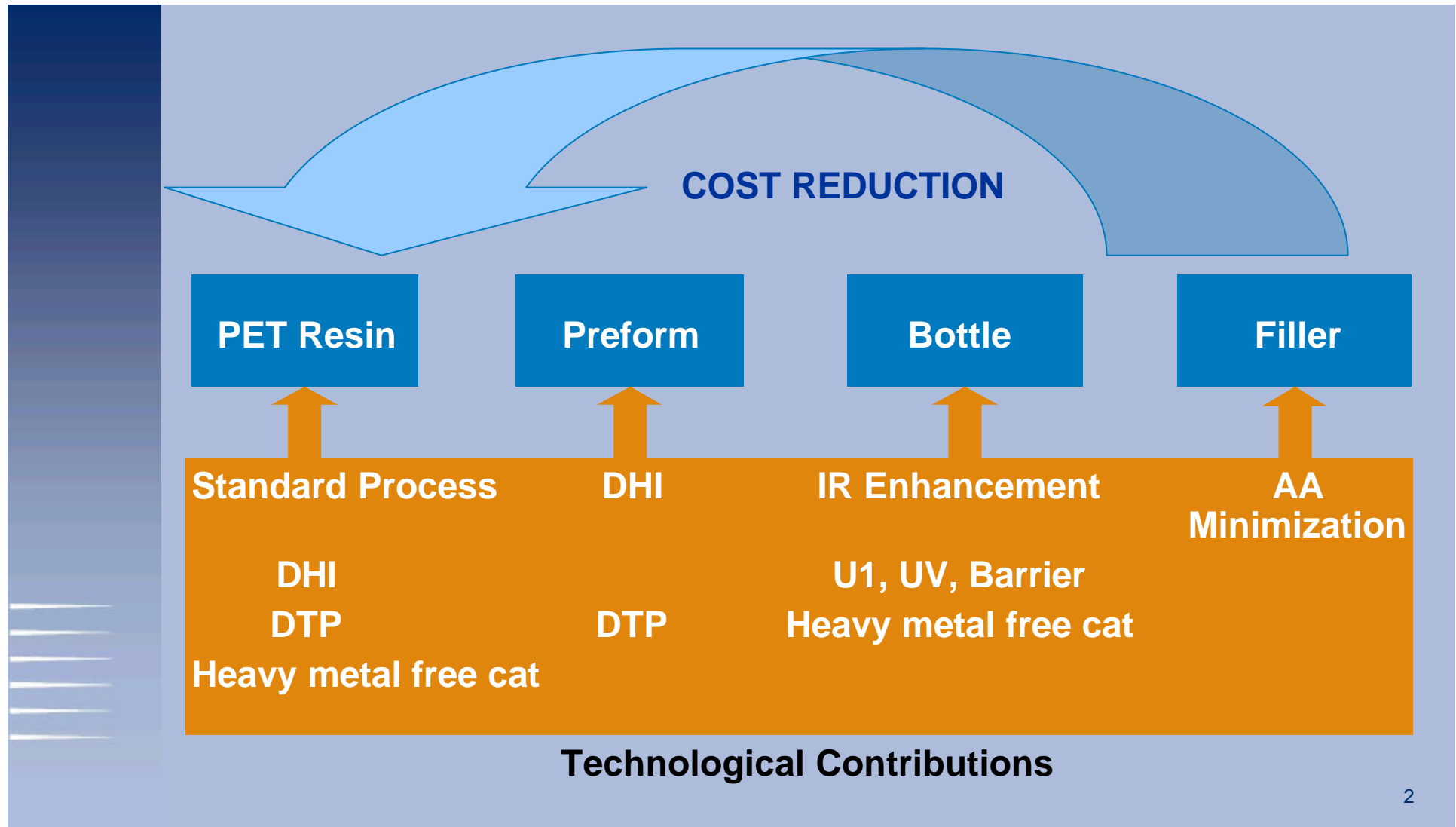




Direct to Preform – Concept for the Future

Drivers of the PET Bottle Market

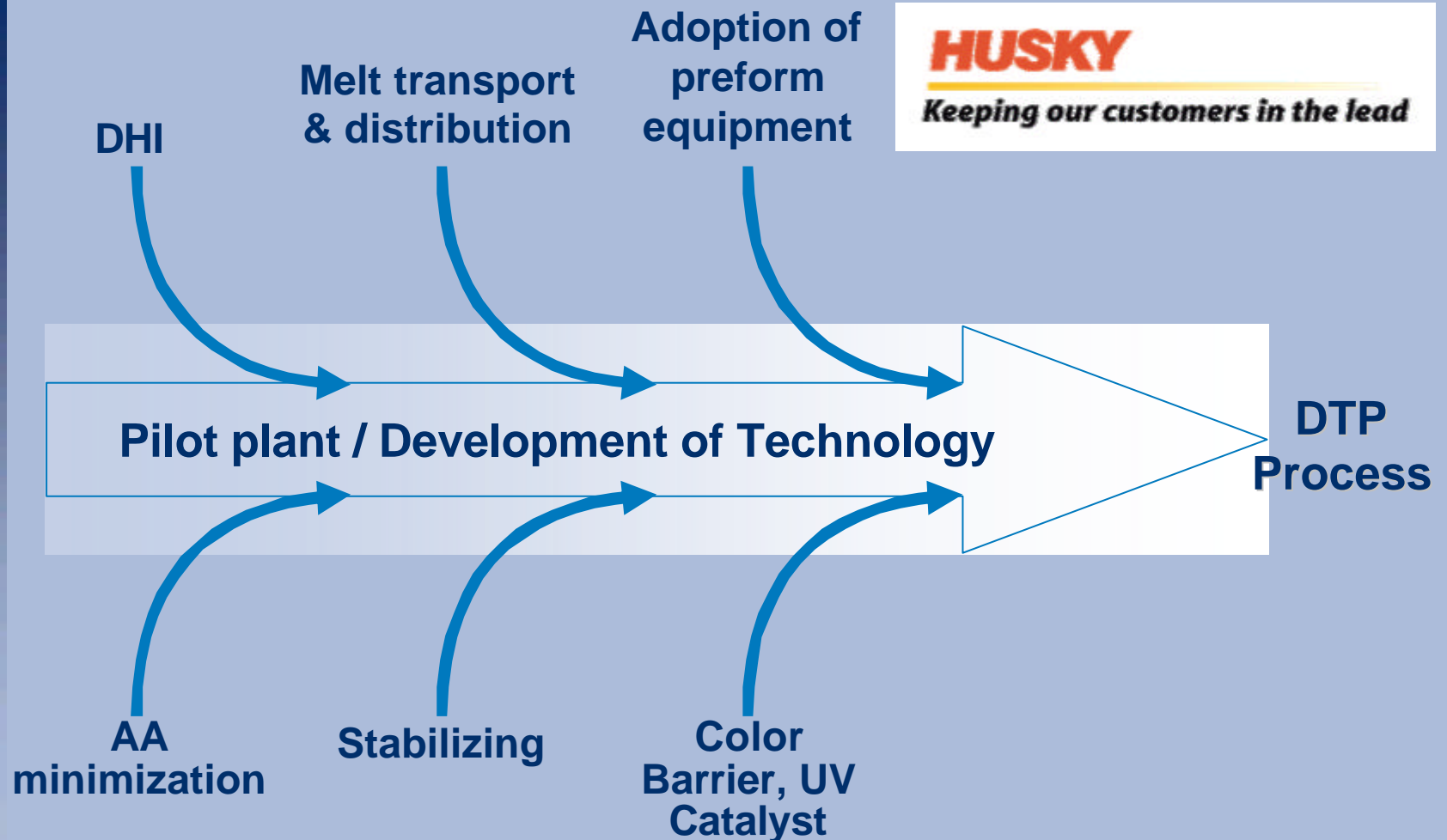


Innovation Targets

