



ADVANCES IN CATALYSIS FOR HYDROCARBONS

RESULTS FROM ZEOCAT-3D, C123 & BIZEOLCAT EU RESEARCH PROJECTS



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the European Union

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TECHNO-ECONOMIC ASSESSMENT OF BIZEOLCAT NEW PROPANE AND BUTANE DEHYDROGENATION AND PROPANE AROMATIZATION

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16 March 2023

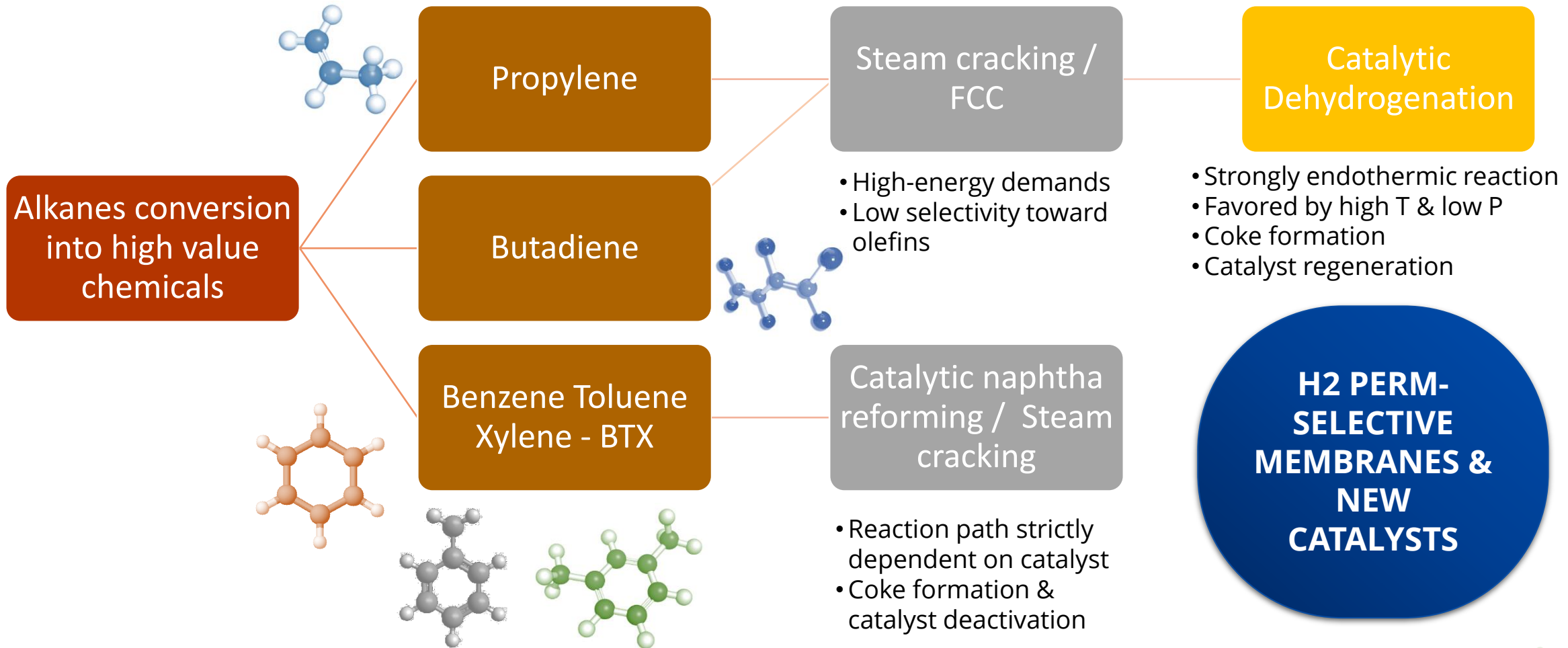
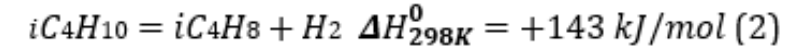
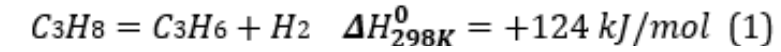


