Shared Success: Customer Collaborations in Biogas, RNG & Carbon Capture

A conversation with Vaisala's Antti Heikkila and Justin Walsh

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Quick Notes

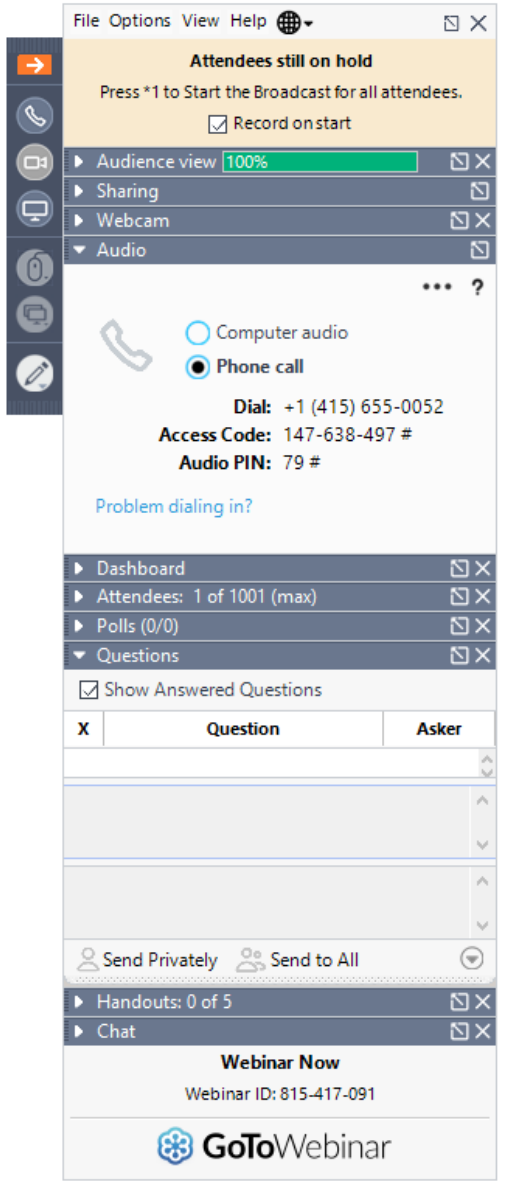
You should be able to hear me talking now. If you can't, use the questions module to describe your issue.

Two Audio Options: Phone or Computer
Choose one and connect

Pro tip: Don't call in on our phone if your audio is set to "Mic and Speakers"

Ask questions using the Questions Panel on the right side of your screen at any time.

The recording of the webinar and the slides will be available after the event. We will post them online and send you a link.



Audio

Questions

Case study applications:

- Co-Generation
- RNG Upgrading
- Carbon Capture

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We are Vaisala

- We serve customers in Weather and Industrial markets
- 85+ years of experience providing a comprehensive range of innovative observation and measurement products and services
- Trusted supplier of instrumentation to protect sensitive processes and explore the unknown
- Various measurement solutions developed for industrial processes and controlled environments ensure, product quality, energy efficiency, and personal safety

Presenters

Antti Heikkila

- Product Manager / Instrumentation Expert
- 5 years with Vaisala

Justin Walsh

- Business Development / Application Engineer
- 10 years with Vaisala

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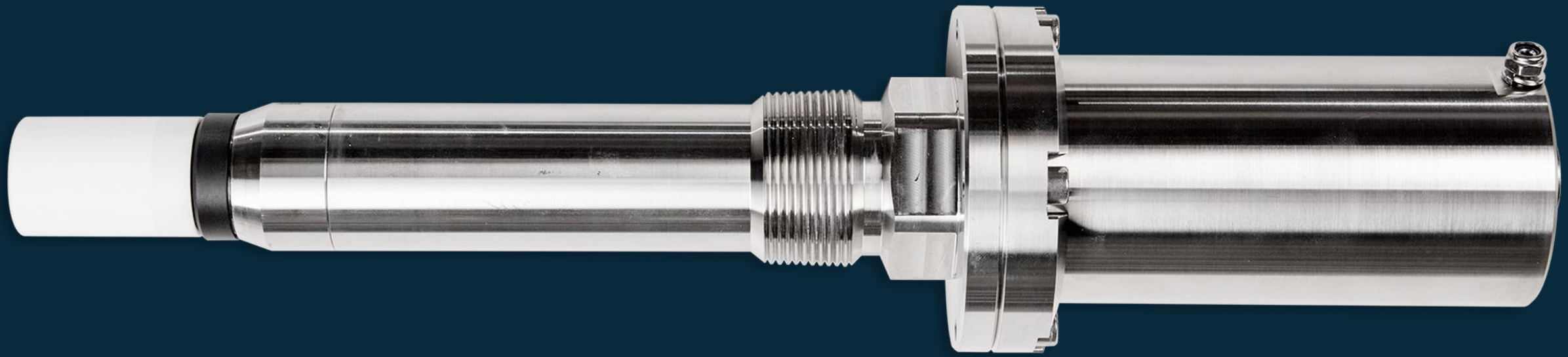
MGP260 Series



