RENEWABLE GAS IN THE ENERGY INDUSTRY

Renewable Natural Gas & Green Hydrogen Opportunities

August 6-7, 2020
Online | Central Time

EUCI is pleased to offer this virtual event on its online interactive platform. Enjoy a valuable learning experience with a smaller impact on your time and budget. You will gain new knowledge, skills, and hands-on experience from the convenience of your remote location.
OVERVIEW

Renewable gas is increasingly gaining attention as a valuable resource in the decarbonization era. This conference will serve as a forum for the energy sector to explore the applications and opportunities of this resource – specifically evaluating two categories of renewable gas:

- **Renewable Natural Gas (RNG):** pipeline-quality natural gas (biomethane) derived from processing, cleaning and treating raw biogas; primarily from landfills, wastewater treatment plants, and animal manure. It is interchangeable with natural gas and carbon neutral.
- **Renewable Hydrogen or Green Hydrogen:** hydrogen produced without emitting greenhouse gases as a by-product. It can be generated from renewable electricity by electrolysis, from biogas by steam reforming, and biomass through thermal conversion.

Attendees will gain in-depth knowledge about these renewable gas resources, with sessions providing comprehensive coverage of their involved technologies & production processes, market outlook & project economics, and related policy & regulatory initiatives. There will be a holistic review of renewable gas project due diligence, considering financial, investment, engineering and legal aspects of project development. Case studies from California and the rest of the country will highlight how the energy industry is researching, deploying, promoting and utilizing renewable gas resources. Expert discussions will also address the potential roles of renewable gas to: utilize existing infrastructure (thus mitigating stranded assets), serve as an energy storage resource (power to gas), and support decarbonization efforts and high penetrations of renewable energy on the grid.

LEARNING OUTCOMES

- Evaluate the rapidly growing landscape of renewable gas resources & development across the country
- Review renewable gas specific technologies, resource types, production processes & applications
  - Renewable natural gas (RNG)
  - Renewable/green hydrogen
- Assess available RNG supplies, costs, production & emissions reduction potential
- Discuss renewable gas projects/case studies that highlight the relevance of renewable gas from an energy industry perspective
- Evaluate federal, state, & local regulatory initiatives related to and impacting renewable gas
- Describe decarbonization initiatives and what it means for natural gas utilities in the short and long term
- Examine opportunities for renewable gas applications in a low carbon economy
- Analyze emerging platforms for renewable gas credit markets & trading platforms
- Examine holistic due diligence processes for RNG project development & transactions
- Assess the green hydrogen solution & applications for carbon free production
- Review power-to-gas (P2G) processes & applications as a long duration energy storage resource
- Review utility perspectives and case studies on renewable gas related efforts
## AGENDA

**THURSDAY, AUGUST 6, 2020 – CENTRAL TIME**

### 9:40 – 10:00 am
**Log In and Sign On**

### 10:00 – 10:10 am
**Welcome & Introduction**

### 10:10 – 11:00 am
**Renewable Natural Gas (RNG): A Brief History, Supply & Production Potential, & Emerging Trends**
- Brief history of renewable natural gas (RNG) – how we got from where we are today
  - RNG benefits, opportunities & challenges
  - How the RNG market has changed in the last 8-10 years
  - RNG applications across industry sectors
  - RNG definitions – what is biomethane?
- RNG resources, technologies & production process of biogas
  - Biomethane vs. biogas definitions
  - Landfills
  - Dairies & livestock operations
  - Wastewater treatment plants
  - Forestry waste and other organic sources
- Review of the ICF & American Gas Association (AGA) report on RNG in the U.S.:
  - Available supplies and costs
  - Analysis of RNG production potential
  - Associated GHG reductions & emissions reduction potential
  - How much will it cost, and what’s the cost effectiveness from a decarbonization standpoint?
  - RNG overall potential, technical & economic viability
- Federal & state policy and regulatory efforts and initiatives related to, and impacting, RNG
  - Renewable Fuel Standard
  - RNG policy specific issues
  - RNG's role in climate change and decarbonization policies
  - Various state approaches to RNG
  - What does this all mean for natural gas utility operations and their ability to move forward with new gas products?
- State of play of RNG across the country
  - Developments across the country

*Philip Sheehy, Technical Director, ICF*

### 11:00 am – 12:30 pm
**Renewable Natural Gas (RNG) Project Development, Transactions & Emerging Markets**
- Update on U.S. renewable natural gas (RNG) market, investment & acquisition trends
  - Market drivers
  - Parties involved in the RNG market
  - Transactional processes emerging in the RNG market
- Alternative fuel markets and the emerging RNG voluntary market
  - Tracking platform to track RNG and other renewable thermal commodities that covers all of North America
- Utilities & RNG: what is the role of the utility, and what is the utility RNG opportunity?
- Perspectives and update on the RNG project development landscape
- RNG project development due diligence best practices
  - Assessing options at different stages of development
  - Cost-effective projects, risk mitigation & successful transactions
  - Financial quantification of RNG resources & independent engineering review
- Environmental, land use and permitting
- Legal, siting & interconnection

