IEA Bioenergy

Task 42 Biorefining

Australia Task 42 Update
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IEA Bioenergy

Task 42 Biorefining

MicroBioGen

Microbiogen Optimisation Project – Grant

- Three year project:
  - "Biocatalyst optimisation for efficient production of biofuels from non-food biomass and deployment through a global partner corporation"
- Core partners: Global Biotech firm with support from the Australian Government
- Total spend in Australia: $8M (US$6.5M) by Microbiogen alone of which some to come from Government
- **Opportunity and aim**: Optimisation of the next generation yeast catalyst that can:
  - Bio-catalyst that operates under challenging hydrolyzate conditions
  - Maximise yield of valuable products from non-food biomass
  - Fuel and feed produced under optimised engineering conditions NOT optimised biological conditions

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…the challenge is: higher yields, lower costs and more from same substrate

Issue	Technical Impact	Economic Impact
Limited hydrolyzate resistance	Low solids loading	Higher operating and capital costs
Slow fermentation	Long residence times	Higher operating and capital costs
Incomplete fermentation	Lower yields	Lower unit revenues
Heavy inoculation required	Large propagators + sugar loss	Lower yields and higher unit costs
High unwanted by-products	Waste glycerol and xylitol	Lower yields and higher unit costs
Low temp and acid resistance	Low solids loading	Higher operating and capital costs

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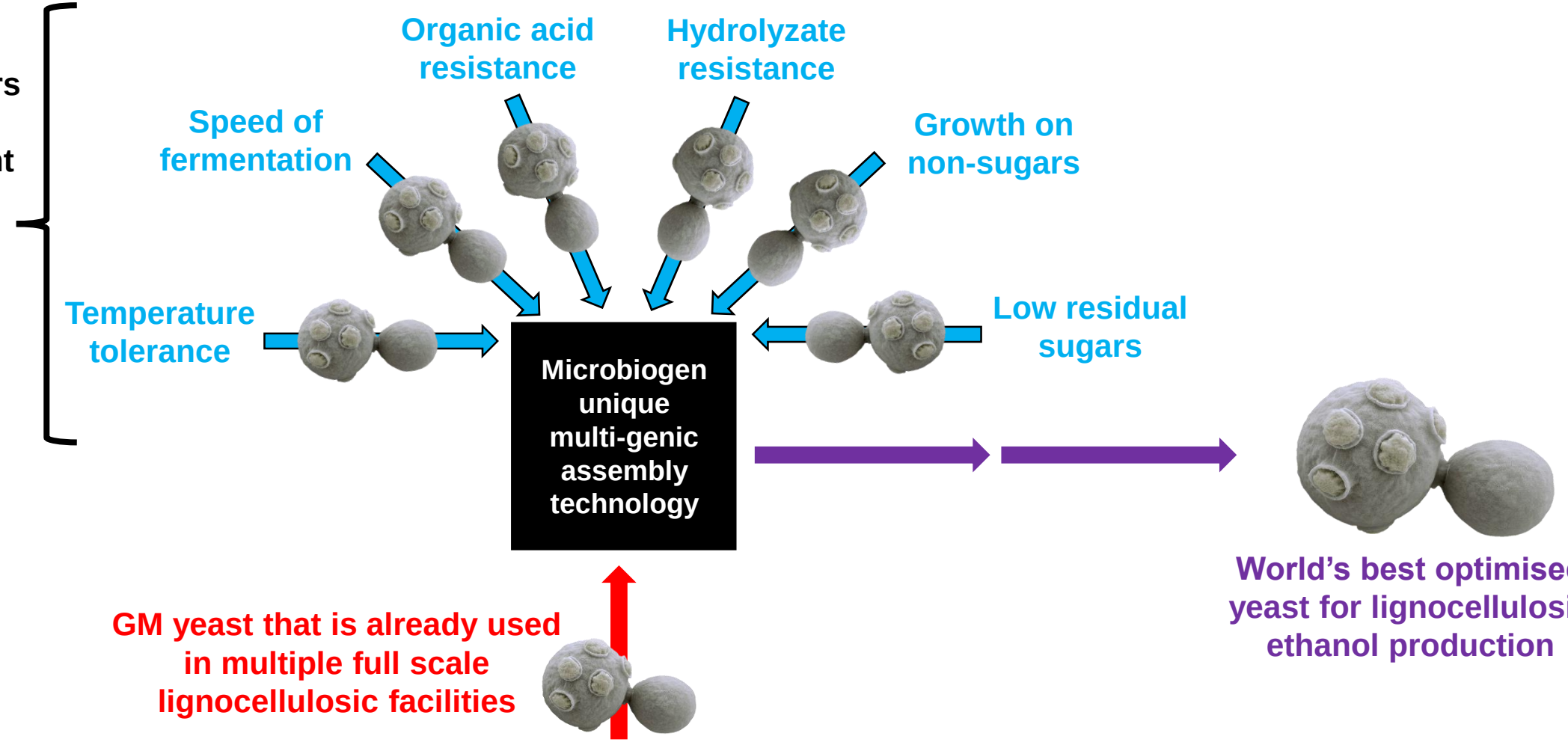
The Project: Optimise catalyst for conversion of sugars to biofuel and by-products

