Factbook
2019
WACKER: At a Glance

**Facts & Numbers**

€783m
EBITDA in 2019

€4,928m
Sales in 2019

15.9%
EBITDA margin in 2019

4 Business Segments

24 Production Sites

14,650 Employees

23 Technical centers
WACKER: An Overview

- **POLYSILICON**: No. 1 in merchant market
- **SILICONES**: No. 2
- **POLYMERS**: No. 1
- **BIOSOLUTIONS**: Leading in niches

Sales FY 2019: €4.9bn
Fact Book 2019: Agenda

- At a glance _p.4
- Strategy _p.9
- SILICONES _p.21
- POLYMERS _p.36
- BIOSOLUTIONS _p.48
- POLYSILICON _p.57
- Sustainability _p.64
- Financials _p.73
### WACKER AT A GLANCE

#### Over 100 Years of History

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1914</td>
<td>Foundation of the &quot;Dr. Alexander Wacker Gesellschaft für elektrochemische Industrie KG&quot;</td>
</tr>
<tr>
<td>1921</td>
<td>Hoechst AG becomes shareholder in Wacker Chemie; providing 50% of the share capital</td>
</tr>
<tr>
<td>1947</td>
<td>Start of work in the area of silicones</td>
</tr>
<tr>
<td>1953</td>
<td>First production of hyper-pure silicon for the semiconductor industry</td>
</tr>
<tr>
<td>1966</td>
<td>Production start of VAC-Ethylen-Copolymer Burghausen, Germany</td>
</tr>
<tr>
<td>1978</td>
<td>Foundation of the Wacker Siltronic Corporation, USA</td>
</tr>
<tr>
<td>1995</td>
<td>Takeover of wafer site in Freiberg, Germany</td>
</tr>
<tr>
<td>1998</td>
<td>Takeover of the silicone site in Nünchritz, Germany; JV with APCI: APP/WPS¹</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>Going public; JV with Dow Corning in China; JV Siltronic Samsung Wafer Pte. Ltd.</td>
</tr>
<tr>
<td>2007</td>
<td>Acquisition of outstanding shares of APP/WPS¹</td>
</tr>
<tr>
<td>2010</td>
<td>Takeover of the silicon smelter plant in Norway from Fesil Group</td>
</tr>
<tr>
<td>2012</td>
<td>Inauguration of the new polysilicon plant in Nünchritz, Germany</td>
</tr>
<tr>
<td>2015</td>
<td>Going public of Siltronic; Wacker Chemie AG holds majority with 58%</td>
</tr>
<tr>
<td>2016</td>
<td>Inauguration of the new polysilicon production site at Charleston, Tennessee (USA)</td>
</tr>
<tr>
<td>2017</td>
<td>Deconsolidation of Siltronic, WACKER moves into minority position holding a 30.8% stake</td>
</tr>
<tr>
<td>2018</td>
<td>Acquisition of a production plant for biopharmaceuticals from SynCo Bio Partners in Amsterdam, NL</td>
</tr>
</tbody>
</table>

¹) APP/WPS = Air Products Polymers/WACKER Polymer Systems
**WACKER AT A GLANCE**

Highly-Integrated Operations Based on Five Key Raw Materials

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Upstream</th>
<th>Downstream</th>
<th>Customer Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>Siloxane</td>
<td>Silicones</td>
<td>Chemicals, textiles, consumer care, construction, coatings, manufacturing machinery, energy &amp; electronics, automotive, health care</td>
</tr>
<tr>
<td>Silicon metal</td>
<td>Fumed silica (HDK®)</td>
<td>Polysilicon</td>
<td>Solar and semiconductor wafers, cells and modules</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dispersible polymer powders (DPP)</td>
<td></td>
</tr>
<tr>
<td>Ethylene</td>
<td></td>
<td>Vinyl acetate ethylene (VAE)</td>
<td>Adhesives, paints &amp; coatings, carpets, nonwovens &amp; textiles</td>
</tr>
<tr>
<td>Acetic acid</td>
<td></td>
<td>Vinyl acetate monomer (VAM)</td>
<td>Construction, renovation, insulation</td>
</tr>
<tr>
<td>Starch/dextrose</td>
<td></td>
<td>Dispersible polymer powders (DPP)</td>
<td>Food, automotive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polyvinyl acetate (PVAc)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Therapeutic proteins, food ingredients</td>
<td>Food, pharma &amp; agro, biopharmaceuticals</td>
</tr>
</tbody>
</table>

**Raw Materials**
- Methanol
- Silicon metal
- Ethylene
- Acetic acid
- Starch/dextrose

**Customer Industries**
- Chemicals, textiles, consumer care, construction, coatings, manufacturing machinery, energy & electronics, automotive, health care
- Solar and semiconductor wafers, cells and modules
- Adhesives, paints & coatings, carpets, nonwovens & textiles
- Construction, renovation, insulation
- Food, automotive
- Food, pharma & agro, biopharmaceuticals
WACKER AT A GLANCE
Well Diversified End Market Portfolio

Sales Split by End-market

Sales 2019: €4.9bn

- **Smart Construction**
  - e.g.
    - Walls & Facades
    - Flooring
    - Concrete & Masonry
    - Infrastructure etc.

