



# ANNUAL REPORT

## 2018

our year in facts and pictures

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H<sub>2</sub> MOBILITY DEUTSCHLAND



**SIX COMPANIES AND SIX ASSOCIATED PARTNERS**  
FROM THE AUTOMOBILE, GAS AND OIL SECTORS  
JOINED FORCES TO FOUND H<sub>2</sub> MOBILITY.  
THEIR COMMON GOAL? TO PUT IN PLACE THE  
**INFRASTRUCTURE** NECESSARY TO GUARANTEE  
HYDROGEN-POWERED MOBILITY COUNTRYWIDE  
IN GERMANY.

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# INTRODUCTION



# 1. INTRODUCTION

## 1.1 DISCLAIMER

This is a report about the activities of H<sub>2</sub> MOBILITY Deutschland GmbH & Co. KG in 2018. It has been prepared for key stakeholders from the automotive sector who together form the Industry Advisory Committee (IAC).

The Industry Advisory Committee meets quarterly to assess the progress of the infrastructure and advise the Managing Director of H<sub>2</sub> MOBILITY on matters concerning the customer value proposition.

This report is based on non-confidential information only and can be shared without restrictions.





Opening event at the 50th German Hydrogen Service Station in Potsdam //  
Nikolas Iwan, H<sub>2</sub> MOBILITY Deutschland, Jann Jakobs, Mayor of Potsdam, Bart Biebuyck, FCH-JU, Kathrin Schneider, Minister of Transport Brandenburg,  
Dr. Klaus Bonhoff, NOW, Bruno Daude-Lagrave, TOTAL Deutschland, Mural: Julian Vogel

# 1. INTRODUCTION

## 1.2 MILESTONES 2018



Hannover Trade Fair 2018  
**23 - 27 Apr 2018**



Launch of Hyundai NEXO  
**23 Apr 2018**



50th HRS Potsdam  
**7 Sept 2018**



Leipzig, 1st H2ME station opened  
**22 Oct 2018**



GWM MoU  
**24 Oct 2018**



Bayreuth – first station completed in under 12 months  
**28 Dec 2018**



60th HRS Munich, Ottobrunner Str.  
**28 Dec 2018**



Public Funding through NIP for 16 HRS secured  
**31 Mar 2018**

Lohfelden 1st COHRS station  
**9 Aug 2018**

Von der Europäischen Union kofinanziert  
 Fazilität „Connecting Europe“



CleverShuttle & IOKI start with FCEVs in Frankfurt  
**Oct 2018**



Launch of Mercedes GLC  
**13 Nov 2018**



Europa Release H2.LIVE  
**November 2018**



# 1. INTRODUCTION

## 1.3 EXECUTIVE SUMMARY



**Demand at H2M stations tripled**

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**26 new stations built**

14 already open for customers

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**60 stations open to customers**

at the end of 2018, 54 operated by H2M

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**Average availability stable at 93%**

technical issues at new stations during the first months

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**New cars Mercedes-Benz GLC F-CELL and Hyundai NEXO**

on the market, with demand exceeding supply by far

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**Strong growth of digital offer H2.LIVE**

> 1,000 weekly users of the app

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**COMPANY UPDATE //**

**H<sub>2</sub> MOBILITY 2018**





Growing H<sub>2</sub> MOBILITY fleet: 4 Toyota Mirai, 1 Mercedes-Benz GLC F-CELL, 1 Hyundai NEXO, 1 Hyundai ix35

2. COMPANY UPDATE // H<sub>2</sub> MOBILITY 2018  
2.1 FACTSHEET

**300 %**

demand tripled vs. 2017

**26**

new HRS built

**7**

FCEVs on the road for H2M

**5,000**

invoices to fuel customers  
(1,500 in 2017)

**1,600**

Purchase orders (500 in 2017)

**35**

people working for H2M

**12**

months to complete a station  
(Bayreuth)



## 2. COMPANY UPDATE // H<sub>2</sub> MOBILITY 2019

### 2.2 GROWING UP – AN INTERVIEW WITH NIKOLAS IWAN

**Nikolas Iwan was appointed Managing Director of H<sub>2</sub> MOBILITY in April 2016. In the interview below, H<sub>2</sub> MOBILITY Communications Adviser Sybille Riepe talks to him about key developments at H<sub>2</sub> MOBILITY over the past few months.**