Over 10 years of development to achieve unique industrial genetics



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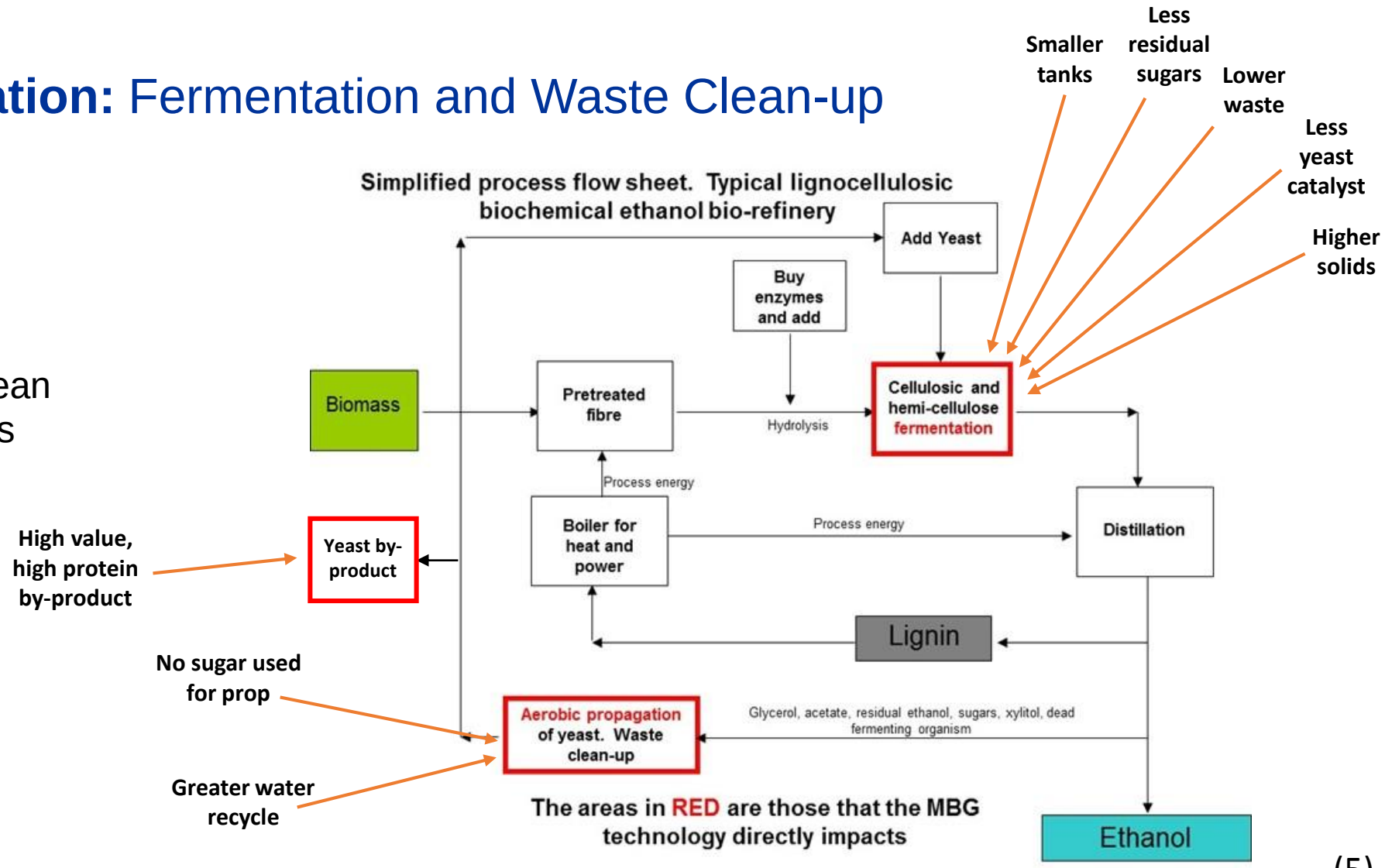
Two areas of application: Fermentation and Waste Clean-up

