

Economy-wide Deep Decarbonization - Beyond Electricity

Advanced Biofuels

Why Biofuels?

BIOMASS

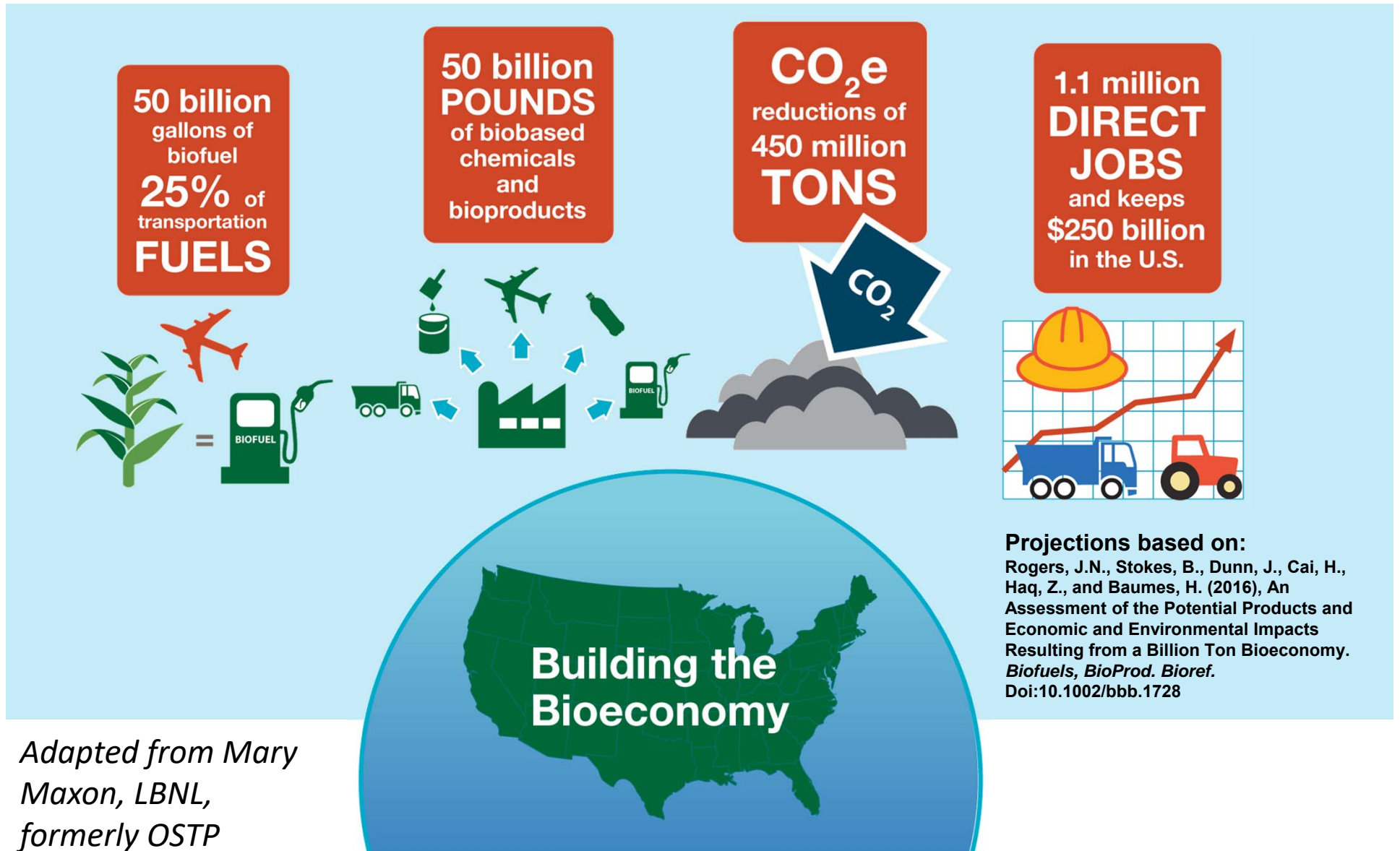


BIOTECHNOLOGY



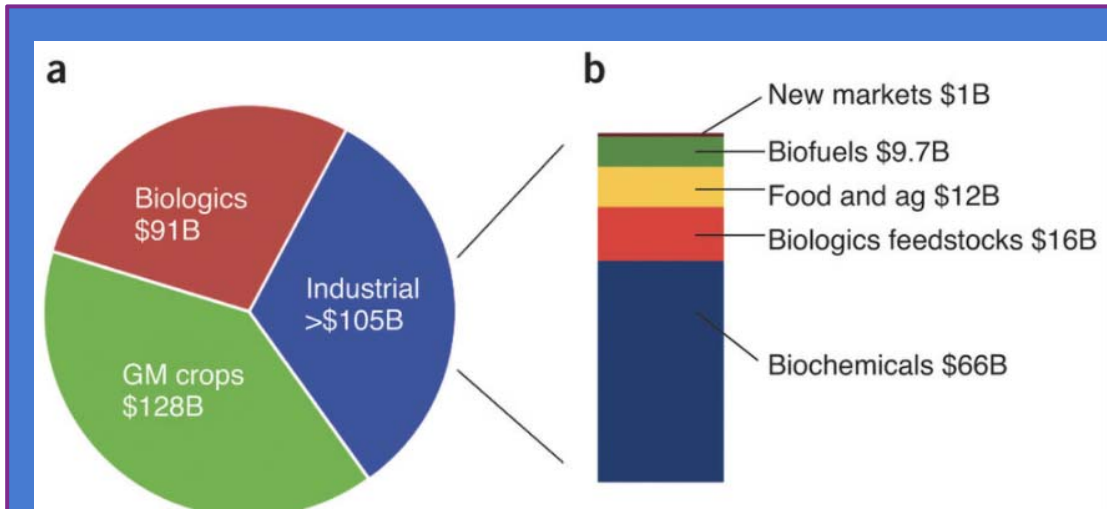