Nikolas Iwan

**H<sub>2</sub> demand at your station tripled and 26 new hydrogen stations built – 2018 was a successful year! What were the driving factors?**

Indeed, 2018 saw good progress being made on many fronts. Demand at our stations increased threefold, we finished building 26 new stations and significantly lowered the 'time to market' for planning and building them. One of the stations, Bayreuth, we started building in 2018 and opened for customers before the year was out. That's record time to market! Our latest release of H<sub>2</sub>.LIVE shows not only our own H<sub>2</sub>M stations, but all stations across Europe where 700 bar FCEVs can refuel.

The 54 stations now operated by H<sub>2</sub>M make us the world's biggest network managed by a single operator – a big task for our operations team who did a fantastic job, literally working day and night to keep stations available and help customers on our hotline as needed. In the background, processes and systems were improved to handle the growing number of transactions. All in all, it's been an intense but successful year.

**Potsdam saw the grand opening of Germany's 50th hydrogen station. The station was funded by the European Commission in the Hydrogen for Europe (H<sub>2</sub>ME) project. Are you part of any other projects or funding programmes?**

We rely both on our growing team and on partners. Without the support we've received from the European Union and the German government, we wouldn't have come this far. In fact, we receive funding from two European projects, COHRS and H<sub>2</sub>ME, and also from Germany's NIP II program.

Without this public-sector support at this early phase of moving from R&D to mass market, we could neither build nor operate the network of stations. We have to bear in mind that hydrogen stations are very effective; the 60 stations we currently have can easily serve 20,000 customers and more. At this time, there are around 500 FCEVs in Germany.

## 2. COMPANY UPDATE // H<sub>2</sub> MOBILITY 2019

### 2.2 GROWING UP – INTERVIEW WITH NIKOLAS IWAN

**Sounds like you had a perfect year. Is that the case?**

Not quite. I expect that many customers still aren't happy with our availability, which averaged 93% over the year. Given the number of new stations, this is a remarkable achievement by the Operations team, but clearly there is still room for improvement! The biggest disappointment this year was probably that we were close to signing a contract with a new investor, Great Wall Motor from China, and then GWM walked away at the last moment.

The reason was that GWM, now with a newly appointed CEO, plans to focus on its domestic agenda – in China, the pressure to deliver FCEVs is growing very quickly. While from a global perspective this may be good news for hydrogen-powered mobility, it was not good news for us. We will intensify our dialogue with the other potential investors who have contacted us. Not because we are running out of money but because I foresee that the hydrogen business will gain momentum in the years ahead, and we

want to be prepared to possibly invest more than we currently envision with the existing investors.

**What are your goals for 2019?**

If I were to pick an overarching goal, it would be to use the many lessons learned in 2018 to improve the quality of our offer for customers in 2019. To name a few: it took us as long as 3 months to adjust and finetune a station after startup. That needs to be brought down to just a few days, and eventually zero. We had a supply shortage in Munich – this was a major annoyance for customers. Talks are ongoing with the suppliers about improving the situation.

Our average availability last year was 93%. In 2019, we want to take a big step forward, in particular by investing in some known issues at certain stations to fix those problems once and for all. Our hotline encountered its limits at around 3,000 calls this year – we are implementing an IT platform to better understand why customers are calling and handle calls

