

# Unlocking value with chemical and mechanical recycling



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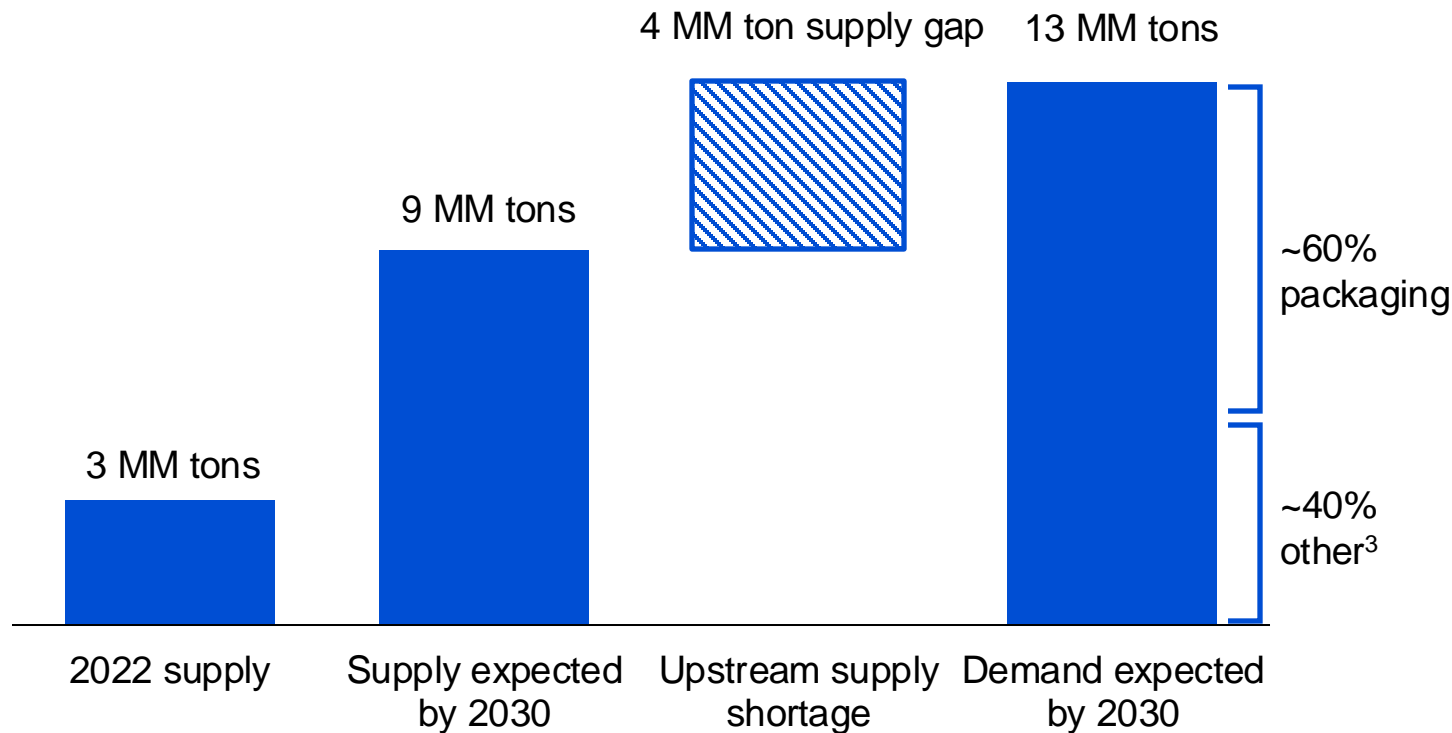




# Circular plastics market is structurally attractive

Upstream supply gap is creating a tight market<sup>1</sup>

## Market assessment for circular plastics<sup>1,2</sup>



- Consumer preferences driving robust demand growth for LYB's CLCS products
- European regulatory developments, including PPWR, bolstering demand for recycled content in packaging
- Infrastructure build-out for gathering, sorting and processing plastic waste lagging demand growth for recycled polymers
- Brand owners' scaling back plans for usage of recycled content due to slower growth in supply



