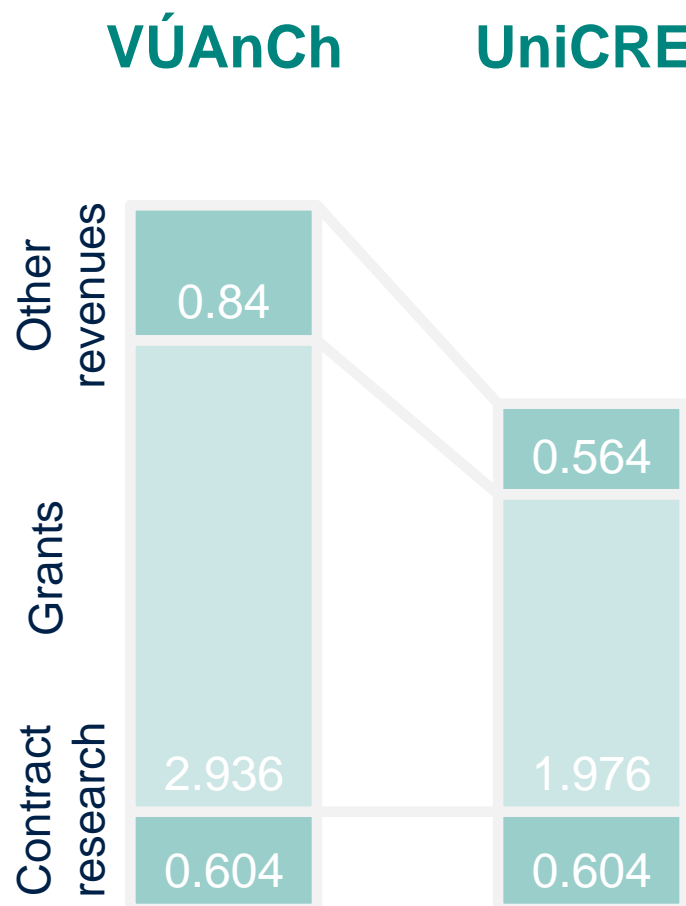
2008 ▼ research organization

2010 ▼ UniCRE launched

2016 ▼ UniCRE in full operation

Key numbers (2014)

Assets*	9.2
Costs*	4.376
Revenues*	4.38



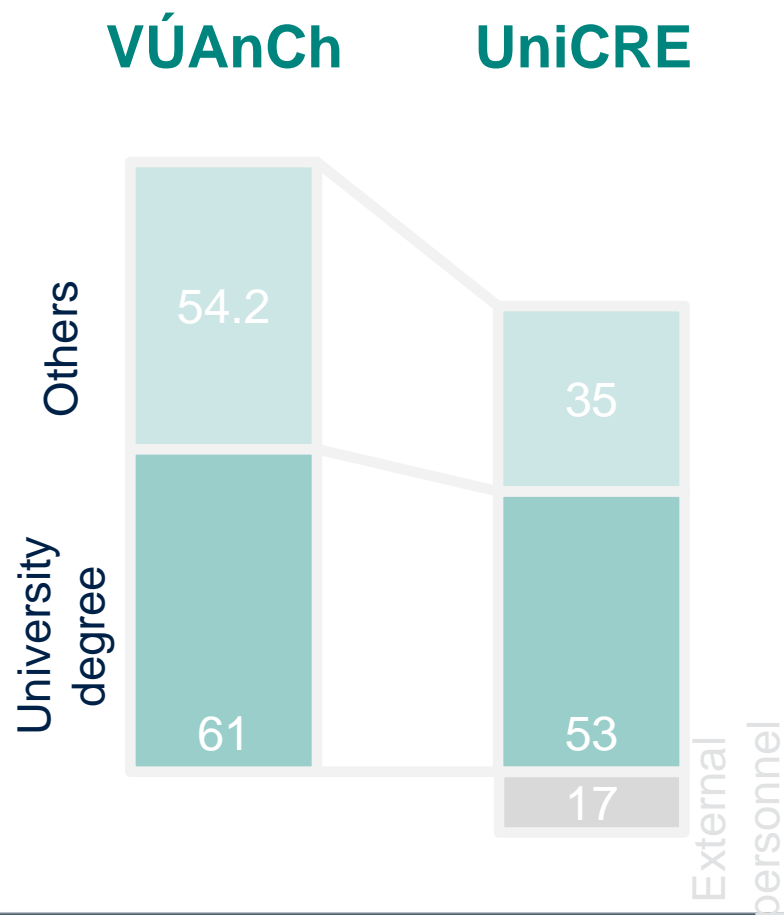
* EUR Million, 25 CZK/EUR



Key numbers (2014)

