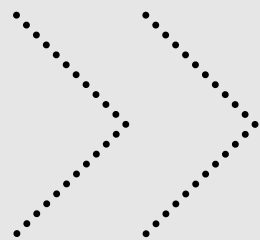
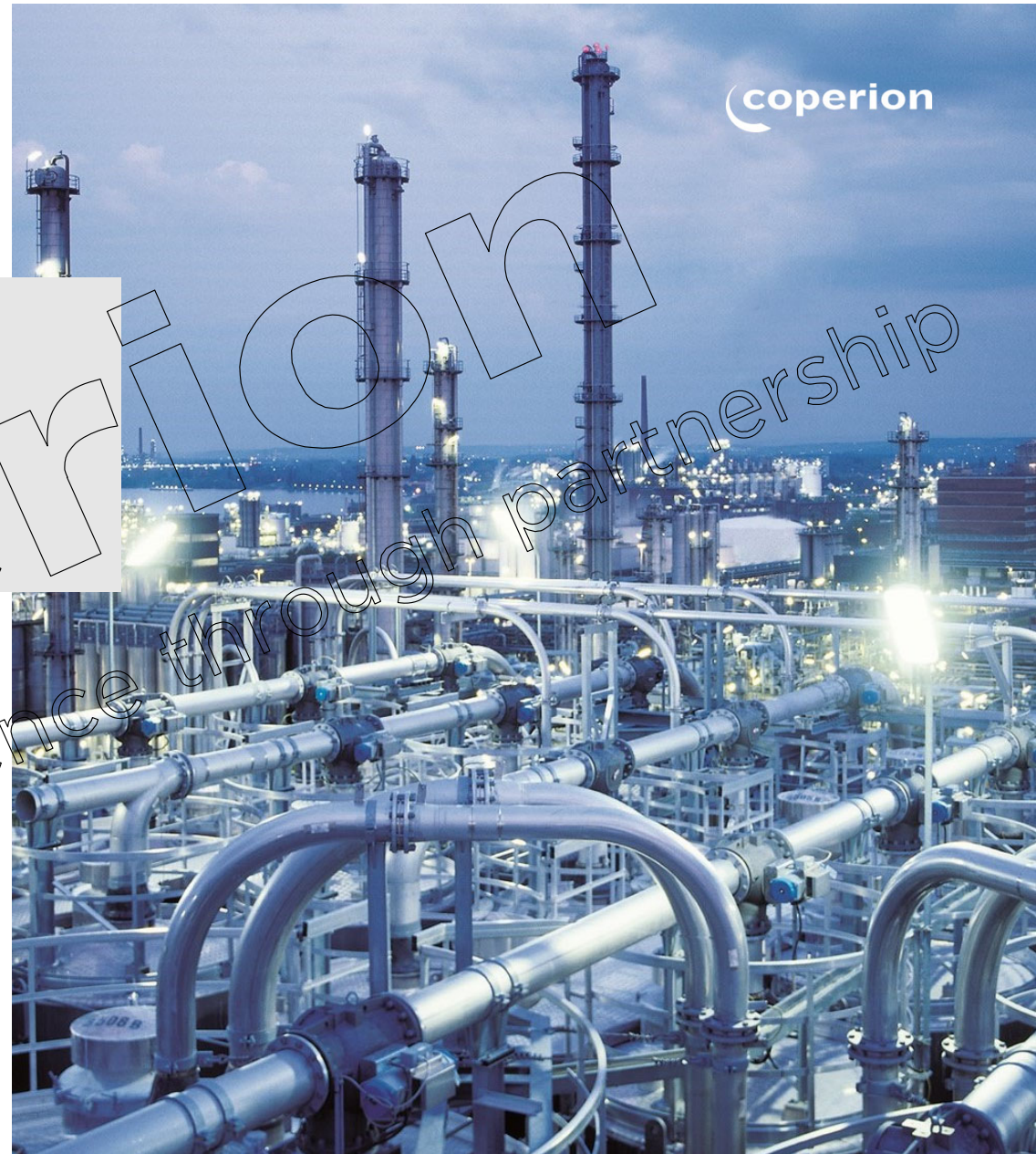