Adapted from Mary Maxon, LBNL, formerly OSTP

We Have Biomass...



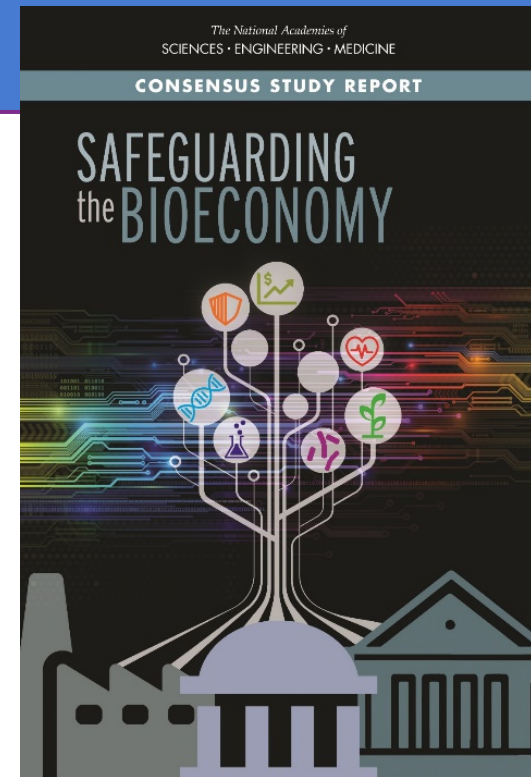
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We Have Biotechnology...