- The superior industrial characteristics benefit the fermentation process
- The unique ability to grow on non-sugars benefits waste clean up and high value by-products



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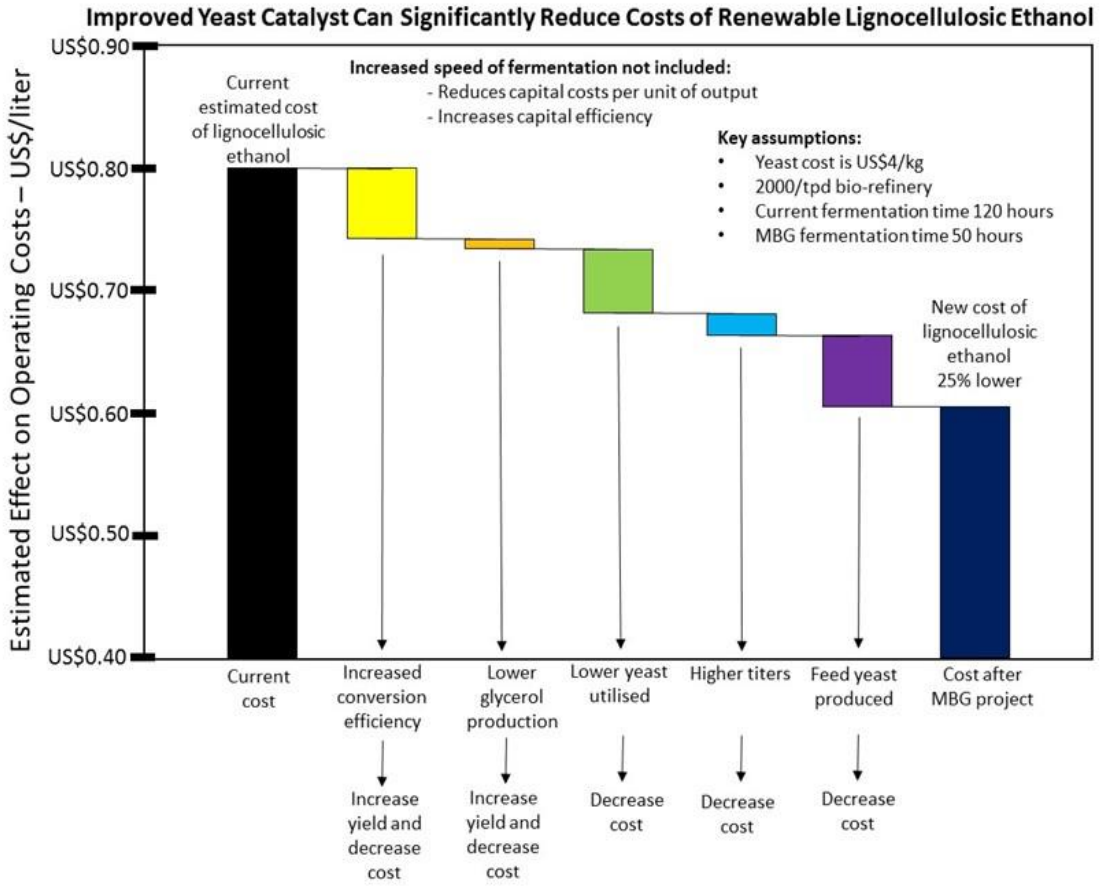
Expect a 25% reduction in effective costs

- Increased conversion efficiency
- Lower unwanted by-products
- Less bio-catalyst required
- Higher solids loadings
- High value by-product

- **Impact of lower costs/higher revenues is a significant improvement in lignocellulosic bio-refinery economics**



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High likelihood of success

- First round of development already concluded with excellent results
- All core genetics already developed over last decade
- Utilises proven proprietary Microbiogen technology
- World class leading partner – Global Biotech Company