

#24H2Challenge

Information Package

2nd European Hydrogen Challenge

6 & 7 April 2018

www.hydrogenchallenge.eu



H2.LIVE

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About the Hydrogen Challenge



Arjan de Putter

Journalist, writing about about the transition to e-mobility.
www.e-xpeditie.nl (translation: expedition)

Also works as an independant consultant
www.fastconcepts.nl . Consultancy, Events, Content & Applications

Briefly held the record for most electric kms driven in 48 hours (while driving a Tesla).

Also: builds its own concept e-tricycle

Arjan drives a BMW i3



Bastiaan du Pré

Project management consultant in spatial planning, mobility and water management with Infram BV Maarn.

Also works for platform www.waterstofwerkt.nl (translation: hydrogen works!) This Infram- initiative works towards improvement of the hydrogen infrastructure in the Netherlands by focussing on fuel points and potential users.

Bastiaan saved 123 kg's CO2 during the October-2017-Low Car Diet

Bastiaan sometimes drives the company Hydrogen vehicle (iX35). But as the nearest public Hydrogen Refuelling Station is 117km away, he drives a Mitsubishi Outlander PHEV.

Summer 2018 he will likely drive a hydrogen vehicle, as Infram BV will be purchasing a Resato Fleetowner unit to be able to fill up Hydrogen vehicles "at the office" and more vehicles.



Why hydrogen? Why the 24h challenge?

- Hydrogen has a crucial role in our future energy system and economy. Hydrogen mobility is a smaller part of that, but a very important part where we now actually can work toward that transition.
- Looking closer at mobility: steps are being taken but for the public it all moves very slowly. Our example: in the Netherlands there are currently 2,5 HRS and 40 cars on the road. Hydrogen is “world famous” amongst its believers (within governments and businesses) but not in any potential user group.
- We need hydrogen more broadly known and accepted. For that everybody needs more knowledge of hydrogen – so let’s open the conversation with hydrogen for mobility.
- We want to reach the public and also potential front runners in this e-transition in mobility by creating FUN experiences that go far beyond just driving Hydrogen Electric.



You are very welcome in joining this 24 hour hydrogen challenge, that is organised with the purpose of generating attention for hydrogen as a fuel. It is not about FCEV vs BEV but about transition from fossil fuels to zero emission. We open the conversation by focussing on FUN and discovering the possibilities and challenges for hydrogen-electric driving in Europe yourself.

After the race you will find that it was truly an adventure, and that you have a new bond not only with your fellow teammates, but also with all those other drivers who spent one day of their lives on this particular 24 hour hydrogen challenge. And you will realise: you are now an experienced FCEV driver.

We thank you in advance for the information you share with us and the operators of the Hydrogen Refuelling Stations. We thank you even more for all the hydrogen stories you will be telling shortly...

Bastiaan and Arjan!

To Everyone else

- Please enjoy this presentation!
- If you have any questions, please contact us through our contact information on the last slide.

Hydrogen Challenge by



OUR PARTNER: H2MOBILITY

Partner & competing team

Sponsor: this Challenge is sponsored by:



H2.LIVE

and powered by:



For a 4,5 minute impression of the first European Hydrogen Challenge
(29/30 September 2017), please copy this to your browser:
<https://www.youtube.com/watch?v=W8CqRxxwOnLw>

In Dutch, no su

TEAM INFRAM

ERVARINGEN UIT 24 UUR WATERSTOF



The Concept of the 24h Challenge

- Teams of 3 to 4 persons will drive 24 ours in a FCEV through Europe
- They will investigate the possibilities and challenges of driving and fuelling a hydrogen vehicle, and communicate about it through individual channels and with #24hc
- It is a challenge, not a race. Safety is paramount
- Each team formulates its own strategy to collect the most points:
 - 1 point per kilometer
 - 25 points per HRS visited
 - 25 points penalty for using an HRS for second time
 - 100 points per country visited
 - **And for 2018: some new and challenging rules.**
- The team with the most points accumulated within 24 hours wins, provided it has reached the finish within the 25th hour of the race.