Outline

- Introduction
- Process technologies overview
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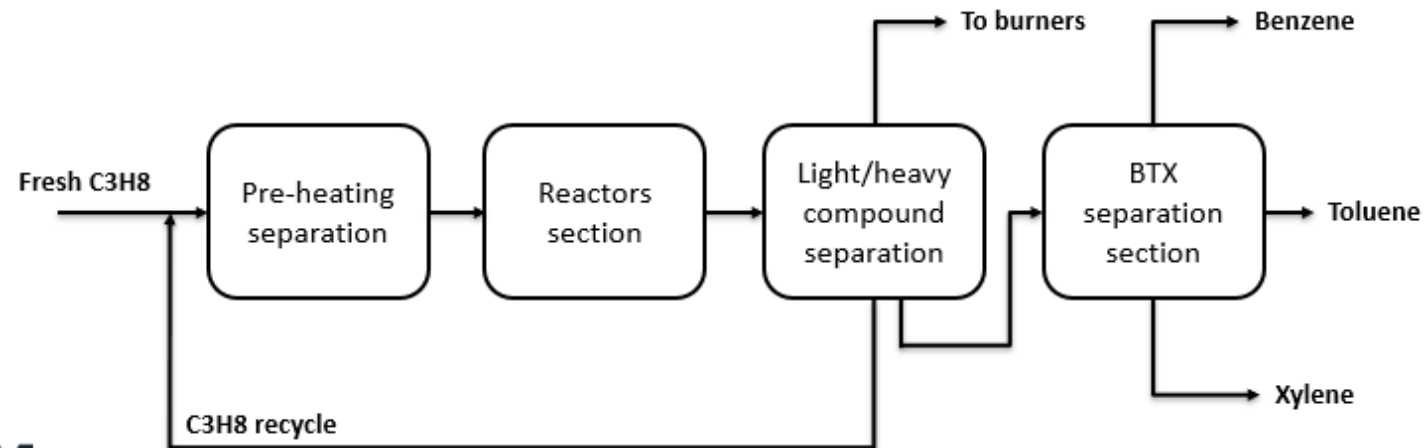
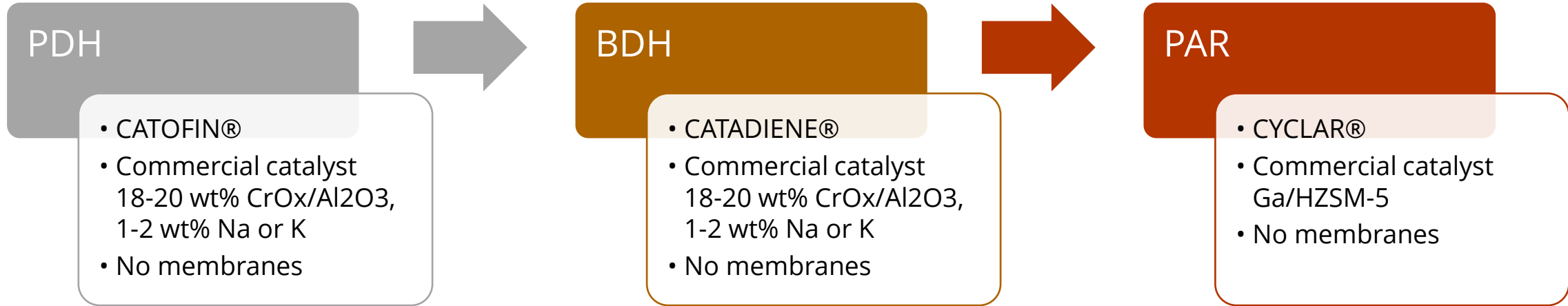
Introduction