- **Energy & Electronics**
  - 12%

- **Renewable Energies**
  - 10%

- **Textiles**
  - 7%

- **Health Care**
  - 6%

- **Chemical Industries**
  - 6%

- **Transportation**
  - 6%

- **Adhesives**
  - 5%

- **Others**
  - 12%

Sales Split by End-market

- **Chemical Industries**
  - 33%

- **Transportation**
  - 12%

- **Health Care**
  - 10%

- **Textiles**
  - 9%

- **Renewable Energies**
  - 12%

Sales 2019: €4.9bn

- ** Others**
  - 12%

- **Adhesives**
  - 5%

- **Transportation**
  - 6%

- **Health Care**
  - 6%

- **Textiles**
  - 7%

- **Renewable Energies**
  - 9%

Sales Split by End-market

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Sales 2019: €4.9bn

- **Others**
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- **Adhesives**
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- **Transportation**
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- **Health Care**
  - 6%

- **Textiles**
  - 7%

- **Renewable Energies**
  - 9%
WACKER AT A GLANCE
Regional Footprint: Globally Present and Close to Customers

Sales Split per Region
- Europe: 36%
- Americas: 19%
- Asia: 5%
- Other Regions: 40%

Employees
- Europe: 13%
- Americas: 12%
- Asia: 19%
- Other Regions: 75%

Segment Sales 2019
- SILICONES: 100%
- BIOSOLUTIONS
- POLYMERS
- POLYSILICON
STRATEGY: Managing for Growth and Cash
Targets for the Next Years – Growth and Cash

1. Extend Leverage Phase
2. Continue to Grow Above Chemical Production
3. Focus on Sustainability
4. Sustain Attractive Margins Throughout the Cycle
5. Generate Cash
Target:
Extend Leverage Phase with Investment Focus on Chemicals

CapEx vs. Depreciation expense WACKER Group w/o Siltronic (€m)

Leverage Phase:
- **Group CapEx < Depreciation**
- Clear investment focus on Chemicals

<table>
<thead>
<tr>
<th>Year</th>
<th>POLYSILICON</th>
<th>OTHERS</th>
<th>CHEMICALS</th>
<th>D&amp;A excl. impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 2008-2015</td>
<td>&gt;700</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>338</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>325</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>461</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>380</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Development of Sales (€bn) – Chemicals divisions and POLYSILICON

Target: Continue to Grow Above Chemical Production

CAGR +6%
Target:
Focus on Sustainability

Raw Materials

- Sustainable Sourcing
  - Product stewardship

Production

- Energy efficiency
  - Integrated cycles - Recycling

Products

- Sustainable Portfolio
  - Enable Sustainable Solutions
Target:
Sustain Attractive Margins Throughout the Cycle

Development of Group Earnings (€m) (as reported)

Profitability of Chemicals:
well above the 16% target margin

1) Gross Cash Flow / EBITDA (excluding Siltronic); 2) including Siltronic
Dividend (€) and Net Debt (€m)

<table>
<thead>
<tr>
<th>Year</th>
<th>Dividend (€)</th>
<th>Net Debt (€m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>2.00</td>
<td>-1,074</td>
</tr>
<tr>
<td>2016</td>
<td>2.00</td>
<td>-993</td>
</tr>
<tr>
<td>2017</td>
<td>2.50</td>
<td>-454</td>
</tr>
<tr>
<td>2018</td>
<td>2.50</td>
<td>-610</td>
</tr>
<tr>
<td>2019</td>
<td>0.50</td>
<td>-714</td>
</tr>
</tbody>
</table>

Dividend Yield:
1) Based on average weighted share price
2) Dividend proposal

Targets:
- Leverage: 0.5-1.0x EBITDA
- Dividend: 50% of Net income

Leverage
- 2015: 1.02
- 2016: 1.04
- 2017: 0.45
- 2018: 0.66
- 2019: 0.91

Legend:
- Regular dividend
- Bonus
- Net debt

1) Based on average weighted share price; 2) Dividend proposal
OPERATIONAL EXCELLENCE
Focus on Productivity and Relentless Optimization

Reduce Specific Operating Costs
- Plant utilization levels
- Specific energy consumption
- Raw-material yields
- Labor productivity & maintenance costs

Strong Employee Participation
- 900 employees trained in total at WOS\(^1\) ACADEMY
- Productivity methods, such as Six Sigma and LEAN

Evolution of Operating System

WOS Scorecard 2017
- 6% improvement in labor productivity
- 5% drop in specific maintenance costs
- 3% lower specific energy consumption
- €140m in business value contribution\(^2\)

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\(^1\) WOS = WACKER Operating System
\(^2\) 2-year reporting period 2017-18
DIGITALIZATION
Further Improving Stability and Efficiency in Production

Digital Operations
Prediction
- Estimate lifetime and maintenance

Condition Monitoring
- Internal view of key equipment

Avoid Surprises
- Anomalies are detected instantly

Soft Sensors
- Process Optimization
# INNOVATION

Innovation is Key to WACKER’s Business Strategy

## Innovation Figures

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D Spend in €m in 2018</td>
<td>165</td>
</tr>
<tr>
<td>Employees in R&amp;D</td>
<td>730</td>
</tr>
<tr>
<td>Active patents</td>
<td>3,900</td>
</tr>
<tr>
<td>Pending patent applications</td>
<td>1,700</td>
</tr>
<tr>
<td>Inventions annually applied for over the last 5 years</td>
<td>85-100</td>
</tr>
<tr>
<td>Scientific collaborations</td>
<td>45</td>
</tr>
</tbody>
</table>

- **3.3%** of 2018 group sales spent in R&D

## Tomorrow’s Solutions
- New markets & products

## Biotech platforms
- New syntheses & molecules

## Process Development
- Scale-up lab and modelling
- Process improvement

## Chemistry & Formulation
- Profound formulation knowledge
INNOVATION

Our R&D Pipeline Covers a Diverse Range of Applications

- **New Battery Solutions**
  - Active anode materials for lithium-ion-batteries
  - Silicone based thermal interface materials

- **Electronics**
  - Ready-to-use electroactive silicone laminates
  - Silicones for automotive electronics

- **Construction**
  - Polymer-modified bitumen emulsions
  - Reinforced concrete
  - Waterproofing membranes

