

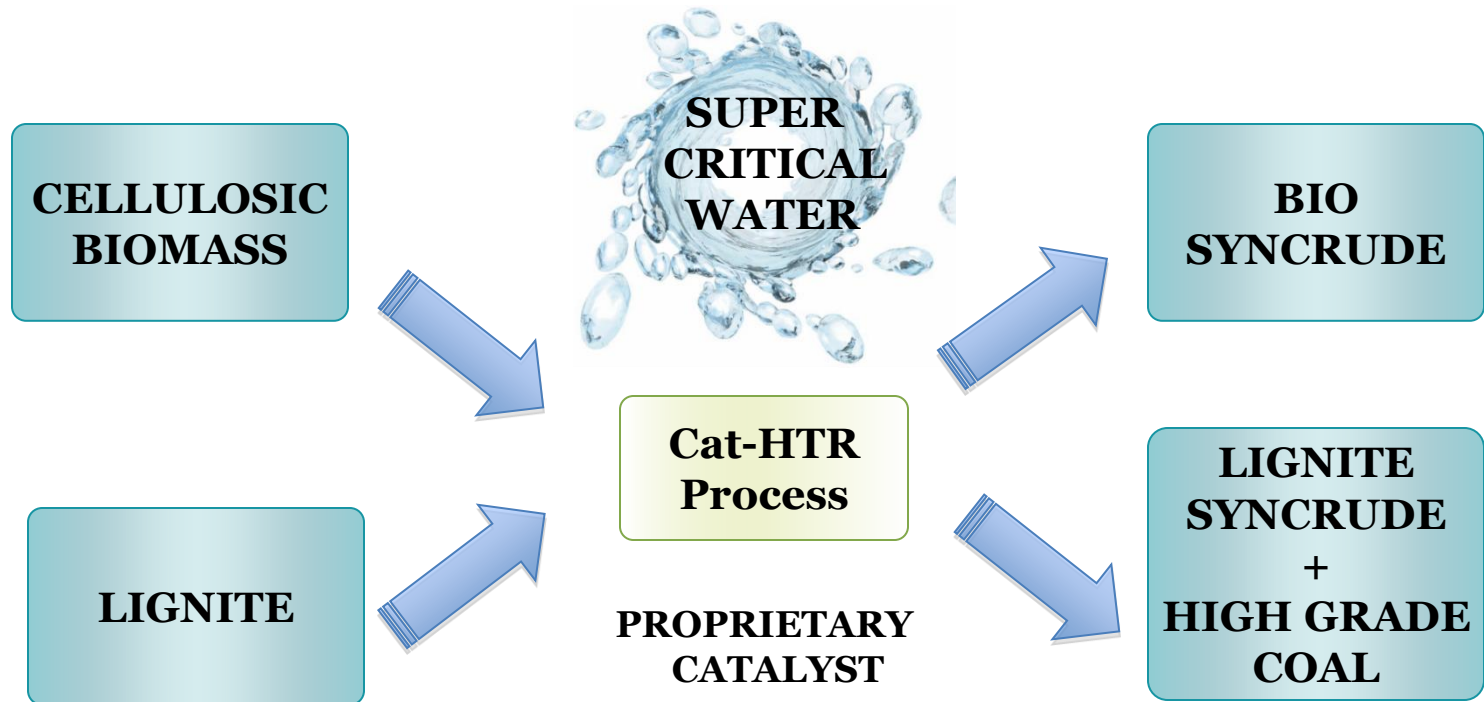
Ignite Energy Resources – IER A Resource & Technology Company

Biomass and Lignite Conversion to “Drop-In” Transportation Fuels

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Managing Director, IER NZ
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IER's Cat-HTR Technology for Lignite & Biomass to Syncrude



