



www.colorado-hydrogen.org

Monthly Meeting
16 July 2024

Agenda

- Private hydrogen EV's and mobile fueler
 - Branden Doner
 - Jane Allo, Elektrikgreen
- Colorado Hydrogen Day event
- New CHN membership categories now live
 - Individual and Start-Up memberships

Toyota Mirai + Fueling Operator



Brendan Doner

Principal Data Scientist at Pilot Flying J

Owner-operator of Breathe Transport Ltd.

- Toyota Mirai hydrogen EV to rent
- Available on Turo car share service
- Personal mobile hydrogen fueler





Breathe Transport

HYDROGEN POWER

Company Overview

July 16, 2024

Agenda

1. Who | **Me**
2. What | **Breathe Transport**
3. Why | **Mission**
4. How | **Hydrogen**
5. How | **Rentals**
6. How | **Blog**



Who | Me

- **Family** wife, me, 7, 6, 2 $\frac{2}{3}$, Trestle dog
- **Colorado** native, skier, mountain biker, hiker, gardener, Eagle Scout
- **Professional** Principal Data Scientist at Pilot, Owner & Operator at Breathe Transport



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What | **Breathe Transport**

- **Produce** green hydrogen
- **Rent** hydrogen vehicles
- **Publish** data & analysis



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Why | **Mission**

- **Clean air**
 - Human health
 - Planet health



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How | Hydrogen

- **ElektrikGreen H2Go**
 - Small scale
 - Mobile
- **Green**
 - Renewable Energy Credits (RECs) from Xcel Energy
 - Zero leakage target¹



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¹<https://www.nature.com/articles/s43247-023-00857-8#citeas>

How | Rentals

- **Turo**
 - Airbnb for your car
- **Customers**
 - Low mileage needs
 - Denver West pickup
- **Convenience**
 - No refill at end of rental
 - \$1.99/gallon_{equivalent}



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How | **Blog**

- **Educate**

- Free
- Data
- Analysis

- **Where**

- breathetransport.com/blog/
- medium.com/@brendan.doner



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Breathe Transport

HYDROGEN POWER



ElektrikGreen

Elektrikgreen



- Residential & Commercial Energy Storage as Hydrogen
- Emergency & Portable Power
- Commercial & Industrial Hydrogen Production
- Hydrogen Fuel Filling Station
- Microgrids & Smart Connected Communities

Jane Allo

FOUNDER AND CHIEF EXECUTIVE OFFICER



ElektrikGreen

The Future of Clean Energy

Jane Allo

CEO & Co-Founder

Jane.Allo@ElektrikGreen.com

303-589-2490



Breathe Transport

H Y D R O G E N P O W E R

Brendan Doner

Owner & Operator

Brendan.Doner@BreatheTransport.com

720-818-0205

ElektrikGreen is providing clean energy storage and hydrogen production for electrification and green hydrogen fuel uses.

Breathe Transport is bringing the experience of the hydrogen future today. Offering hydrogen vehicle carshare services and an authorized ElektrikGreen reseller of hydrogen products.



Greenhouse Gases & Climate Feedbacks = Climate Change

The earth's climate is changing. These changes are due to a buildup of greenhouse gases. Carbon dioxide is the primary greenhouse gas contributing to climate change.



Climate Feedbacks are natural processes that respond to global warming causing amplification to our climate. Water vapor, melting sea ice & clouds.

ElektrikGreen & Breathe Transport



- Hydrogen fueling
- 5,000 PSI
- 10,000 PSI
- Refuel in 2 hours or less



Low cost
Long ranges
Uncommon conveniences



Green hydrogen
No air pollution
Safe and secure

ElektrikGreen & H2Go



POWERED BY  **ElektrikGreen**



Technical Specifications



Small H2Go Fueling System (Base 2kg/day)

Mechanical

Trailer unit size	16' L x 7' W x 7' H
System weight	2700 lbs.
System mounting	Trailer self-contained
Tank dimension (ea.)	108" L x 15" Dia
Tank weight (ea.)	150 lbs.
Tank capacity (ea.)	9300 L / 12.4 kWh
Tank mounting	Internal to trailer
Tank Max storage press	500 psi (35 bar)
Booster Dimension	78" H x 23-46" W x 41-48" D
Booster Input Press Min	30psi
Booster Max H2 flow rate	240Nm ³ /H
Nozzle Options	<=350Bar, <=700Bar
Max H2 output pressure	500–10,000psi (350–700bar)
Water connection	3/8" water line
Water usage	1.6 – 4 L per hour

Electrical

Hydrogen Production	5kw
Voltage / Freq supported	230-240VAC 50-60Hz
Communications	TCP/IP and Mobile App
Booster Production	10kw

