

# Norner AS – a plastics institute

Your partner in plastics - Norner is an international plastics and packaging institute with more than 35 years of industrial experience. Our services and competencies are utilised by our clients for development projects, technical studies, material and packaging testing, lab analysis and troubleshooting.

Norner AS, Asdalstrand 291  
NO-3960 Stathelle, Norway

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# Norner is...

- **Industrial** plastics and packaging institute
- **International** innovation company
- Clients through the plastic **value chain**

**50** Scientists, polymer technologists, end user specialists, lab and conversion engineers.

International innovation projects

**4000m<sup>2</sup>** Scientific Laboratories

- Our vision

## Innovation through Insight



# Norner key competence



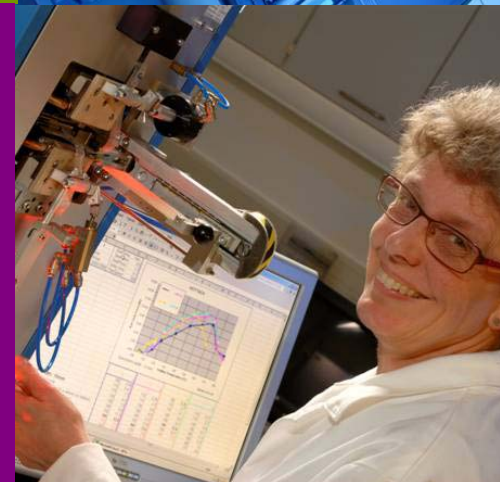
Plastics end use,  
processing, products  
and packaging