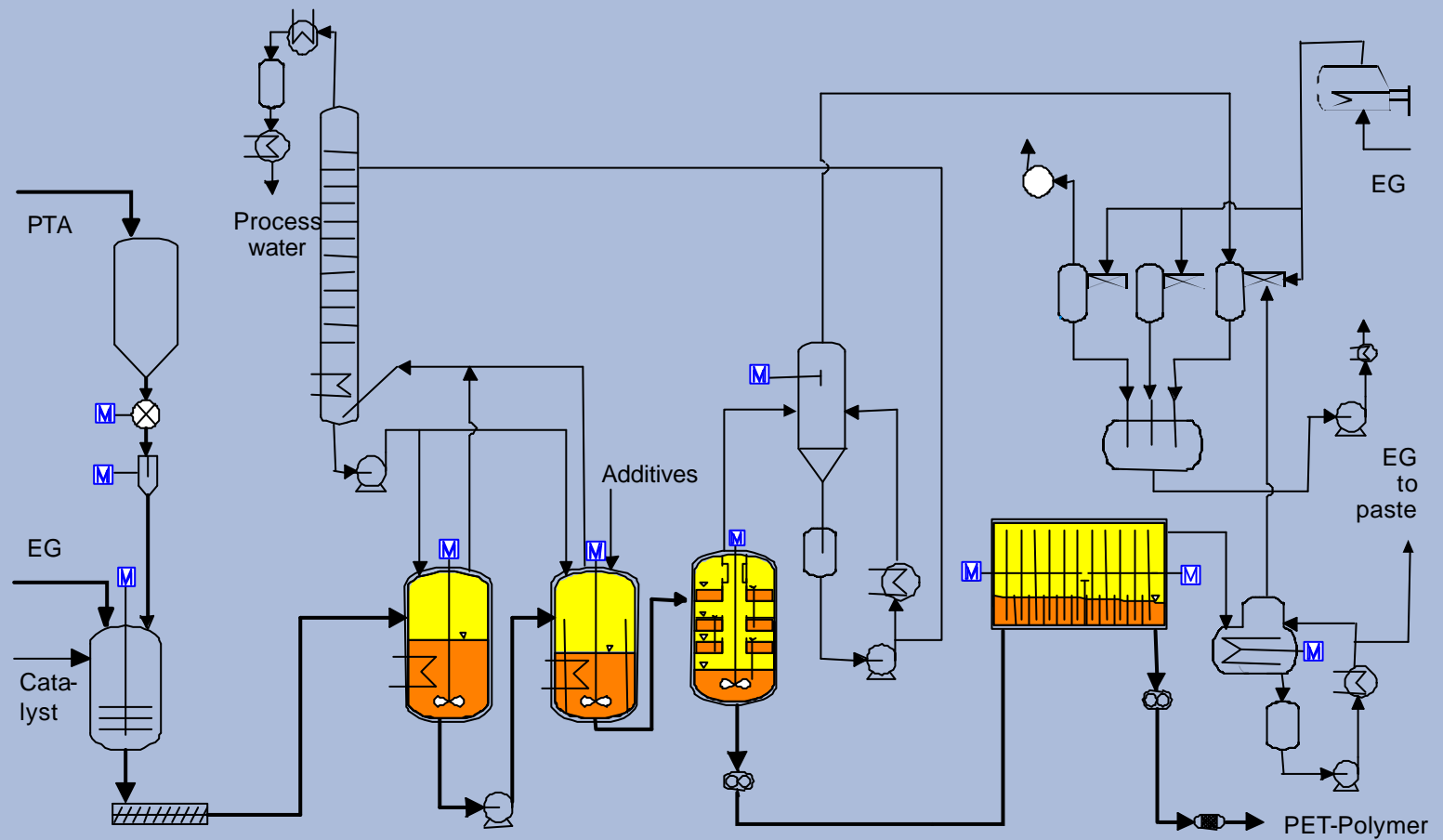
Integrated process concept

- ▶ Integrated polymer process for PET bottle preforms
- ▶ No intermediate production of low viscosity chips
- ▶ No solid state polycondensation
- ▶ Broad process flexibility
- ▶ Significant reduction of investment and production costs
- ▶ Outstanding product properties
- ▶ Excellent plant reliability