Outcome 2017



- 'Le Mans' start
- Demo Forze H2 (Universiteit Delft)
- Public interest
- <https://www.youtube.com/watch?v=nPBsfU1BbuY>



- Artikel Stentor <https://www.destentor.nl/deventer/wat-is-er-eerder-de-tank-of-de-auto~a4256c8f/>
- Radio interview Bastiaan du Pre op BNR incl artikel: <https://www.bnr.nl/nieuws/duurzaamheid/10330712/door-europa-racen-op-waterstof>



Results

Team	Kilometers
Van der Linden	2115
Infram	2043
Gem Deventer	1891
Rijkswaterst	1660
Herwers	1650
Footprint Solutions	1511

kilometers

Team	Aantal vulpunten
Herwers	13
Infram	10
Van der Linden	8
Gem Deventer	8
Footprint Solutions	8
Rijkswaterst	7

Refuelling points

Countries visited

Team	Aantal landen
Gem Deventer	7
Rijkswaterst	6
Herwers	5
Infram	4
Footprint Solutions	4
Van der Linden	3

Total score

Team	Totaal punten
Gem Deventer	2766
Infram	2643
Van der Linden	2590
Herwers	2475
Rijkswaterst	2435
Footprint Solutions	2086

Only 2 teams back in time



Some learning experiences

Denmark

- Dense network, small distances between stations, well positioned for highway travel
- Generally stand-alone stations on remote sites, not always sense of safety
- User functionality: no pressure gauge. Some teams missed this, others stated this simplified the user experience
- Team Infram: Token did not work at all stations; 2 out of 5 stations (Kolding en Korsør) gave error message 'nonsys'.
- Danish answering machine is not helpful.



De Hyundai ix35 FCEV

- Comfortable, also after long drive, also during high speeds. No noise, no vibrations, Comfortable seats, plenty space in boot.
- Range affected by heavy vehicle and high speeds, specially in Germany (no limit)
- Gear needs to be in P, to be able to start properly.

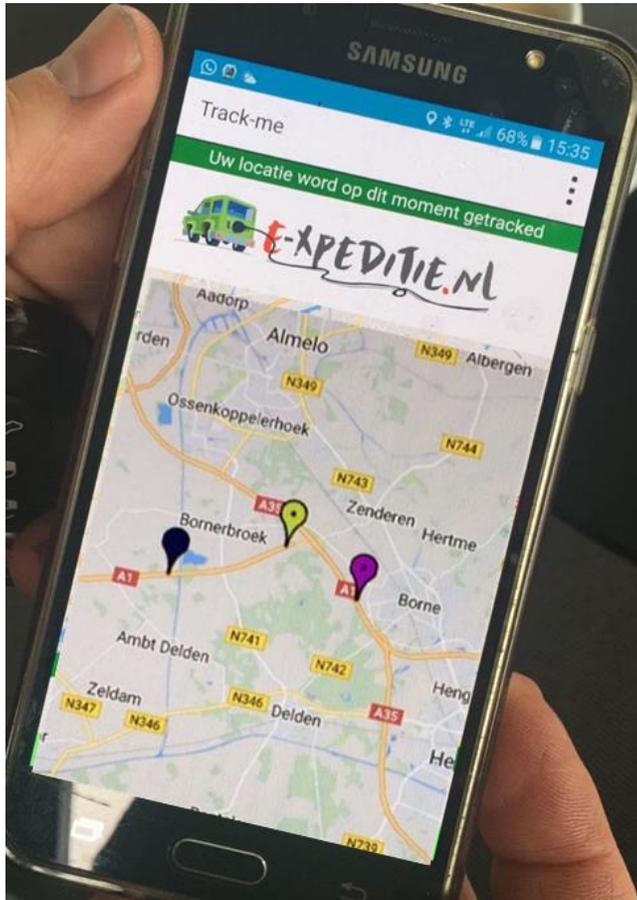
Germany: Refuelling as it should be.

- Both 350 and 700 bar available, “normal” experience.
- Next to other fuels under the same canopy
- Nozzles are comfortable (less cold transfer than in NL)
- Longer hose, easier to connect nozzle
- Fuelling card CEP works well, like regular cards at home, but challenge teams ran into a refuellings limit of 10 per day.

Live Tracking

This smart app* ElektriciTijdrit.nl made the challenge so much more than just a team experience.

- Friends and family could track their teams minute by minute;
- and teams could track their competition :-)
- We used a second nav system and brought extra charging cables and powerbanks



Communication

- We need to prepare more messages beforehand – it takes a lot of effort to communicate using smartphones.
- Next time we bring a laptop
- We need to communicate also in English
- We need a more clear hashtag for the challenge (#24H2Challenge)

Whatsapp

- Apping between the teams was great fun! But we need to share more contact information beforehand

Safety on board of team Infram

- There were 4 drivers, every driver had 3 shifts of about 2 hours.
- With 4 drivers you cannot stretch on the hind seat, but everyone drives less.
- For “peace and quiet” in the car we sometimes chose not to answer the phone, and did not often play music
- Once a driver disqualified himself for being tired.
- The role of navigator / buddy of driver was actively passed onto the back if navigator was distracted.
- Only a handful safety instructions from the navigator: distance to vehicle in front, adjusting speed when entering rain, lose speed before turning a corner for comfort.