>\$325B revenues from GMOs
~20% annual growth

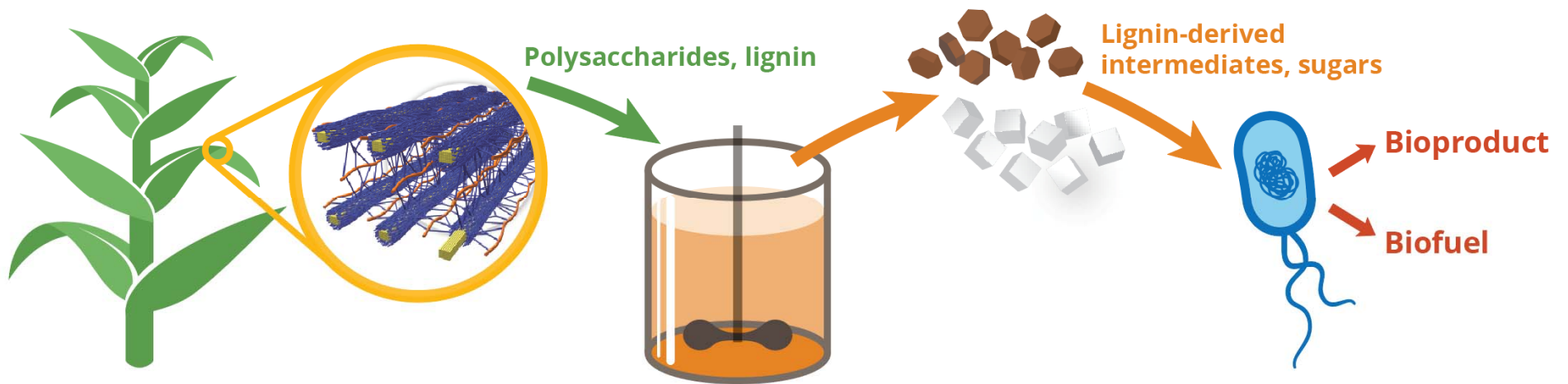
Rob Carlson, Biodesic



- 17 Billion gallons of Ethanol produced in the US in 2019* (by far, the most dominant biofuel)
 - **15B gal as corn ethanol**
- ~20B gallons total renewables

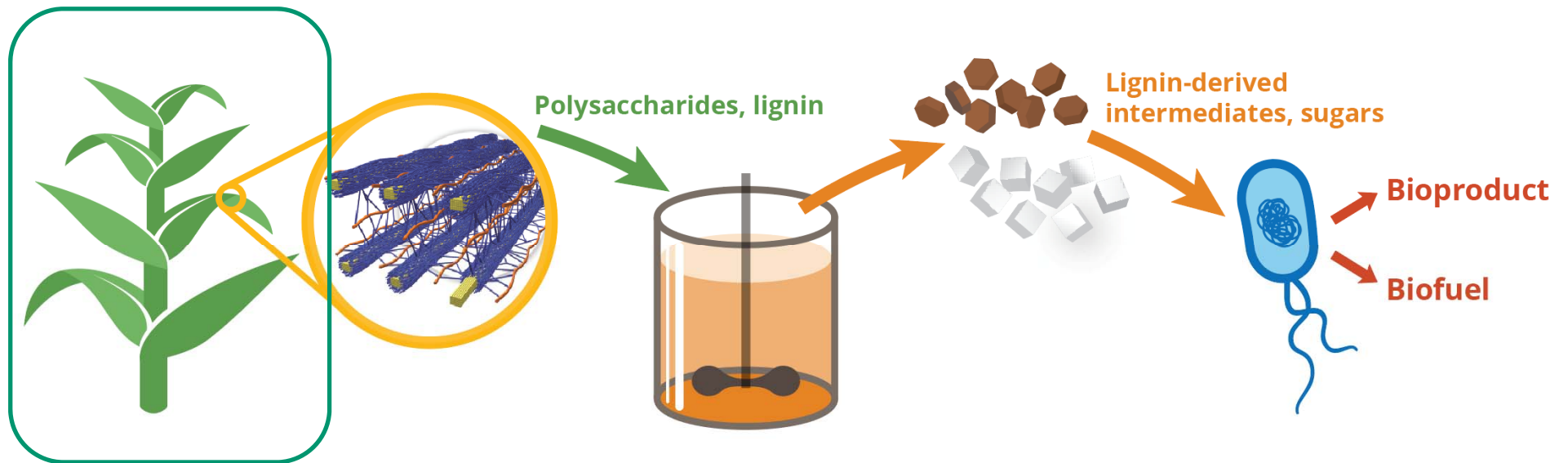
*https://www.ftc.gov/system/files/documents/reports/2019-report-ethanol-market-concentration/p063000_ethanol_report_2019.pdf

What about Advanced Biofuels?