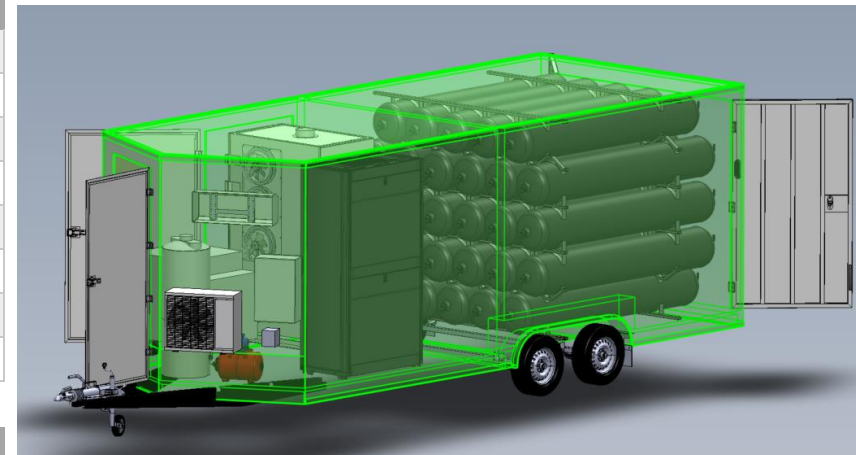
Amount to Fill	Time to Fill (Hr:min) @700Bar	Time to Fill (Hr:min) @350Bar
1kg	:26	:14
2kg	:52	:28
3kg	1:13	:42
4kg	1:44	:56
5kg	2:10	1:10

Environmental

Energy source	Solar, wind, or grid
Operating temp range	32°F – 90°F
Recommended temp	40°F – 110°F
Hydrogen purity output	99.999%
Noise level	< 75 dB
Emissions	0
Mini-Split (optional)	For cold/hot climates
Annual CO2 reduction	22,800 and up lbs. per year

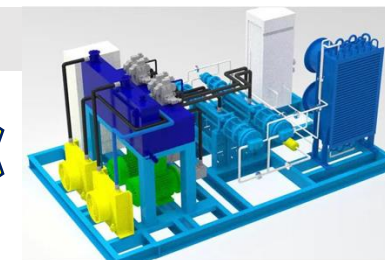
Performance

Hydrogen Production/Day	2kg
H2 Production Efficiency	62.5%
KWh to produce 1 kg H2	60
Workmanship warranty	10 years
Product warranty	Component manufacturer's warranty
Tank Storage Capacity	3kg
Cost per kg (H2GO)	\$3.74



Also available Fast Fill H2Go Fueling System

5kg





ElektrikGreen

www.elektrikgreen.com
(720) 515-5670



Breathe Transport

H Y D R O G E N P O W E R

www.breathetransport.com
(720) 818-0205

The Future of Clean Energy is Today!



Colorado Hydrogen Day Event Sunday October 6th



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Colorado Hydrogen Day

Sunday October 6th, 10 AM to 5 PM
CSU Spur Campus Hydro Building
At National Western Center



- Exhibit hall
 - Booths by many of the 40+ organizations involved in hydrogen in Colorado
 - Dozens of freestanding posters educating on H₂ tech and the ecosystem
- A one-hour media briefing in a “press room”
 - For the media & booth sponsors
 - Featuring CEO Director Toor, Gov. Polis, Mayor Johnston
- Outdoor display
 - 2 Mirais, Nexo, Nikola truck, Elektrikgreen mobile fueler
- Food at the Hydro “Western Daughters Kitchen”

Poster Session (Self Guided)

- Important part of the event
- To inform and educate
- Eye-catching through graphics and message
- Target high school level and non-technical
- Topics
 - H2: safety, water use, why hydrogen, sources, uses
 - Climate
 - All about EV's
 - Simple electrolyzer & fuel cell
 - Hydrogen transportation coming to Colorado
 - Outdoor: Info on vehicles & fueler.



Poster Examples

Does Making Hydrogen Use a Lot of Water?

No

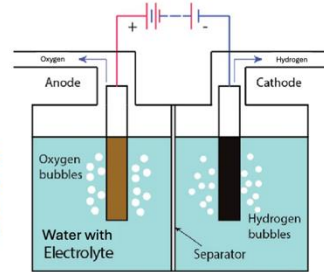
The average restaurant uses 6 times the water of an average hydrogen fuel station



Making Gasoline uses 3.5 times the water of making hydrogen



Electrolysis Process
Water (H₂O) is Split Into Hydrogen and Oxygen Using Electricity