**Highly Selective Oxygen Removal
& Depolymerization**



IER's Cat-HTR Technology Pilot Plant Operational for 2.5 Years



Located near Sydney, Australia

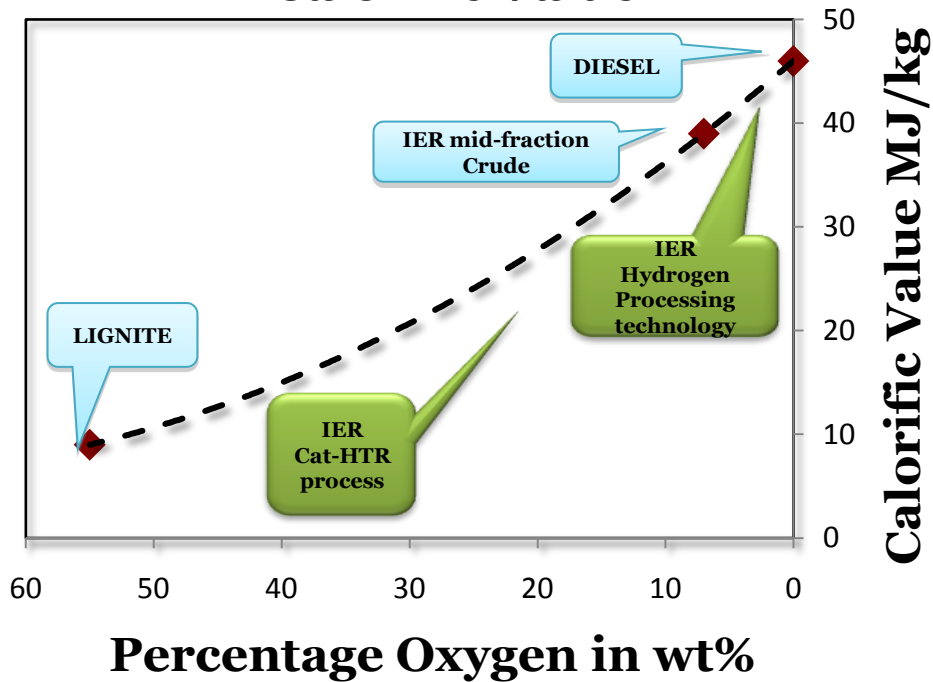
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IER's Cat-HTR Technology Lignite & Biomass Energy Density Upgrading