Process technologies overview

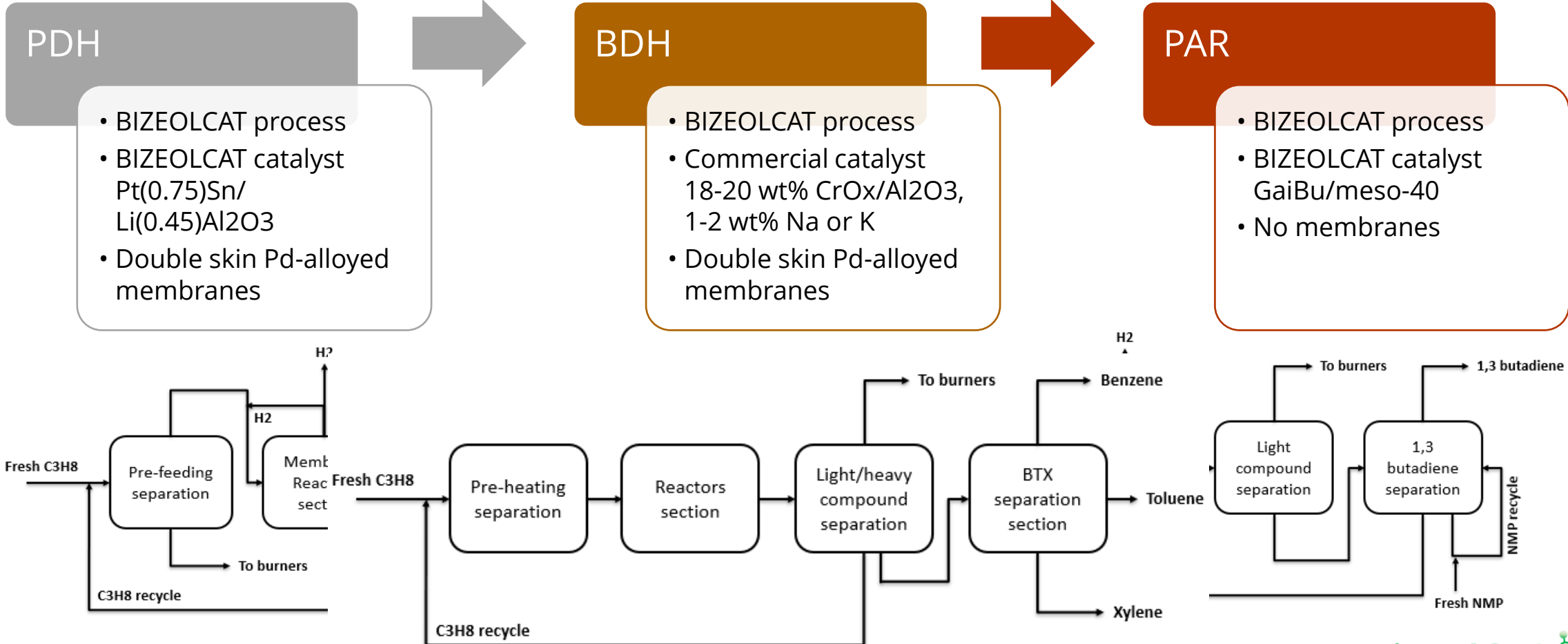
Benchmark





Process technologies overview

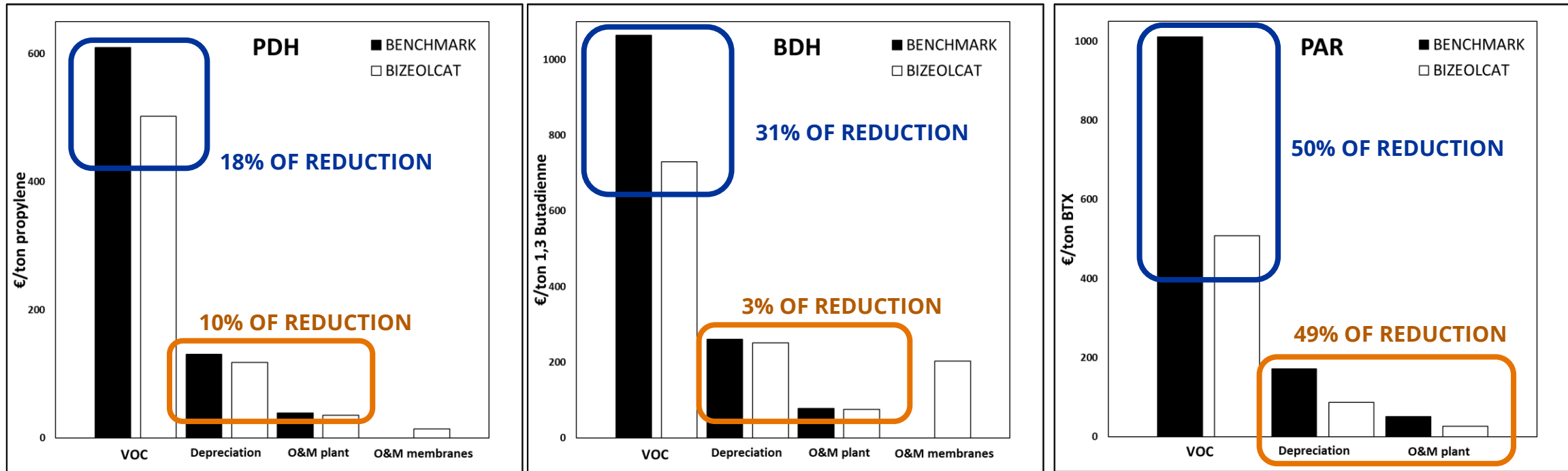
Innovative processes





Techno-economic assessment

Cost of Production (COP) 1/2