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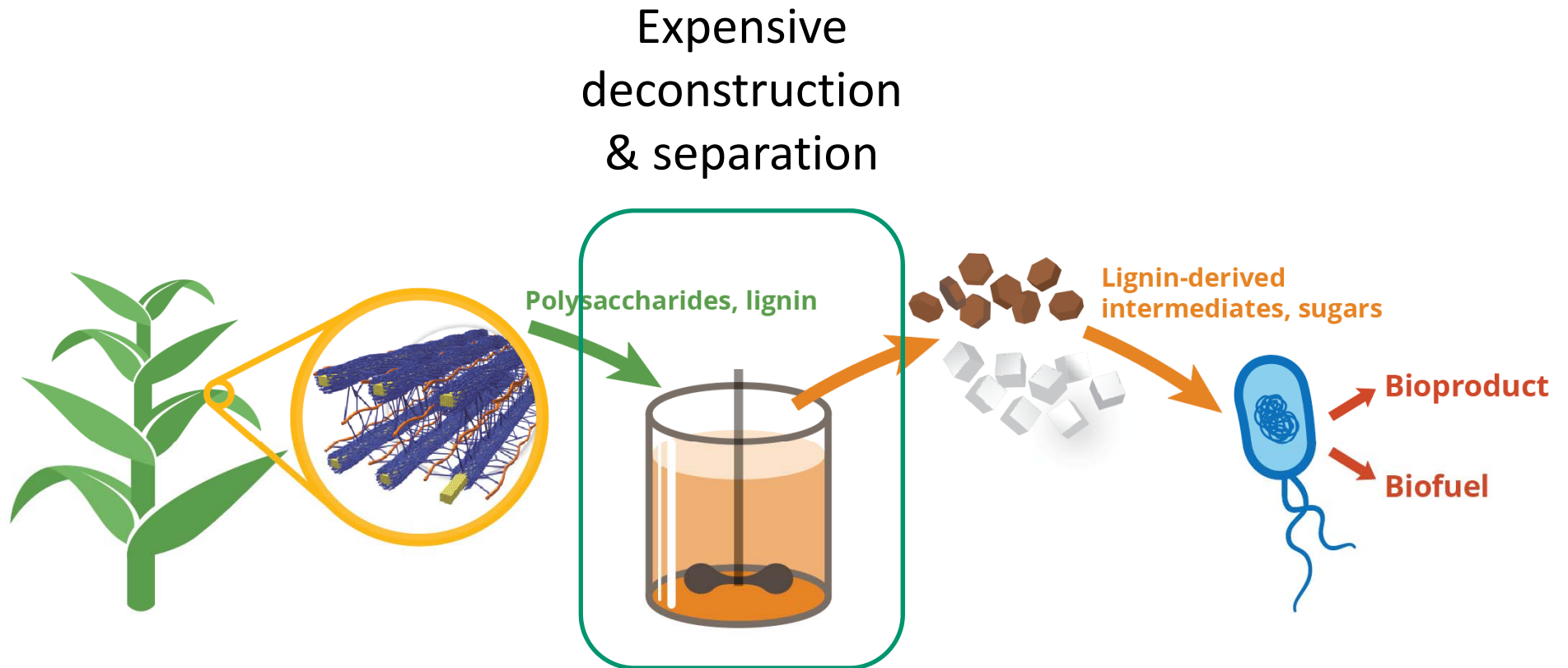
What about Advanced Biofuels?



Diverse,
recalcitrant
feedstocks

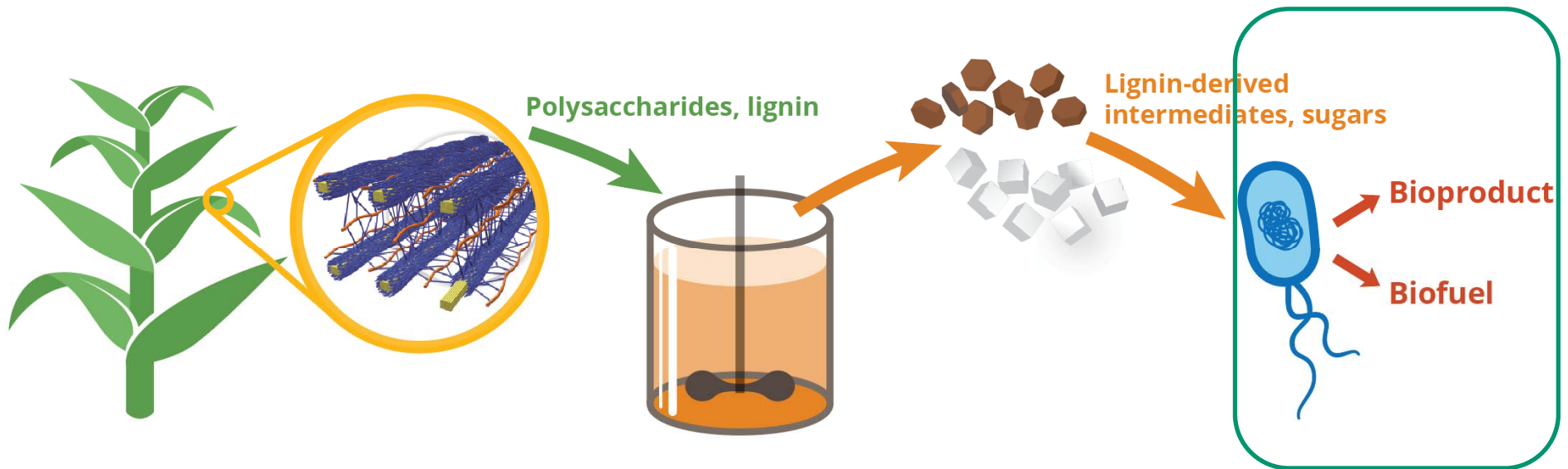
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What about Advanced Biofuels?