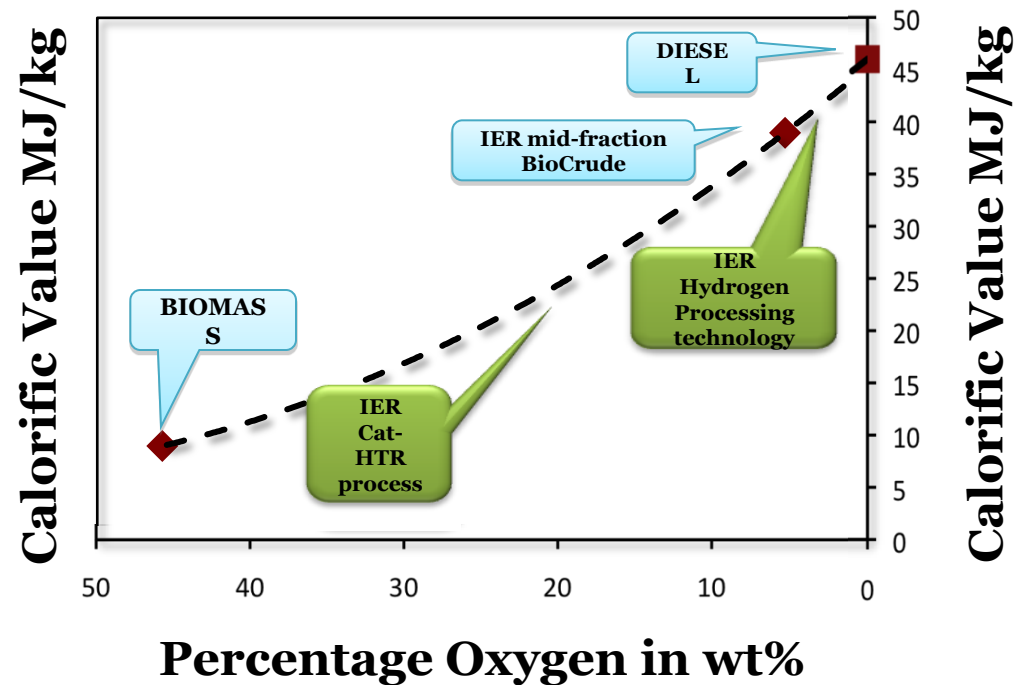
Lignite Upgrading

Percentage Oxygen versus
Calorific Value



Biomass Upgrading

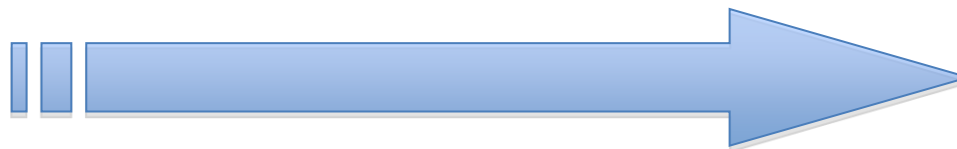
Percentage Oxygen versus
Calorific Value