Additives,  
chemicals, REACH  
and compounding



Polymers, Catalysts,  
Gas, Polymerisation  
and Process

Advanced  
Laboratories





# Advanced technology centre

Your insurance for efficient and relevant service

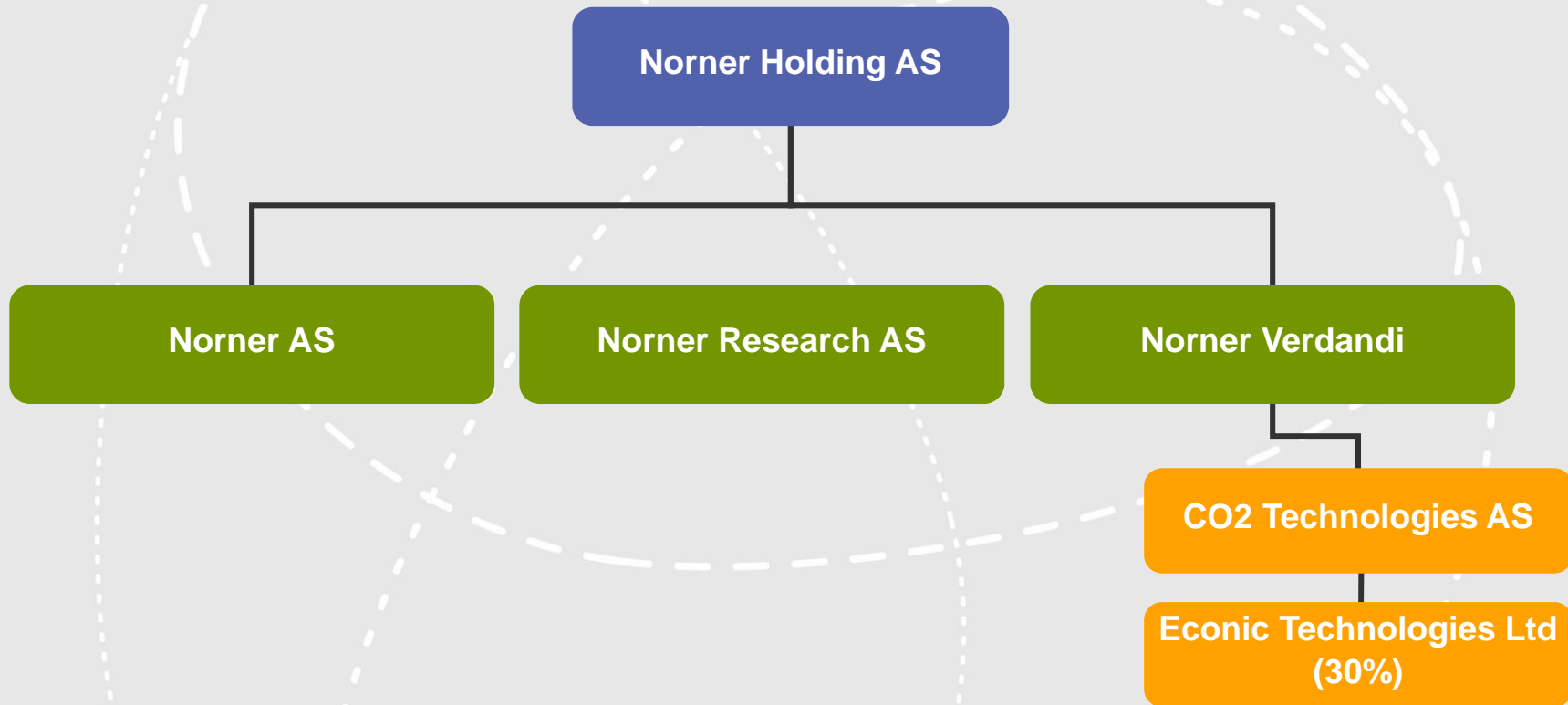


# Our history

- 1975 **Saga** petrokjemi
  - Start employment technologists
- 1977 Bamble technical centre opened
  - Installed laboratories, reactors lab, pilot lines
- 1984 **Statoil**
  - High competence and facilities developed
- 1994 **Borealis**
  - Development of innovative technologies
  - >100 patents in technology and applications
- 2007 **Norner AS**
  - Independent plastics technology institute
  - International breakthrough



# The Norner Group



# Ownership and organisation

- SCG Chemicals acquired the shares in Norner Holding AS in 2014



- Norner Holding AS is the owner of
  - Norner AS – supplier of B2B consulting, development and lab services
  - Norner Research AS – a non profit R&D organisation
  - Norner Verdandi AS – for the ownership and sale of technology
- The ambition is to grow Norner further as a global independent innovation partner for the plastics value chain.
- Norner contribute with innovation, consultancy and testing services to a wide variety of clients needing plastics expertise from consumables, packaging, oil & gas and infrastructure to petrochemical raw materials production



# – Siam Cement Group



- Founded in 1913 following a Royal Decree by King Rama the 6<sup>th</sup> – son of King Chulalongkorn - to produce Cement
- Turnover of approx. 16 Billion USD
- 3 Business Groups: Historic roots in cement, with diversification into Cement and Building Materials, Paper, and Chemicals
  - > 200 companies & ~50.000 employees
- SCG Chemicals Co. Ltd.
  - > 50 companies
  - Integrated approach
  - Leading player in ASEAN
  - High focus on Innovation, Value Added and Sustainability
    - Acquired 51% of Norner Dec 18<sup>th</sup> 2014
    - Part of an enlarged strategic European R&D partnership for SCG