Hydrogen Safety Compared to Batteries, Gasoline and Diesel



- Hydrogen is lighter than air, diffuses quickly, and is non-toxic if inhaled
 - Gasoline and diesel pool on the ground where they continue to burn
 - Since diesel is an oil, it clings to objects as it burns
- Hydrogen generates much less radiant-heat than gasoline, greatly reducing the risk of a secondary fire
- Lithium-Ion batteries will burn violently if deformed, punctured or can develop spontaneous internal short-circuits
 - A burning battery needs no oxygen, so extinguishing it is difficult. Many fire departments recommend letting the car burn where possible
 - Lithium-ion batteries extinguished with water have a documented history of re-ignition

CSU Spur Hydro Building



Hydro Building Lobby



Exhibit Hall



Hydro Bldg. Confluence Room

- 3,000 Square Feet
- 20 to 25, 4'x8' booths
- Educational posters

Call to Action

- Help us spread the word
 - Social media
 - PoC's at any of the media outlets (TV, print, radio, podcast)
- Attend the event
 - And bring friends and family!
- Sponsor a booth
 - We need 18 to 25 exhibitors (companies & organizations)
 - Nominal fee (\$150) to defray event costs
 - E-mail invitation forthcoming
 - Sign-up by contacting Brian at brian.debruine@gmail.com

Reasons to Become an Exhibitor

- Be seen by The Governor, Mayor & the media during a walk-around
- Help showcase the plethora of Colorado hydrogen stakeholders
- Network with other exhibitors
- Help support the event
- You might even make a deal!

Colorado Hydrogen Network Membership

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Background

- CHN has operated 4 ½ years with a shoestring budget
 - Expenses are small (website, Zoom, some marketing material)
 - Labor is all volunteer
- Only a handful of paying members supports the organization
 - We'd like to get more stakeholders invested in CHN
 - High dues have been an issue (starting at \$1K)
 - CHN membership has included CCIA membership
 - Dues follow CCIA's membership rates.

New CHN Membership Categories

- New low-cost dues
 - \$50 for individuals
 - \$200 for start-up companies (for 2 years)
 - These dues are voluntary and tax deductible
- Everyone will continue to be welcome to participate and engage with CHN at no charge
- Benefits of donating
 - Help to support and grow CHN
 - Become more invested and engaged in CHN
 - Enable CHN to (someday) have paid positions
 - Allows CHN to sponsor events (like Hydrogen Day!)
 - Your name and logo on a CHN members page on the website.

New CHN Memberships



	CHN Only		CHN + CCIA Membership			
	Individual	Start-up (2 years)	1-20 Employees	21-50 Employees	51-150 Employees	151+ Employees
Annual Dues	\$50	\$200	\$1,000	\$2,500	\$5,000	\$10,000
Tax Deductible Donation	✓	✓				
CCIA Membership included			✓	✓	✓	✓

See the benefits at coloradocleantech.com

[Join at: www.colorado-hydrogen.org/join](http://www.colorado-hydrogen.org/join)



Call to Action

- Consider becoming a paying member to help support CHN
- Join at: www.colorado-hydrogen.org/join
- Tax-deductible donations can also be made.

Membership in the Colorado Hydrogen Network has been provided as a joint membership in both CHN and our parent organization, the Colorado Cleantech Industries Association (CCIA). CCIA's dues are tailored for established companies, but CHN stakeholders include many individuals and start-up companies, many of whom would like to have a stake in supporting CHN.

So new in 2024, we're adding CHN-only dues so that individuals and start-up companies can help support the organization. These dues are voluntary and tax deductible. The rate for start-up companies is limited to the first 2 years of membership. The complete set of annual dues is shown in the table.

	CHN Only		Corporate Membership			
	Individual	Start-up (2 years)	1-20 Employees	21-50 Employees	51-150 Employees	151+ Employees
Annual Dues	\$50	\$200	\$1,000	\$2,500	\$5,000	\$10,000
Tax Deductible Donation	✓	✓				
CCIA Membership included			✓	✓	✓	✓

Why Join?

CHN is a non-profit organization devoted to advocating for hydrogen infrastructure and educating, so everyone is welcome to participate in the organization whether they pay dues or not. But here are the benefits of donating:

- Help to support and grow CHN
- Allows CHN to sponsor events
- To be invested and engaged in CHN
- Enable CHN to eventually have paid staff
- Your name and logo on the CHN members page on the website

[Join Individual / Start-up](#)

[Join Corporate](#)

Donations

Since CHN can now accept tax-deductible donations, we invite everyone to consider donating to the organization. (UNDER CONSTRUCTION, COMING SOON)

[Donate](#)

School Hydrogen RC Car Racing and STEM Curriculum

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Workforce Development

School Hydrogen RC Car Racing

- The H2GP Foundation and CHN have teamed up to sponsor school hydrogen RC car racing in Colorado
- H2 Grand Prix PRO is a STEM-based educational program for students where they design, construct and race hydrogen-powered RC cars
- Working in teams, students design, engineer, and construct a 1:10 scale fuel-cell-powered RC car
- The program culminates in a series of regional 4-hour endurance races, where students put their engineering skills to the test and compete against other teams.