High Quality Lignite (NZ) Syncrude



Increasing Average Boiling Point

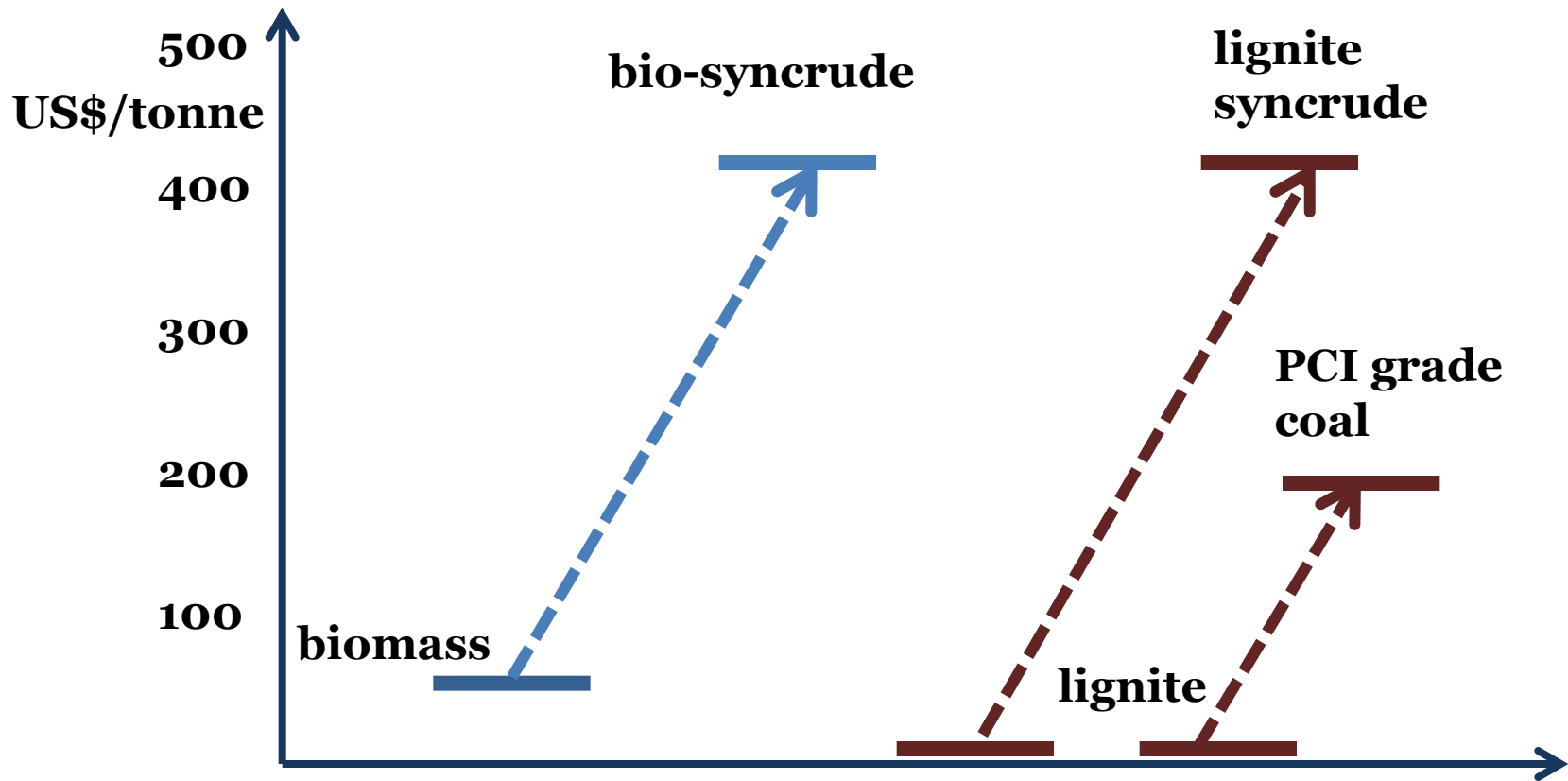