Challenge 2017: closed wallet project

- It started as an informal challenge, organised by people who just wanted to have fun. No money exchanged hands.
- The organisation invested
 - Time for communication and project management.
 - In building the tracking app
 - Creating an easy website for all teams: www.facebook.com/waterstofchallenge,
 - And a webpage including several longer articles on <https://e-xpeditie.nl/24hc>
- There were 6 teams who paid no registration fees. But they were asked to provide feedback and communicate through their own channels
- Municipality Deventer hosted the challenge. Deventer wanted to promote their new green business park A1bedrijvenparkdeventer.nl. The municipality made some out of pocket expenses for the challenge, for stickers, inviting the Forze H2 team, gadgets etc. They created a website www.waterstofchallenge.nl and shot a film <https://www.youtube.com/watch?v=nPBsfU1BbuY>



A1
BEDRIJVENPARK
DEVENTER
SMART choice.



2017



2018

Starting location: Van der Lindengroep in Waddinxveen

Waddinxveen

- **Rhoon 0:31 – 35 km**
- Helmond 1:27 – 127 km
- Brussel 1:55 – 159 km
- Mülheim 2:08 – 205 km
- Münster 2:25 – 228 km
- Wuppertal 2:31 – 243 km



Van der Linden Groep heeft primeur aflevering 1e waterstofauto

december 30, 2015 / in Algemeen / door VDLGROEP

De Van Der Linden Groep Waddinxveen heeft als Hyundai dealer de eerste waterstofauto in Nederland af mogen leveren, een primeur. De Hyundai IX35 Fuel Cell gaat zijn dienst leveren bij Van Uden Logistic Site Solutions.

De Van Der Linden Groep Waddinxveen is 1 van de 3 waterstof dealers in Nederland en loopt hiermee voorop in de verkoop van de auto met de brandstof van de toekomst.

This car dealership has been a front runner in the Netherlands since 2015, is one of three FCEV dealers in the Netherlands.

For this Challenge, the dealership will host both a Hyundai IX35 Fuel Cell as a Toyota Mirai (and possibly a HESLA).



Teams

1



2



3



4



5



6



7



8



9



10



11



12



13



14



15



16



17



18



19



20



Please note: In NL there are 40 FCEV's

Still making contact with owners / operators of FCEV's

- 21  21
- 22  22
- 23  23
- 24  24
- 25 2nd car/team Peter Hendriks

Potential teams but without FCEV's...HELP!

- 25  25
- 26  26
- 27  27
- 28 TEAM BOLSCHER
- 29  29
- 30  30

Plus, we have some friends in

- Germany
- Belgium
- France
- Denmark
- Sweden
- The United Kingdom

All teams are welcome, and if teams do not truly participate this challenge, perhaps we can organise some meet&greet abroad... please contact us for that!

Programm (as per 18/03/12)

Still investigating timing of miniconference:

- a) morning
- b) afternoon
- c) Morning and afternoon

Friday 6th of April 2018

10:00 – 10:45	Challenge organisation available for press interviews requested in advance
11:00	Location open to press
11:00 – 13:00	Time still to be set: Mini-conference?
12:00	Team members on location: FCEV's get specific parking locations on site.
13:00 – 13:30	Teams meeting – safety briefing
13:30 – 13:50	Opening of the event by Challenge organisers with H2Mobility and host, photo opportunity
13:50 – 14:00	START!
14:00 – 17:30	Time still to be set: Mini-conference?

Saturday 7th of April 2018

14:00 – 1500	Arrival of challenge vehicles
1500 – 1600	Simple Award Ceremony and press release
16:00	Event concluded

Mini-conference / Speakers Corner

Confirmed

- Presentation Van der Linden Groep
- H2 Mobility – what is possible already in Germany. Fuelling experience / FCEV's
- Mirai
- Hesla
- Interview with CMC about NEFUSTA, the fuelling station of the future.
- Infram will be fuelling at home (powered by Resato & Holthausen)
- The potential of hydrogen (Robert van Hoof)
- Experiences team infram (5 minute film on a loop)

Start

- Confirmed: we will make a jump photo
- Confirmed: Start will be broadcast live to the NEFUSTA conference in Arnhem
- Under investigation: drone footage
- Under investigation: who will be our Juror –for winning the prize

Under investigation

- Presentation Hyundai Europe
- H2 Mobility / inspiration: the story of building 100 stations
- Remote controlled hydrogen vehicles
- <https://www.greenteamtwentenl/nl/>
- Honda Clarity
- Forze H2
- The H2 in Brabant conference
- GreenVillage Fuel FCEV with power outlet
- Something for kids
- After the start: mini challenge conference for entrepreneurs in Waddinxveen / Gouda area
- Invitation to Lage Weide
- And many others