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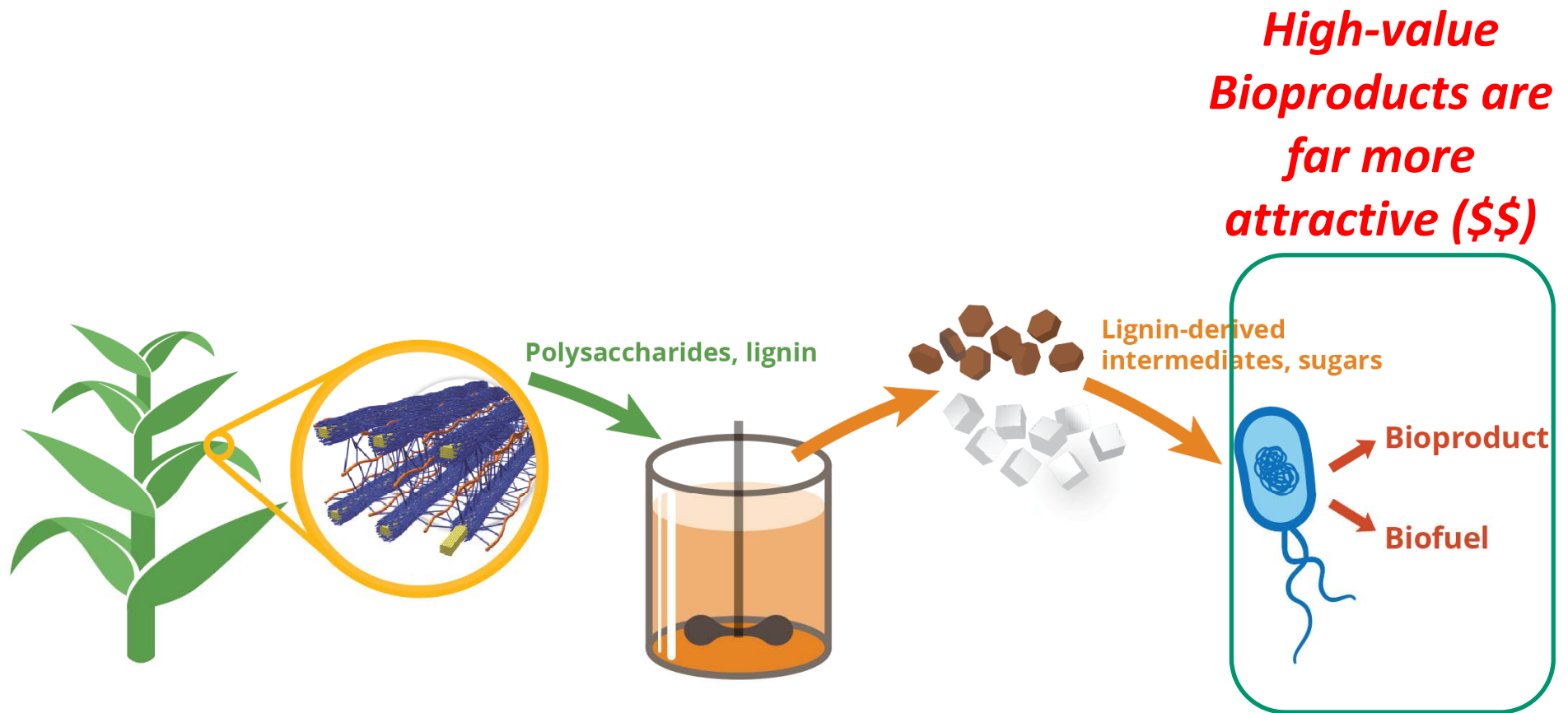
What about Advanced Biofuels?



Toxic, low-yielding products

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What about Advanced Biofuels?



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How to get to Advanced Biofuels?

BIOMASS

BIOTECHNOLOGY