Negligible Polyaromatics

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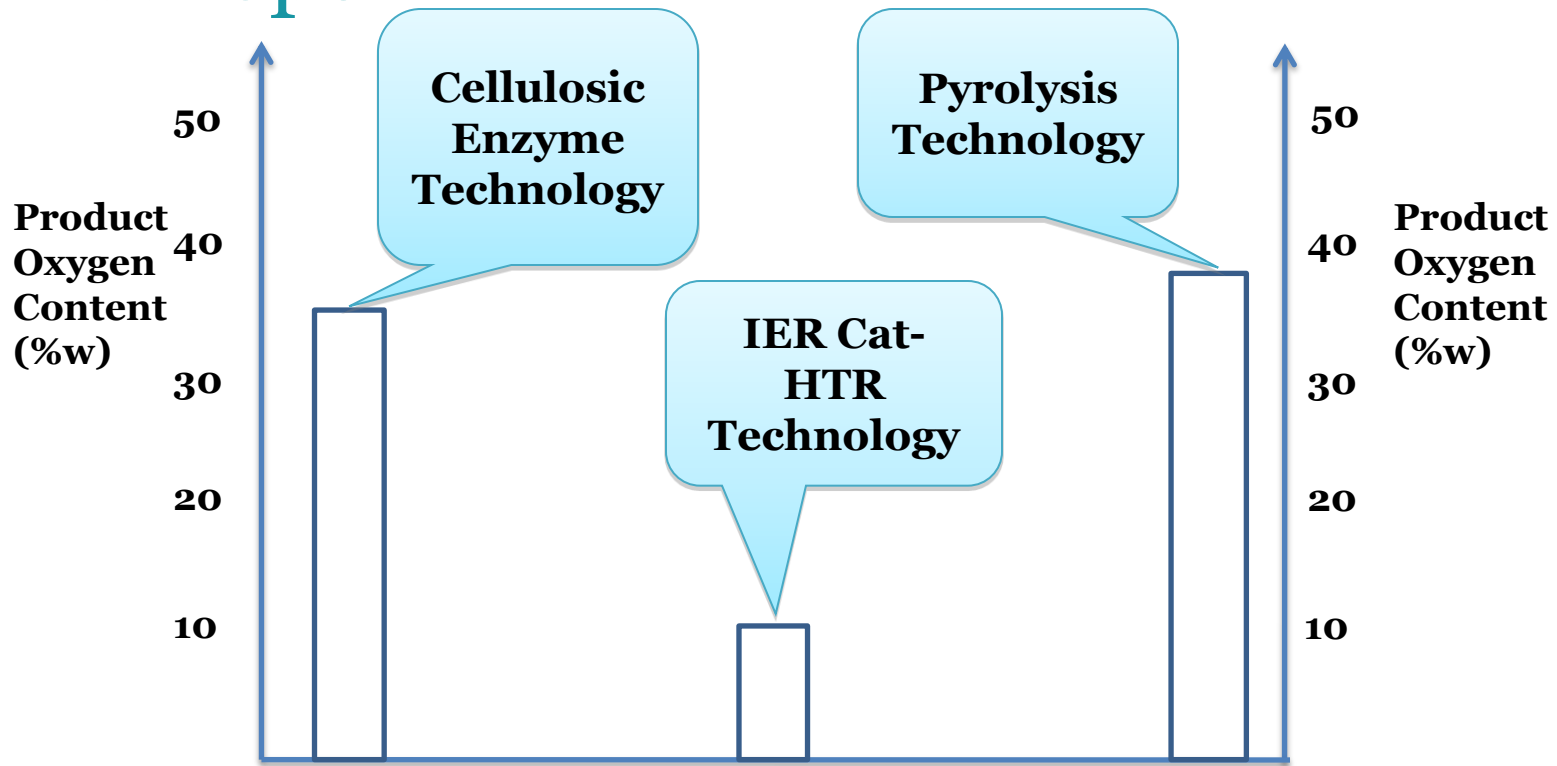