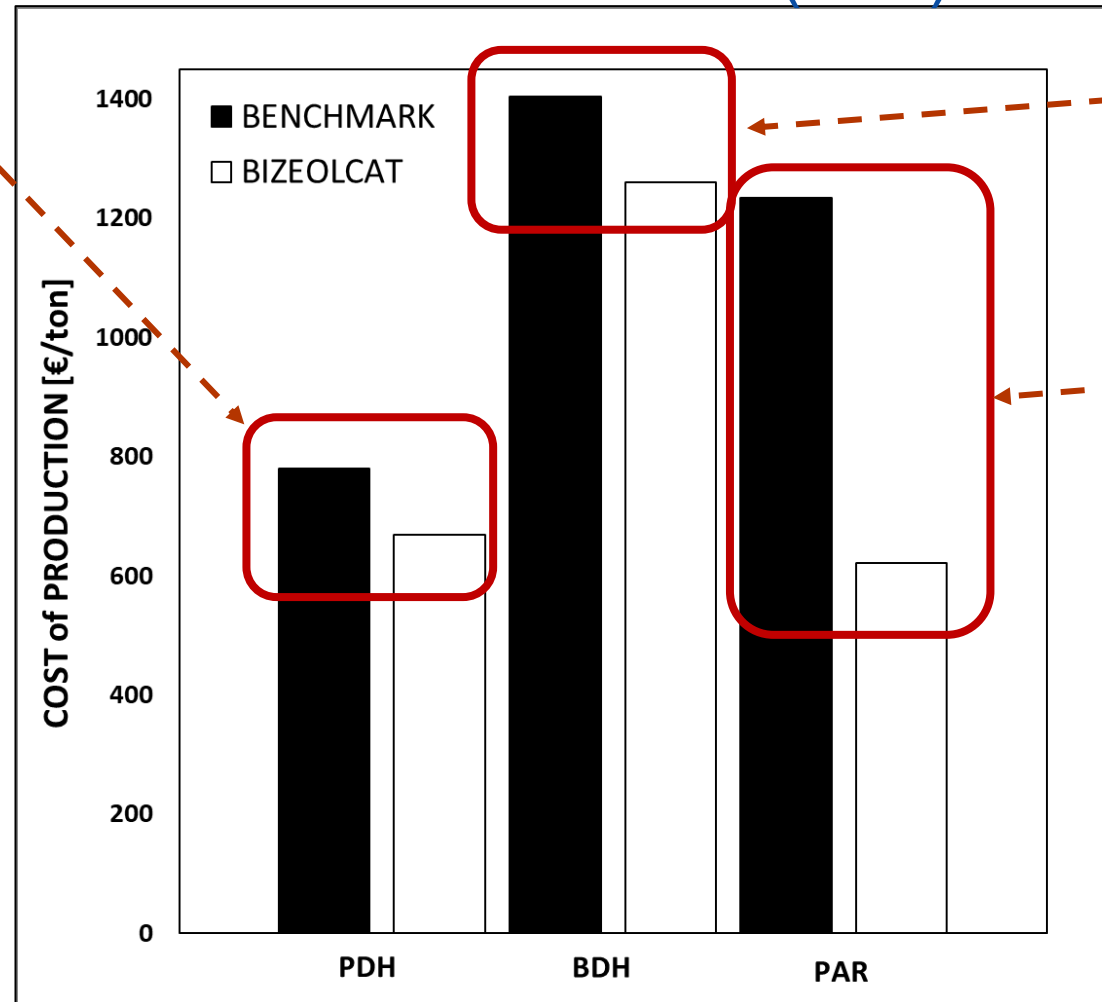
- VOC calculated on feed basis: propane cost of 430 Euro/ton PDH and PAR; butane cost of 440 Euro/ton for BDH
- Depreciation: 10% Fixed Capital Investment
- O&M plant: 3% Fixed Capital Investment