- **Adhesives**
  - Medical skin adhesives
  - Pressure sensitive adhesives for electronics
  - Hybrid adhesives

- **Sustainable Products**
  - Biocide-free powder paints
  - Silicone fluids and polymer binders made from renewable raw materials

- **Food / Pharma**
  - Functional ingredients for food and pharma
  - Innovative production systems for biologics
CUSTOMER FOCUS
WACKER ACADEMY – A Global Network for our Customers

15
WACKER ACADEMIES

8,500
Participants worldwide

850
Events Globally

- Customer & Distributor teach-in
- Mix between theory and practice
- Meeting room plus lab
- Direct customer interaction
WACKER SILICONES
An Integrated Global Player with a Leading Market Position

Value Chain

- **Upstream**
  - Raw materials
    - Methanol
    - Quartz
  - Silicon metal
    - Siloxane / polymer
    - HCl
    - Salt mine

- **Downstream**
  - Sealants
  - Elastomers
  - Fluids
  - Emulsions
  - Resins
  - Functional silanes

Global Footprint

- Production Site
- Technical Center
- Integrated Production Site

Competitive Landscape 2018

- WACKER
- Elkem
- ShinEtsu
- Momentive
- Dow + DuPont
- Others

Market Characteristics

- Historic growth rates above worldwide GDP
- High entry barriers (capital and technology)
- Serving diversified end markets through broad market penetration and wide customer base
- Innovation broadens scope of applications

1) WACKER JV participations fully consolidated
WACKER SILICONES

Structural Variety as a Formula for Success

Silicone Fundamentals

Non organic silicon-oxygen (Si-O) backbone chain with organic side groups (CH₃)

Extremely Stable
- Si-O molecule with very high bonding energy

Extremely Versatile
- Multiple ways to modify structure, side groups and chain length

Building Blocks

Silicone Examples

Fluids
Resins
Antifoam agents
Textile finishes
Masonry protection agents
WACKER SILICONES
Silicone – A Material for Unlimited Applications

Broad Spectrum of Adjustable Properties

<table>
<thead>
<tr>
<th>Hydrophilic</th>
<th>Hydrophobic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesive</td>
<td>Release</td>
</tr>
</tbody>
</table>

- Electrically conducting
- Form stable

Customized Products with Unique Properties

- UV stability
- Long term elasticity
- Surface tension
- Heat stability / resistance
- Best-in-class lubrication
- Water-vapor permeable
- Chemical resistant
- Microbial resistant
- Water repellent
- Softening
- Release properties
- Weather resistant

Hydrophilic

Hydrophobic

Insulating

Formable

Adhesive

Electrically conducting

Form stable

WACKER
WACKER SILICONES
Silicones Create Value in Many Industries

Market Structure by Application

- Automotive
- Energy & Electronics
- Manufacturing Machinery
- Coatings
- Health Care
- Advanced Processing & Performance Additives
- Consumer Care
- Smart Construction

Total Silicone Market 2018: ~ €15.4bn

Industry Split; Source: Freedonia, Company Reports, WACKER Estimate

- 32% Automotive
- 15% Energy & Electronics
- 14% Manufacturing Machinery
- 10% Coatings
- 10% Health Care
- 9% Advanced Processing & Performance Additives
- 5% Consumer Care
- 5% Smart Construction

E.g.
- Defoamers for household, food or process industry
- Release agents for plastics
- Binders for fabrics or textiles
- Impregnating resins
Regional Growth Opportunities: Emerging Markets Catching Up

Silicone Consumption (kg/capita)

- **Mature Markets**: high silicone consumption
- **Emerging Markets**: medium silicone consumption
- **Developing Markets**: low silicone consumption

Countries depicted:
- **Developed Markets**: Canada, United States, UK, Japan, South Korea, Spain, Other W. Europe, Italy, France, Taiwan, Germany, United States, Canada
- **Emerging Markets**: China, Brazil, Mexico, Other Central & South America, CIS, South Korea, Spain, UK, Japan, Germany, United States
- **Developing Markets**: India, Africa

GDP (€/capita) Range: 0 to 40,000

Source: WACKER Estimate
WACKER SILICONES

Increasing Demand for Silicones in Future Growth Markets

Comfort

Hair Care

Cosmetics

Hair Care

Cosmetics

Urbanization

Paints

Concrete

Urbani-
zation

Paints

Concrete

Renewable Energy

Encapsulation

Energy Transmission

Renewable Energy

Encapsulation

Energy Transmission

E-Mobility

Battery

E-Motor

E-Mobility

Battery

E-Motor

Aging Population

Medical Care

Wound Care

Aging Population

Medical Care

Wound Care

Communication

Electronics

Sensors

Communication

Electronics

Sensors
Full Portfolio Provider

- Backward integrated
- Cost leadership
- Focus on innovation, customers and technical service

WACKER SILICONES

Mix Shift Towards Specialties

- High CapEx intensity
- High value creation
- Increasing diversification of products & applications

Standards

- Siloxane
- Intermediates

Specialties

- Elastomers
- Fluids & Emulsions
WACKER SILICONES
A Global Competence Network – Close to our Customers

Munich, Germany
- Corporate R&D

Burghausen, Germany
- Solids and Interface Science
- Central Analytics

Moscow, Russia
- Technical Center Adhesives & Sealants

Adrian / Ann Arbor, USA
- Solutions for Health & Wound Care
- ACEO® Open Print Lab Silicone Rubber

Tsukuba, Japan
- Solutions for Airbag Coatings

Seoul, Korea
- Solutions for Electronics

Shanghai, China
- Solutions for Silicone Rubber
- Competence Centers for Consumer Care
- Competence Center for Cement and Concrete Applications