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AGENDA

THURSDAY, AUGUST 6, 2020 – CENTRAL TIME (CONTINUED)

11:00 am – 12:30 pm Renewable Natural Gas (RNG) Project Development, Transactions & Emerging Markets (Continued)

- Project finance, investment & transactions
  - Who are the RNG investors and what they’re looking for in a deal
  - Project finance & contract options
  - Best practices and considerations for transactions
- Typical challenges and reasons for project/capital delays
- Attributes and decisions that have meaningful impacts in the competitive RNG market
  - Type of project & biogas resource
  - Developing vs. fully operating projects
  - Type of off-taker agreement
  - Size of project

Moderator: Scott Chabina, CEO & Founder, Chabina Energy Partners
Ben Gerber, Executive Director, Midwest Renewable Energy Tracking System (M-RETS)
Gautam Arora, CEO and Founder, Biogas Engineering
Bryan Nudelbacher, Director of Business Development, U.S. Gain

12:30 – 1:15 pm Break for Lunch

1:15 – 2:30 pm The Regulatory & Policy Landscape in California: Decarbonization, Natural Gas & Renewable Gas Initiatives

- Efforts to decarbonize the California economy will need a variety of creative and effective policies
- Making rules for long-term gas planning that considers reliability, cost allocation, electric generation and right sizing the system for future use
- California’s gas system in transition: a new state plan
  - New rules for gas pipelines that supply natural gas-fired power plants
  - Reconsideration of cost allocations of the gas system
  - Plans to implement a long-term planning strategy to manage the state’s transition
  - Helping gas utilities cost-effectively reduce carbon emissions
- Implications of local & jurisdictional regulatory decarbonization activities
  - Electrification initiatives
  - City bans on new natural gas hookups
- Challenges & issues related to decarbonization efforts
  - Stranded assets
  - Financial costs
  - Grid support for high renewable penetration
- Renewable gas in California
  - Policy initiatives
  - Tariff
- Renewable gas opportunities for decarbonizing California
  - Finding new uses for existing assets
- Streamlining the interconnection process for RNG onto the transmission system
  - CPUC joint biomethane initiative (SoCalGas, PG&E, Southwest Gas)
- Applications outside of California – how state climate goals will require consideration of best pathways to transition legacy gas systems without causing severe financial risks

Chris DiGiovanni, Manager – Gas Strategy, Policy & Development, Pacific Gas & Electric
Michael Colvin, Director Regulatory and Legislative Affairs, California Energy Program,
Environmental Defense Fund
AGENDA

THURSDAY, AUGUST 6, 2020 – CENTRAL TIME (CONTINUED)

2:30 – 2:45 pm  Afternoon Break

2:45 – 3:45 pm  The Green Hydrogen Solution
Decarbonizing the grid is no easy task – it will require new forms of collaboration, effective policies, and implementing a variety of new technologies and energy resources. Green hydrogen – a GHG-free energy source that can be used across sectors – is one resource that could play a major role in grid decarbonization efforts and transform power, transportation, industry, and more. This session will evaluate green hydrogen and its potential, discussing:

• Future scenarios of high renewable penetrations in California
  o Needs for multi-day and seasonal storage
  o Why hydrogen is a top solution

• Green hydrogen in the energy transition
  o Qualities, benefits & challenges
  o Market design/scale
  o Decarbonizing gas grid

• Green hydrogen production, storage & transport technologies and their current level of maturity
  o Power-to-gas: hydrogen production via electrolysis of renewable energy
  o Hydrogen-to-power based on fuel cells
  o Technologies for storage and transport of hydrogen

• Regulatory innovation to optimize green hydrogen across industry sectors

• Building momentum for very large green hydrogen projects

• Specific green hydrogen project initiatives
  o Intermountain Power Project in Utah – coal plant conversion to be 100% carbon free
    - Leveraging renewable energy to produce green hydrogen
    - On-site hydrogen storage to use in place of natural gas
  o Belgium’s first industrial green hydrogen plant
  o Other national and international activity

Janice Lin, Founder & President, Green Hydrogen Coalition
FRIDAY, AUGUST 7, 2020 – CENTRAL TIME

9:40 – 10:00 am  Log in and Sign On (Microsoft Teams)

10:00 – 11:00 am  Power-to-Gas (P2G): Applications & Potential as a Long Duration Energy Storage Resource
As higher percentages of renewable energy come onto the grid, there is an increasing need for longer duration energy storage resources. The California energy grid is now generating higher amounts of renewable energy than is needed at certain times of the day, resulting in a supply/demand mismatch for when energy is needed most to meet peak demand. Lithium-ion batteries offer some support, but only last for 4-6 hours. Power-to-gas (P2G) offers a promising technology solution for this situation. P2G uses surplus electricity from renewable energy to create renewable hydrogen or renewable methane that can then be stored in natural gas pipelines and used as needed, and thus can utilize the utility/gas pipeline system as a giant slow battery. This session will explore P2G technologies and potential. It will evaluate how the P2G pathway could help address the challenges of renewable energy variability on the grid and support higher integration of renewable energy needed to meet California state goals.