1. Sources: Townsend and Conversio (EU); ACC, TRP, CMA (US); CLCS internal insights  
2. In North America and Europe  
3. Other includes automotive, durable goods and construction

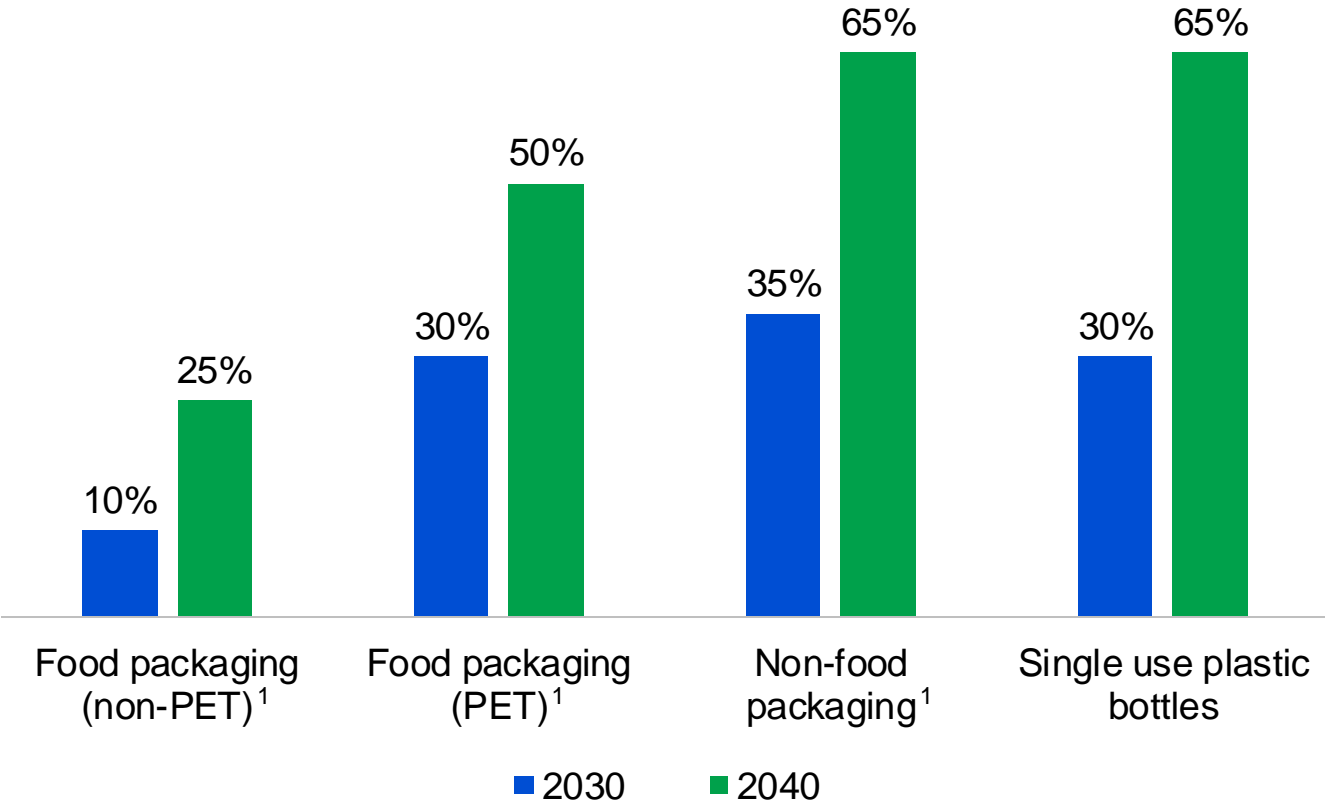


# PPWR: constructive regulatory progress in Europe

EU's Packaging and Packaging Waste Regulation (PPWR) stimulates demand for circular solutions