Roadmap for DTP



DHI Process – Economic 4-Reactor-Plant Concept



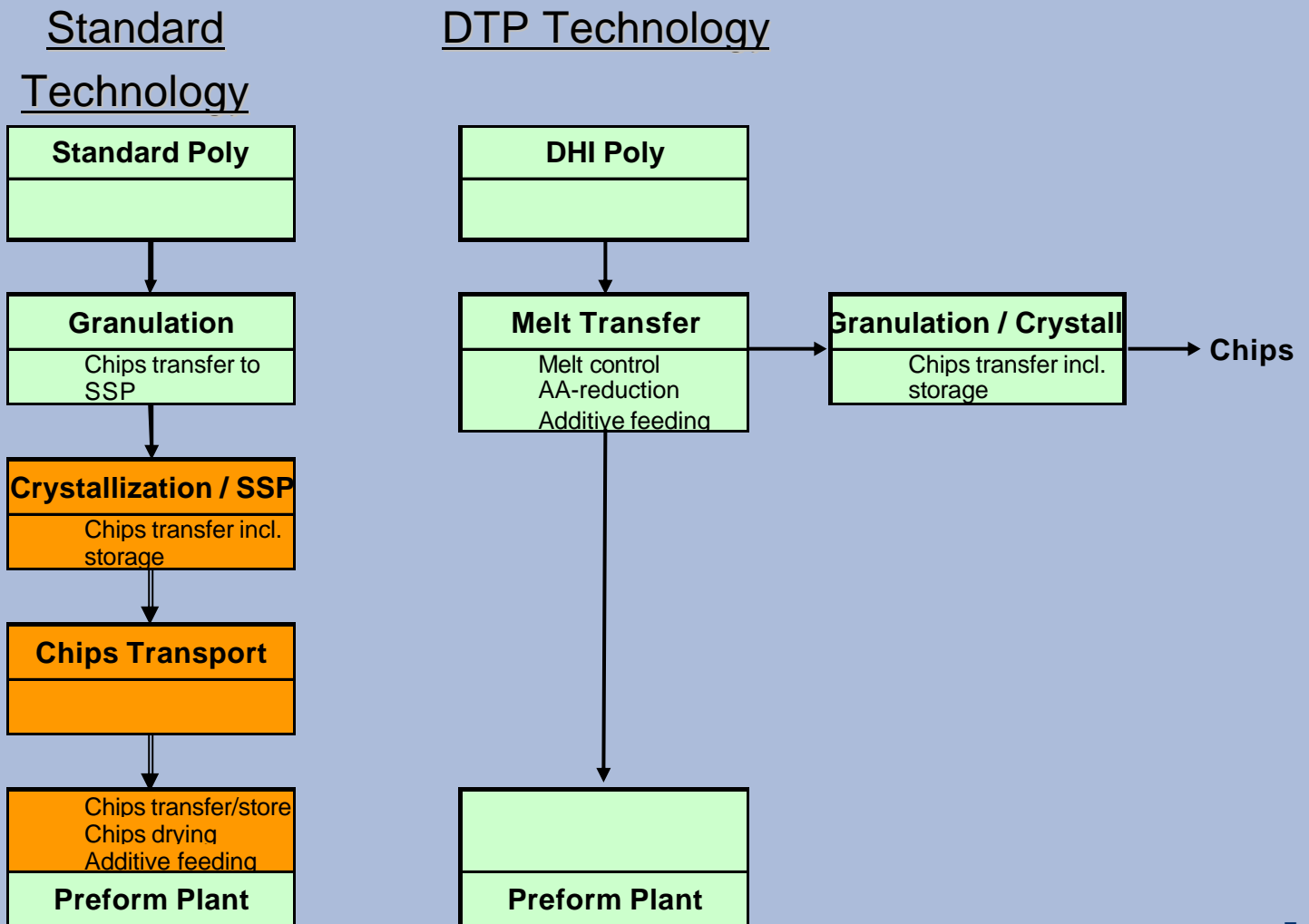
DHI Process – Chips Crystallization

Latent Heat Crystallization:

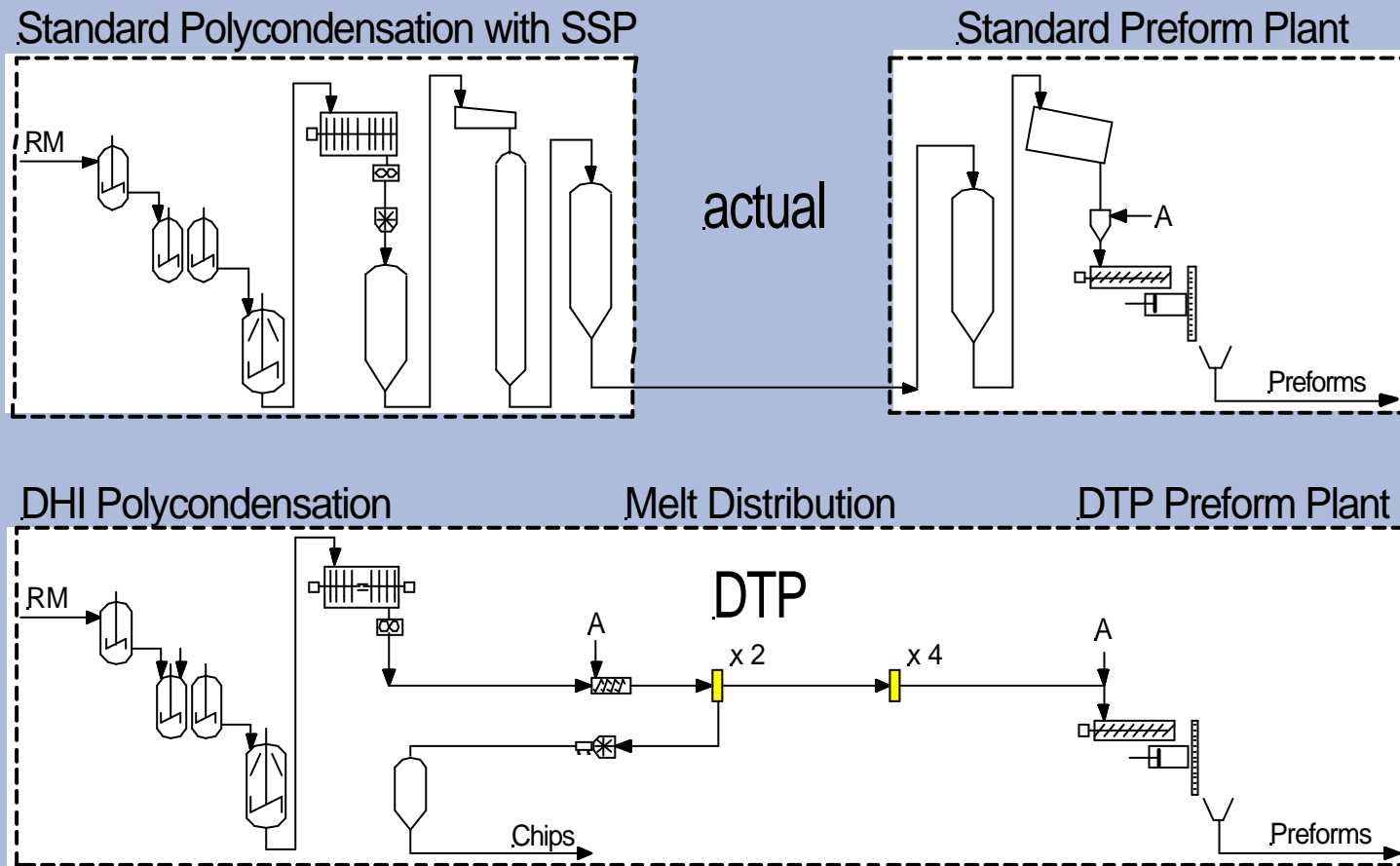
- ▶ **Chips formation using new BKG system**
- ▶ **High viscosity crystallized chips**
- ▶ **Crystallization degree adjustable**
- ▶ **Low Acetaldehyde**
- ▶ **Bright color**
- ▶ **Lower heat of fusion**