IER Technology Upgrading Economics



Based on crude oil US\$70/bbl and syncrude @15% discount
process economic models indicate 35% IRR

The IER Biomass Conversion Process Technology – Product Oxygen “Sweet Spot”



Temperature

35 C → 350 C ← 500 C

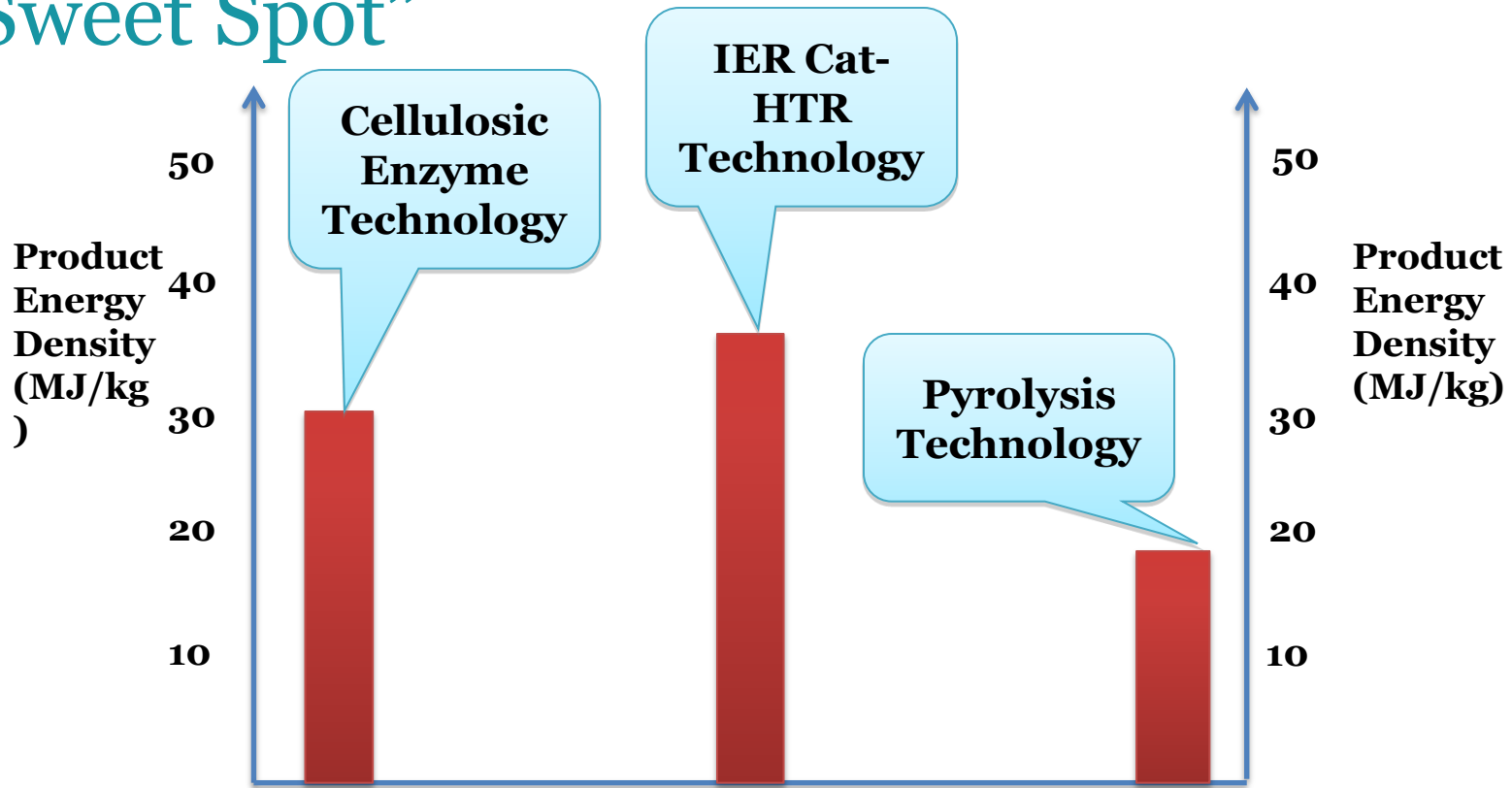
Residence Time

Hr → Minutes ← Seconds

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The IER Biomass Conversion Process Technology – Product Oxygen “Sweet Spot”