Product Family of Multi-Gas Probes for

Biogas, Renewable Natural Gas (RNG), and Carbon Capture (CCU/S) Applications

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MGP260 Product Family

MGP261 – CH_4, CO_2, H_2O

- Measured gases include
  - 0…100 vol-% Methane
  - 0…100 vol-% Carbon Dioxide
  - 0…25 vol-% Water Vapor

Property	Methane CH_4	Carbon dioxide CO_2	Water vapor H_2O
Accuracy specification at 25 °C (+77 °F) and 1013 mbar including non-linearity, calibration uncertainty, and repeatability; temperature and pressure compensated			
Accuracy at +25 °C (+77 °F) and 1013 mbar [1]	• 0 … 40 vol-%: **±2 vol-%** • 40 … 70 vol-%: **±1 vol-%** • 70 … 100 vol-%: **±2 vol-%**	• 0 … 30 vol-%: **±2 vol-%** • 30 … 50 vol-%: **±1 vol-%** • 50 … 100 vol-%: **±2 vol-%**	0 … 25 vol-%: **±0.5 vol-%**
Repeatability	±0.5 vol-% at 60 vol-%	±0.3 vol-% at 40 vol-%	±0.1 vol-% at 10 vol-%

MGP262 – CH_4, CO_2

- Measured gases include
  - 0…5 vol-% Methane
  - 0…100 vol-% Carbon Dioxide

Property	Methane CH_4	Carbon dioxide CO_2
Accuracy specification at 25 °C (+77 °F) and 1013 mbar including non-linearity, calibration uncertainty, and repeatability; temperature and pressure compensated [1]		
Accuracy at +25 °C (+77 °F) and 1013 mbar	0 … 2 vol-%: **±0.1 vol-%CH_4** 2 … 5 vol-%: **±5% of reading**	90 … 100 vol-%: **±1 vol-%** 0 … 90 vol-%: **±2 vol-%**
Repeatability	< ±0.1 vol-% at 1% CH_4	±0.4 vol-% at 95 vol-%