Extruder Process Technology - Latest Developments

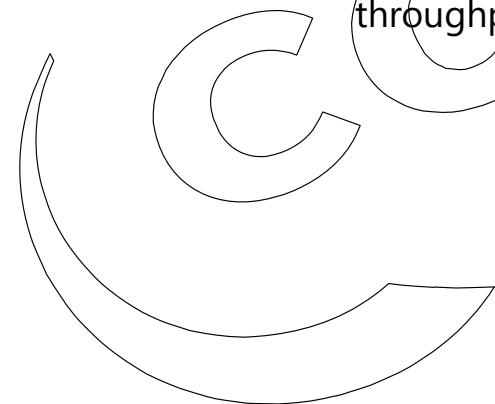
Claus Hermann – General Manager Extrusion Systems Large

Coperion Technology Update 2025



Large Capacities

What can Coperion offer for highest throughputs?



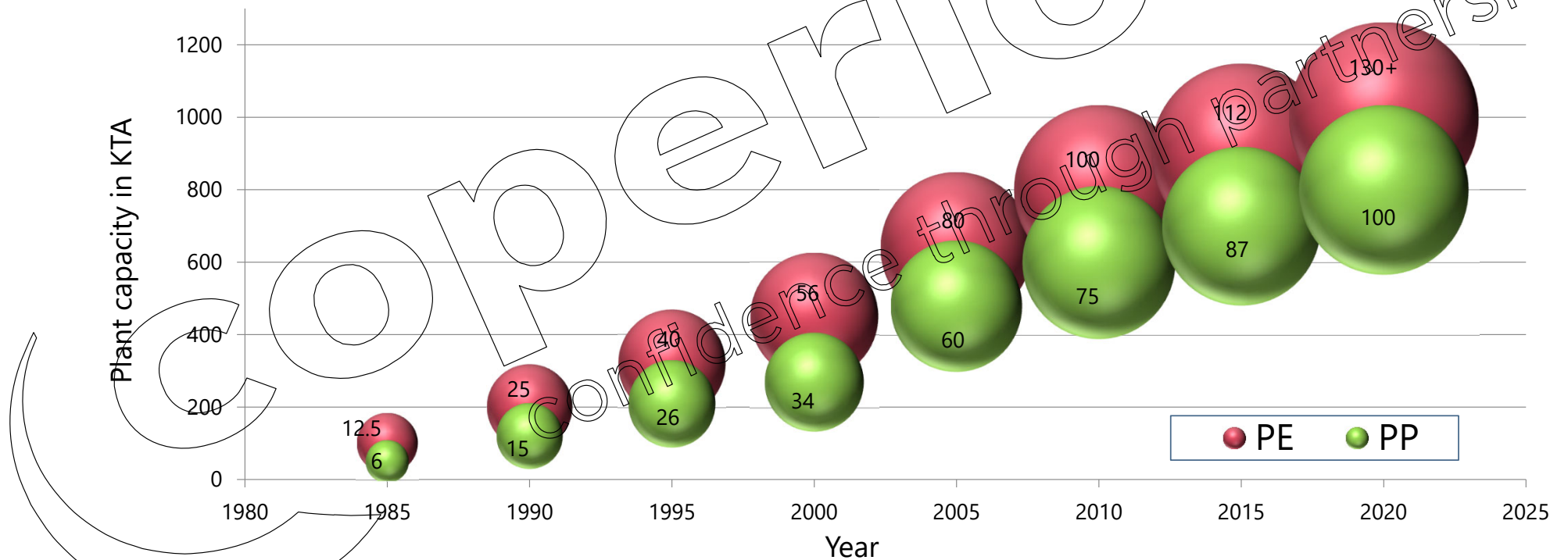
Large Capacities

Market development



Reaching highest capacities

Development since 1985



Large Capacities

Market development

Reaching high capacities

Increasing product demands

Bimodal HDPE

- Wider molecular weight distribution requires more homogenization
- Demands for > 100 t/h