Techno-economic assessment

Cost of Production (COP) 2/2

14% OF REDUCTION



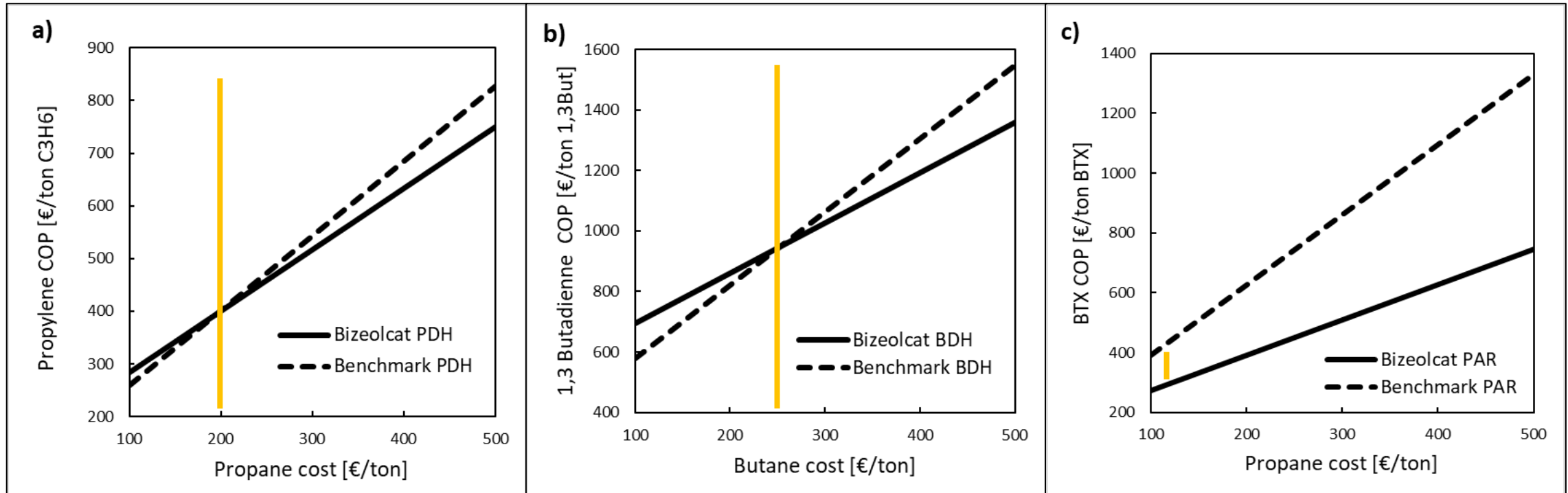
10% OF REDUCTION

50% OF REDUCTION



Analysis of main parameters on COP

Feed cost

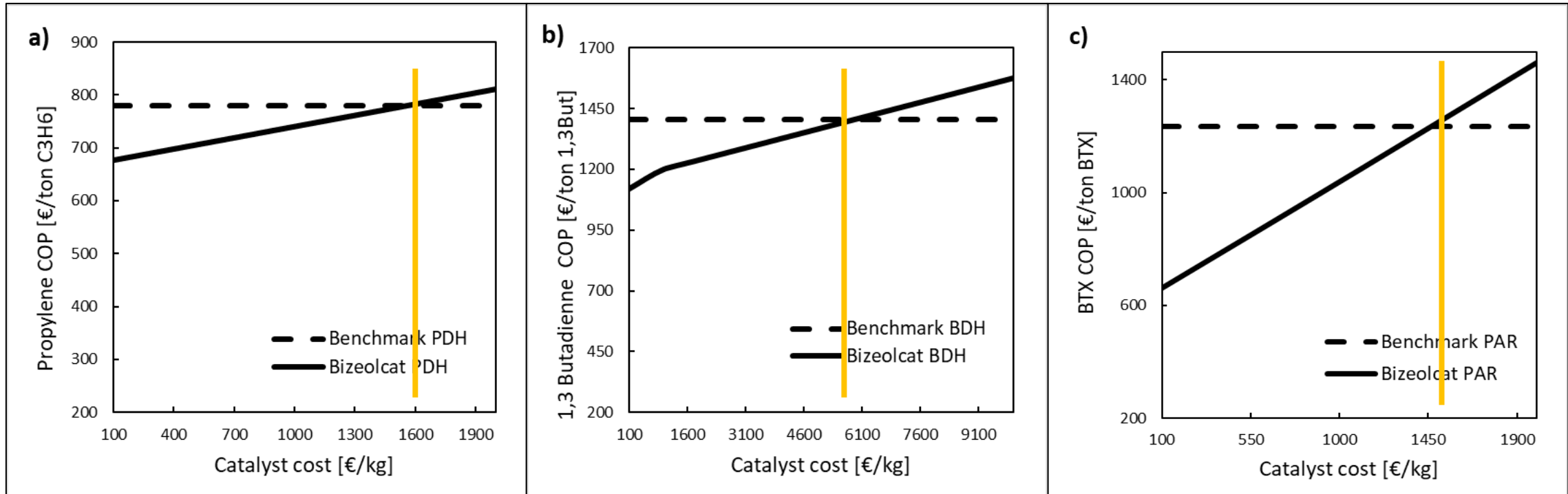


Cost of production versus feed cost for a) PDH, b) BDH and c) PAR



Analysis of main parameters on COP

Catalyst cost

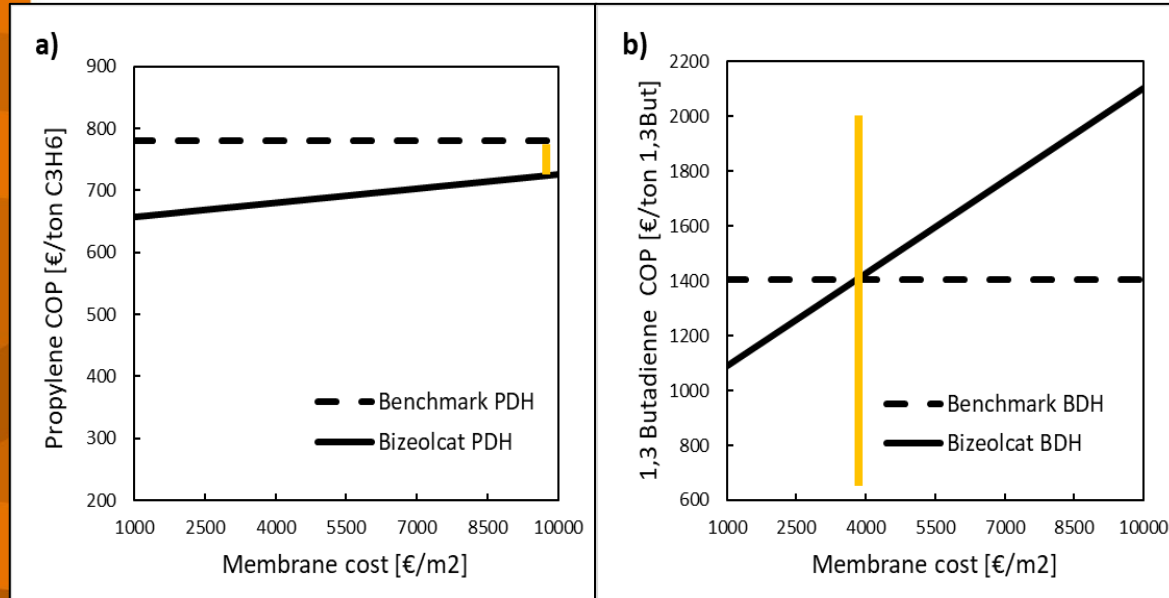


Cost of production versus catalyst cost for a) PDH at propane cost at 430 Euro/ton, b) BDH at butane cost of 440 Euro/ton and c) PAR at propane cost at 430 Euro/ton