Temperature

35 C → 350 C ← 500 C

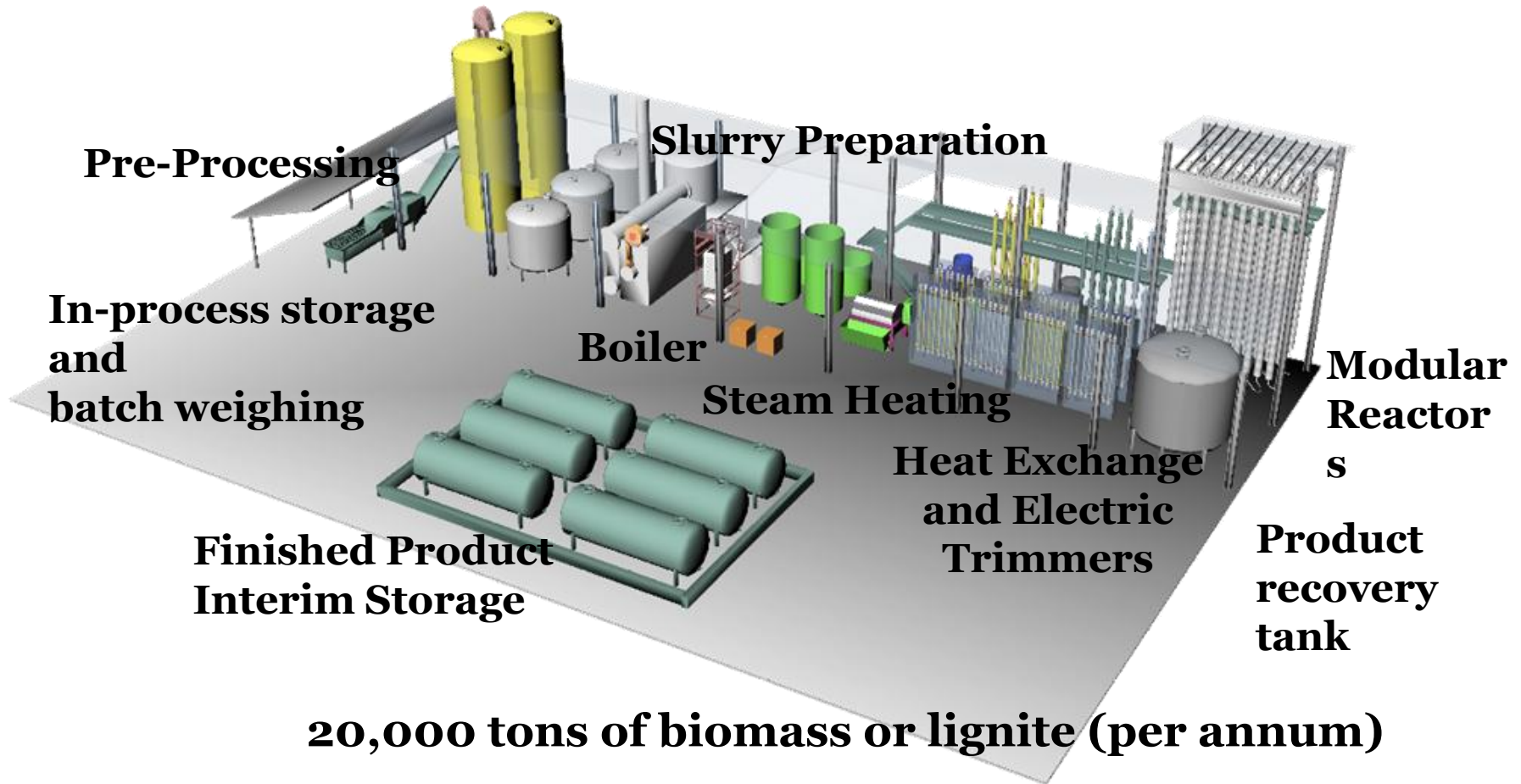
Residence Time

Hr → Minutes ← Seconds

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Biomass and/or Lignite to Syncrude Demonstration Plant