R&D Center
- Technical Center & WACKER ACADEMY
- Technical Center
Properties

- **Unique effects**: powder free flow, thermal insulation, rheology control, reinforcement and many more

- **A highly versatile** performance enhancer

- **A safe and consistent** substance, non-hazardous for humans and for the environment

Applications

- **Silicone Elastomers**
- **Composites**
- **Coatings & Paint**
- **Adhesives & Sealants**
- **Thermal Insulation**
- **Filler**

Beside industrial use, fumed silica applications include:

- Cosmetics & Personal care
- Pharmaceuticals (excipient)
- Food (direct food additive) & Feed
WACKER SILICONES
Fumed Silica HDK® Enables Innovative Insulation Solutions

WACKER Solution: Vacuum Insulation Panels (VIPs) filled with HDK®

- Excellent insulator
- Improved fire safety
- Extremely robust
- Long-term stable
- Re-usable core
- Light weight

Traditional Insulation (e.g. PU, PS, Fiberglass, Mineral wool)

- Flammable and / or
- Voluminous

<table>
<thead>
<tr>
<th>Non-Flammable</th>
<th>Space Saving</th>
</tr>
</thead>
<tbody>
<tr>
<td>2cm VIP</td>
<td></td>
</tr>
</tbody>
</table>

Standard insulation panel
"WACKER Silicon Verbund" Enables Competitive Cost Position

- Charleston (TN, USA)
  - Polysilicon
  - Fumed silica

- Nünchritz (Germany)
  - Siloxane
  - Polysilicon
  - Fumed silica

- Burghausen (Germany)
  - Siloxane
  - Polysilicon
  - Fumed silica

- Zhangjiagang (China)
  - Joint Venture with DOW:
    - Siloxane
    - Fumed silica

Verbund sites
Other production sites WACKER SILICONES
WACKER SILICONES
WACKER with Highest Level of Integration in the Industry

Open Loop Silicones & Poly Production

Competitor Processes

- Si
- HCl

CS-Synthesis

- HCl
- Polysilicon
- Waste

Si

Müller-Rochow

- Waste
- Siloxane
- HCl

MeCl

Unique Silane-Silicone-Silica Loop

WACKER

- Si
- CS-Synthesis
- Polysilicon
- Waste

NaCl

HCl Makeup

- HCl

Müller-Rochow

MeCl Synthesis

- Methanol
- Si

Müller-Rochow

- Polysilicon
- Chlorosilane
- Fumed Silica
- Organosilane
- Siloxane
WACKER SILICONES
Strong Chemistry, Innovation Potential and Set Up

A World of Unlimited Potential
High performance products for future growth markets

Innovative Specialty Portfolio
Growth with focus on specialties

Unique Silicon Verbund
Full portfolio provider with benchmark costs
WACKER POLYMERS
Market Leader in VAE Dispersions and Powders

Value Chain

Raw Material  Upstream  Downstream  Key Markets

- Ethylene
- Acetic Acid

VAM = Vinylacetate monomer, PVAc = Polyvinyl acetate, PVOH = Polyvinyl alcohol

- Dispersions
- DPP
- PVAc
- PVOH

Construction
Nonwovens & Textiles
Adhesives
Carpet
Coatings & Paints

Competitive Landscape 2018
Global VAE1 Dispersions and DPP2 Market

- WACKER
- Others
- Dairen
- Celanese

- WACKER
- Others
- Dairen
- Nouryon

VAE disp.

DPP

Global Footprint

Market Characteristics

- Diverse market and customer base
- Historic growth above GDP
- Moderate capital entry barriers and high technology barriers in most segments
- Innovation and in-depth formulating expertise broaden scope of applications

1) VAE = Vinyl acetate ethylene  2) DPP = Dispersible Polymer Powders

Key Markets

- Construction
- Nonwovens & Textiles
- Adhesives
- Carpet
- Coatings & Paints

Ethylene
- VAM

PVAc
- PVOH

Global VAE1 Dispersions and DPP2 Market

- Istanbul
- Dubai
- Moscow
- Sao Paulo
- Melbourne
- Singapore
- Jakarta
- Shanghai
- Bogota
- Madrid
- Mexico City
- Bengaluru
- Seoul/Ulsan
VAE Fundamentals

Vinyl acetate Ethylene (VAE)

Environmentally friendly solutions
- with ethylene functioning as internal plasticizer, VAE dispersions are waterborne and free of additional solvents

Versatile binders
- with multiple ways to modify (e.g. ethylene content, stabilizing system, etc.)
Features for Consumer & Industrial Applications

- Gloss
- Water repellent
- Color fastness
- Strength
- Absorbency
- Hand feel variety
- Durability
- Adhesion
- Processability

Features for Construction Applications

- Adhesion
- Flexibility
- Leveling/Flow
- Water repellent
- Thixotropic
- Surface quality
- Durability
- Workability
- Mechanical strength
Market Structure by Application

Smart Construction: Floor Systems
- Tile adhesives
- Self-leveling compounds

Smart Construction: Wall Systems
- ETICS/EIFS: External thermal insulation composite systems

Adhesives & Sealants

Paints & Coatings

Nonwovens, Textiles & Carpet

WACKER POLYMERS 2018

WACKER Sales Split; Source: WACKER Estimate
WACKER POLYMERS
Excellent Performance in a Wide Variety of Applications

Consumer & Industrial Polymers
- Printing inks
- Nonwoven
- Heat seal lacquers
- Paper & Packaging
  - Industrial coatings
  - Carpet
- Paints & Coatings
  - Wood & Furniture
  - Automotive

Construction Polymers
- Tile adhesives
- Insulation systems
- Flooring
- Water proofing membranes
- Plasters
- Skim coat
- Concrete
- Gypsum
- Asphalt
WACKER POLYMERS