HDPE / LLDPE

- Processing requires less melt fracture
- Demands for > 130 t/h

PP

- Different peroxides challenge homogenization in extruder and pelletizer performance
- Request for devolatilization
- Demands for > 90 t/h

Large capacities

- Demands depend on polymer type
- and individual limits

Large Capacities



Coperion large equipment

Reaching high capacities

High-capacity equipment: ZSK 380 Mc and ZSK 420 Mc

Diameter ratio
1.55

New gearbox

Motor sizes larger
20 MW

Optimized
discharge

Next size pelletizer

Specific torque up
to 12.5 Nm/cm³

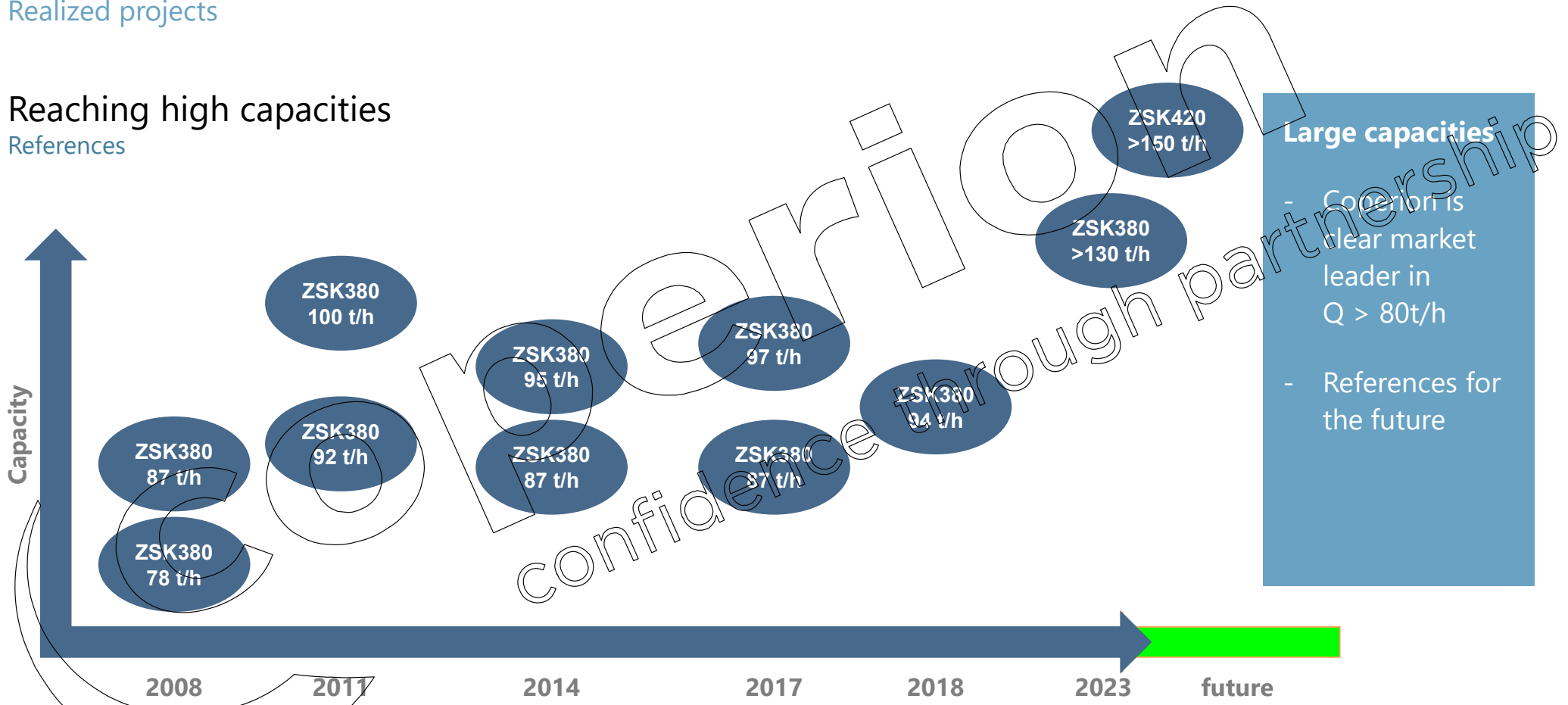
ZSK420 > 35% more
free volume
compared to ZSK380