Promotion of / Interaction with other events

- Friday 24th and Saturday 25th of March: World Record attempt electric driving in 24 hours, using a Hyundai iX35. Current WR: 2378 km. Team Van der Linden Groep (Arjan de Putter)
- Thursday April 5th Hydrogen Congress Brabant Hallen Den Bosch “Brabant aan de Waterstof”
 - Promotion of slow fill fleetowner installation and the European Hydrogen Challenge
- Friday April 6th: Clean Mobility Center Conference on Charging Possibilities voor Future Transport (NEFUSTA) “The future filling station”
 - Live Skype feed of the start



Please link us with other events, before or after the challenge

Organisation



Sponsor



Teams



1,2, 3, 4

Rijkswaterstaat
Ministerie van Infrastructuur en Mili



AI
BEDRIJVENPARK
DEVENTER
SMART choice.



WERKPLAATS
GRUYTER



footprint solutions
making your information work

HOLTHAUSEN



Peter Hendriks
HYDROGENICS
SHIFT POWER | ENERGIZE YOUR WORLD



Potential partners



provincie
Gelderland



COST-EFFECTIVE GAS SUPPLY



OP WEG MET
WATERSTOF.NL
POWERED BY H2PLATFORM



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DEVENTER
SMART choice.



We do not ask the teams a registration fee

- We want it to be financially easy to participate.
- However: we see that 7 out of 10 vehicles will be backed by companies – we will put before them a voluntary sponsor request for € 1.500 each. This is truly voluntary – we will contact teams mid March to inform us of their decision.
- We welcome any additional support for the process management by the organisation

OUR SPONSOR: H2.LIVE

FREE HYDROGEN FOR ALL TEAMS IN GERMANY!!

Partner & competing team

H2Mobility: Six companies and five associated partners from the automobile, gas and oil sectors joined forces to found H2 MOBILITY. Their common goal? To put in place the infrastructure to guarantee nationwide hydrogen-powered mobility in Germany.

H2Mobility = AirLiquide, Daimler, OMV, Shell, Linde, TOTAL

H2Mobility Associated partners= BMW, Honda, Hyundai, Toyota, Volkswagen, NOW

Sponsor: this Challenge is sponsored by:



H2.LIVE



Germany's hydrogen refuelling network is growing fast. To make sure you always know where you can fill up with hydrogen – and where the next hydrogen event is about to take place – we have designed a new app. Keeping up with your next hydrogen refuelling option and future H2 developments just got easier!

More help has already been offered



What?	Who?
Location	Van der Linden Groep
Press releases / PR	Hydrogen Challenge coordinates with H2Mobility / Shell NL
Making a film of the start and editing team material of various teams into small film	Peter Hendriks!
Car Bikini's	H2Mobility
Challenge stickers on every vehicle	Infram BV

We are still looking for (18.03.12)

What?	Who?
Gadgets for the teams (fruit / durable water bottles / caps / other)	
Contribution the development of the tracking app (completed)	
A native English writer for communication	
A native German writer for communication	
A native French writer for communication	
Teams with cars that want to join	
Car owners / operators that want to share or lend their vehicles	
A prize (or four) for the winner of the Challenge (how about a remote controlled hydrogen car?)	
Challenge Flags to plant on various locations	
Active participation of PR departments of competing teams	

We will ask teams

- To make themselves available for interviews at specific challenge locations
- To be open to a having 4th driver when there are only 3 (car dating – Bastiaan du Pré)
- To make a small blog with pictures, can be in any language: who are you, why do you participate, how do you prepare for this challenge (publication after review challenge organisation, before the start)
- To share information about driving experiences, fueling experiences and the experience at the HRS (digital form).
- To include @24h2Challenge on twitter or #24h2Challenge on social media

Safety briefing before Challenge (also to be included with final registration documents)

- Do not forget this is not a race.
- Please all contribute to an atmosphere where everyone can address safety issues, but nobody has to.
- Please take into account your and your teams mental state (H.A.L.T.):
 - “Hungry”: make sure you eat and drink regularly and healthy
 - “Angry” (or stressed): please relax: this is fun.
 - “Late”: you are in a challenge, not a race. If arriving on time is that important to you, make sure to take that into account in your strategy.
 - “Tired”: you will get tired during this challenge. So take it from experience: take your rest while you can (tip: make a schedule!)

Registration / briefing

1. You are entering into a partnership!

- This hydrogen challenge is organised WaterstofWerkt.nl en E-xpeditie.nl, with the purpose of generating attention on hydrogen as a fuel. It is not about FCEV vs BEV but about transition from fossil fuels to zero emission fuels. It is all about the FUN and discovering the possibilities and challenges for hydrogen-electric driving in Europe.
- Everyone is welcome to register, the organisation reserves the right to deny participation.
- We ask all participants to share their experiences online **#24H2Challenge** and also with us through some small formats. All this collected basic information will be made publicly available.
- Registration and participation in this challenge is FREE, but we do welcome all parties to support our efforts in organising this challenge. We ask all company backed teams to support us with € 1.500,- By signing this form teams complete their registration for this challenge. You are free at any time to withdraw your registration.
- You will have sign separately for using the fuel cards in Germany. No signature – no cards!