Arun Raju, Director - Center for Renewable Natural Gas & Assistant Research Engineer at University of California, Riverside

11:00 am – 12:00 pm  Southern California Gas: Evolving the Role of the California Gas Utility
• Gas utility perspective on RNG in California
  o Transforming the gas utility role to meet state carbon goals
  o Why renewable gas is a key part of meeting climate goals, & why utilities will play a key role
  o Where the utility industry is as a whole in California
• Southern California Gas (SoCalGas) commitments for renewable gas
• Renewable gas policy & program update
  o California’s new Utility RNG procurement program
  o Voluntary RNG tariff
• Hydrogen
  o Hydrogen blending
  o Hydrogen production from excess wind & solar
  o Utilizing gas utility pipeline system as a slow battery
  o Power to gas applications
• Repurposing existing infrastructure
• Looking to Europe – developments in “hybrid solutions” to reduce emissions on both gas & electric grids

Tanya Peacock, Public Policy and Planning Manager, Southern California Gas Company (SoCalGas)

12:00 – 12:45 pm  Break for Lunch
FRIDAY, AUGUST 7, 2020 – CENTRAL TIME (CONTINUED)

12:45 – 1:45 pm  Pacific Gas & Electric: Renewable Natural Gas (RNG) & Hydrogen Roadmap
• Overview of PG&E’s RNG Roadmap, R&D and deployment initiatives
• RNG conversion goals
  o Woody biomass conversion with digesters
  o Develop a portfolio of gasification & pyrolysis technologies available
  o Develop standards for anaerobic digesters in California/US
• RNG resource upgrade goals
  o Interconnection
  o Treatment methods
  o Commercial development
  o Biomethane gas quality measurement devices
• RNG demand goals
  o Gas microgrids as interconnection alternative
  o Uses for transportation/other purposes
  o Compression/cooling methods
• Hydrogen goals
  o Hydrogen engineering standards
    - Blending mixtures of hydrogen and natural gas into existing infrastructure
    - Hydrogen interconnection process and requirements
  o Portfolio efficiency for hydrogen
    - Hydrogen to methane technologies
    - Hydrogen extraction technologies
  o Hydrogen to customers using natural gas system
    - Hydrogen vehicle fueling
• Alternative carbon market goals
• Biomethane deployment projects
  Danielle Mark, Senior Gas Engineer - R&D and Innovation, Pacific Gas & Electric

1:45 – 2:00 pm  Afternoon Break

2:00 – 3:00 pm  Closing Panel: Moving Forward to Optimize the Role of Renewable Gas in the Energy Industry
• What have been the takeaways from this event about the role of renewable gas as a resource in the transition to a low-carbon economy?
• What are best practices for companies who own, operate, or invest in natural gas in the changing decarbonization landscape? What is the renewable gas opportunity?
• How can the energy industry optimize renewable gas as a resource?
• What should utilities and the energy industry be doing in the near and long-term to plan and integrate renewable gas resources?
  Philip Sheehy, Technical Director, ICF
  Janice Lin, Founder & President, Green Hydrogen Coalition
  Tanya Peacock, Public Policy and Planning Manager, Southern California Gas Company (SoCalGas)
INSTRUCTIONAL METHODS

PowerPoint presentations and case studies will be used in program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must log in each day and be in attendance for the entirety of the conference to be eligible for continuing education credit.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 0.8 CEUs for the conference.

ONLINE COURSE DELIVERY & PARTICIPATION DETAILS

We will be using Microsoft Teams to facilitate your participation in the upcoming event. You do not need to have an existing Teams account in order to participate in the broadcast – the course will play in your browser and you will have the option of using a microphone to speak with the room and ask questions, or type any questions in via the chat window and our on-line administrator will relay your question to the instructor.

- You will need to join the appropriate meeting at the appropriate time.
- You will receive a meeting invitation will include a link to join the meeting.
- Separate meeting invitations will be sent for the morning and afternoon sessions of the course.
  - You will need to join the appropriate meeting at the appropriate time.
- If you are using a microphone, please ensure that it is muted until such time as you need to ask a question.
- The remote meeting connection will be open approximately 30 minutes before the start of the course. We encourage you to connect as early as possible in case you experience any unforeseen problems.

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this event may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.
REGISTRATION INFORMATION

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name  Job Title

Company

Address

City       State/Province       Zip/Postal Code       Country

Phone       Email

CREDIT CARD INFORMATION

Name on Card

Account Number

Exp. Date       Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx)

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Billing Zip Code/Postal Code

OR Enclosed is a check for $                       to cover                      registrations.

Substitutions & Cancellations
Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before July 3, 2020 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI’s liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800.
EUCI reserves the right to alter this program without prior notice.

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Energize Weekly is EUCI’s free weekly newsletter, delivered to your inbox every Wednesday. We provide you with the latest industry news as well as in-depth analysis from our own team of experts. Subscribers also receive free downloadable presentations from our past events.

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Online Course Delivery & Participation Details

See page 8 for information

PLEASE SELECT

- RENEWABLE GAS IN THE ENERGY INDUSTRY:
  Renewable Natural Gas & Green Hydrogen Opportunities
  AUGUST 6-7, 2020: US $1295

REGISTRATION INFORMATION

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