Large Capacities

Realized projects

Reaching high capacities

References



Large Capacities

Recent Upgrades

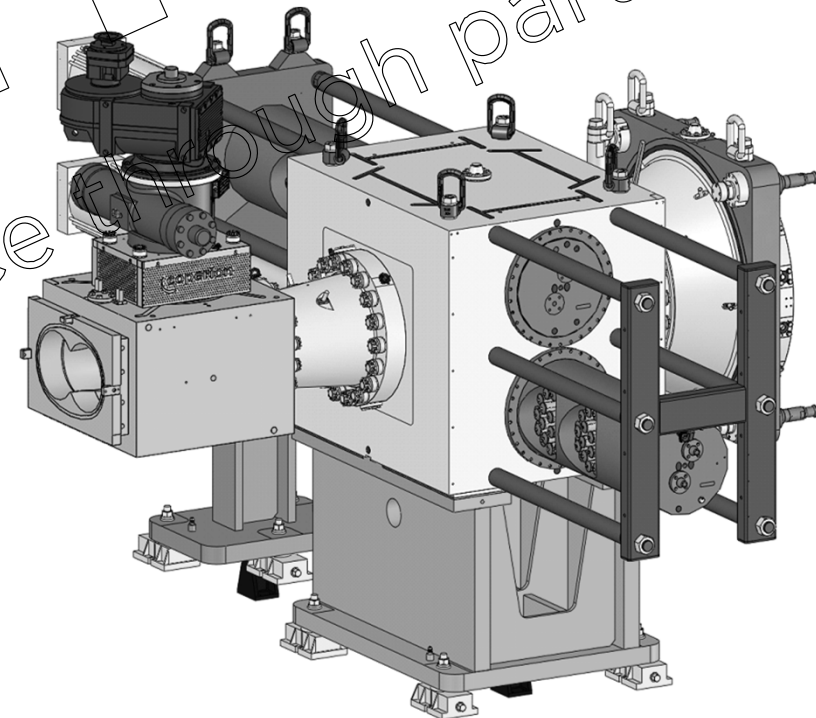
Reaching high capacities

Reliability
for maximum OEE

Efficiency
for lowest CAPEX and OPEX

Full Integration
in Coperion material handling