Registration / briefing (2/3)

2. Safety is paramount.

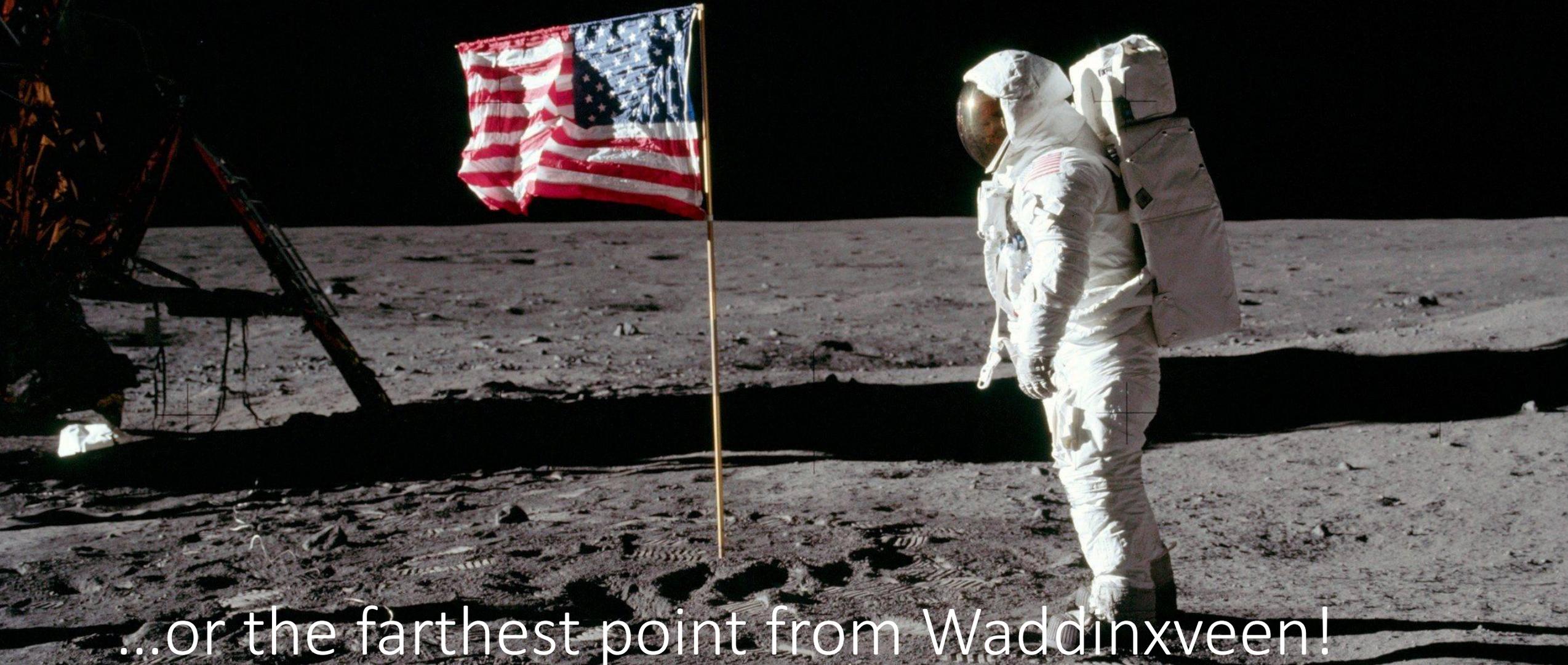
- It is not about speed. This is not a race.
- All participants partake at their own risk. You will ensure your vehicle is fit to drive, is legally allowed on the road and is insured.
- Teams consist of at least 3 or maybe 4 persons, each with a valid drivers licence.
- Contestants will adhere to all traffic regulations and will not commit serious traffic offences.
- Contestants will ensure that they are in good shape and well rested.
- Every contestant will drive no more than ~ 8 hours during the challenge.
- The hind seat is the resting place. The navigator functions as active support for the driver.

Registration / briefing (3/3)

3. The challenge has the following additional rules:

- Start and finish are at the same location: Waddinxveen. Teams have to return latest in the 25th hour of the challenge – to compete.
- Teams will get points for # kilometers driven, # visited countries, # visited refuelling stations, cheapest H2 price and some other factors which will be communicated latest one week before start. Teams are allowed to use hydrogen refuelling stations only one time.
- You will receive your points for refuelling stations after we have received your feedback (google form).
- The organisation will use a smart phone app to track all teams location and speed. Each team will make one smartphone available for this exclusively. The location and speed will be broadcast live on a website.