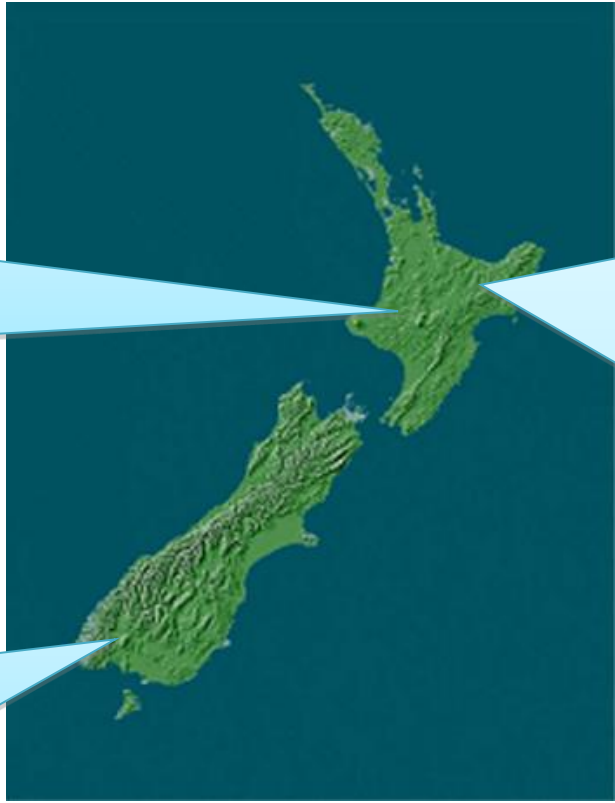


NZ Indigenous Resource Transportation Fuel Strategy Based On IER Technology



**Methanol
Complex With
Excess
Hydrogen For
Biorefinery**

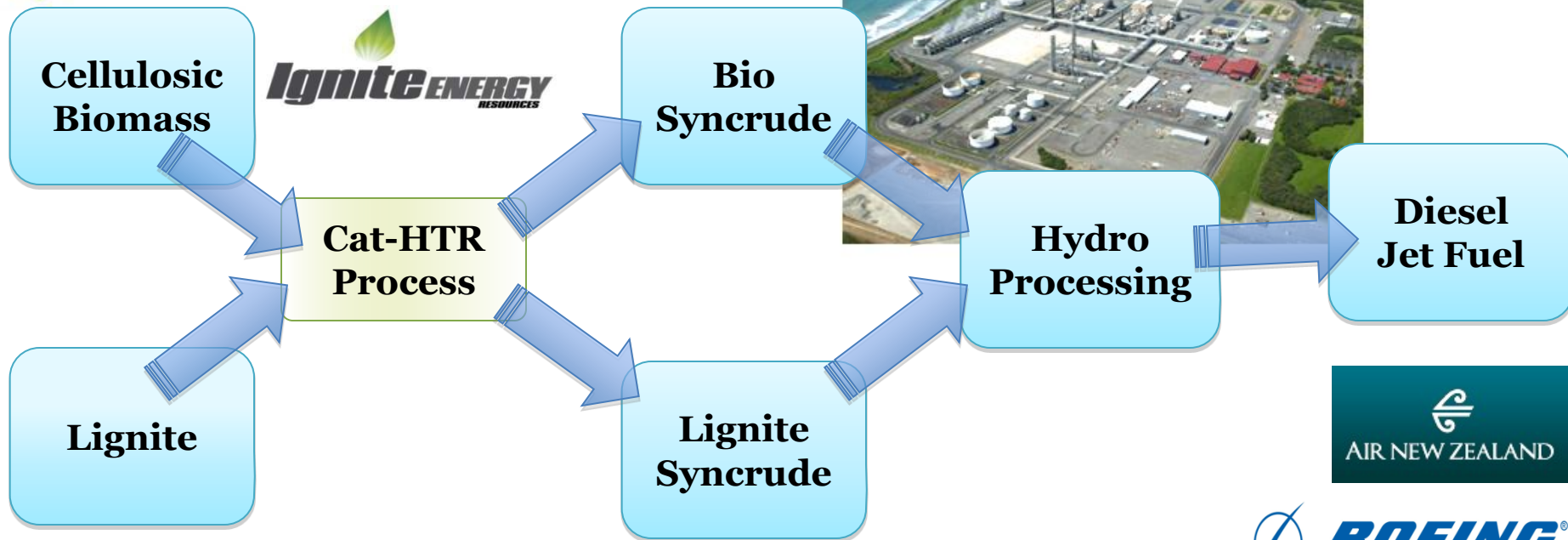
**3-5 Billion
Tons Lignite
(Low Ash &
Sulphur)**



**1.8 Million
Hectares Of
Pinus Radiata &
Marginal Land
Available to
Double
Resource**



NZ Indigenous Resource Transportation Fuel Strategy Based On IER Technology



**Hydroprocessing Plant (30,000 bbl/day)
Planned at Methanex Methanol Site**

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NZ Strategy to “Drop-In” Partially Renewable Fuels From Indigenous Biomass & Lignite



Biorefinery



feasibility

design

construction

production



demonstration design

construction

production



Bio-Syncrude
& Lignite
Syncrude
Production

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IER Technology Summary



- **IER has developed a “game changing” technology to convert biomass and lignite to high quality syncrudes.**
- **The NZ government support for a strategy to deploy the IER technology to produce diesel and jet fuel (30,000, bbl/day from biomass and lignite derived syncrudes and reduce imports of fuel and crude oil.**
- **The NZ strategic transportation fuels model could be replicated in other countries.**



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