# Market overview

## Market segments

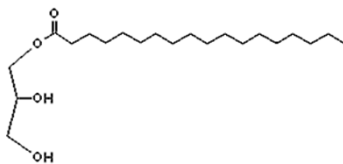
### Polymer producers



### Oil & Gas



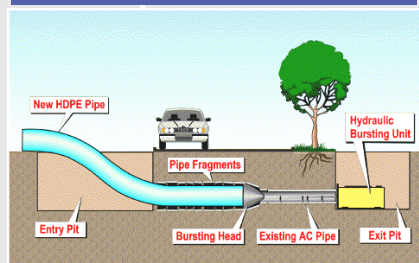
### Chemicals



### Consumables



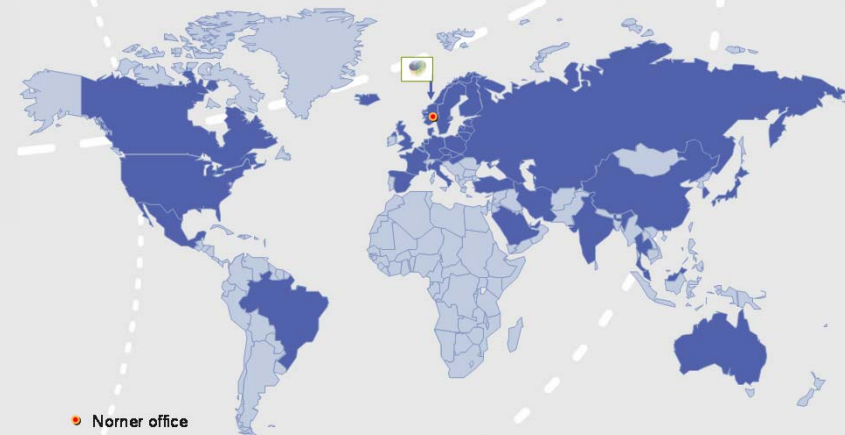
### Infrastructure



## Characteristics

- International client base
- Market focus on South East Asia, Middle East and Europe
- Growth in emerging economies
- Largest countries in terms of sale is Norway, Thailand, Sweden and Russia

