

Scaling-Up Ethanol Biorefinery with Synergies in Coproducts

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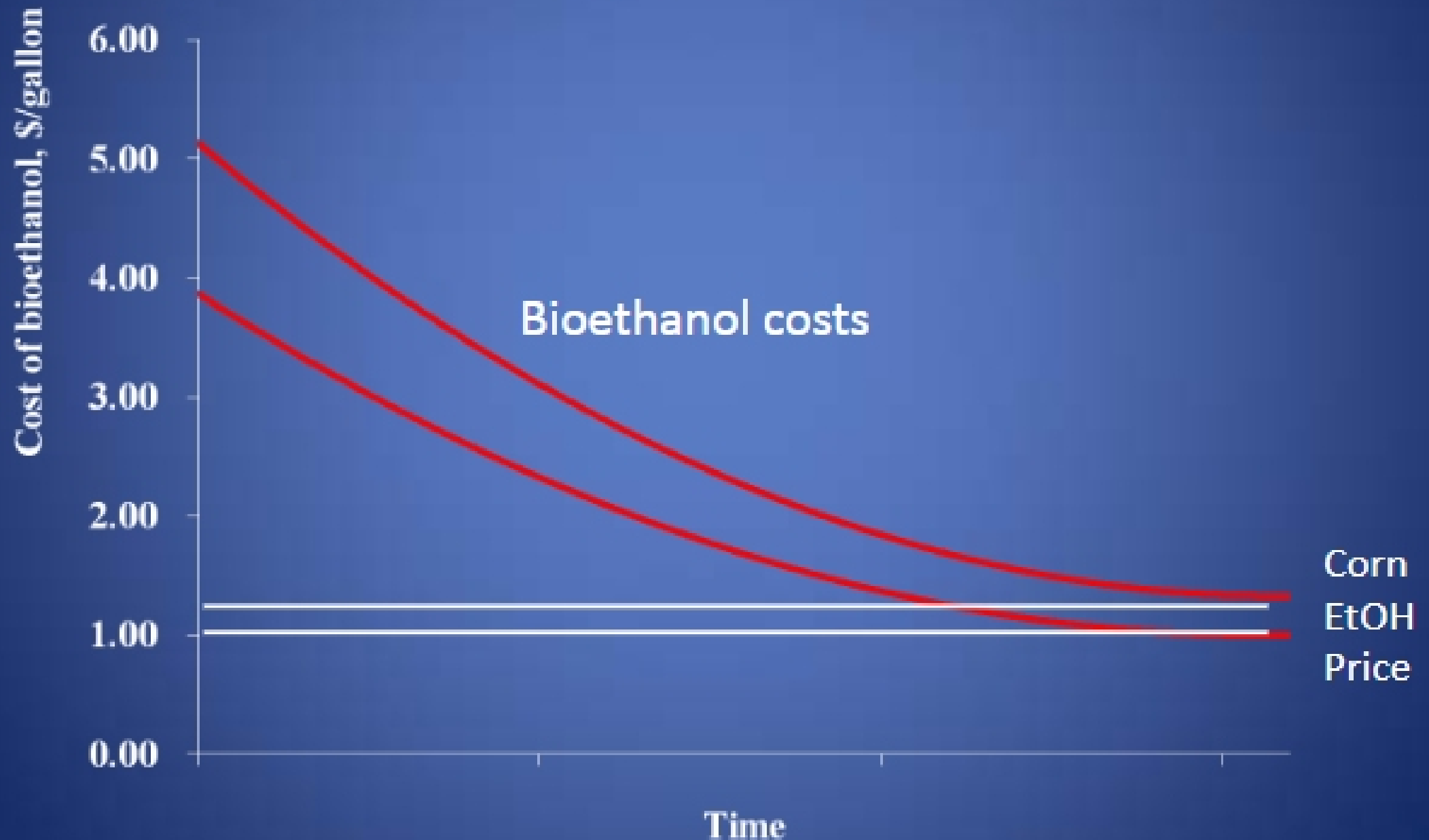
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Significant Progress in Enzyme Based Technology for Bioethanol



Biosugar Cost Estimate

- Enzyme based technology
- Derived from NREL bioethanol base case with some modifications
- Eliminated ethanol production and recovery
- Yields for each step from biomass storage to sugars factored in
- Power law scaling of equipment costs varied with each equipment item per NREL factors
- 20% capital recovery factor used initially corresponding to frequent equity financing assumptions
- Electricity from lignin sold at \$0.00 or 0.05/kwhr