

Integration of Bio-based and Fossil-based Chemical Manufacturing

Track 3: Renewable Chemical Production

Linde Engineering Dresden GmbH
FP Innovations
Petron Sciencetech Inc.
Lignol Innovations Ltd.

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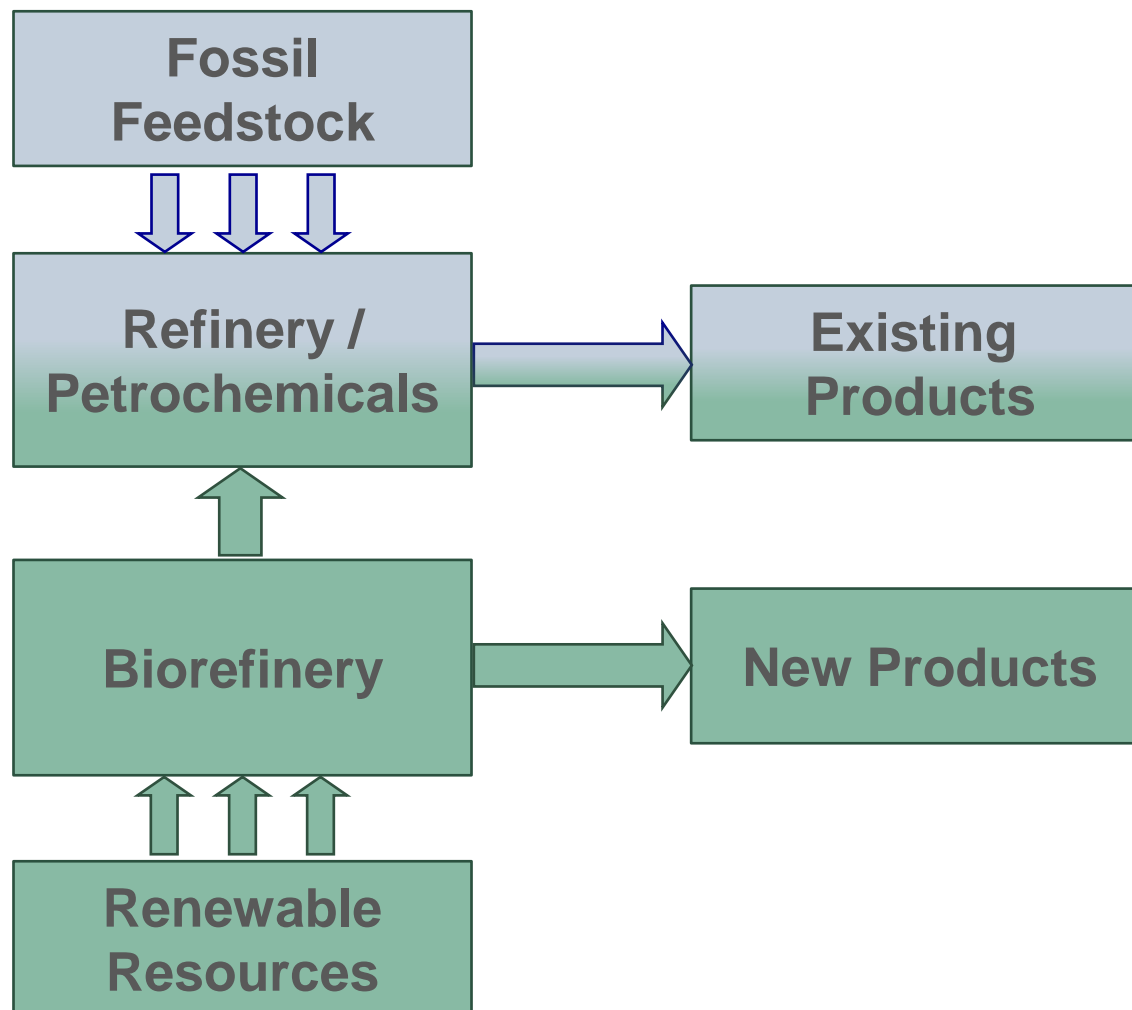
Panel Agenda