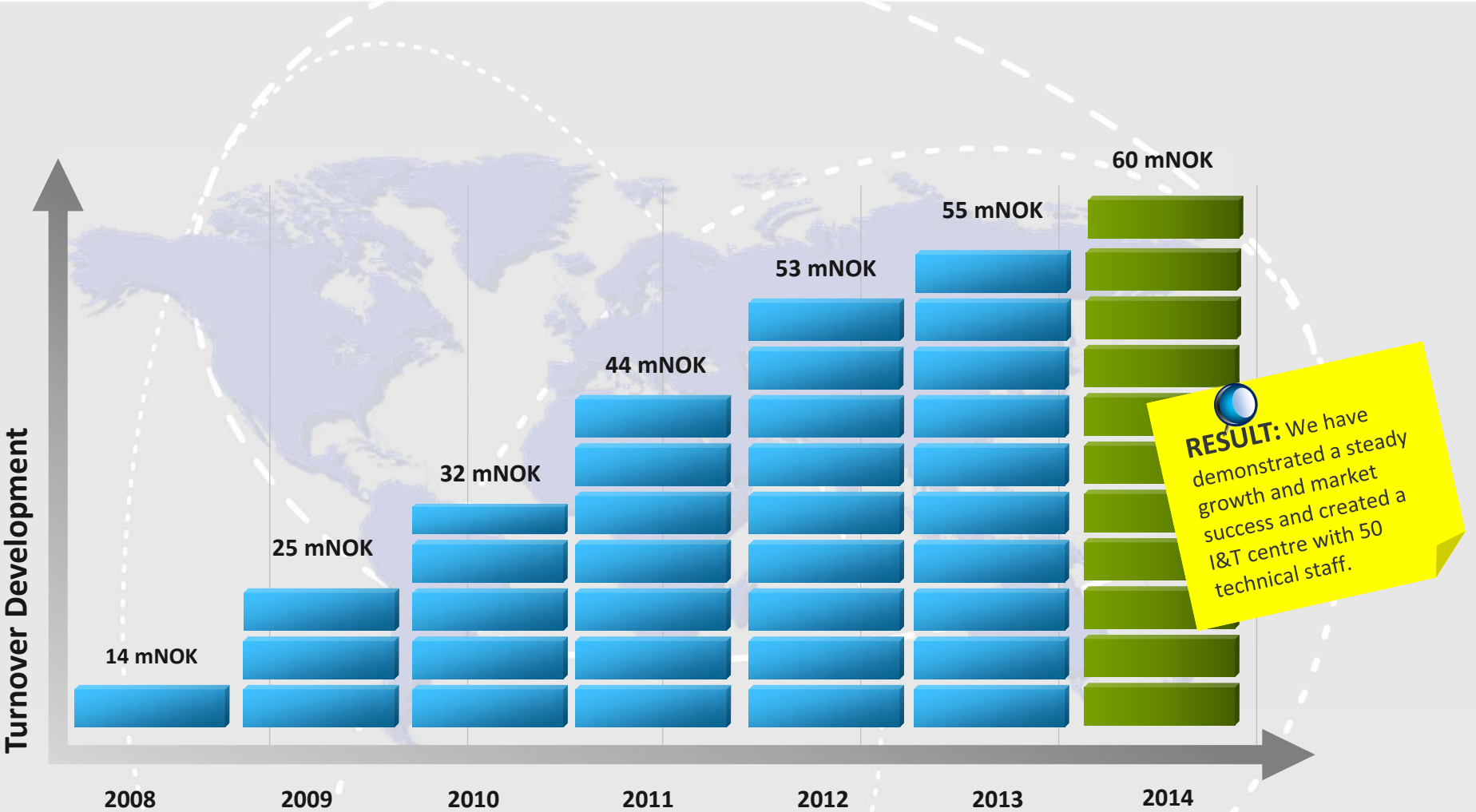
## Geographical coverage



• Norner office



# Financial results




# Norner business proposal

**Advisory**




- Optimised value chain
- Cost saving programs
- Innovation management
- Systems & Organisation

**Innovation**



- Technology Projects
- Product Development
- Multi-client & Sponsored Studies & Feasibility projects