Plant a Challenge flag where no FCEV has ever gone before!



...or the farthest point from Waddinxveen!

We are looking for long term partners!

In the Netherlands and abroad.
International partners are important because:

- For the Dutch public it is important to know and to show that this topic is also important in not just one country
- We want to exchange views (on realising more HRS's) and driving experiences
- We think international presence will also attract more interested parties to the event.

Competing Team



Challenge powered by H2.LIVE

(Free H2 in Germany)



We need to think ahead.
A big Challenge
5 countries
10 starting places
150 FCEV's



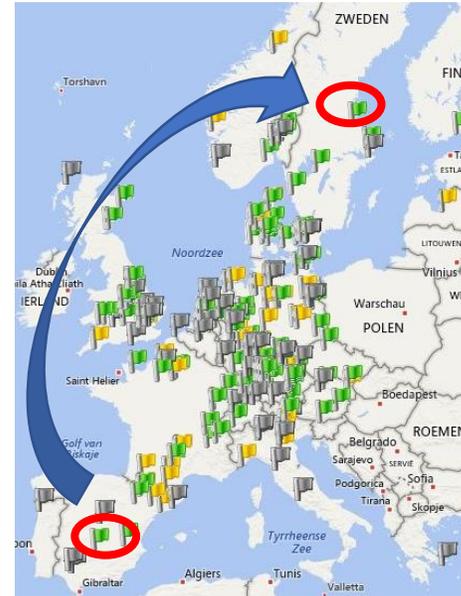
?

Some other goals / dreams

- Theme: Next Challenge we need to give more attention to the importance of international Hydrogen corridors for kickstarting zero emission transport. How can we contribute to zero – emission transport across borders.
- Mobile HQ: During the Challenge a bus drives from start to some landmarks to finish. This is the driving HQ bus that starts rolling 1 hour after start and is back in time for the finish. HQ has a communications team. Adventurous passengers can apply for a seat
- 24 hour hackathon: why waste time? Bring the right people together and have them crack a problem or a case. If the timing is right: put them the driving HQ bus.
- Other H2 experiences: We will check the development of the infrastructure and when its possible...see next slide:

96 hour North Cape

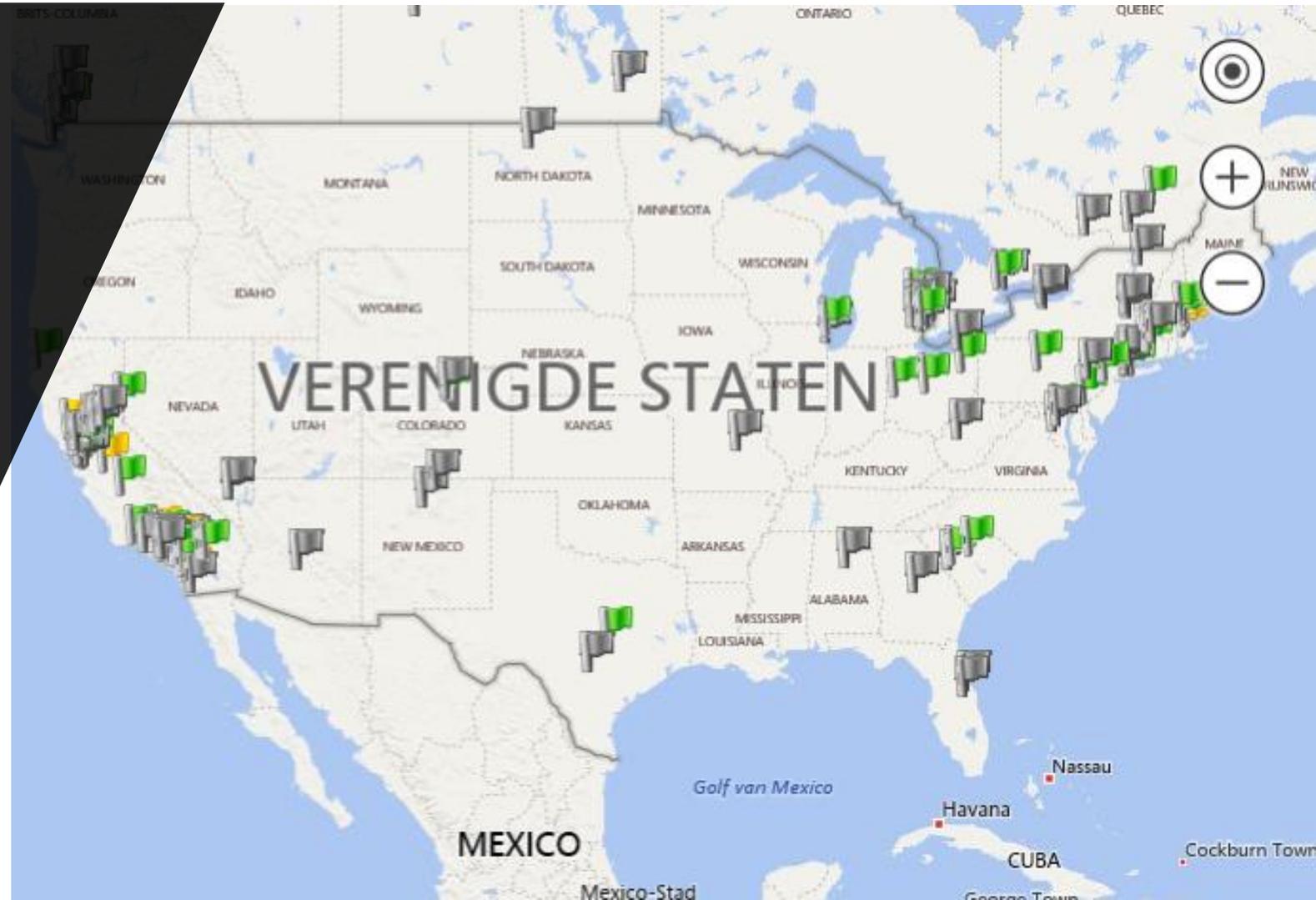
- From Spain to North Cape
- Southern point: Spain Castile La Mancha, Puertollano
- Northern point: Trondheim, Noorwegen (not yet operational) or Sweden Gävleborg, Sandviken.