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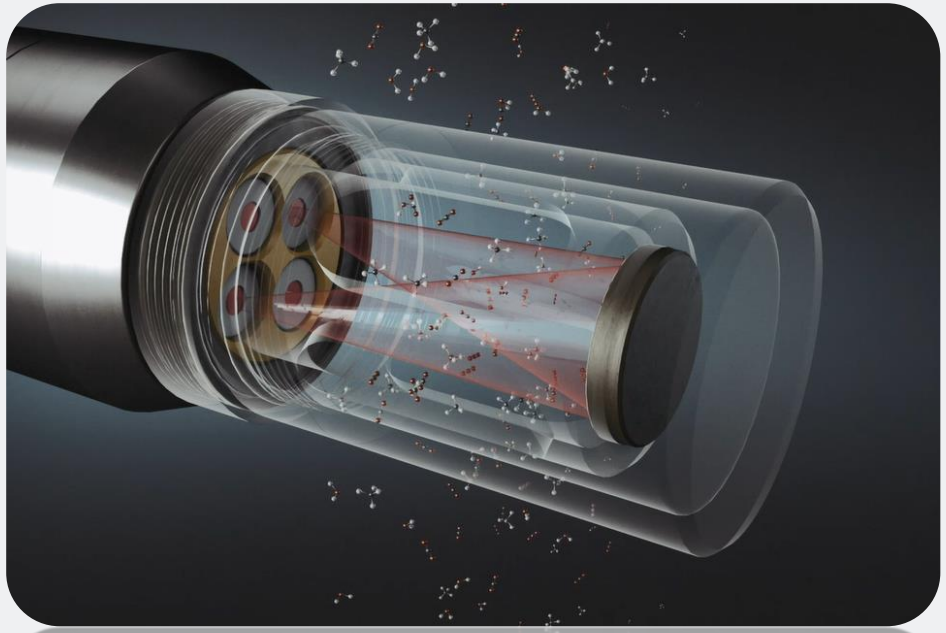
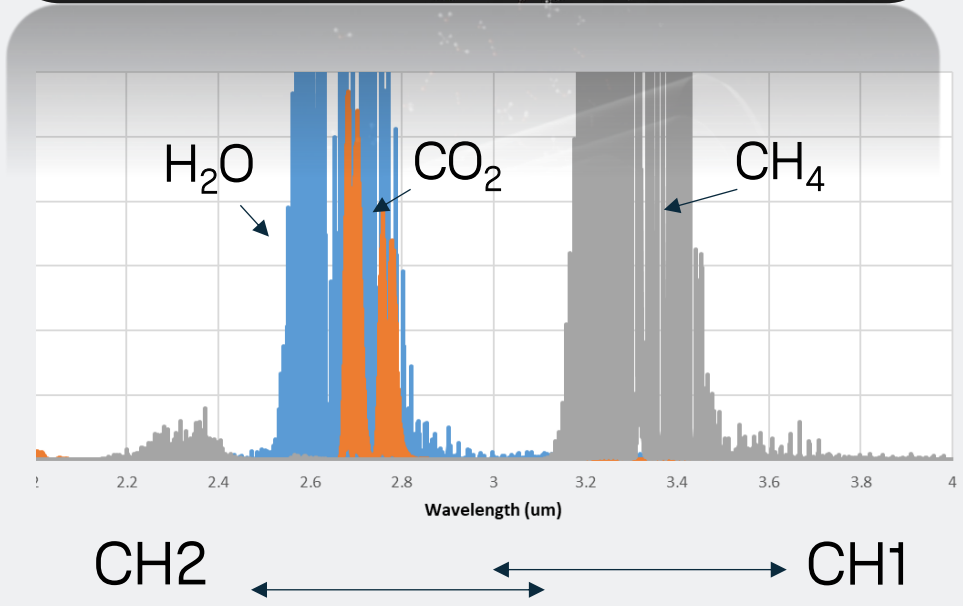
Multigas measurements with CARBOCAP®

- Multi-gas capability, with optical measurement channels combined into a single probe
- Measurement stability is achieved with proprietary reference measurements
- Sensor head is heated to prevent condensation
- Active components are protected from flammable gases (CH_4) and corrosive gases (H_2S)
- Cross-interference is avoided by measuring humidity in combination





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MGP260 Series Applications

Biogas & Landfill Gas

- Anaerobic Digester or Landfill gas measurement
- Pre / Post treatment
- H_2S resistant

Combined Heat & Power Engines

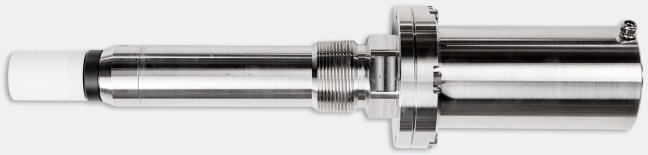
- Fast methane concentration monitoring
- Real-time in-situ humidity measurement

Renewable Natural Gas (RNG) Upgrading

- Continuous measurement
- Highly accurate off-gas monitoring
- Dew point output reduces risk

Carbon Capture

- Full-range (0-100%) and continuous CO_2 measurement in exhaust and off-take piping



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Combined Heat & Power

JFE Environment Technology Co.