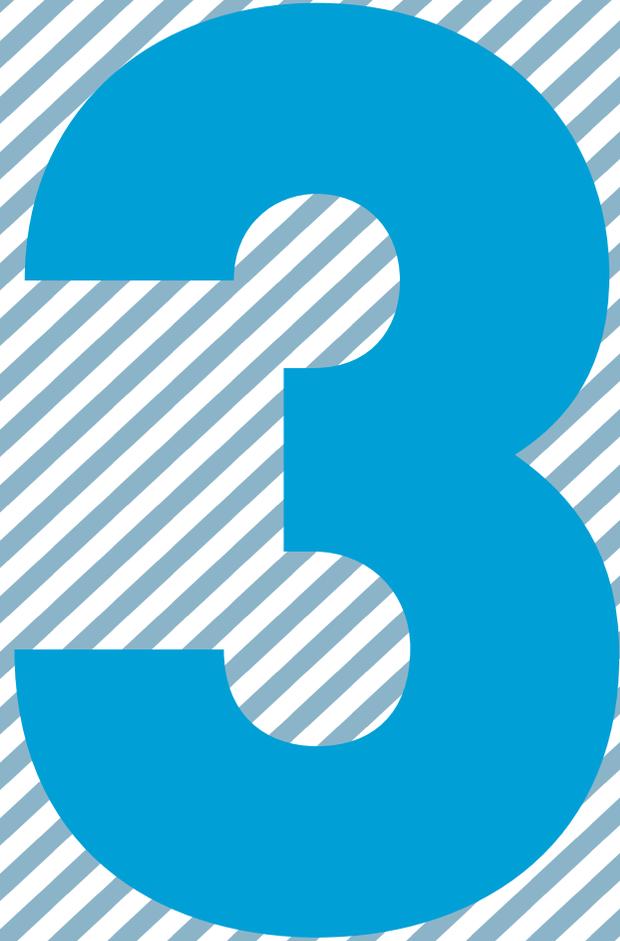
more efficiently. The current payment-card system is not state of the art, and with the launch of the H2.LIVE/CARD in February we are laying the foundation for a competitive payment offer. And there are many more projects to meet our most important goal: to win new customers, and to provide them and our existing customers with an offer that meets their needs.



H<sub>2</sub> MOBILITY at team event

**NETWORK OPERATIONS //**

**HANDLING TRIPLING  
OF DEMAND**



### 3. NETWORK OPERATIONS // HANDLING TRIPLING OF DEMAND

#### 3.1 FACTSHEET

**93 %**

availability

**10**

team members

**90 %**

refuelling performance  
9 of 10 refuellings were successful  
at first attempt

**> 600**

services on site

**23,000**

refuellings

**16**

new stations integrated

**40**

staff safety trainings on site



Safety training



### 3. NETWORK OPERATIONS // HANDLING TRIPLING OF DEMAND

#### 3.2 ACTIVITIES 2018

The factsheet gives good insight into key operations activities. What it doesn't show is the steep growth. Our hotline averaged about 10 calls per day, but by the end of the year there were days with 30 calls. Overall, the intensity for the operations team is growing in line with demand. And demand almost tripled vs. 2017, and continues on the up and up (see chart page 31).

Besides the regular activities in operations, there are several areas where the operations team executed projects to improve the robustness of the network and optimise costs. 35 stations were connected to the new monitoring system HRS CONNECT and started delivering data points into our systems from 50 sensors every minute. This lifts the potential for analysis of errors and fast reaction to a new level.

The next step is to introduce the right analytical tools to make the most of this data. Several smaller projects were conducted for individual stations or groups of stations to exchange critical hardware and improve software. For example in Frankfurt, right on time for our customers CleverShuttle and IOKI who started at the end of November with fleets of 10 FCEVs each, a task force changed the complete cooling system at the busiest station in Frankfurt. This enabled a smooth start for both customers and the HRS' performance has been very positive ever since (before it was one of the most difficult HRS in the network).

### 3. NETWORK OPERATIONS // HANDLING TRIPLING OF DEMAND

#### 3.3 PRIORITIES IN 2019

Safety has been a priority in 2018. It will become even more important and challenging with the increasing number of stations and customers in 2019. We are about to hire a dedicated HSEQ (Health Safety Environment and Quality) manager to reflect the increased span of activities in that area.

Operations made a big step forward in terms of the availability and performance of the stations in 2018. However, the focus in 2019 is to stabilise the high level that has been achieved for many stations, and to increase both values for stations where we are still below 95%. The overall goal is to beat the 93% average achieved in 2018.

The 24/7 hotline for problems customers face will be brought to the next level by implementing an IT platform that will allow us to generate data for better problem analysis and scalability.