Coast to coast?



- Maybe later... 😊





Adventure challenge

- Bergen – Trondheim – Oslo
- When will Bergen / Trondheim be operational? PDCA
- Build program.
 - Rally
 - Ferries (Bergen – Trondheim)
 - Toll (Trondheim- Oslo)
 - Renting cars?
 - Transport Bergen / Oslo
- NB Bergen – Trondheim is 800 km (!)
- NB according to KNAC 2000 km total. Google says in total 1400 km and 24 hour drive



Hackathon – let us hack a business case

What

Hydrogen is not yet cost competitive with other fuels. So they say. What is possible NOW? And what are the costs and the risks?

Infram has developed business case tools for commercial HRS's. These tools used in the pre-development stages of several stations in the Netherlands.

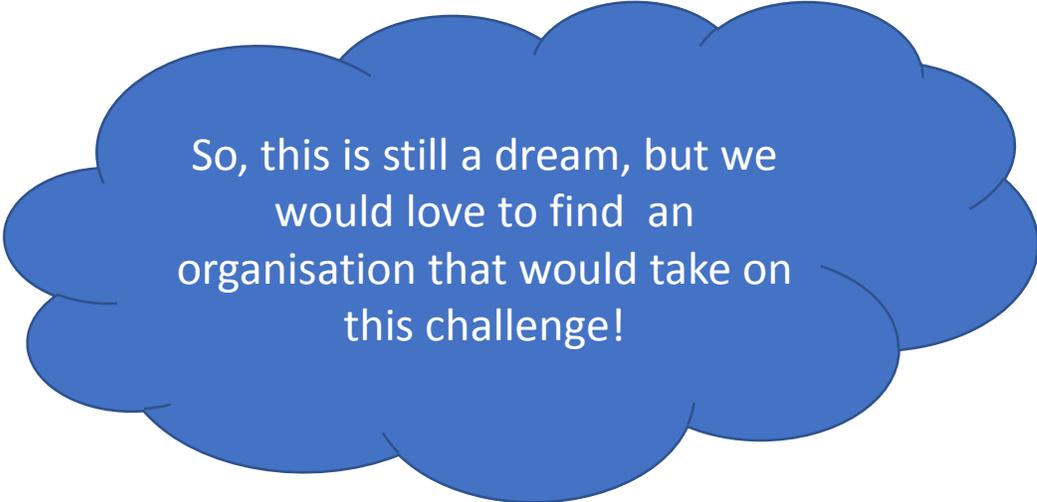
<https://www.rwsleefomgeving.nl/onderwerpen/mobiliteit/aandrijftechnieken/businesscase-toolbox/>

How

In this 12 or 24 h hackathon we facilitate the development of a proper case for a hydrogen refueling station.

Needed

- H2 HRS entrepreneur
- Local municipality
- Other businesses with zero emission ambitions
- Location for hackathon



So, this is still a dream, but we would love to find an organisation that would take on this challenge!

elfstedentocht

- speelregel tips ?

max 5 x tanken in
Land
25 strafpunten per
vulpunt

- andere events ?