**Services**



- 3rd party testing
- Standardised testing
- Application testing
- Tailor made verification



"Nornene" - The goddesses of faith in Norse mythology.

# Selection of Norner customers





# Plastics Application Expertise

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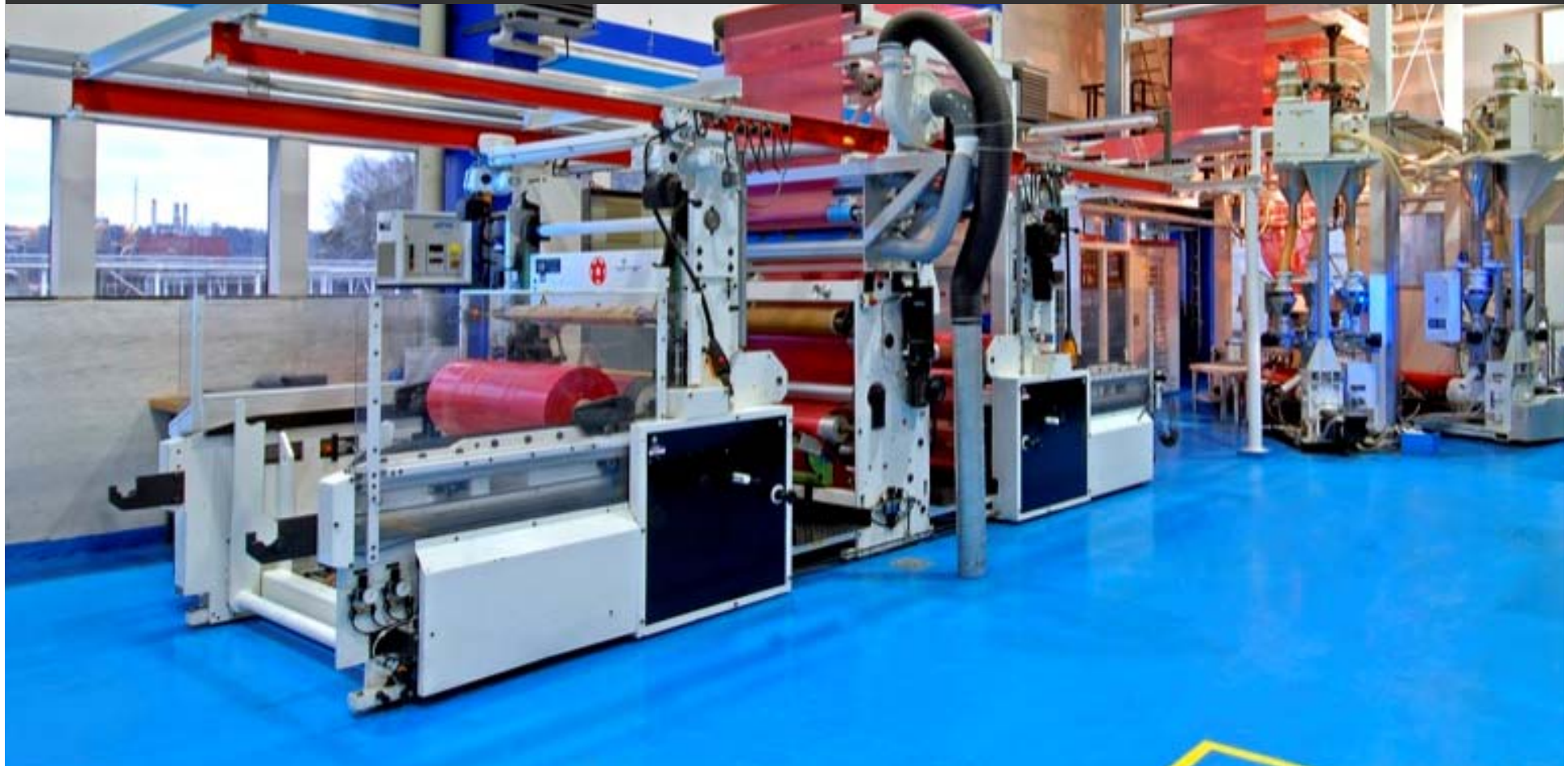