VAE Outgrew Other Polymers in Latex Market in the Last Years

Synthetic Polymer Latex Market¹
Volume Growth 2011-2016

Global Synthetic Polymer Latex Market 2016

SA = Styrene Acrylics, VAc-copo = Vinyl Acetate Co-Polymers, PVAc = Polyvinyl Acetate, SBL = Styrene Butadiene Latex

¹) Source: Kline 2017
Enabler in Mature Markets

- Residential New Built
- Commercial New Built
- Residential Renovation
- Others

Global Ceramic Tiles Market → trending towards higher quality

Enabler in Emerging Markets

Thick bed CTA

- Material Savings

Thin bed CTA

- Increased Labor Productivity

1) CTA = Ceramic Tile Adhesives; Source: Transparency, WACKER Estimate
WACKER POLYMERS
Dispersible Polymer Powders for Biocide-Free Wall Paints

New Product Opportunity for Paint Industry

Biocide-Free
Simply add water just prior to application – no need for adding biocides to avoid spoilage

Low Weight
Avoids plastic usage for paint buckets

Preparation on demand and at precise dosage

Ease of Storage
At challenging climate conditions
**WACKER POLYMERS**

Success Based on Combination of Dispersions and Powders

### Leading VAE Producer

- **>1,000,000** tons of VAE globally in 2018
- **5** Production Sites
- **~1,600** Employees
- **16** Technical centers

### VAE Dispersions and DPP Tandem

<table>
<thead>
<tr>
<th></th>
<th>VAE disp.</th>
<th>DPP</th>
<th># of tech centers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global</strong></td>
<td>✓</td>
<td>✓</td>
<td>16</td>
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<tr>
<td><strong>Americas</strong></td>
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<td>✓</td>
<td>5</td>
</tr>
<tr>
<td><strong>Asia-Pacific</strong></td>
<td>✓</td>
<td>✓</td>
<td>7</td>
</tr>
<tr>
<td><strong>EMEA</strong></td>
<td>✓</td>
<td>✓</td>
<td>4</td>
</tr>
</tbody>
</table>

- Only producer with production sites for VAE dispersions **and** DPP in Americas, Europe and Asia
WACKER POLYMERS
Continuously Expanding Footprint

Latest Capacity Expansions

- **2015**
  - VAE dispersions
  - USA

- **2015**
  - Polymer powder
  - Germany

- **2015**
  - Special monomers
  - Germany

- **2017**
  - VAE dispersions
  - Germany

- **2013**
  - VAE dispersions
  - South Korea

- **2014**
  - Polymer powder
  - China

- **2018**
  - VAE dispersions
  - China

- **2019**
  - Polymer powder
  - South Korea

- **2020**
  - VAE dispersions
  - South Korea
Global Footprint of Technical Centers

Global Competence Network – Close to Our Customers
WACKER POLYMERS
Growth via Customer Focus, Substitution and Innovation

Customer Focus
Global presence with production and technical centers

Substitution
Value based substitution & transformation towards higher building standards

Innovation
Sustainable binder solutions for target markets
WACKER BIOSOLUTIONS
Focusing on Fast-Growing Markets

Value Chain

**Raw Materials**
- Starch/Dextrose
- Ethylene
- Acetic Acid

**Upstream**
- Biologics
- Cyclodextrins / Cysteine
- Gumbase
- Ketene
- Chem. Intermed.

**Downstream**

**Key Markets**
- Biopharmaceuticals
- Life Sciences
- Food & Flavor
- Pharma & Agro

Sales Split

**Food**
- Nutrition/Bioprocessing
  - Cyclodextrins and CD-complexes, Cysteine as food ingredient
- Gumbase
  - Gumbase resin for chewing gum production

**Biopharmaceuticals**
- Drugs
  - Custom manufacturing of biologics with strong technology, fill & finish

**Pharma & Agro**
- Life Sciences
  - Building blocks for drugs or pesticides, auxiliaries and excipients for pharma
**WACKER BIOSOLUTIONS**

**Biopharmaceuticals and Nutrition are Strategic Growth Areas**

### Accelerated Growth

**Biopharmaceuticals**
- Service business
- Process development
- Genetic modification, fermentation, purification, fill & finish

**Nutrition/Bioprocessing**
- Dietary Supplements
- Cysteine for bakery and flavors
- Cyclodextrins for food and household applications

### Organic Growth

**Pharma & Agro**
- Cyclodextrins for pharma, industrial and agro applications
- Cysteine for Pharma
- Acetyl acetone and fine chemicals

**Gum**
- PVAc¹ for gumbase
- Copolymers for innovative products

¹) PVAc = Polyvinyl acetate
Established by R&D and Acquisitions

- 2005: ProThera (Jena)
- 2014: Scil Proteins Production (Halle)
- 2018: SynCo Biopartners (Amsterdam)

Biopharmaceuticals Sales Growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales Growth (€m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
</tr>
</tbody>
</table>

CAGR: +22%

Business Model

- Drug Development
- Drug Substance Manufacturing
- Formulation
- Marketing & Sales

Rationale

- Strengthened position as microbial contract manufacturer globally
- SynCo transaction doubled WACKER Biotech’s fermentation capacity for pharmaceutical actives
- Leverage our proprietary ESETEC® technology
WACKER BIOSOLUTIONS

Time and Cost-Efficient Manufacturing of Biopharmaceuticals

ESETEC® (E.coli secretion technology)

- ESETEC® reduces the number of process steps
- ESETEC® reduces production costs
- ESETEC® significantly increases yields