concept

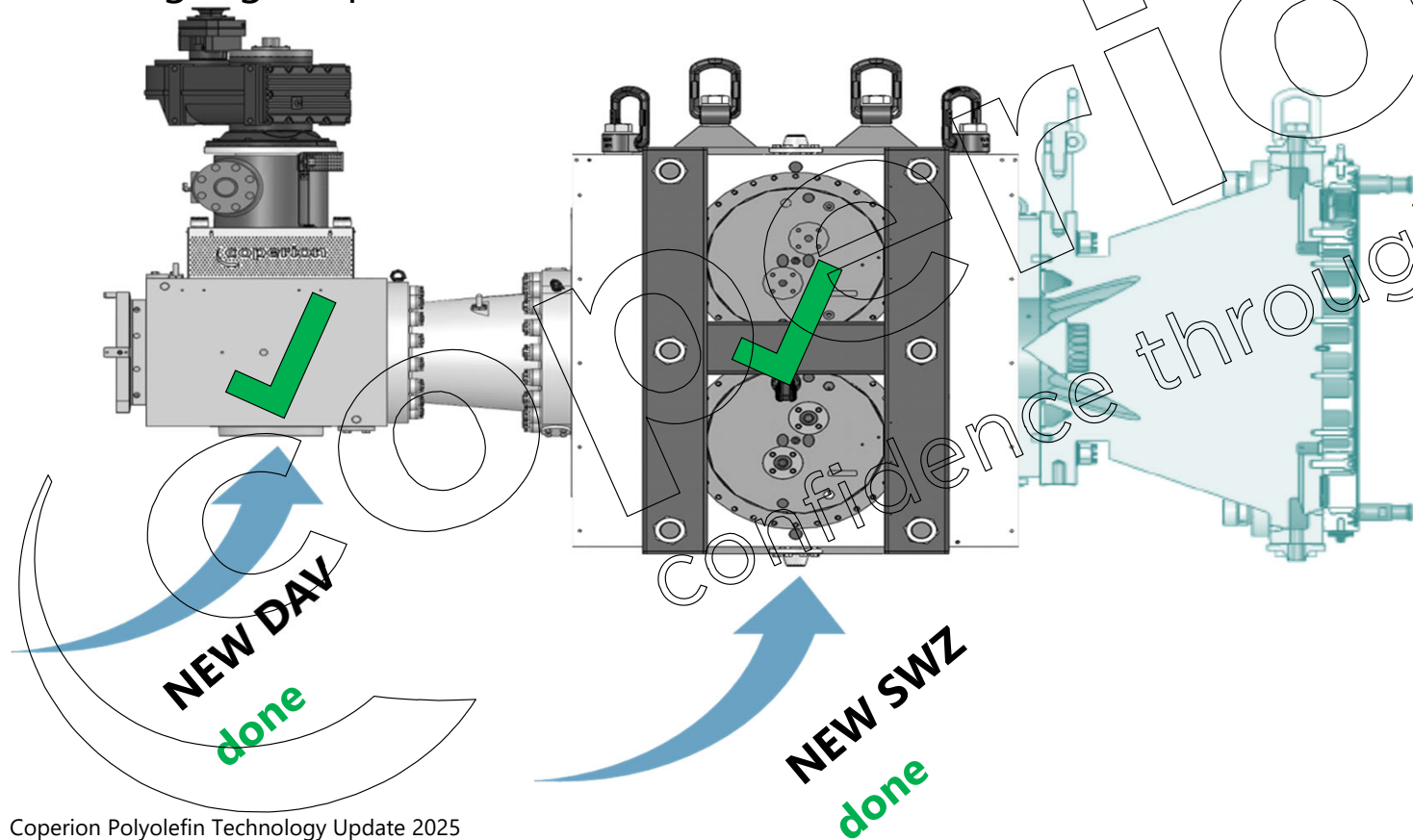
- Optimized equipment
 - **DAV-XT**
 - **SWZ**
 - **UG**
- Throughput up to 150 t/h
- Maximum availability
- Minimum pressure consumption
 - **Best product quality**
 - **Maximum energy efficiency**
↳ **OPEX reduction** (> 300,000 \$)