Punten voor de ecorijden!
langste afstand tussen
2 tankstations?

- vraagstukken ?

Punten als je iemand
random persoon /
hoe vaak hoort
laat (meer) rijden in je
auto
↳ Bonus punten / CAK! ☺

- netwerk ? LINKEDIN

↳ nieuw idee delen
+ Ford's
video's

- In EU Mobility week
2 à 3 einddoelen + Bonus

september 2018
startpunt Arnhem of
Nijmegen

- Hoogst bereikte punt + NAP

x website st.
com. monday
XFCH2U - funding
de Poverie
x Toyota 3 vehicles..

x Hydrogen CARS
BRUSSELS
#H2 #24h24h

→ slide 1
Network
→ Japan tone
Beoordeling

Hydrogen
journalistiek

(online)
Magazine
Hydrogen
Toyota.

- Skype CMC
- mail groepen

Some feedback / idea's 6 March

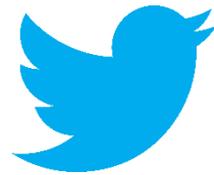
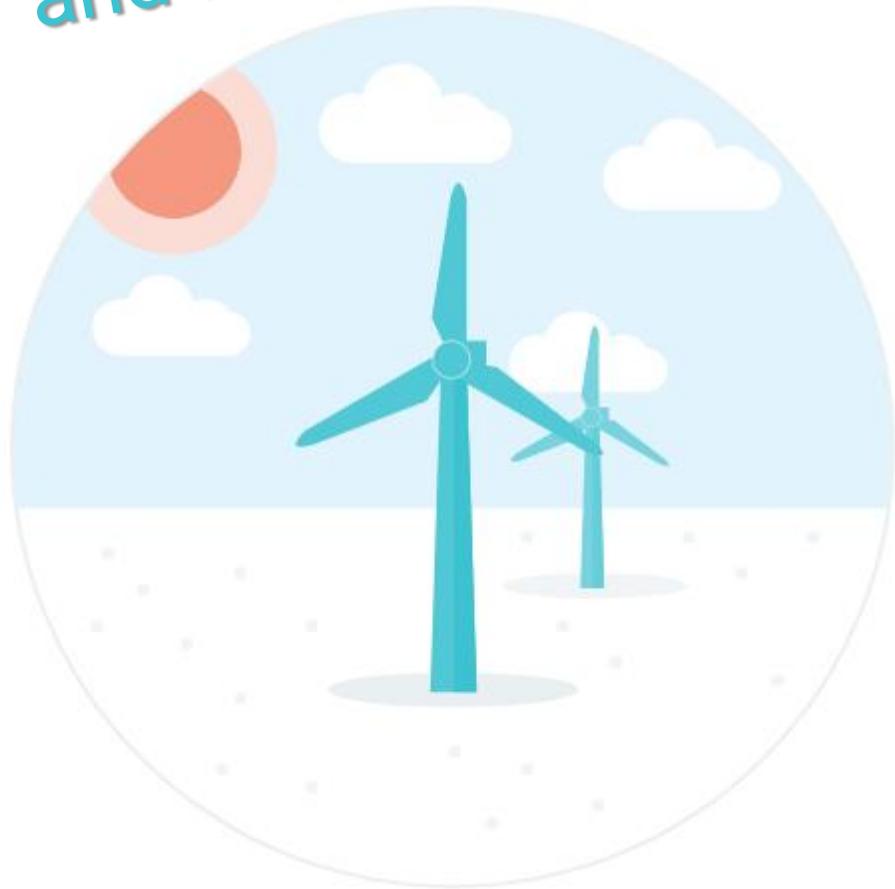
- Other Hydrogen Challenge concepts
 - FCEV Flash Mob in Brussels
 - EU Mobility week
 - September 2018 Green Capital Arnhem / Nijmegen
 - 11 steden tocht (11 cities round trip – carroussel/caravan)
- Rules / goals for this challenge
 - To go where no one has gone before
 - Highest and lowest point reached during challenge
 - Farthest N, E, S, W. Farthest from Waddineen, Farthest from any HRS
 - Special landmarks
 - Not too many fuellings in one country
 - Points for meeting / helping others
 - Points voor getting someone famous in your car
 - Points if you lose time while talking to media
 - Points for taking coffee / resting
- Other suggestions
 - Website in english (www.hydrogenchallenge.eu will be ready soon)
 - Invite press on board
 - Invite journalism colleges
 - Use the car brand online magazines

In the end, everybody is a winner!



www.hydrogenchallenge.eu

See you on 6th
and 7th of April, 2018!



#24H2Challenge
@24H2Challenge

**Thank you for your
attention. Any and all
feedback is
apprecreated!**

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