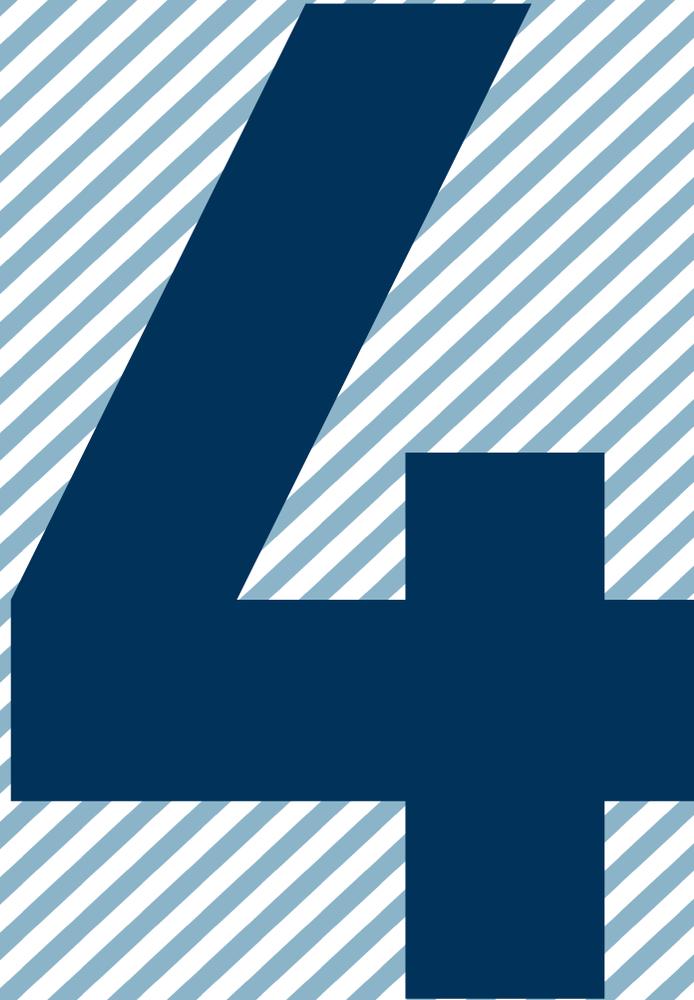


Back-to-back refuelling



New Station Wendling with new car  
Mercedes-Benz GLC F-CELL

**NETWORK DELIVERY //**  
**SCALING UP**



## 4. NETWORK DELIVERY // SCALING UP

### 4.1 FACTSHEET

26

HRS built,  
of which 14 opened  
for customers



Announcing five new HRS  
in the Nuremberg region

50

HRS projects started and  
handled in parallel



Opening in Ingolstadt

30

regions identified  
for 2020/2021, talks about  
demand concepts ongoing



Opening in Lohfelden

## 4. NETWORK DELIVERY // SCALING UP

### 26 HRS BUILT, 16 COMMISSIONED, 9 OPENING EVENTS



**15 Feb 2018**  
Opening HRS  
Wendlingen



**9 Aug 2018**  
Opening HRS  
Lohfelden



**7 Sep 2018**  
Opening HRS  
Potsdam (No. 50)



**5 Oct 2018**  
Opening HRS  
Leipzig



**21 Nov 2018**  
Opening HRS  
Magdeburg

**5 Mar 2018**  
Opening HRS  
Ingolstadt



**31 Aug 2018**  
Opening HRS Stuhr-  
Großmackenstedt



**18 Sep 2018**  
Opening HRS  
Dresden



**23 Oct 2018**  
symbolic opening  
HRS Weiterstadt



## 4. NETWORK DELIVERY // SCALING UP

### 4.2 KEY ACTIVITIES 2018

After seven stations opened for customers in 2017, the year 2018 added 14 new 'green dots' to the H2.LIVE map. Still short of our target – but another 12 stations were built and their opening is merely pending final tests (in all, 26 stations were built). So for the Delivery team it was a year of 'scaling up', also because around 50 projects were started and handled in parallel. This required varying approaches in some cases, and optimisation in others. Tendering and framework contracts for the major parts of a given HRS project – e.g. architect services and civil works – allowed for reducing the cost and increasing the reliability of planning.

Internal processes were optimised, from the hand-over to operations or the upstream stages of planning with the shareholders (the oil companies).

Safety has always been crucial to success, and has become even more central, in part because safety processes can significantly slow down a project if not properly planned and structured.

We have increased the focus on safety and also the efficiency of our safety processes by building the necessary in-house competencies to perform certain reviews, like pre-start safety reviews.