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Innovation through Insight

# Industrial processing pilot lines

Development in film and moulding applications



# Moulding development centre

- IM machines
  - Demag 350to HP machine
  - Netstal 120to HP machine
  - Netstal 300to
  - Engel 60to
  - Arburg 15to
- EBM machines
  - Fischer Müller
  - Uniloy
- Prototypes
  - Bottles & canisters
  - Caps & closures
  - Thin wall packaging
  - ...and more







# Industrial processing pilot lines

Your insurance for relevant development





# Norner Competences for Oil & Gas

- Material selection
- Cost performance optimization
- Lifetime estimates
- Durability and climate testing
- High pressure and high temperature testing
- Testing according to Norsok M-501 and Norsok M-710
- Quality evaluation and improvement
- Design development
- Standardization
- Failure analysis



# Polymer Research

Polymer modification and additives

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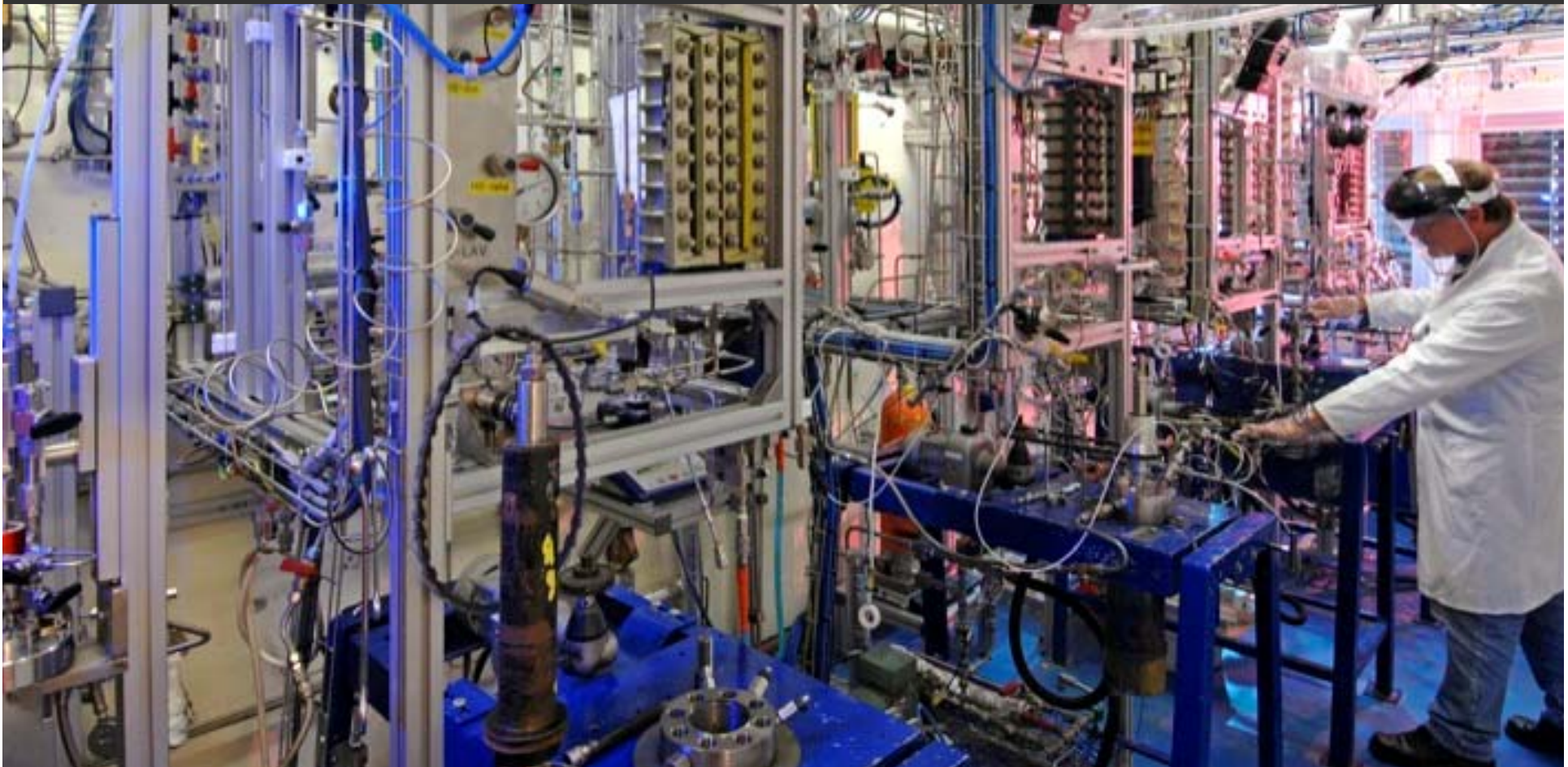
Innovation through Insight





# Bench scale reactors – a plant in a laboratory

Development of new products and technology





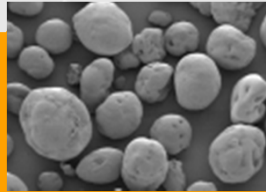




# Olefin polymerisation catalyst

## CATALYST

- Carrier treatment
- Catalyst synthesis, development
- Inert handling



## POLYMER

- Advanced polymers
- Polymer structure/properties
- Additivation



## POLYMERISATION

- Process studies, scale up/down
- Highly flexible lab pilots
- Comonomers
- Advanced polymerisation



## CONSULTING

- IPR/FTO/Technology Studies
- Sourcing
- Production cycle optimisation



# Additive performance characterisation

Wide range of performance and durability tests



# Additives and chemicals

- Additive functionality
- Polymer modification
- Additive performance testing
  - Ageing, durability
  - Modifier testing
- Additive analysis
  - Troubleshooting
  - Claim handling
- Chemical analysis
- International supplier network
- Small scale compounding
- Recipe development and optimisation
- Method development
- Laws and regulations