Example: Medimmune Project

- up to 5x lower costs
- >10x higher output

Comparison chart:
- Conventional system vs. ESETEC®
- Client system (mammalian) vs. ESETEC® 2.0
- Values: 0.2 vs. 2.7 g/L
Cyclodextrins & Cysteine: The Pillars of Our Nutrition Business

**Cyclodextrin Applications**
- Emulsifier
- Whip-it
- Taste masking
- Curcumin complex
- Soluble fiber
- Vegetarian sausages
- Fat-binding fiber
- Bakery

**Cysteine Applications**
- Dough Softening
- Vegetarian Savory Flavor
- Probiotics
- Anti-Fruit Browning
VINNAPAS® Gumbase Resins

- Leading supplier of PVAc¹ to the chewing gum industry with over 60 years of experience
- Two world-scale sites in Germany and China with highest food quality standards

Innovation

CAPIVA® platform for next generation chewing gums:

CAPIVA® S:
Simplified gum base formulation replacing elastomers and resins

CAPIVA® C:
New kind of gum made in a cooking process enabling new shaping technologies.

¹) PVAc = Polyvinyl acetate
WACKER BIOSOLUTIONS
Pharma & Agro: Profitable Business with Our Ketene Products

Ketene Products

- Acetic Acid
- Acetyl Acetone (AcAc)
- Isopropenyl Acetate (IPA)

Acetyl Acetone Downstream

- Acetyl acetone
- 3.5-DMP
- Ca-AcAc\(^1\)

- Coatings
- Agro
- Window frames
- PV-cable

- Other Metal-AcAc salts for e.g., rubber curing (Co), print applications (Ti), PVC stabilization (Zn)

\(^1\) Ca-AcAc = Calcium Acetylacetonate
WACKER BIOSOLUTIONS
Well Positioned for Further Growth

Unique Technology Platforms
Develop fast growing biotechnology businesses

Innovative Solutions Partner
Leveraging our know-how, experience and assets

Strong Track Record
Continuous investments in innovation and growth
WACKER POLYSILICON
A Market Leader in Cost and Quality

Value Chain

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Upstream</th>
<th>Downstream</th>
<th>Key Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt</td>
<td>Polysilicon</td>
<td>Electronic wafer</td>
<td>Semi-conductors</td>
</tr>
<tr>
<td>Silicon Metal</td>
<td></td>
<td>Solar wafer</td>
<td>Solar Modules</td>
</tr>
<tr>
<td>Hydrogen</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Global Footprint

- Production site and head office
- Sales and application representatives
- Production site

Competitive Landscape 2018

- WACKER
- GCL
- OCI
- Easthope
- Hemlock
- Yongxiang
- Daqo
- Xinte/TBEA
- Others

~413kt

Market Characteristics

- PV market growth driven by increasing competitiveness of solar as a source of power
- Excellent product quality is key to highest conversion efficiencies in solar
- Cost and quality are decisive for market success
- Intense competition further drives industry consolidation

Source: Industry announcements; WACKER estimate
WACKER POLYSILICON
Solutions for all Silicon-Crystal-Pulling- and Wafer-Technologies

Product Groups

- Polysilicon chunks

- Polysilicon rods

Various Chip Sizes for Optimized Crucible Filling and Recharging
Solar is lowest cost and most scalable form of energy production

Market shifts from subsidy driven to competitive pricing

Mono (p-type PERC) modules have ~5% more power output

New technologies (mono n-type HJT) improve output further

Shift to highest efficiency modules continues

WACKER material is a key enabler to our customer’s processes

Source: LCOE Analysis, v.12, Lazard

* HJT = Heterojunction technology; Source: ITRPV Roadmap, 10th edition, Mar. 2019
WACKER POLYSILICON

WACKER Quality Reflected in Overproportional Mono Share

Market Structure by Application Segment

Semiconductor

Volume Growth (CAGR 2015-2018)

~5%
Global Silicon Consumption in Semi Market

~25%
WACKER Shipments (in tons)

Polysilicon Market 2018 ~ €6bn

Solar

Market Volume Split (2018)
Multi 50% 50% Mono

WACKER Volume Split (2018)
Multi 20% 80% Mono

Source: WACKER Estimate; Semiconductor: Gartner
Polysilicon Market Segmentation

- Semi
- Mono n-Type
- Mono PERC
- Mono Standard
- Multi PERC
- Multi Standard

WACKER POLYSILICON
Maintaining Highest Quality while Reducing Costs

Aggressive Cost Reduction Targets

Cash Costs (Index = 100)

- Continuous cost reduction at all sites
- Reducing energy consumption
- Optimizing raw materials mix and resource efficiency
- Improving labor productivity etc.

1) without Tennessee
WACKER POLYSILICON
Generate Cash Flow from Strong Assets

Focus on cost and quality

Cost leadership in high quality polysilicon

Leveraging our assets

Serving High-End Markets

Aggressive Cost Roadmap

Fully Invested
SUSTAINABILITY
Our Contribution to the UN Sustainable Development Goals

- Global challenges that WACKER can help overcome
- Significant opportunities for our operations
- Our guiding principle for innovations
Very High Recycling Rates

- Integrated production at Burghausen prevents about 1 million metric tons of CO$_2$eq emissions annually

Closed Loops Reduce Waste

- Byproducts and waste heat are fed back into production via highly complex material and energy loops
Our Environmental Management Strictly Controls Emissions

**Fewer Dust Emissions**
- Silicon-metal production
- Process optimization
- Reduction of specific dust emissions by 50% since 2012

**Fewer Water Pollutants**
- Wastewater treatment plant
- Emissions of organic pollutants to the Salzach river have decreased by 42% since 2010

**Fewer CO₂ Emissions**
- Ethylene recovery plant
- CO₂ emissions reduced by 6,800 mt per year since 2015
SUSTAINABILITY
We Offer Coatings and Cosmetics Based on Renewable Raws