### PPWR – Minimum recycling content targets

2030 and 2040, by product group



- Mandates minimum recycled content requirements for packaging
- Sets specific targets to incentivize circularity for both PET and other packaging materials, such as PE and PP
- PPWR expected to contribute ~4-5 MM tons to EU PE and PP demand for recycled content by 2030

LYB is uniquely positioned to address demand for contact-sensitive packaging with our *CirculenRevive* products and *MoReTec* technology in our future Cologne hub

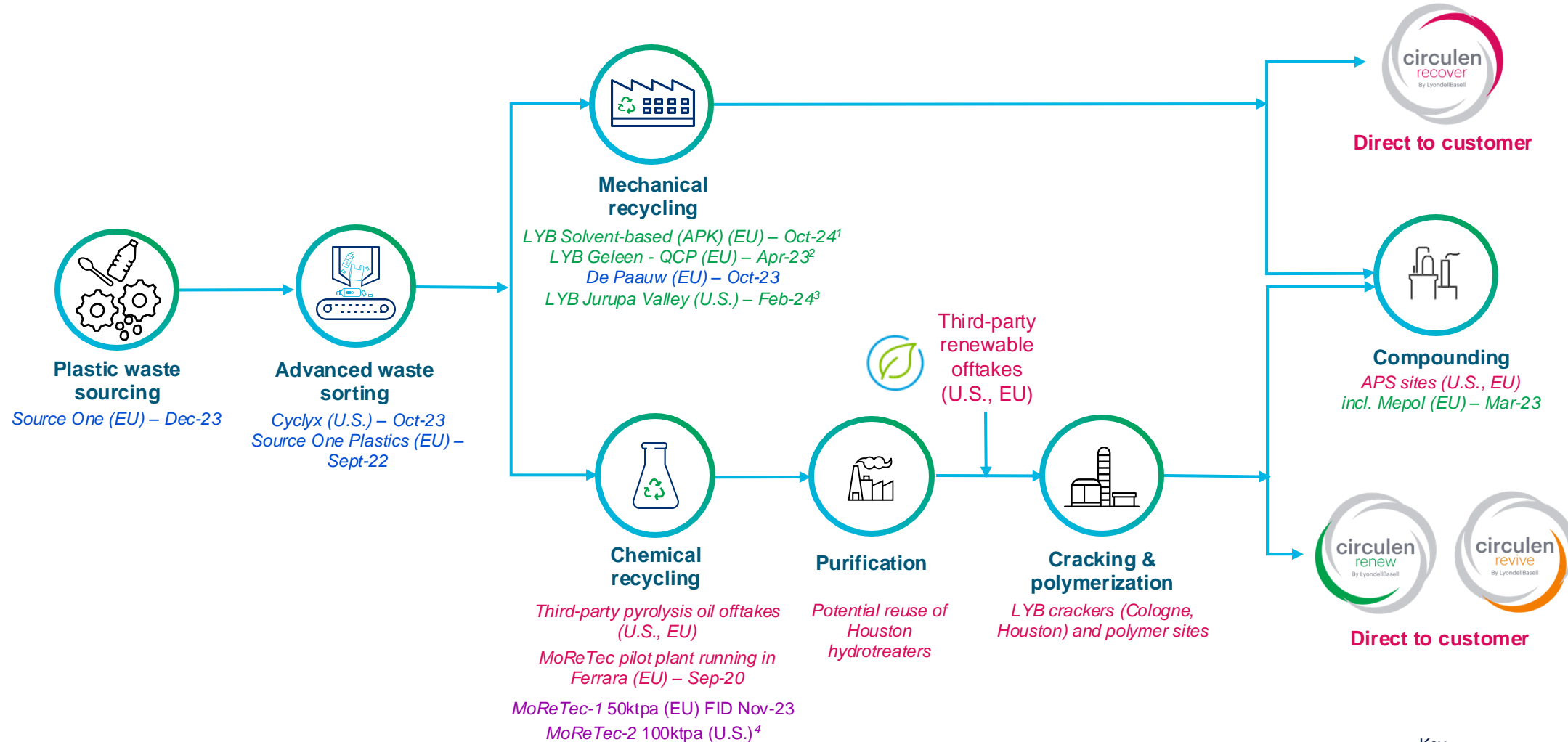


Source: European Commission  
1. Regulation specifies "contact-sensitive" applications (e.g., food, medical, skincare); food packaging is majority of relevant volumes



# Our Circular & Low Carbon Solutions Circular strategy

We are building capabilities across the value chain



## NOTES:

1. Date of acquisition of Solvent-based recycling in Germany from APK.
2. Date of increase of LYB share in QCP to 100%
3. Date of acquisition of Jurupa Valley Mechanical Recycling assets from PreZero in California (U.S.) announced
4. Under development subject to final investment decision

## Key

- LYB joint venture