Besides handling the core task of planning and building, the Network Delivery team is also responsible for HRS specifications and tendering. In 2018 we conducted a successful tender for the remaining nine HRS: 3 were ordered from Air Liquide, 3 from Linde, 2 from nel and 1 from McPhy. This reflects our commitment to fostering competition, which will have positive effects on innovation and eventually on the prices of the technology, which is still expensive.

The tender was based on the improved specification document for HRS, which now incorporates the combined experience of the past two years of project and operations work. In parallel, work has begun on the specification for 2020 and beyond. Workshops were conducted with all suppliers to make sure they understand the expectations of the market and help us understand what they have in their development pipelines.

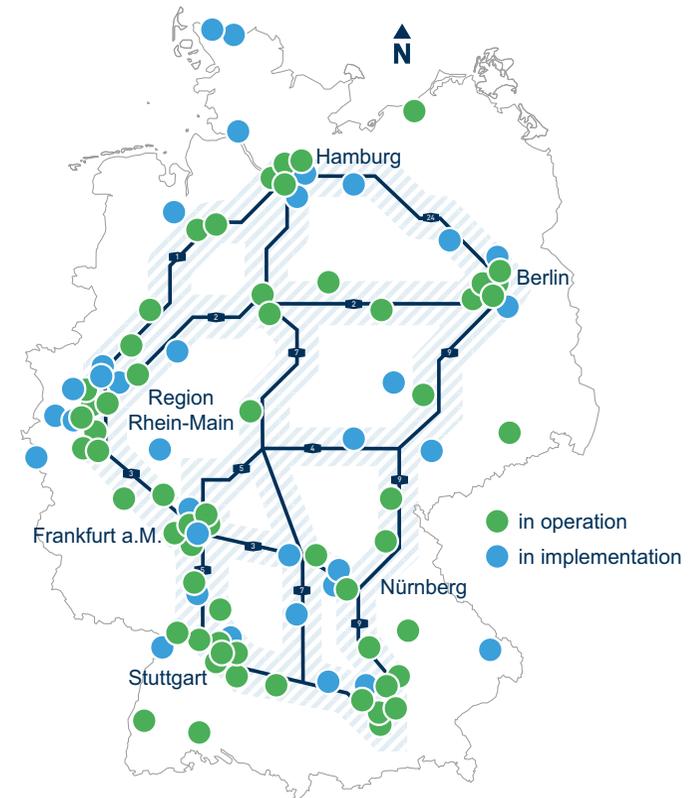
## 4. NETWORK DELIVERY // SCALING UP

### 4.3 PRIORITIES IN 2019

The key themes of Network Delivery will be, first, to continue with a continuous and fast rollout, with more than 25 HRS to be opened for customers.

Secondly, the projects for 2020 need to be initiated. A key prerequisite for this is to conclude agreements with customers to ensure that there is demand at the stations from day 1. This is because H2M is exiting the phase of unconditional roll-out and entering the next phase, in which stations will be built only if there is demand for H<sub>2</sub> at a given location.

The third focus is to complete the specification and launch the tender for the HRS to be built in 2020 and beyond.





Opening in Stuhr-Großmackenstedt

**BUSINESS  
DEVELOPMENT //**

**MARKET ACTIVATION**

**5**

## 5. BUSINESS DEVELOPMENT // MARKET ACTIVATION

### 5.1 KEY ACTIVITIES 2018 AND FACTSHEET

Business Development has become an integral part of our activities. We distinguish between short-term and strategic business development. In the short term, we strive to serve as a supporter and facilitator for the car manufacturers. We support their sales force with information and material, and we present the infrastructure so that they can offer new customers a service including all the salient aspects.

Important achievements in 2018 were that CleverShuttle started operations in Frankfurt with 10 FCEVs, and IOKI, another ride-sharing operator, started in Frankfurt at about the same time, with another 10 FCEVs.

The biggest ongoing project was the collaboration with DHL and StreetScooter, where we held regular workshops and status meetings to prepare for the launch of the first delivery vehicles.