Polymers with Bio-Acetic Acid
- Fossil Source
- Ethylene
- VAM
- VAE
- Bio-Acetic Acid
- Renewable Feedstock
- Architectural Coatings

Silicones with Bio-Methanol
- Si metal
- Fossil Source
- Siloxane
- Silicone
- Bio-Methanol
- Renewable Feedstock
- Cosmetics

VINNECO® VAE
- Performance identical to non-biomass based
- No reformulation necessary
- Bio-acetic acid feedstock: cellulose, no competition to food
- Renewable content available at 60% and 100% based on solids

BELSIL® eco Silicone
- Same properties as fossil based products
- Drop-in-solution for customers
- Bio-methanol feedstock: grass, straw, sugar beets
- 100% fossil free cosmetic products
**SUSTAINABILITY**

Our Products Reduce Material Intensity and CO\textsubscript{2} Emissions

**Polysilicon for Photovoltaics (PV):**

- **Avoided Emissions Compared to Coal**

**Emissions along the entire value chain**

- Generating energy based on national grid mixes
- Solution with WACKER solar-poly for photovoltaics
- Emissions avoided\textsuperscript{1} 466 million mt

**Binders for Ceramic Tile Adhesives (CTA):**

- **Reduced Materials compared to Thick-Bed CTA**

**Emissions along the entire value chain**

- Reference Technology: Thick-bed mortar CTA
- Thin-bed mortar CTA using WACKER DPP
- Emissions avoided\textsuperscript{2} 12 million mt

\textsuperscript{1) over a life span of 30 years with the amount of solar-poly sold in 2017 \textsuperscript{2) using the amount of Dispersible Polymer Powder (DPP) produced in 2017}
SUSTAINABILITY
Our Products Enable Sustainable Applications and Processes

Antifoam Compounds for Hand Wash

Reduction in Water Consumption

Laundry rinsed with water
SILFOAM® reduces water usage by 50%

Sustainable Cysteine Production

Reduction in Consumption of HCl

HCl consumption traditional process
WACKER process needs less HCl

1) HCl = Hydrochloric acid; Source: WACKER Estimate
SUSTAINABILITY
Continuously Working on Quantitative EHS and Energy Targets

Safety
- Lost Time Injury Frequency
  - 2016: 3.0
  - 2018: 2.9
  - Target: 1.7

  - 2020

- Process Safety Incident
  - 2016: 1.6
  - 2018: 1.7
  - Target: 0.7

  - 2020

Environment
- Specific dust emissions
  - 2007: 100%
  - 2018: 52%
  - Target: 50%

  - 2020

- Spec. rel. VOC\(^1\)/Spec. NO\(_x\)
  - 2012: 100%
  - 2018: 77%
  - Target: 75%

  - 2020

Energy & Climate
- Spec. energy consumption
  - 2007: 100%
  - 2018: 73%
  - Target

  - 2030

- Spec. CO\(_2\) emissions
  - 2012: 100%
  - 2018: 88%
  - Target

  - 2030

EHS = Environment – Health – Safety; \(^1\) VOC = Volatile Organic Compounds
SUSTAINABILITY
Recognition for Sustainability by Independent Organizations

- WACKER ranked as “Outperformer” by SUSTAINALYTICS in 2018
- “Very strong Environmental Management Systems”

- WACKER received a “PLATINUM” CSR rating by EcoVadis in 2020
- “The result in all evaluated areas is well above the industry average”

- WACKER ranked with a “B” in CDP’s 2019 climate change ratings

- WACKER ranked with an “A” by MSCI in 2018
- “Corporate governance practices are generally well aligned with shareholder interests”
FINANCIALS
## FINANCIALS

**FY 2019 and Q4 2019 Results – P&L**

<table>
<thead>
<tr>
<th>In €m</th>
<th>FY 2019</th>
<th>FY 2018</th>
<th>% YoY</th>
<th>Q4 2019</th>
<th>Q4 2018</th>
<th>% YoY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>4,928</td>
<td>4,979</td>
<td>-1%</td>
<td>1,156</td>
<td>1,189</td>
<td>-3%</td>
</tr>
<tr>
<td><strong>EBITDA</strong></td>
<td>783(^1)</td>
<td>930</td>
<td>-16%</td>
<td>158</td>
<td>174</td>
<td>-9%</td>
</tr>
<tr>
<td><strong>EBITDA margin</strong></td>
<td>15.9%</td>
<td>18.7%</td>
<td>-</td>
<td>13.7%</td>
<td>14.6%</td>
<td>-</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>-536</td>
<td>390</td>
<td>n.a.</td>
<td>-744</td>
<td>37</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>EBIT margin</strong></td>
<td>-10.9%</td>
<td>7.8%</td>
<td>-</td>
<td>-64.4%</td>
<td>3.1%</td>
<td>-</td>
</tr>
<tr>
<td><strong>Net income for the period</strong></td>
<td>-630</td>
<td>260</td>
<td>n.a.</td>
<td>-748</td>
<td>29</td>
<td>n.a.</td>
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<tr>
<td><strong>EPS in €</strong></td>
<td>-12.94</td>
<td>4.95</td>
<td>n.a.</td>
<td>-15.13</td>
<td>0.53</td>
<td>n.a.</td>
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<tr>
<td><strong>Capital expenditures</strong></td>
<td>380</td>
<td>461</td>
<td>-18%</td>
<td>89</td>
<td>172</td>
<td>-48%</td>
</tr>
<tr>
<td><strong>Depreciation / amortization</strong></td>
<td>1,320</td>
<td>540</td>
<td>&gt;100%</td>
<td>902</td>
<td>137</td>
<td>&gt;100%</td>
</tr>
<tr>
<td><strong>Net cash flow</strong></td>
<td>184</td>
<td>86(^2)</td>
<td>&gt;100%</td>
<td>122</td>
<td>45</td>
<td>&gt;100%</td>
</tr>
</tbody>
</table>