Employees

115,2



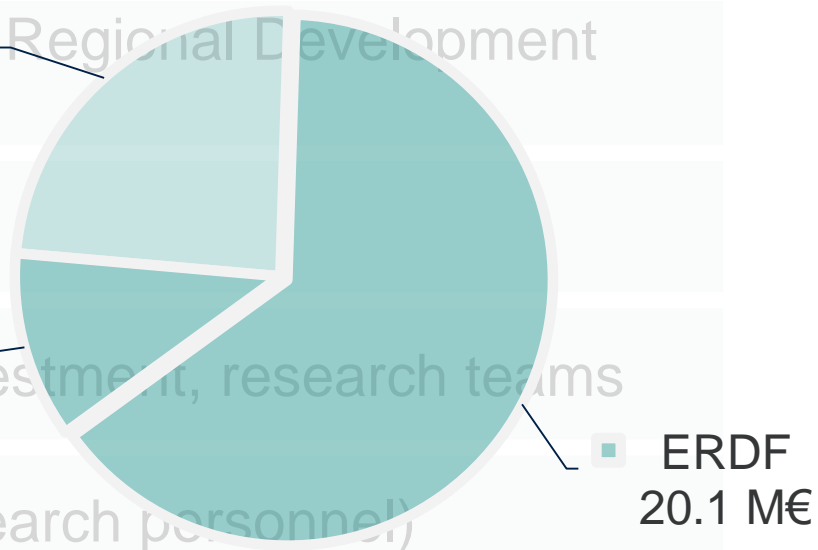
UniCRE – basic facts

Funding	ERDF: European Regional Development Fund
Timeframe	2010 - 2015
Scope	Infrastructure investment, research teams
Staff (2014)	80-90 (65-75 research personnel)
Total cost	780 mil. CZK (31.2 M€)
Subsidy	592 mil. CZK (24.2 M€)