- LYB acquisition
- Existing LYB asset / contract / sales channel
- LYB proprietary technology under development



# MoReTec: a differential chemical recycling technology

## Construction of the first commercial facility in Germany: 50kt single train

Post-consumer waste journey

**Mechanical recycling** recovers single polymer plastics

**Chemical recycling** complements mechanical methods by processing a broader range of plastics, including difficult-to-recycle multi-polymer types

Unique catalyst lowers reaction temperatures requiring lower heat input



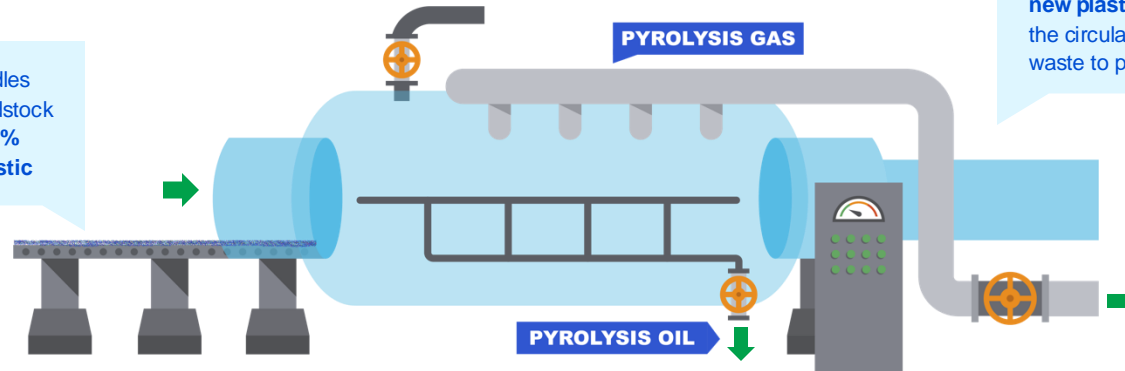
LYB CATALYST

MoReTec achieves **80%+ yield<sup>1</sup>**

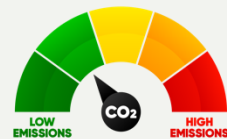
Contributing to the high yield is the recovery of pyrolysis gas to make new plastics, maximizing the circularity of plastic waste to plastics.

MoReTec facility will process the plastic packaging waste equivalent generated by 1,2 million German citizens annually

MoReTec handles pre-sorted feedstock with at least **85% polyolefin plastic**



Unique process design allows for electrical heating, enabling the process to be **powered by renewable energy**.