Miura Biomass Center in Japan

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Miura Biomass Center Biogas Plant

Kanagawa prefecture, Japan

Challenge

- Optimize the efficiency of the combined heat and power engine with seasonally varying biogas composition

Solution

- Monitor for CH_4, CO_2 and H_2O in the gas stream to tune engine performance and ensure safe humidity levels

Results

- Increased overall operational efficiency and minimized seasonal instabilities

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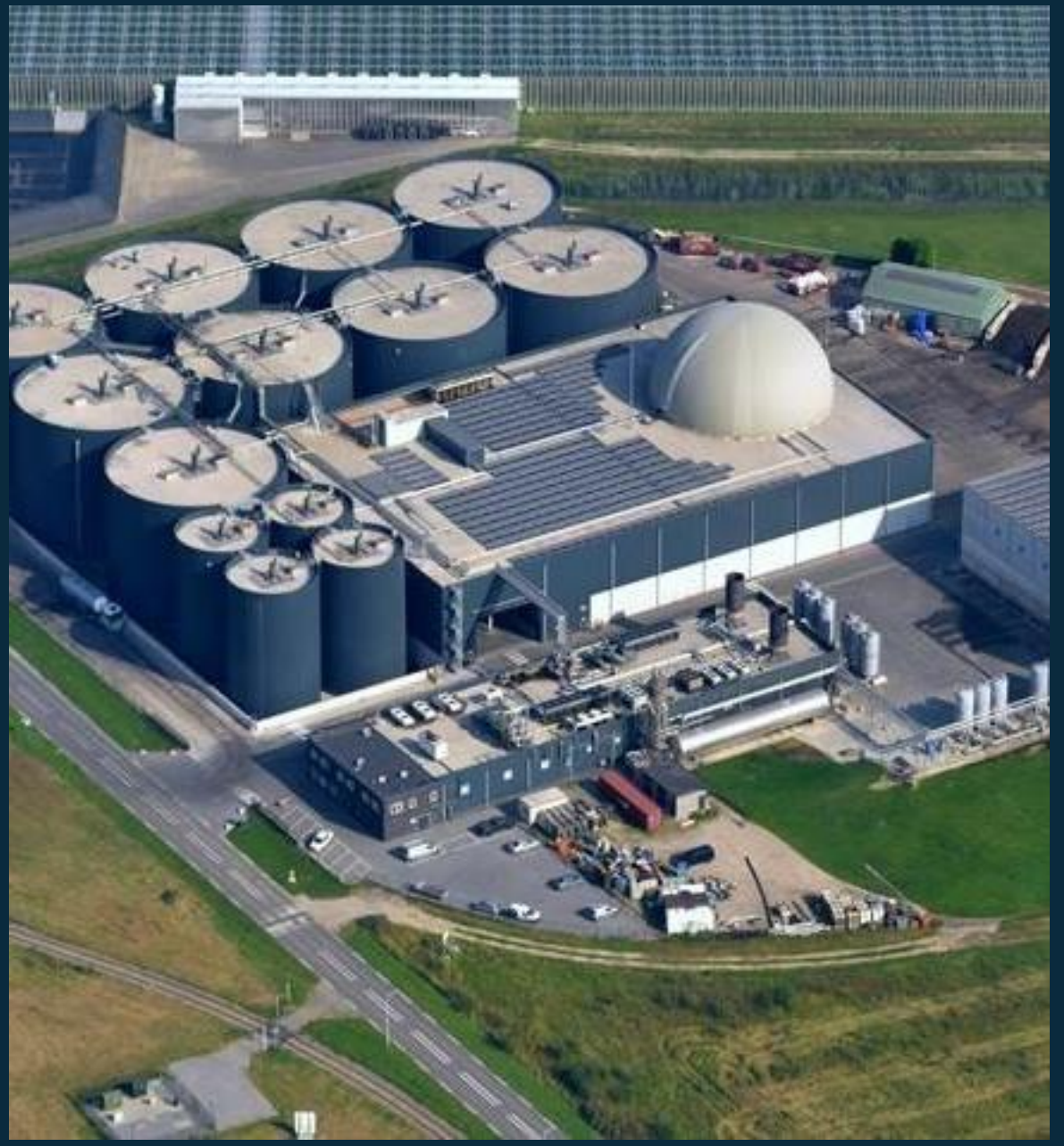
Biogas/ RNG Upgrading

Pentair

The SFP Zeeland plant in the Netherlands



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Pentair – Haffmans

Sustainable Fuels Plant (SFP) Netherlands

Challenge

- Enhance the quality of RNG produced and minimize the methane slip.