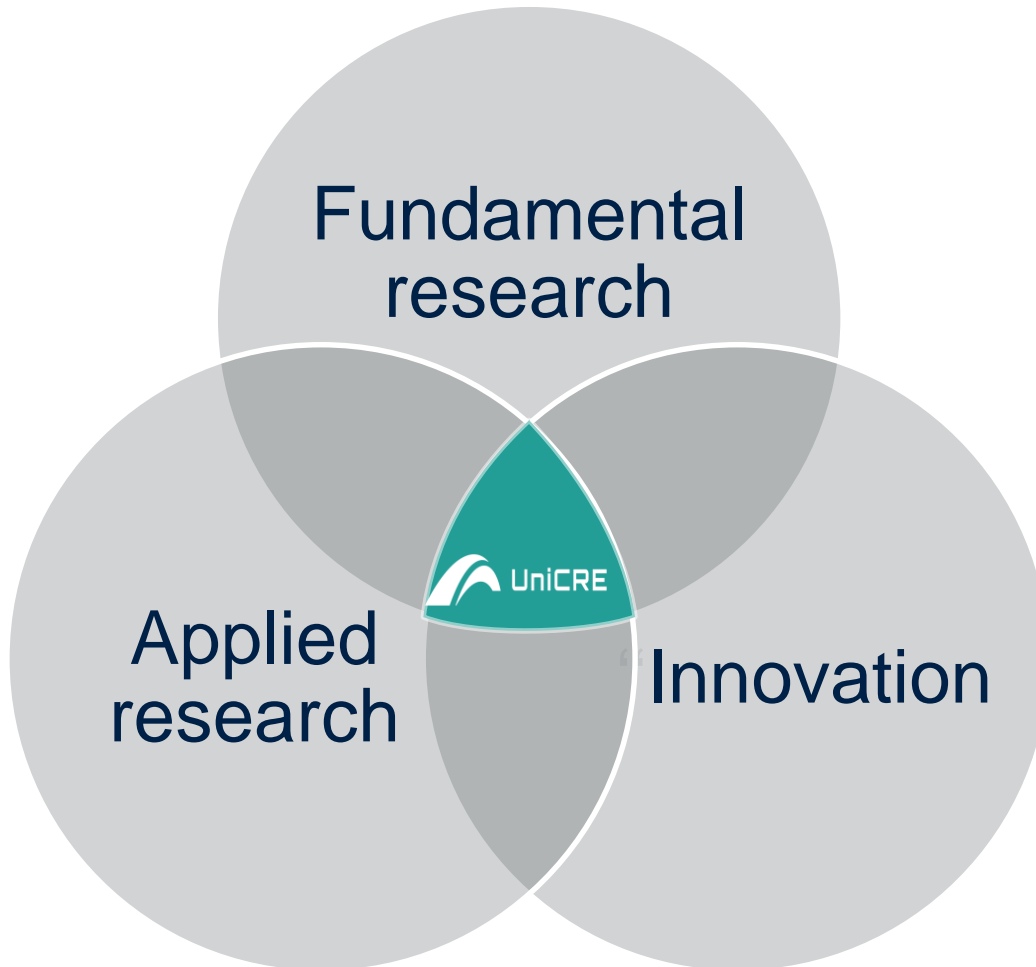
UniCRE – basic facts

Funding	<p>ERDF: European Regional Development Fund</p> <p>own resources 7.5 M€</p>
Timeframe	2010 - 2014
Scope	<p>state budget 3.6 M€</p> <p>infrastructure investment, research teams</p>
Staff (2014)	80-90 (65-75 research personnel)
Total cost	780 mil. CZK (31.2 M€)
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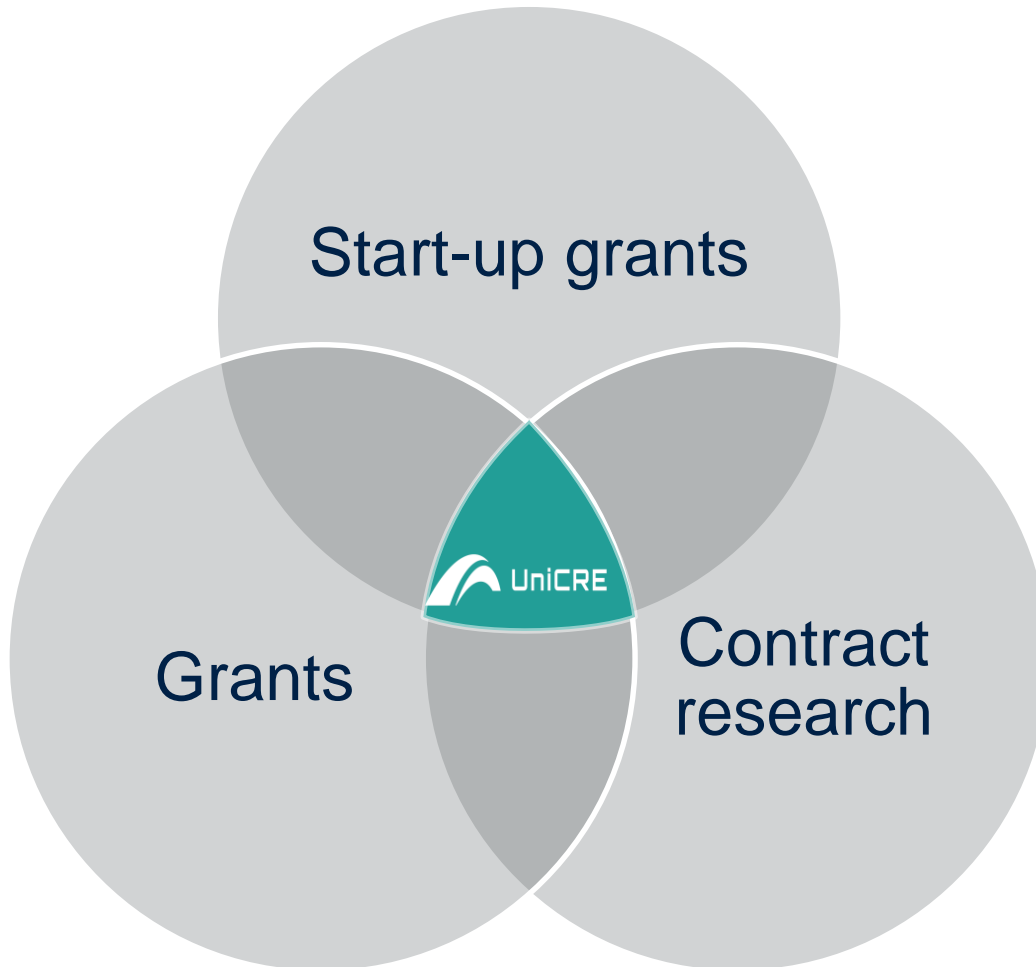