The MoReTec process is estimated to have at least a **50% lower carbon footprint** than the process for fossil-based feedstocks.<sup>2</sup>



MoReTec's innovative design enables **commercial scaling** and supports the LYB goal to produce and market at least **2 million metric tons/year of recycled and renewable-based polymers** by 2030.<sup>3</sup>



LYB is developing **post-treatment solutions** to enable higher volumes of chemical recycled feedstock to be processed into plastics via steam crackers

1. Yield is defined as the percentage of waste plastic converted into usable products (pyrolysis oil and gas).  
2. Cradle-to-gate LCA based on pilot plant data; system boundary includes plastic waste management.  
3. Production and marketing includes: (i) joint venture production marketed by LYB plus our pro rata share of the remaining production produced and marketed by the joint venture, and (ii) production via third-party tolling arrangements.

# Unlocking Further Investments: Ensuring Effective FUE Mass Balancing in SUPD IA and PPWR IA

Key Focus: Acknowledgement of Dual Use Streams

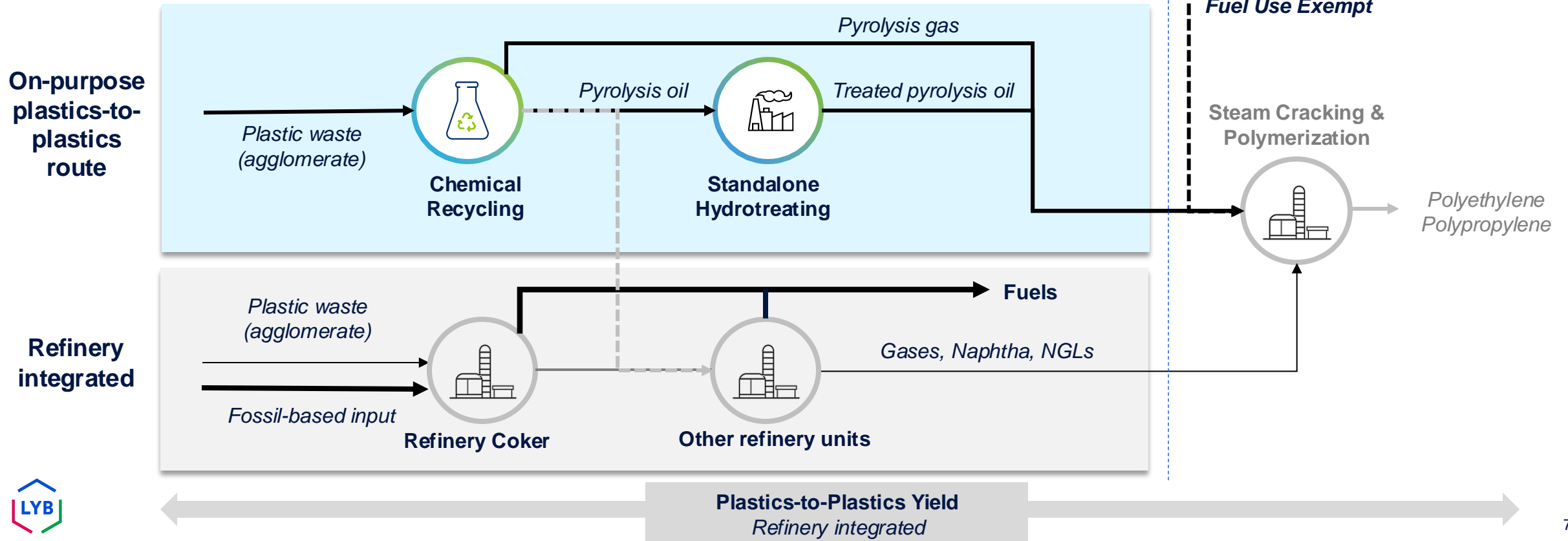


## 1 Chemical Recycling Technology Routes

## 2 Certificate Generation

**Plastics-to-Pyrolysis Yield**  
MoReTec achieves a higher yield

No mass balance applied



**ISCC+ Mass Balance**  
From free attribution to **Dual Use Fuel Use Exempt**

**Steam Cracking & Polymerization**

Solutions for a better tomorrow