## **Compounding pilot lines**

For polymer modification and additivation



# Scientific Laboratories

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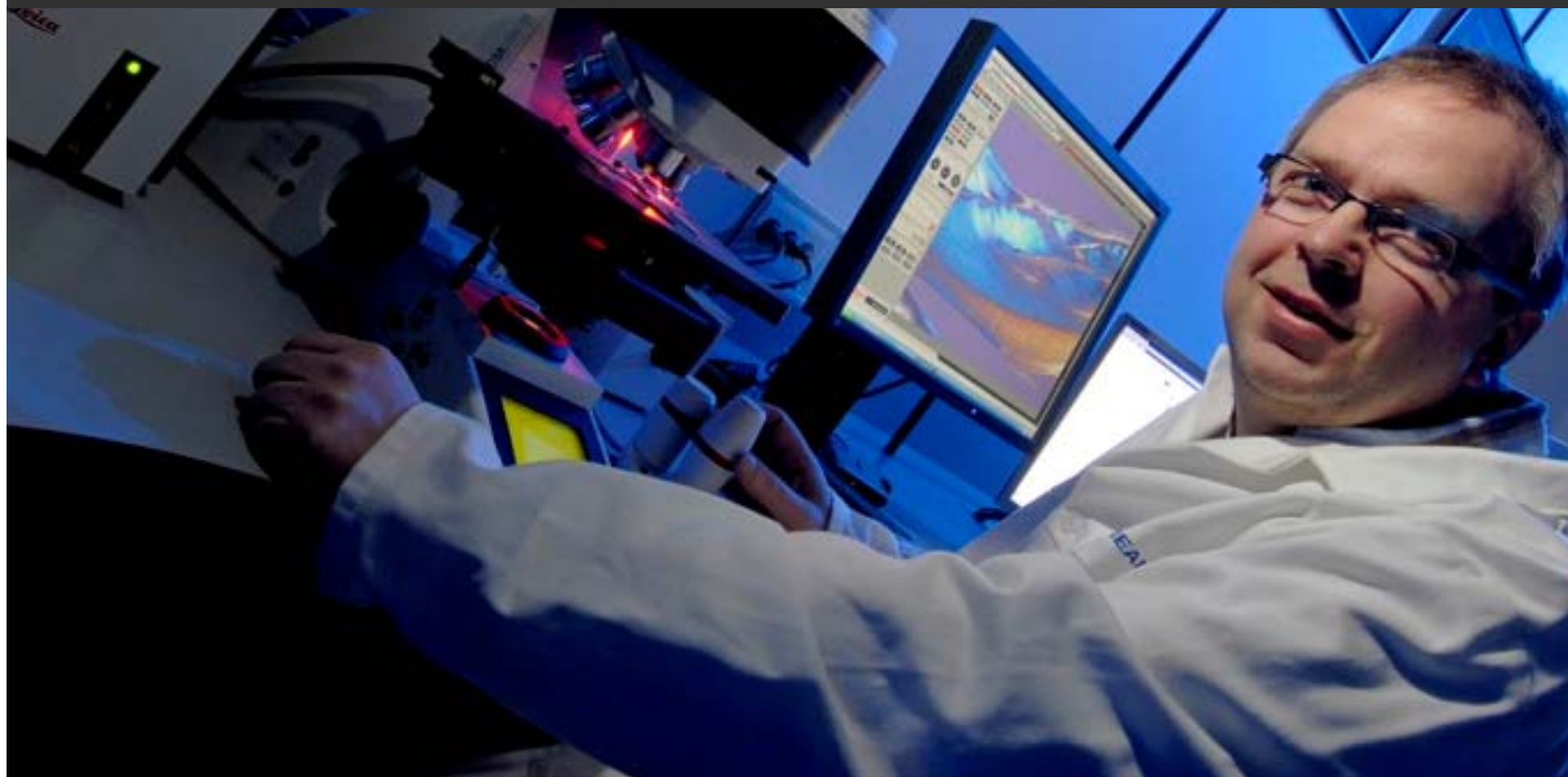