Solution

- Monitoring directly in the high-humidity inlet as well as in off-gas stream

Results

- System performance was able to be optimized and verified

Portable Test Unit

Bohr Limited
ADvantage

A compact and portable analysis tool for Biogas systems as a service or product.

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Bohr Limited
ADvantage
United Kingdom

Challenge

- Bring versatility to biogas system evaluation with minimal investment

Solution

- Expand the opportunity for continuous process monitoring to more plants

Results

- A wider range of opperators can evaluate the benefits of measurement and make informed investment decisions

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Carbon Capture

CopenHill Center

Amager-Bakke waste incinerator in Denmark

Partnership with the **Technical University of Denmark (DTU)**

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Amager Bakke Waste to Energy CHP

Copenhagen, Denmark

Challenge

- Prove the economic viability of the point source capture method used at the plant

Solution

- Directly measure the CO_2 concentrations at multiple points to best account for the carbon in the system

Results

- Process optimization demonstrated by accurate measurements during testing of different configurations

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Carbon Capture Utilization

Carbonaide

Carbon-negative pre-cast concrete curing

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Carbonaide Production pilot-plant

Hollola, Finland

Challenge

- Optimize the process for captured CO_2 to be absorbed during concrete curing

Solution

- “Our unique advantage is that we accurately measure and control the carbon-curing process.” – COO Jonne Hirvonen

Results

- Carbonaide’s process has become commercially viable and energy-efficient

What's in it for You?

INCREASE CONTROL WITH METHANE MEASUREMENT

REDUCE RISK WITH HUMIDITY MEASUREMENT

ENSURE PEAK PRODUCTION WITH OFFGAS MEASUREMENT

Superior Stability & Accuracy

- Three-in-one: methane, carbon dioxide and humidity measurement in wet biogas
- CARBOCAP® autocalibration

World's 1st Optical Biogas Moisture Measurement

- Corrosion resistant measurement up to condensing conditions
- Hydrogen Sulfide H_2S resistant

In Situ Installation

- Real-time and Ex certified
- No sampling lines, pumps or moisture removal needed
- No calibration gases needed in routine use

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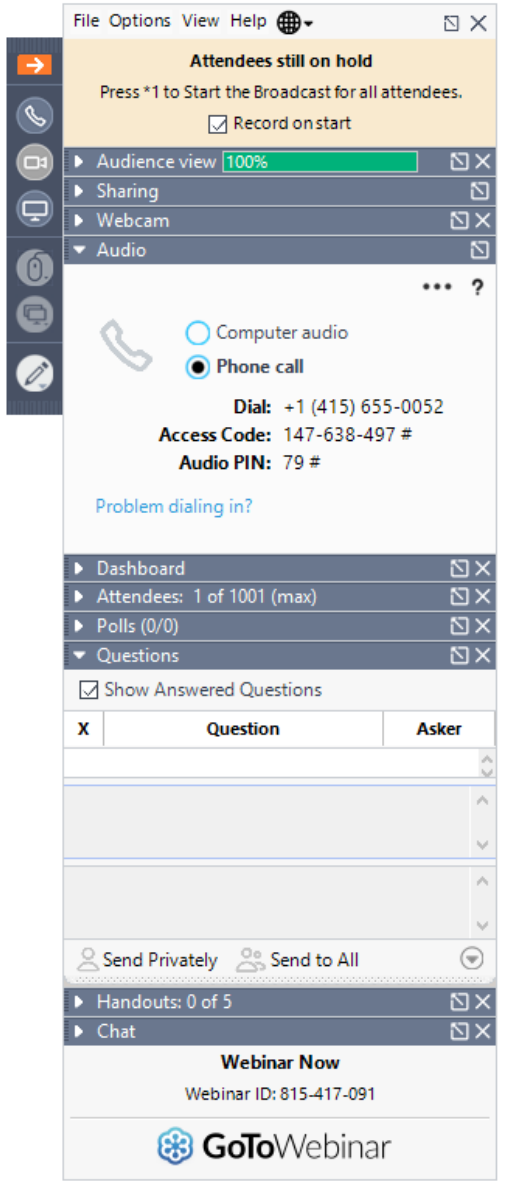
Q&A

Type in your questions under “Questions” in the toolbar.

Make sure to answer the survey at the close of this webinar.

Thank you!



Audio

Questions

Thank You

Engage with us at Vaisala.com