Chips directly usable for preform production

DTP Process

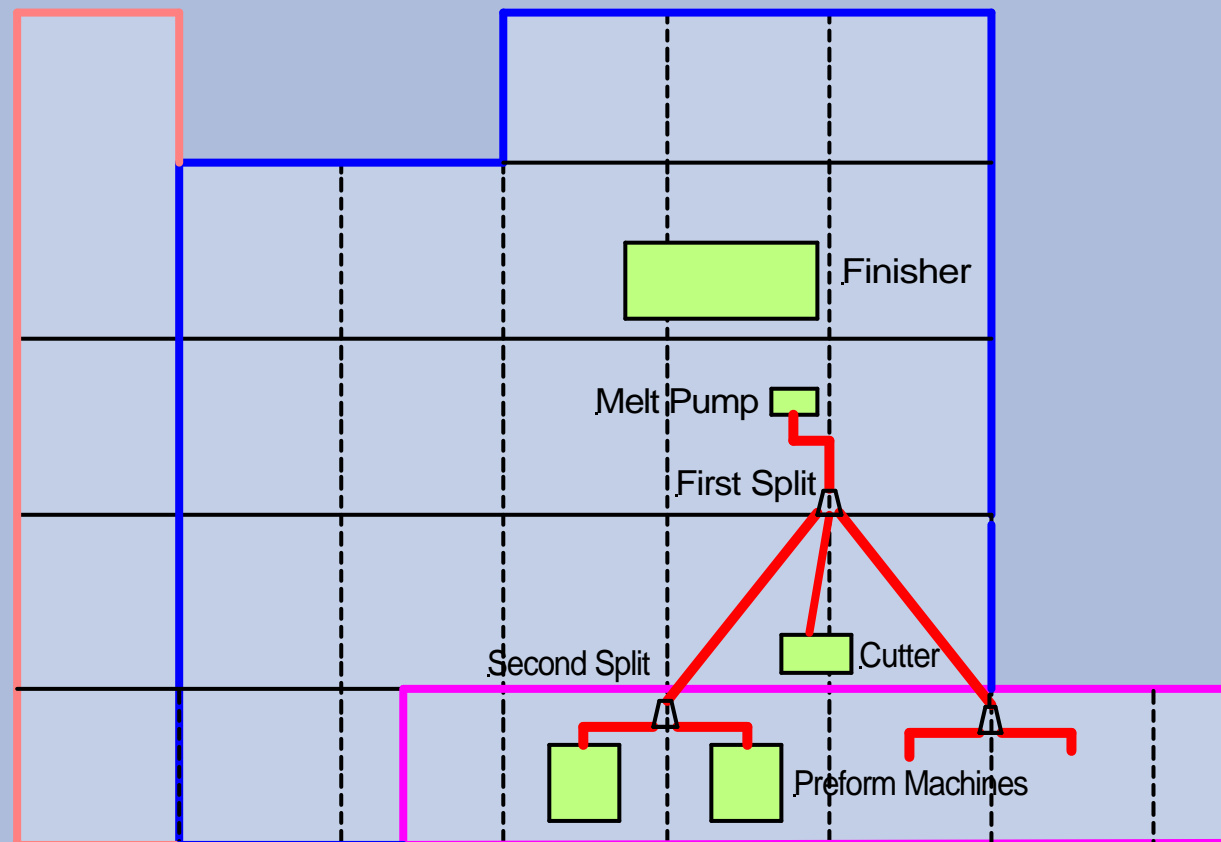


DTP Process



DTP Process

POLYCONDENSATION & PREFORM PLANT PLANT ARRANGEMENT



DTP Technology – Improved Quality

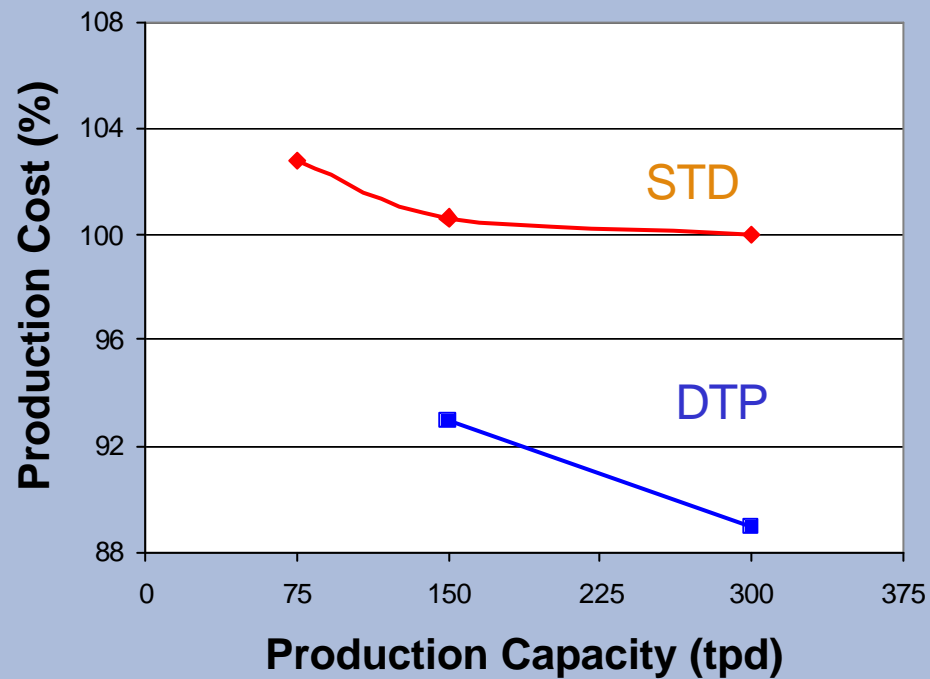
- ▶ **Quality improvements**
 - Lower I.V. variations
 - No residual moisture in the melt (I.V. decrease)
 - No risk of oxygen intrusion (colour values)
 - No haze through crystallinity
 - No contamination through chips handling
- ▶ **New qualities, new formulations**
 - E.g. use of titanium catalysts

DTP – Process Flexibility

- ▶ **Excellent Adoption to Market Requirements**
 - Simultaneous production of preforms and chips
 - Broad diversity of preform types
 - Size, shape, cavitation
 - Color
 - Acetaldehyde content
 - Specialty additives for UV inhibition, better barrier properties, and others
 - Chips production without SSP

DTP – Saving of Production Cost

Preform costs



Basis

Preform mashines: 8 (150 tpd)
16 (300 tpd)
Cavities: 144
Preform weight: 28 g

DTP Cost Savings

Cost model for preform production

	Standard-Plant		DTP-Plant
Raw materials Utilities Additives (Surcharge +freight)	95%	-10% →	85,5 %
Depreciation Personnel Maintenance	5%	-10% →	4,5%
Total	100%		90%

Summary

- ▶ **Driver of the PET resin market - Cost competition**
- ▶ **High IV concepts for integrated processes**
- ▶ **DTP results in significant cost reduction**
- ▶ **Outstanding product quality**
- ▶ **High process flexibility for the diverse market requirements**

You buy PTA and EG for your PET plant production, which product do you sell ?



or