Pressure Reduced Discharge

Recent Upgrades

Reaching high capacities



Large capacities

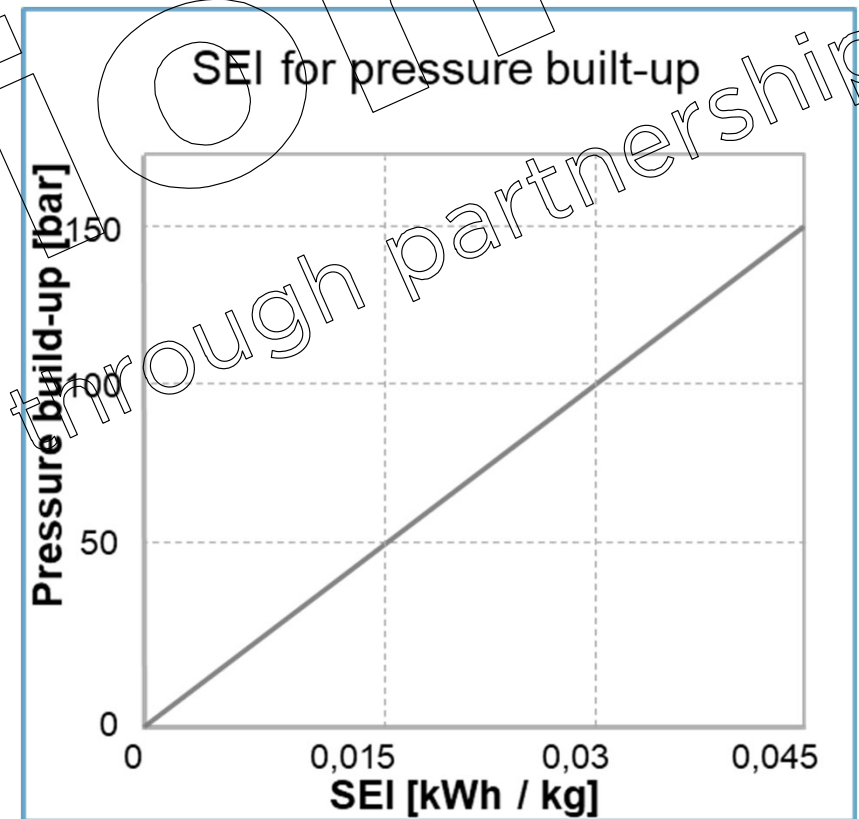
- Modify equipment to meet high throughput requirements
- Reduce losses (pressure and energy consumption)

Large Capacities

Recent Upgrades

Economical benefits

- Required SEI for Pressure Build-Up
→ 100bar ~ 0,03 kWh/kg
- Pressure reduction by ~45 bar
→ Lower SEI: - 0,0135 kWh/kg
- Energy Savings
→ 10,8 Mio kWh / year (100 t/h)
→ ~324.000 \$ (0,03 \$/kWh)

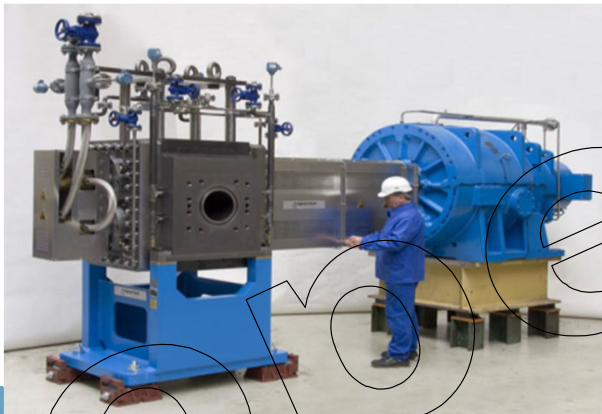


Large Capacities

Under development



Reaching high capacities



PP: 85 t/h
(MP limit)

PE: 100 t/h
(MP limit)

PP: 90 t/h
(UG limit)

PE: 150 t/h
(UG limit)