69

tonnes of hydrogen sold  
at H2M stations

## Frankfurt

became a new hub (after Hamburg  
and Munich) for CleverShuttle and  
IOKI fleets

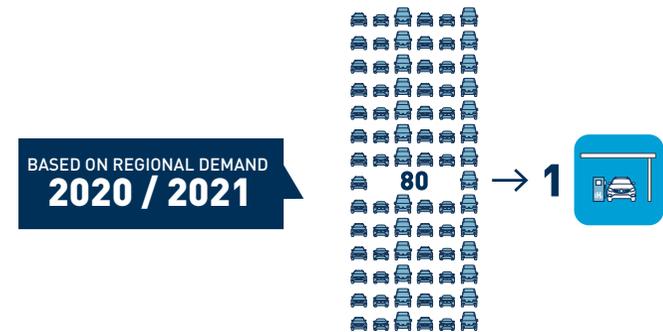
## 5. BUSINESS DEVELOPMENT // MARKET ACTIVATION

### 5.2 PRIORITIES IN 2019 / 2020 / 2021

Our goal is to at least double our sales of hydrogen in 2019. The primary goal of business development is to find customers for achieving that goal in cooperation with FCEV manufacturers.

We also think much longer term than we used to in the past. By the end of 2019 we will have largely completed our 'unconditional roll-out' program. For any further stations to be built, we need to ensure a baseload demand from day 1 of operations. That requires a long-term dialogue with potential customers.

Hence, right now the task of strategic business development is to find customers for 2020 and beyond, get their commitment to acquire FCEVs, and determine the right locations to build HRS, bearing in mind our network plan.





Opening of HRS No. 50 in Potsdam with 10 FCEV

**H2.LIVE //**

**BEING OBSERVED**



6. H2.LIVE // BEING OBSERVED  
6.1 FACTSHEET

## H2.LIVE App

grew steadily to 4,000  
monthly active app users



## Relaunch

of the website: number  
of web sessions increased  
to 50,000 per month

## Launched

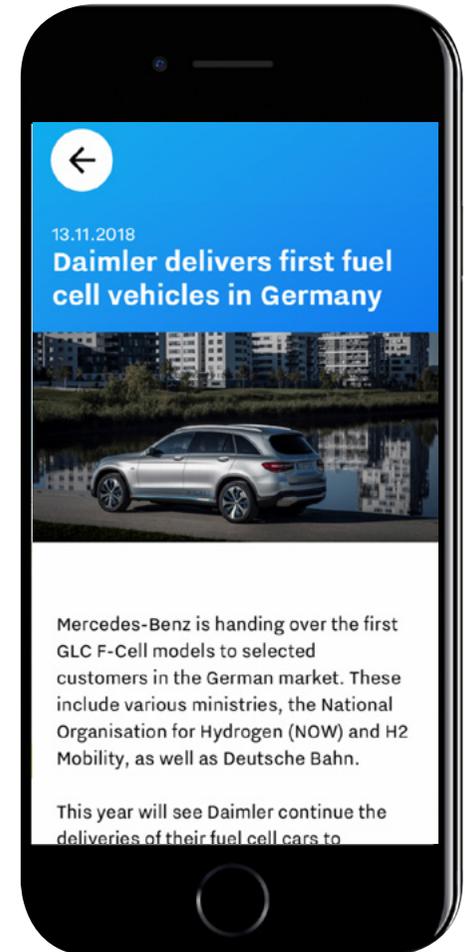
H<sub>2</sub> news:  
6200 clicks per month  
on news articles

## Launched

Europe Release with 110 stations:  
h2.live shall become  
the European platform for  
hydrogen. Comprehensive.  
Consistent. Cross-Device.

## Launched

Customer Login:  
My H2.LIVE grew to 650  
registered customers in 2018



Mercedes-Benz is handing over the first  
GLC F-Cell models to selected  
customers in the German market. These  
include various ministries, the National  
Organisation for Hydrogen (NOW) and H2  
Mobility, as well as Deutsche Bahn.