\(^1\) incl. insurance compensation of €112.5m from 2017 incident in Charleston  \(^2\) restated due to changed definition
## FINANCIALS

### FY 2019 and Q4 2019 Results – Breakdown by Business

<table>
<thead>
<tr>
<th></th>
<th>FY 2019</th>
<th></th>
<th>FY 2018</th>
<th></th>
<th>Q4 2019</th>
<th></th>
<th>Q4 2018</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SALES</td>
<td>EBITDA</td>
<td>MARGIN</td>
<td>SALES</td>
<td>EBITDA</td>
<td>MARGIN</td>
<td>SALES</td>
<td>EBITDA</td>
</tr>
<tr>
<td>Chemicals</td>
<td>4,011</td>
<td>704</td>
<td>17.5%</td>
<td>4,009</td>
<td>788</td>
<td>19.7%</td>
<td>931</td>
<td>162</td>
</tr>
<tr>
<td>SILICONES</td>
<td>2,453</td>
<td>479</td>
<td>19.5%</td>
<td>2,500</td>
<td>617</td>
<td>24.7%</td>
<td>565</td>
<td>104</td>
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<tr>
<td>POLYMERS</td>
<td>1,315</td>
<td>194</td>
<td>14.8%</td>
<td>1,282</td>
<td>148</td>
<td>11.5%</td>
<td>303</td>
<td>48</td>
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<tr>
<td>BIOSOLUTIONS</td>
<td>243</td>
<td>31</td>
<td>12.8%</td>
<td>227</td>
<td>24</td>
<td>10.4%</td>
<td>63</td>
<td>11</td>
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<tr>
<td>POLYSILICON</td>
<td>780</td>
<td>57</td>
<td>7.3%</td>
<td>824</td>
<td>72</td>
<td>8.8%</td>
<td>193</td>
<td>2</td>
</tr>
<tr>
<td>Others</td>
<td>158</td>
<td>22</td>
<td>14.2%</td>
<td>171</td>
<td>71</td>
<td>41.4%</td>
<td>37</td>
<td>-7</td>
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<td>Consolidation</td>
<td>-21</td>
<td>0</td>
<td>-1.4%</td>
<td>-24</td>
<td>-1</td>
<td>-</td>
<td>-6</td>
<td>1</td>
</tr>
<tr>
<td><strong>WACKER Group</strong></td>
<td><strong>4,928</strong></td>
<td><strong>783</strong></td>
<td><strong>15.9%</strong></td>
<td><strong>4,979</strong></td>
<td><strong>930</strong></td>
<td><strong>18.7%</strong></td>
<td><strong>1,156</strong></td>
<td><strong>158</strong></td>
</tr>
</tbody>
</table>
## FINANCIALS
### Key Figures

<table>
<thead>
<tr>
<th>In €m / %</th>
<th>2019</th>
<th>2018</th>
<th>2017</th>
<th>2016(^1)</th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sales</strong></td>
<td>4,928</td>
<td>4,979</td>
<td>4,924</td>
<td>4,634</td>
<td>5,296</td>
<td>4,826</td>
</tr>
<tr>
<td><strong>EBITDA</strong></td>
<td>783</td>
<td>930</td>
<td>1,014</td>
<td>956</td>
<td>1,049</td>
<td>1,042</td>
</tr>
<tr>
<td><strong>EBITDA margin</strong></td>
<td>15.9%</td>
<td>18.7%</td>
<td>20.6%</td>
<td>20.6%</td>
<td>19.8%</td>
<td>21.6%</td>
</tr>
<tr>
<td><strong>EBIT</strong></td>
<td>-536</td>
<td>390</td>
<td>424</td>
<td>338</td>
<td>473</td>
<td>443</td>
</tr>
<tr>
<td><strong>EBIT margin</strong></td>
<td>-10.9%</td>
<td>7.8%</td>
<td>8.6%</td>
<td>7.3%</td>
<td>8.9%</td>
<td>9.2%</td>
</tr>
<tr>
<td><strong>Net income for the period</strong></td>
<td>-630</td>
<td>260</td>
<td>885</td>
<td>189</td>
<td>242</td>
<td>195</td>
</tr>
<tr>
<td>- From continuing operations</td>
<td>-630</td>
<td>260</td>
<td>250</td>
<td>178</td>
<td>242</td>
<td>195</td>
</tr>
<tr>
<td>- From discontinued operations</td>
<td>-</td>
<td>-</td>
<td>635</td>
<td>11</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Net cash flow</strong></td>
<td>184</td>
<td>86</td>
<td>358</td>
<td>361</td>
<td>23</td>
<td>216</td>
</tr>
<tr>
<td><strong>Return on capital employed</strong></td>
<td>-11.3%</td>
<td>5.9%</td>
<td>7.5%</td>
<td>5.6%</td>
<td>8.1%</td>
<td>8.4%</td>
</tr>
<tr>
<td><strong>EPS in €</strong></td>
<td>-12.94</td>
<td>4.95</td>
<td>17.45</td>
<td>3.61</td>
<td>4.97</td>
<td>4.10</td>
</tr>
<tr>
<td><strong>Dividend per share</strong></td>
<td>0.50(^2)</td>
<td>2.50</td>
<td>4.50</td>
<td>2.00</td>
<td>2.00</td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Dividend yield</strong></td>
<td>0.7%</td>
<td>2.1%</td>
<td>4.0%</td>
<td>2.6%</td>
<td>2.2%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

\(^1\) Adjusted according to IFRS 5; \(^2\) Dividend proposal
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