UniCRE – R&D positioning





UniCRE – funding alternatives



UniCRE – research structure

ADPET

**ADvanced
PEtrochemical
Technologies**

EFFRET

**EFFicient
REfining
Technologies**

RENTECH

**Renewable &
ENvironmental
TECHnologies**

Detailed analysis of feedstocks and products

Catalyst and process testing facility

Preparation and characterization of catalysts

UniCRE – core directions

EFFRET

EFFicient REfining Technologies

Increasing of automotive fuels quality

Improvement and modernization of refinery technologies

Increasing the value of alternative energy raw materials and by-products

UniCRE – core directions

ADPET

ADvanced PEtrochemical Technologies

Improvement of economy of existing petrochemical processes

Effective use of steam cracking by-products

New monomers for advanced polymer

Non-traditional raw materials for petrochemical applications

UniCRE – core directions

RENTECH

Renewable & ENvironmental TECHnologies

Biomass upgrading into secondary raw materials for energy and chemical industry

Catalytic processes for upgrading of renewable raw materials into products with high added value

Environmental adsorption and catalytic technologies

UniCRE – testing facilities

Main purpose

- Catalyst testing
 - Process development and scale-up
-

UniCRE – testing facilities

Main features

More than 20 units (plug-flow reactors...)

Catalyst loading: 5-250 ml

Testing conditions:

