



The sunliquid[®] Process: Bringing New Solutions for Commercial Cellulosic Ethanol Production

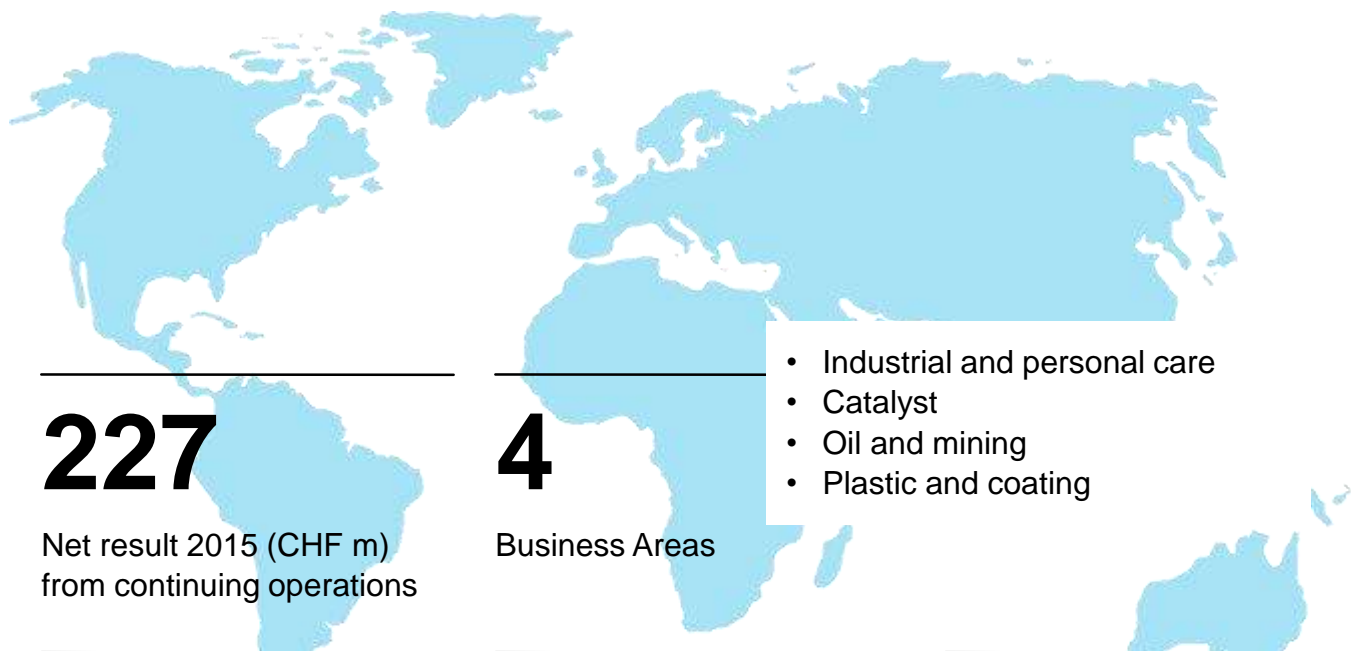
CLARIANT 

Confidential

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Clariant Group Biotechnology

what is precious to you?

3 Your committed partner for commercialization A GLOBALLY LEADING COMPANY IN SPECIALTY CHEMICALS



5 807

Sales 2015 (CHF m)
from continuing operations

227

Net result 2015 (CHF m)
from continuing operations

4

Business Areas

- Industrial and personal care
- Catalyst
- Oil and mining
- Plastic and coating

853

EBITDA 2015 (CHF m)
before exceptionals

14.7 %

EBITDA margin 2015
before exceptionals

110 in **53**

companies countries

17 213

Employees 2015

3 Your committed partner for commercialization GROUP BIOTECHNOLOGY



Munich R&D Center

- Since 2006
- **Grand new research centers opened 10.2015**
- **Projects beyond Cellulosic ethanol (sugar platform, byproduct, enzyme applications)**
- 118 employees
- Lab and office space: 6,500 m²
- Pilot plant since 2009



Straubing pre-commercial plant

- Since 2012
- 22 employees
- Area: 2,500 m²
- Wheat straw, corn stover, and sugarcane bagasse converted to Ethanol

The only validated integrated technology solution THE SUNLIQUID® PRE-COMMERCIAL PLANT



