



# Thermal Conversion Breakout Report Out

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Hydrogen Shot Summit

# Thermal Conversion Breakout - Overview

Objective – The Thermal Conversion with Carbon Capture and Storage Panel Session focuses on the gasification of coal/biomass/plastic waste streams and natural gas to produce clean hydrogen

- Start the dialogue on how to achieve \$1/kg hydrogen production through thermal conversion pathways with CCUS
- Hear from experts in the field on ongoing thermal conversion pathway projects and their thoughts on what can be done to lower the cost of clean hydrogen

Breakout Organization –

- Two expert presentations to “set the stage” for Thermal Conversion Integrated Pathway Analysis
- Five Expert Panels –
  - Methane Pyrolysis Panel
  - Plasma Technologies Panel
  - Transformational Natural Gas Conversion Panel
  - FECM Projects on Gasification for Clean Hydrogen Panel
  - Advanced Gasification Pathways to Clean Hydrogen Panel

# Thermal Conversion Breakout - By the Numbers – Day 1

## Participants -

- Panelists & Moderators from DOE and National Laboratories: 5
- Panelists from Industry, Academia and Research Institutes 8
- Attendees 270
  - US 93%      - Non-US 7%      Countries represented 4

## Demographics of attendees –

Attendees that self-identified as:	% of respondents
Hydrogen producer	18
Hydrogen R&D	18
Infrastructure or systems developer	11
Both a hydrogen producer and end user	8
Component or technology supplier	8
I am not in the hydrogen industry	37



# Thermal Conversion Breakout – Key Points of Discussion – Day 1

- **Make Prudent Investments Across Technical Readiness Level (TRL) Scale**
  - Pilot and large demonstrations projects drive momentum in the research community.
  - Long lead investments by Government can lower technology risk.
  - Government/Private Partnerships are critical.
- **Incubate Multiple Production Pathways**
  - Production pathways may have regional applications and benefits.
  - Unforeseen end-use needs can spur unanticipated innovation.
  - Scale up and reliability are critical.
- **Continue Hosting Workshops on Hydrogen**
  - Production/Consumption H2 Hubs
  - Bulk H2 Storage
  - H2 Production Pathways
  - Information on funding mechanism and engagement
- **Lifecycle analyses across the entire hydrogen value chain are critical to validate H2's benefits and justify a hydrogen enabled economy.**

# Thermal Conversion – Day 2

# Thermal Conversion Breakout - By the Numbers – Day 2

## Participants -

- Panelists & Moderators from DOE and National Laboratories: 4
  - Panelists from Industry, Academia and Research Institutes 5
  - Attendees 210
    - US 95%
    - Non-US 5%
- Countries represented 6

## Demographics of attendees –

Attendees that self-identified as:	% of respondents
Hydrogen producer	14
Hydrogen end user	2
Infrastructure or systems developer	12
Both a hydrogen producer and end user	10
Component or technology supplier	7
I am not in the hydrogen industry	55



# Thermal Conversion Breakout – Key Points of Discussion – Day 2

- **Multiple Demonstration Projects are needed**
  - Pilot and large demonstration projects drive momentum in the research community.
  - Policy incentives and investments by Government can lower technology risk.
  - Public/Private Partnerships are critical.
- **Hydrogen Consumers are Needed to Offtake Hydrogen from Large Demos**
  - Policy incentives are needed to offset cost difference during early stage production
- **Biomass will be Key to Achieving Net-Zero Hydrogen from Thermal Conversion**
  - Regional availability varies.
- **Clean Hydrogen will be a Key Driver for Decarbonization of the Overall Economy**
  - Medium and heavy duty transportation
  - Industrial heat and process feedstock
  - Demand balancing for electric grid