www.H2GP.org

Help Us Contact Schools and Sponsors

For Spring Semester 2025

- Identify Schools
 - Recommend teachers or principals that we can contact (provide e-mail)
 - If you have a school in mind, but don't have a PoC, let us know anyway
- Identify sponsors (tax deductible)
 - Individual and corporate sponsors
 - Sponsor a team – \$6K (1 car, 5 students)
 - Need \$11K to acquire track & carpet (one time expense)
 - Sponsors will receive promotional recognition

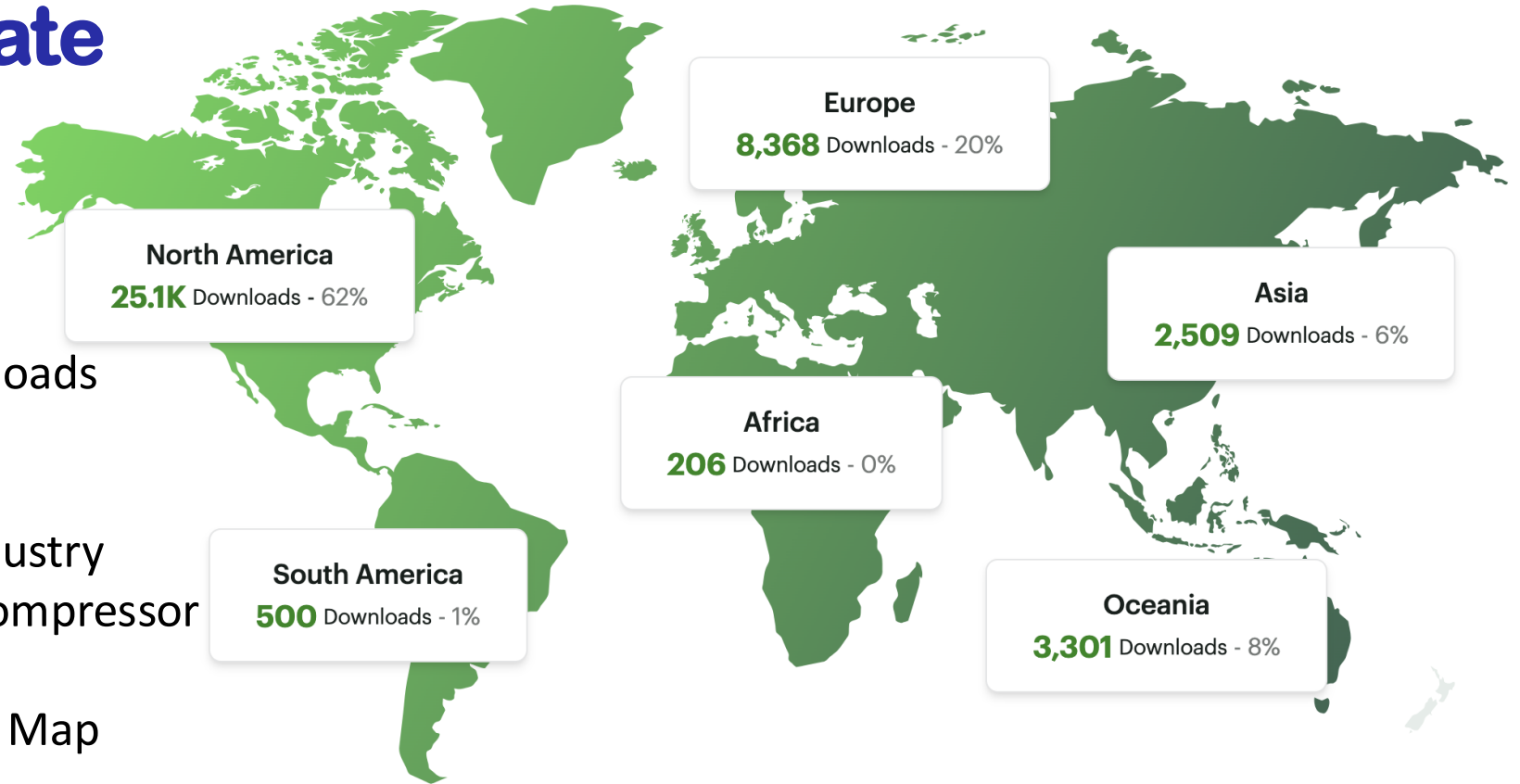
Please contact brian.debruine@gmail.com with Points of Contact



Podcast Update

The *HydrogenNowCast*

- 85 episodes, 40,000 downloads
- Recent episodes
 - Plug Power
 - Path to Zero-Carbon Industry
 - HyET electrochemical compressor
 - Geologic Hydrogen
 - Saoradh Hydrogen Data Map



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