This year will see Daimler continue the  
deliveries of their fuel cell cars to

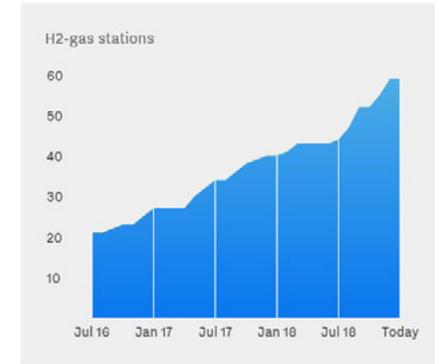
## 6. H2.LIVE // BEING OBSERVED

### 6.2 KEY ACTIVITIES 2018

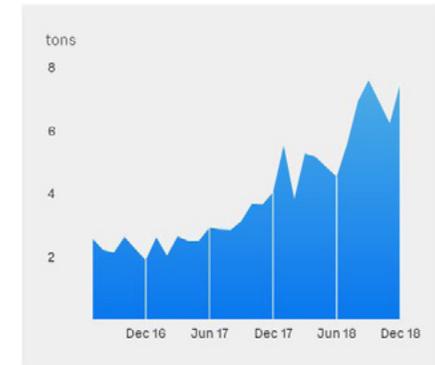
In April, just in time for the world's biggest industry fair in Hannover, Germany, H2 MOBILITY launched its new website [www.h2.live](http://www.h2.live). Both the app and the website are now synchronized and serve as our face to the customer.

The central feature is still the map of stations, which makes it easy to find a station, verify that it is available, give feedback, and get support. Potential buyers will also find information on all the cars currently available. Following the launch of the website, the next milestone was the release of a new version of the app, which now includes a European map of stations.

**Currently: 59 opened H2 stations in Germany**



**Hydrogen demand in Germany**

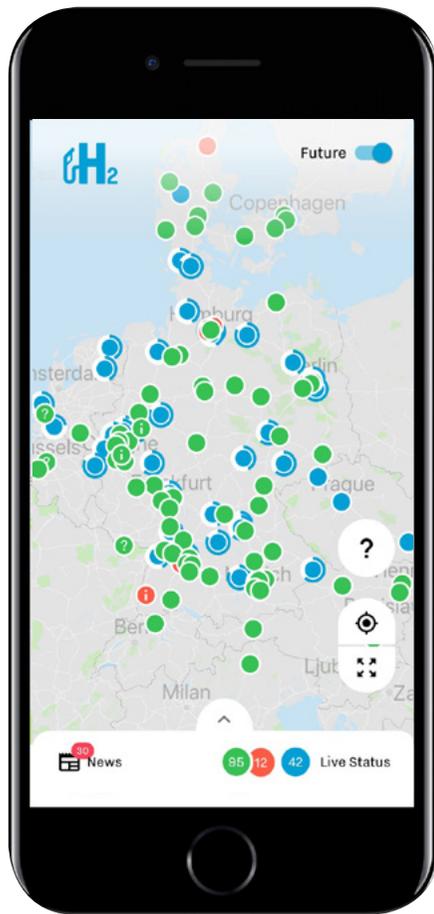


(Based on the fuel stations operated by H2 MOBILITY.)

New statistics available at [www.h2.live](http://www.h2.live)