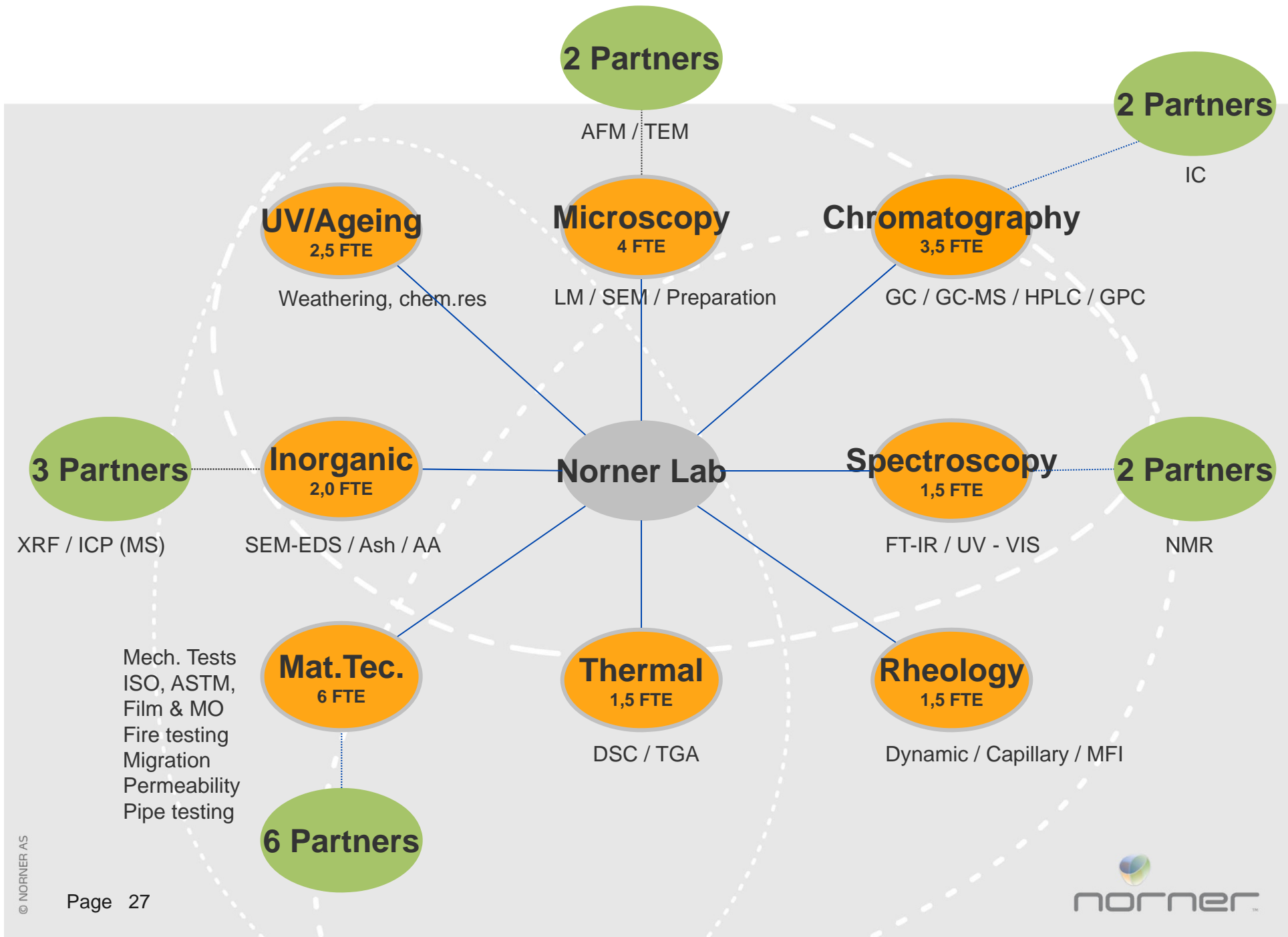
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Innovation through Insight

# Laboratories with high competence

Your insurance for efficient and relevant service





# Our values



**CONFIDENCE**

...in what we do

**TROVERDIG**

**IMPACT**

...of what we do

**INNFLYTELSE**

**IMAGINE**

...what we can do

**NYTENKENDE**

**PASSION**

...for what we do

**ENTUSIASTISK**





# **CO<sub>2</sub> as a valuable raw material for polymerisation**

Case – Technology development

# CO<sub>2</sub> – A new raw material for polymers!