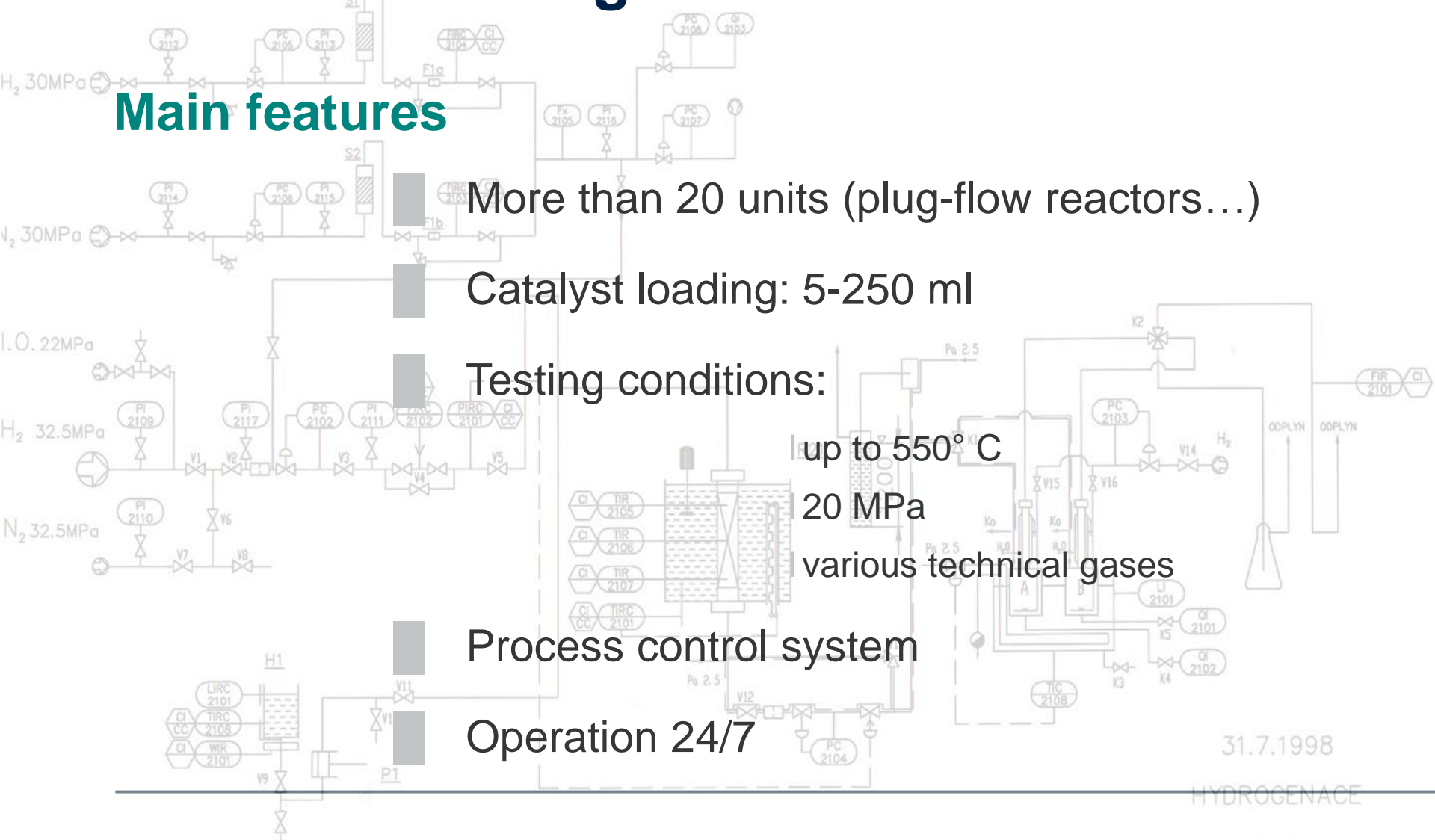
up to 550° C

20 MPa

various technical gases

Process control system

Operation 24/7



31.7.1998

HYDROGENACE

R21-TS

UniCRE – analytical services

Main scope



- Petroleum, petroleum fractions and residues
 - Fuels (gasoline, diesel fuel, biofuels), oils
 - Products of steam cracking (gases, distillates, residues)
 - Heterogeneous catalysts, supporters, adsorbents
 - Liquid products of biomass transformation
 - Industrial waste waters
 - Environmental matrices – water, soil
-

UniCRE – analytical services

Techniques

- Separation methods – GC + FID/ECD/NPD, PFPD, HPLC – DAD, FLD, RID
 - Hyphenated techniques – GC/MS-IT, GCxGC/MS-TOF
 - Molecular spectrometry – FT-IR, FT-NIR, UV/VIS, Raman – microscope
 - Elemental analysis – CHNS/O, ICP-OES, S micro, N micro
 - Thermal analysis – TGA/DTA, DSC, TMA
 - Texture of solid materials – analyzers for physisorption & chemisorption, Hg porosimeter
 - Electrochemistry – polarograph, titrators – potentiometric, volumetric
 - Analyzers for fuel & bitumen analysis
-

UniCRE – selected current grants

MMIT

- Utilization of steam-cracker byproducts
- Catalysts for C5-C6 hydrocarbons isomeration
- Hydrotalcites for catalysis and adsorptions
- Accelerated testing of HDS catalysts

GA CR

- Catalytic conversions of lignin
- Intelligent design of nanoporous catalysts (center of excellence)

UniCRE – selected current grants of 2014/2

TA CR

- Functional asphalt binder for hot mix asphalt
- Catalytic oxidation of alkanes

MEYS

- Preparation of hydrocarbons suitable for jet fuel
-

UniCRE – selected projects of contract research

- Optimization of steam cracker
 - Catalyst management
 - Industrial catalyst testing
 - Purification of FCC propylene
 - Characterization and modification of bitumen
 - NIR utilization for process control
 - Implementation of biofuels
-

UniCRE – Why to cooperate with us?

Modern infrastructure

Qualified and highly experienced researchers

Cooperative research projects

- Contractual projects
- Grants

Long-term catalyst testing and process development

Analytical and technological support

Contacts

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UniCRE is a part of

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