Refuelling hydrogen in Europe



German hydrogen infrastructure

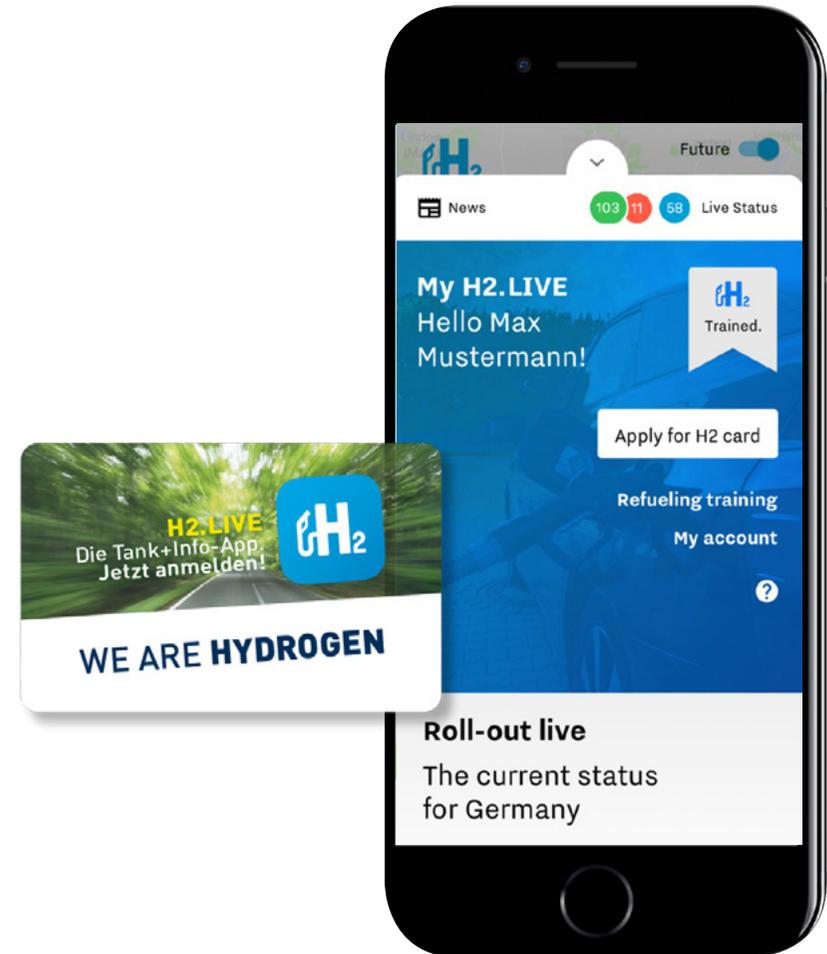


## 6. H2.LIVE // BEING OBSERVED

### 6.3 PRIORITIES IN 2019

Two big milestones lie ahead during the coming year. First, in February we will launch the H2.LIVE/CARD, replacing the existing H<sub>2</sub> card that allows customers to refuel at stations.

The IT platform we create with the H2.LIVE/CARD will be the foundation for further services, e.g. customers can access their refuelling data in the app. It also lays the foundation for our second big milestone: mobile payment and probably first pilots involving cross-border payment.



**PROJECTS //**

**TALKING HYDROGEN**



## 7. PROJECTS // TALKING HYDROGEN

Besides the core activities described in Chapter 6 of this report, there are several projects enabling our progress.

Name	H2.LIVE	HRS CONNECT	Site Openings	Infrastructure Study	Fairs	H2 Quality
<b>Project description</b>	Our <b>digital offer</b> to customers. It comprises the website, the app, and – from 2019 – the H2.LIVE/CARD.	The <b>MAINTENANCE module</b> allows the operations team to plan and document any service and maintenance work on site. This is a precondition for scaling up operations.  The <b>MONITORING module</b> delivers real-time data from each station for analysis.	One of the key projects for Communications. Maximise the <b>visibility of new stations</b> through various formats.	The Forschungszentrum Jülich research centre collaborated with H2 MOBILITY to conduct a comprehensive 'Comparative Analysis of Infrastructures: Hydrogen Fuelling and Electric Charging of Vehicles'.	Industry and energy fairs are an important platform for increasing the visibility of hydrogen- powered mobility in general and our activities in particular.  The <b>Hanover fair</b> was the key event for us in 2018 and will be again in 2019. We will present our work with a big stand and <b>Ride &amp; Drive</b> activities.	We tested the quality of our H2 using <b>stationary test equipment</b> operated by our partner ZSW.  The tests proved that the H2 dispensed at H2M stations complies with critical threshold values and meets the customers' quality expectations.
<b>Launched Status</b>	Q2 2016 Ongoing	Q2 2016 Ongoing	Q2 2016 Ongoing	Q2 2017 Completed Jan 2018	Q1 2017 Ongoing	Q1 2018 Completed in 2018

## 7. PROJECTS // TALKING HYDROGEN



24h challenge at the Future Mobility Summit



Explaining hydrogen at street events



Future Mobility Summit



Presentations



HSH Nordbank Run



Press relations



UNITI Trade Fair



Hannover Trade Fair together with NOW

## Shareholders

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## Associated Partners

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## Funding

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Air Liquide, Daimler, Linde, OMV, Shell and TOTAL joined forces in 2015 to set up the joint venture H<sub>2</sub> MOBILITY Deutschland GmbH & Co. KG. Its mission: swift, efficient development of the hydrogen infrastructure needed to provide country-wide coverage for fuel cell vehicles.



[www.h2.live](http://www.h2.live)

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