NEW melt pump
In development

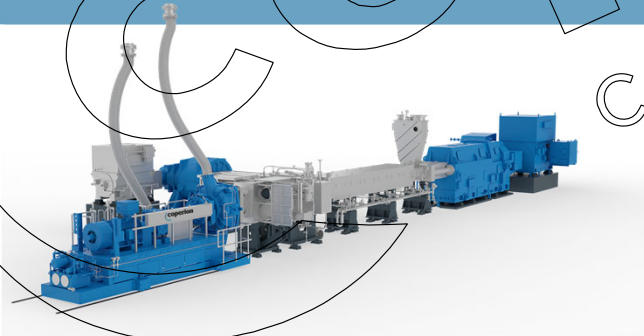
NEW pelletizer
In development

Large Capacities

Single vs. Dual extruder line setup

Single Extruder Concept

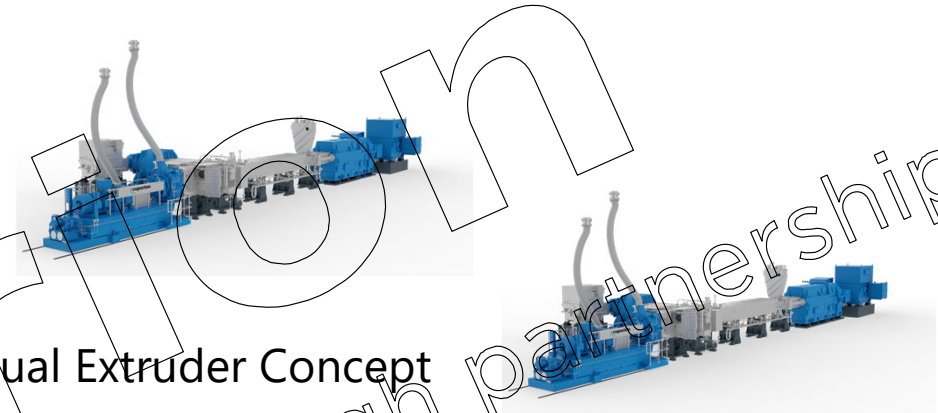
- One ZSK for the full reactor capacity + catch-up
- Smaller footprint and building volume
- Less energy and utility consumption
- Savings on upstream feeding systems and downstream conveying systems and silos
- Lower equipment investment and operation cost
- Optimized spare parts inventory
- Commercially proven for up to 1,000 KTA



Coperion Polyolefin Technology Update 2025

Dual Extruder Concept

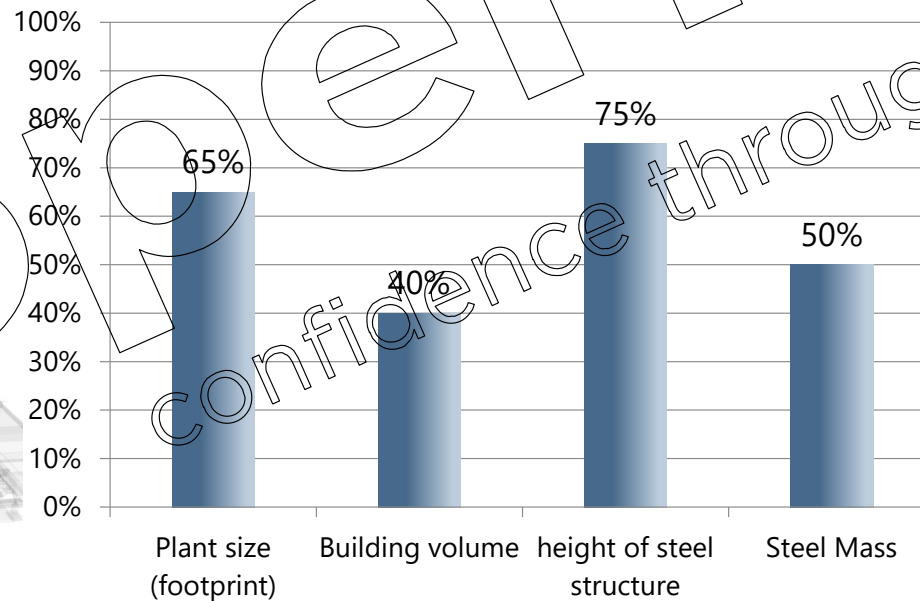
- Two ZSKs for the reactor capacity:
 - 50% + catch-up each
- Increased footprint and building volume
- Higher energy and utility consumption
- Adds also on upstream feeding systems and downstream conveying systems and silos
- Higher equipment investment and operation cost
- Increased spare parts inventory



Large Capacities

Single vs. Dual extruder line setup

The % values show the relative saving potential of a single line compared to a dual line concept on a TIC basis





Thank you very much for your attention.

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