

# Hydrogen Quality Projects in Germany

HYDRAITE Workshop | Ulm, Germany | 8<sup>th</sup> March 2018

Elena Hof | Programme Manager NIP, NOW GmbH

# NATIONAL ORGANISATION HYDROGEN AND FUEL CELL TECHNOLOGY

## GOVERNMENTAL PARTNER FOR SUSTAINABLE MOBILITY



### National Innovation-Programme Hydrogen and Fuel Cell Technology

- Research and Development
- Market activation



### Charging Infrastructure

- Nationwide buildup
- Normal charging
- Fast charging



### Battery Electric Mobility

- Research and Development
- Communal mobility concepts
- Vehicle procurement



### Mobility and Fuels Strategy

- Alternative fuels (efficient, emission-free)
- LNG as a marine fuel
- Pilot projects



### Export Initiative Environmental Technology

- German-Japanese cooperation for P2G
- Development cooperation for H2/FC technologies
- cooperation with the GIZ



Programme coordination and implementation, strategy development, networking and contribution to visibility

# STRUCTURE OF THE NATIONAL INNOVATION PROGRAMME

## HYDROGEN AND FUEL CELL TECHNOLOGY 2016-2026



National Innovation Programme Hydrogen and Fuel Cell Technology 2016-2026 (€ 1.4 bn)

Measures of the Federal Ministry of Transport and Digital Infrastructure within the framework of NIP II (€ 250 million until 2019)

Programme  
Document of the  
BMVI

Contribution to  
the development  
of sustainable  
mobility

Funding Guidelines within the  
framework of NIP II

Funding guideline for measures of  
research, development and  
innovation

Release date 29/09/2016

Term: until 31/12/2019

Funding guideline for measures of  
the market activation

Release date 18/10/2017

Term: until 31/12/2019

# STRUCTURE OF THE NATIONAL INNOVATION PROGRAMME



NIP II

€ 250 million until 2019



Federal Ministry  
of Transport and  
Digital Infrastructure

Funding guideline R&D&I

Funding guideline MA

For measures of  
**research, development  
and innovation**

Release date: 29/09/2016  
Term: until 31/12/2019

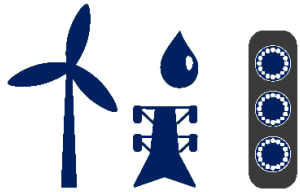
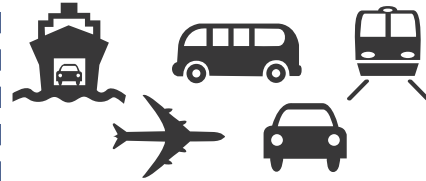
For measures of the  
**market activation**

Release date 18/10/2017  
Term: until 31/12/2019

# MEASURES OF MARKET ACTIVATION



- Vehicles (road, rail, water) and aircraft with fuel cell drives/engines



- Electrolysis installations if operated with renewable power

- Special vehicles in logistics equipped with fuel cells and
- H<sub>2</sub> refuelling stations



- Fuel cell cogeneration installations for on-board power supply on ships, vehicles and aircrafts
- Fuel cell based independent power supply for critical or off-grid infrastructures

# MEASURES OF R&D AND INNOVATION



Road transport

Aviation



Rail transport



Shipping



Logistics and special applications



Electricity-based Fuels  
(H<sub>2</sub>-production)



# HYDROGEN QUALITY PROJECTS WITH NOW INVOLVEMENT

- 2012: R&D project “50 Hydrogen Fuelling Stations in Germany” as part of the Clean Energy Partnership (CEP): Total, Linde, Daimler, Air Products, Air Liquide:  
Development of measures and technologies / establishment of processes for frequent surveillance of the hydrogen quality at refuelling stations.
- R&D project Hy-Lab (ZBT, ZSW)  
term: until September 2019  
funding quota: 100%  
funding volume: 3,082,000.00 €
- Two new project proposals currently in considering for funding

# TOPICS OF INTEREST

- Liquid organic hydrogen carriers (LOHC)  
Concerns for hydrogen quality?
- Timeframe for RCS activities
  - ISO/TC 197, WG 24: ISO/CD2 19880-1
  - ISO/TC 197, WG 27: ISO/CD2 14687
  - ISO/TC 197, WG 28: ISO/DIS 19880-8
  - EN/TC 268, WG 5: prEN 17124
- Demand for sensor systems at refuelling stations  
technical & economic point of view

**Thank you very much for your attention!**

**Elena Hof**

**Programme Manager NIP**

NOW GmbH – National Organisation Hydrogen and Fuel Cell Technology

Fasanenstr.5 | D-10623 Berlin | Germany

Phone: +49 30 311 61 16-39

e-mail: [elena.hof@now-gmbh.de](mailto:elena.hof@now-gmbh.de)

Internet: [www.now-gmbh.de](http://www.now-gmbh.de)



# FAST ADVANCEMENT OF FCEV AND HYDROGEN REFUELLING INFRASTRUCTURE IN GERMANY

- In 2017 refuelling infrastructure was more than doubled
  - Before 2017: **20** refuelling stations
  - After 2017: **45** refuelling stations
- More models are available on the market
- Until now **254 passenger cars** and **64 bus procurements** were granted through the NIP market activation
  - In contrast, in December 2017 there were **304 hydrogen vehicles** registered in Germany

**BEFORE 2017**



**HYUNDAI IX35 FUEL CELL**



**TOYOTA MIRAI**



**MERCEDES GLC FUEL CELL**



**HONDA CLARITY FUEL CELL**



# GERMAN TARGETS FOR HYDROGEN INFRASTRUCTURE



# FILLING UP WITH HYDROGEN WILL SOON BE POSSIBLE GERMANY-WIDE

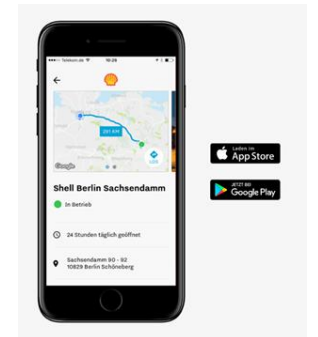


Berlin, October 13, 2015

## Shareholders



## Associated partners and advisors



All hydrogen stations shown are

- 700 bar
- publicly accessible