- **Introduction, Markus Wolperdinger**
 - Integration of Bio-based and Fossil-based Chemical Manufacturing
- **Talk 1: FPIinnovations, Tom Browne**
 - Value-chain of wood-based chemicals
- **Talk 2: Petron Sciencetech, Hassan Taheri**
 - Bio-ethylene from ethanol and value-added chemical intermediates
- **Talk 3: Linde Engineering, Markus Wolperdinger**
 - Bio-based gases, scale-up and the utilization in chemical manufacturing
- **Talk 4: Lignol Innovations, Michael Rushton**
 - Commercialization scenarios for lignin, emerging lignin applications

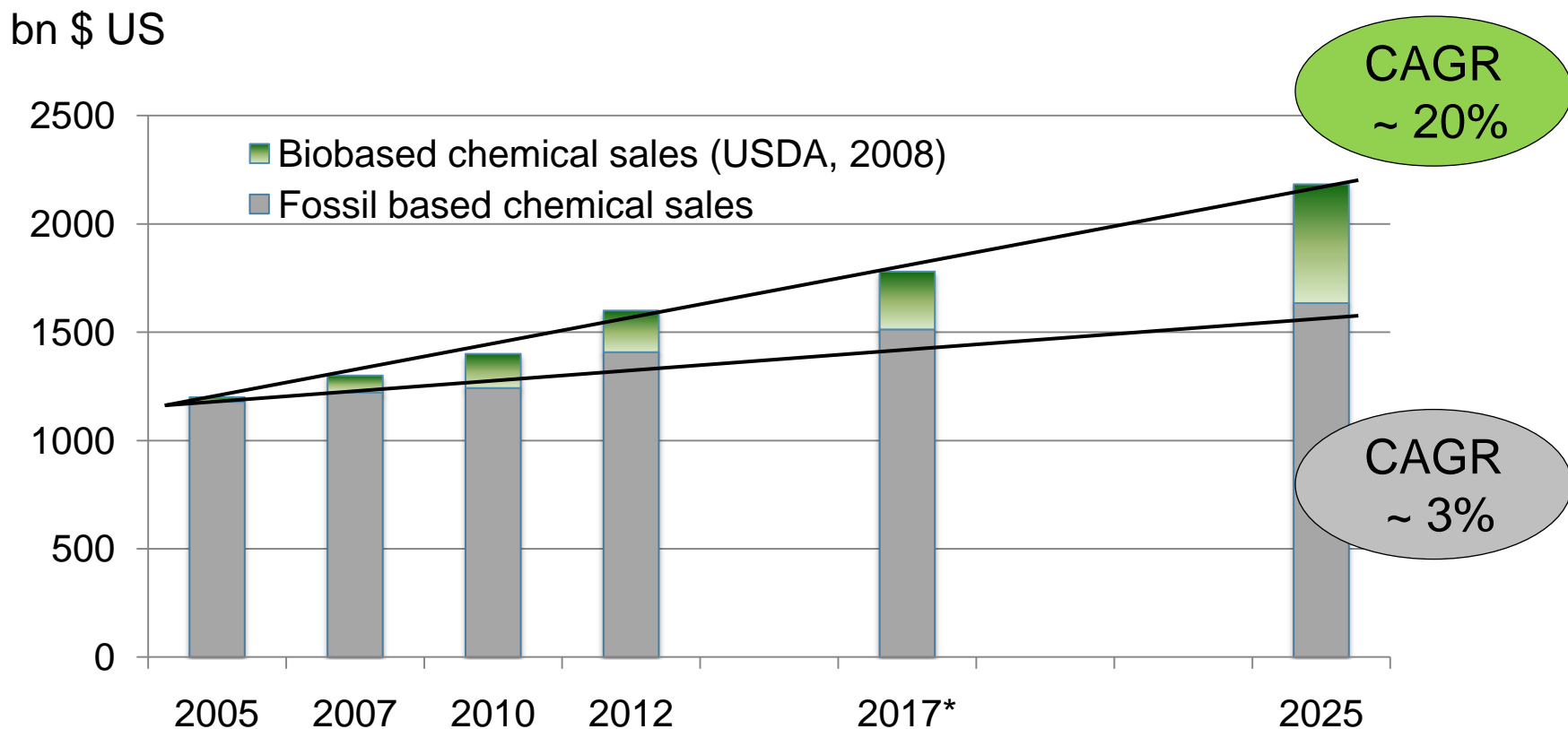
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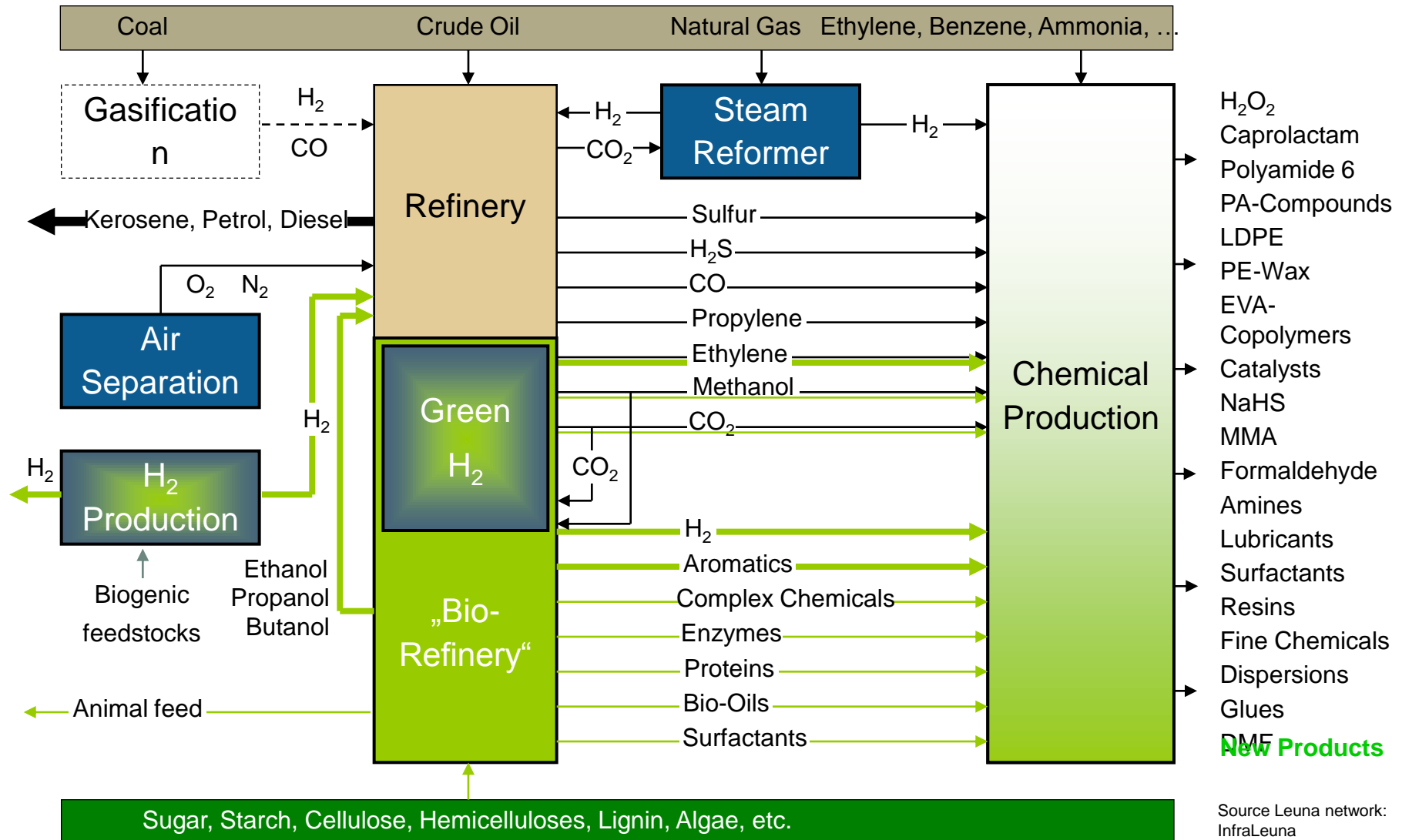


Bio-based Products for Chemical Manufacturing: Market Forecast



Sources: USDA 2008, OECD, 2010 McKinsey & Co. 2009, *data interpolated by Linde

Integrated "Biorefinery" of the Future



Source Leuna network:
InfraLeuna

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Thank you for your attention.

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