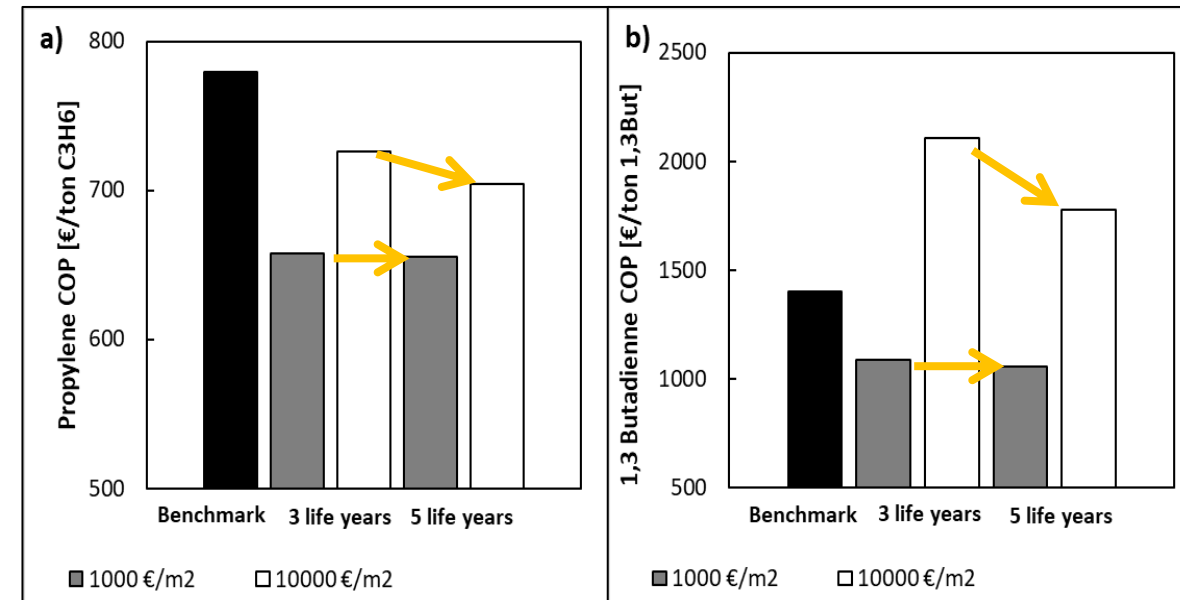
Analysis of main parameters on COP

Membrane cost and life



Influence of membranes life for a) PDH at propane cost of 430 Euro/ton and b) BDH at butane cost of 440 Euro/ton

Cost of production versus membranes cost for a) PDH at propane cost of 430 Euro/ton and 3years of membrane-life, and b) BDH at butane cost of 440 Euro/ton and 3years of membrane-life





Conclusions

- The lower is the price of feedstock and catalyst and the lower is the gain derived from deployment of BIZEOLCAT technology.
- The more is reduced the cost of the membrane and the more is increased the lifetime, the higher is the gain showed by BIZEOLCAT innovative technology.
- PDH is favourably influenced using innovative catalytic membrane reactor since a reduction in COP of 14% can be achieved.
- BDH is favourably influenced using innovative catalytic membrane reactors since a reduction in COP of 10% can be achieved.
- PAR is negatively influenced using innovative catalytic membrane reactors. Without membranes and with BIZEOLCAT catalyst, a reduction in COP of 50% can be achieved.



THANK YOU FOR THE ATTENTION!

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