

# Biomass Gasification

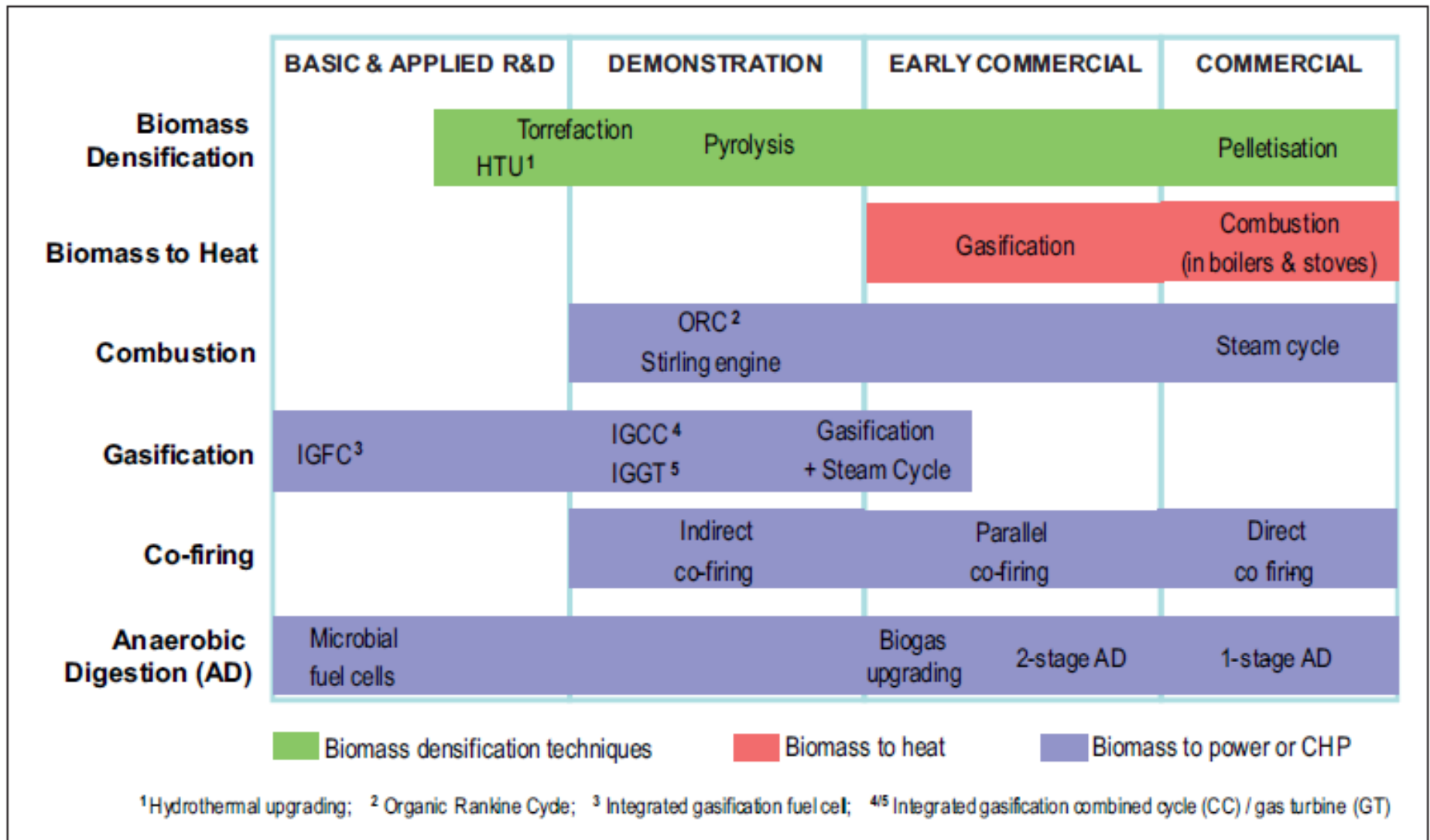


**Richard Bain**

**TC Biomass 2009**

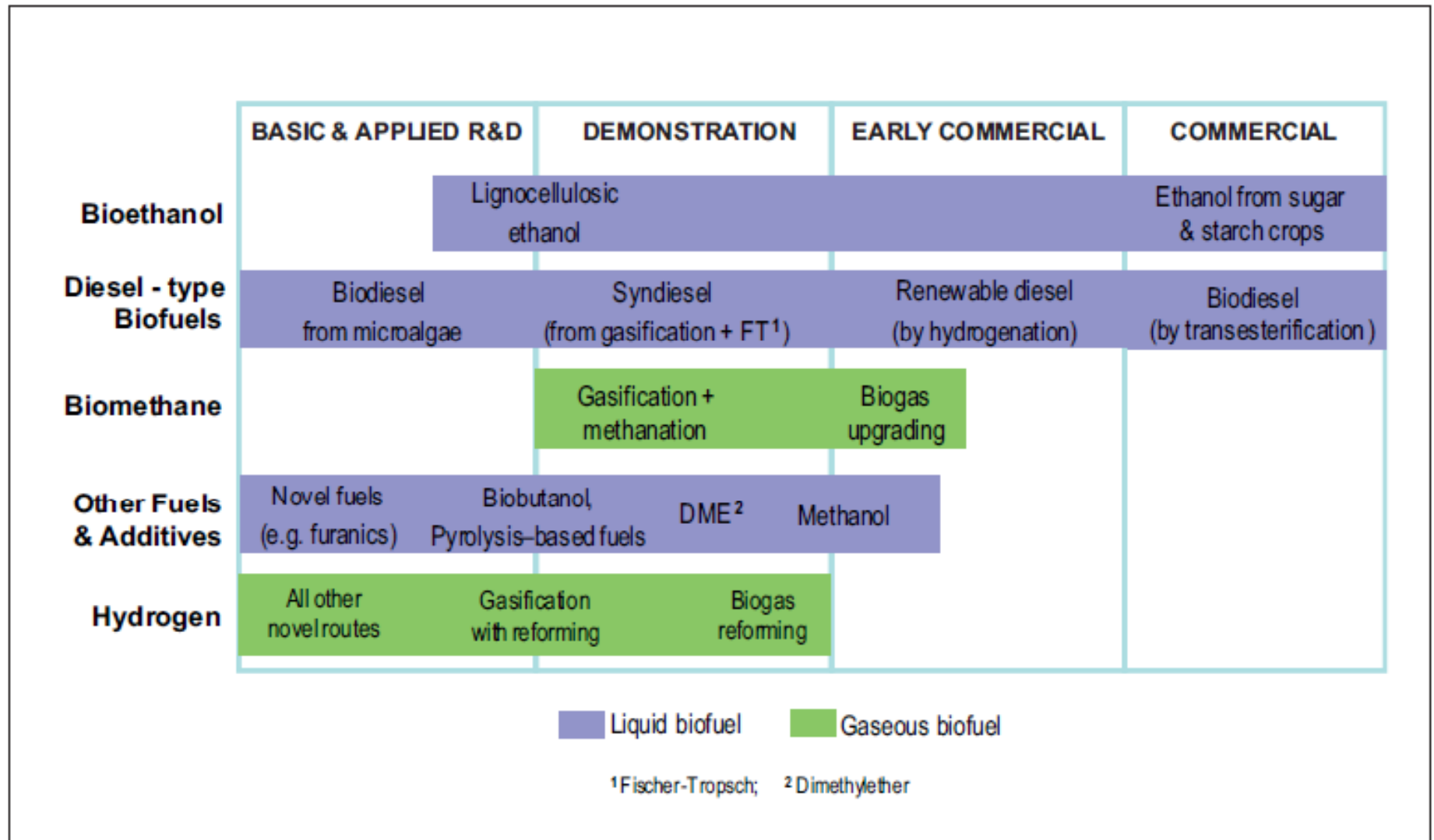
**Sept. 16, 2009**

# Development Status: Upgrading and CHP Technologies



Source: IEA Bioenergy: ExCo:2009-05

# Development Status: Technologies for Biofuels



Source: IEA Bioenergy: ExCo:2009-05

# U.S Status

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- **Biopower**

- Commercial Projects (Nexterra, Front Line)
- Small Scale Systems (CPC, Emery, Chiptec, other)

- **Biofuels**

- DOE Demonstrations
  - Range Fuels, Abengoa
  - Flambeau River
- DOE R&D
  - Gas Cleanup (NREL, GTI, RTI, other)
  - Fuels Synthesis
  - Fundamentals

# Challenges for Biomass Gasification Community

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- Premise – Base technology (gasification and 1<sup>st</sup> generation cleanup) demonstrated and commercial (limited)
- Technology developments needed to
  - Improve carbon utilization
  - Reduce capital intensity
  - Give competitive economics
- Long term operations of integrated systems needed to develop data necessary for commercial guarantees and warranties