2012

Start of operation at
pre-commercial plant

up
to **1,000**

t/a output of ethanol

~ **4,500**

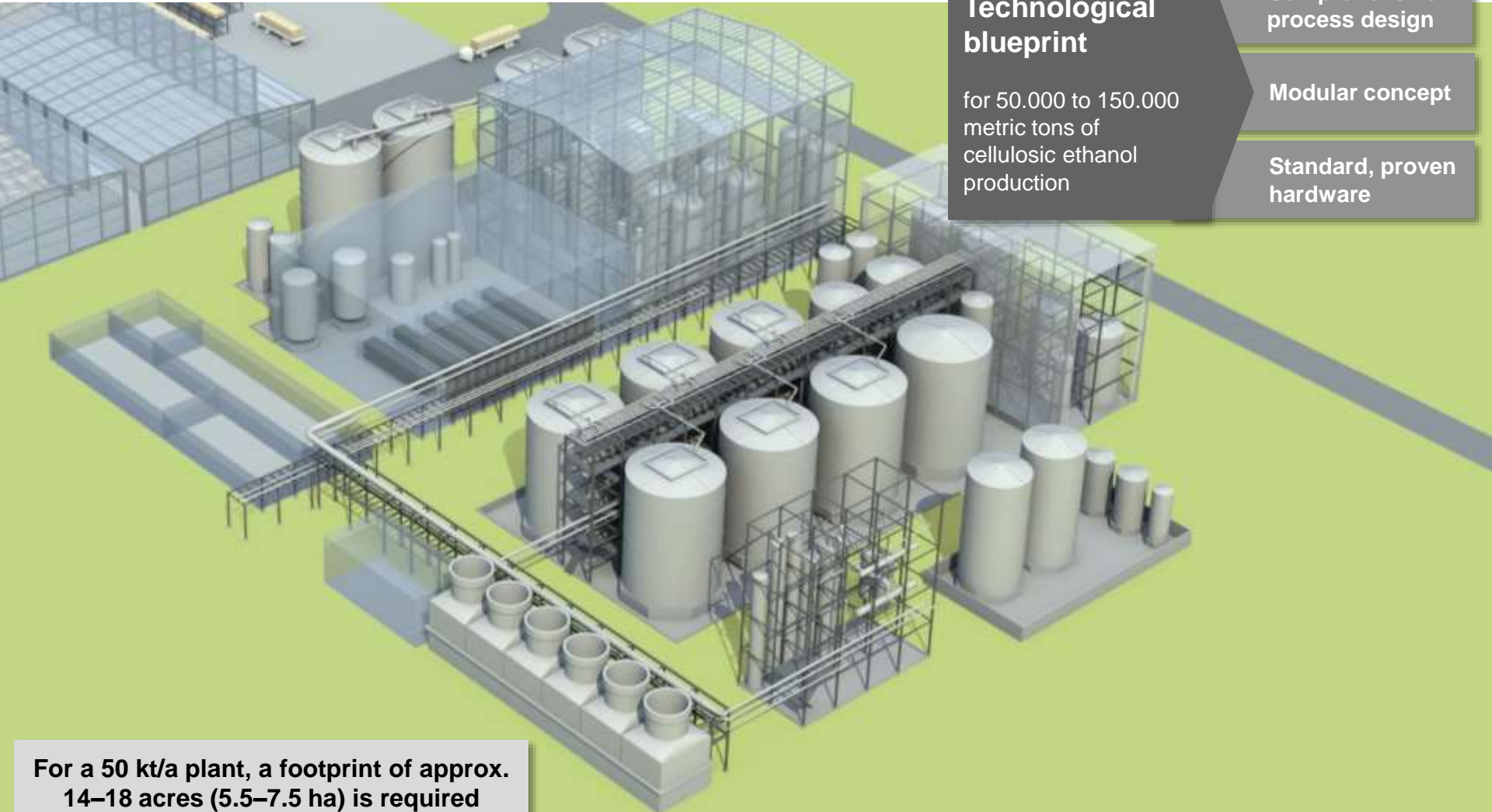
t/a feedstock *
* (cereal straw, corn stover, sugarcane
bagasse & others)

~ **4**

Years confirmation of
commercial-scale design

Your committed partner for commercialization

PROCESS DESIGN PACKAGE



**Technological
blueprint**

for 50.000 to 150.000
metric tons of
cellulosic ethanol
production

Comprehensive
process design

Modular concept

Standard, proven
hardware

**For a 50 kt/a plant, a footprint of approx.
14–18 acres (5.5–7.5 ha) is required**

Cereal Straw availability



Cereal Straw availability



Agricultural residues

Dedicated energy crops on marginal land

For further information please contact:

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For more information on sunliquid® technology visit www.sunliquid.com