

Hydrogen Council

Excerpt Presented by
Ole Hoefelmann

CaFCP

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How hydrogen empowers
the energy transition



DAIMLER



Mission & Vision statement

Mission

The Hydrogen Council is founded **to actively advocate the enabling role hydrogen has in the energy transition** to ensure climate goals are being met and energy security is obtained

Vision statement

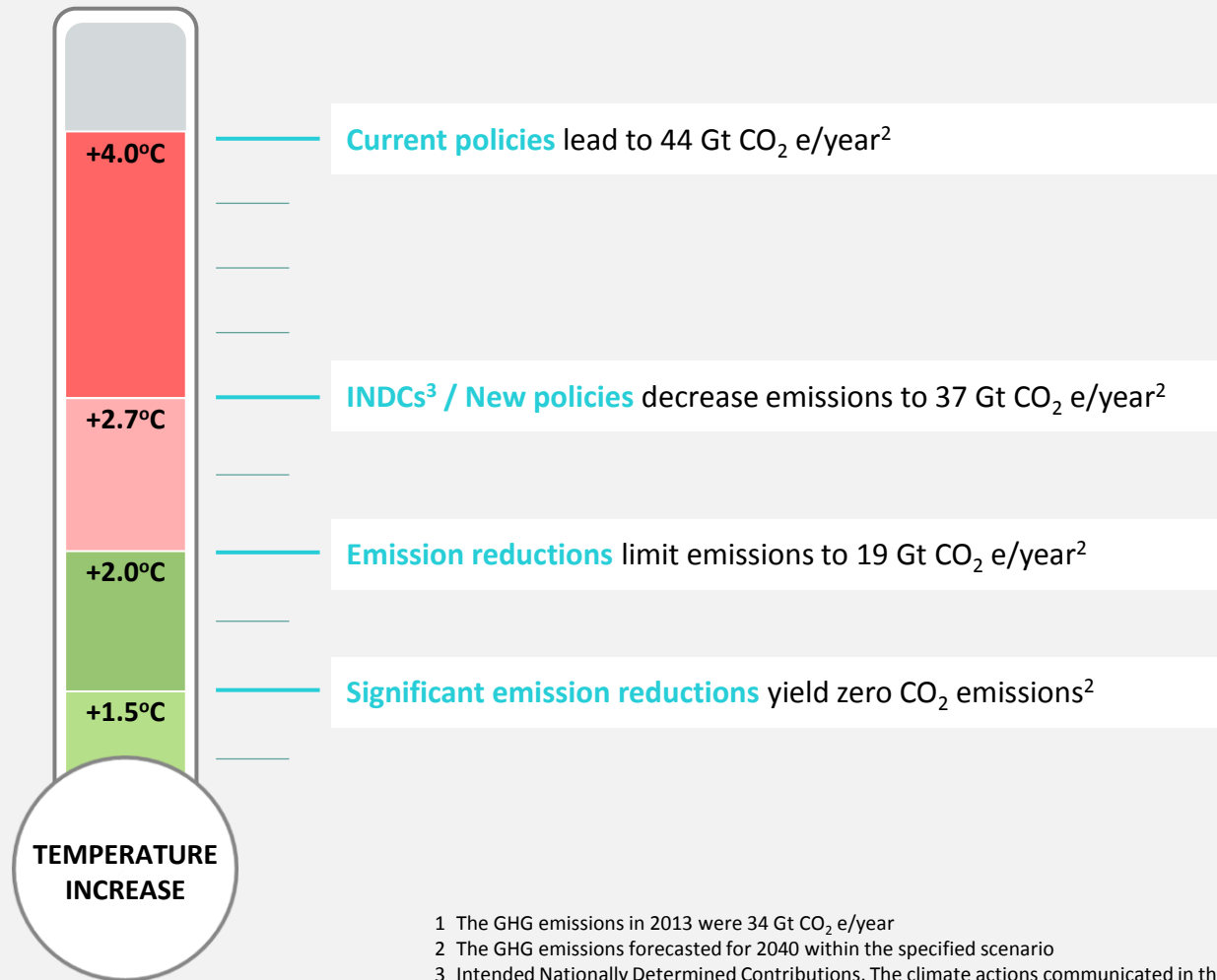
To accommodate good insights and understanding into the potential role of hydrogen, the council will:

- **Facilitate discussion** and provide visibility and understanding of hydrogen technology
- Launch economic studies and host expert workshops on specific issues.
- **Define (multi-)annual priorities** on hydrogen technology progress
- Work with and **provide recommendations to a number of key stakeholders** such as policy makers, business communities, international agencies and the civil society to achieve these goals

As of January 2017, the Hydrogen Council is composed of the following companies:

To limit climate change to well below 2°C by 2100 the energy sector needs to be decarbonized – Current efforts are not enough

Temperature increase by 2100 due to global energy related GHG emissions, in Gt CO₂e/year¹



1 The GHG emissions in 2013 were 34 Gt CO₂ e/year

2 The GHG emissions forecasted for 2040 within the specified scenario

3 Intended Nationally Determined Contributions. The climate actions communicated in these INDcs help estimate whether the world achieves the long-term goals of the Paris Agreement

Source: IEA (2014), CO₂ Emissions from Fuel Combustion; IEA (2015) World Energy Outlook; IEA (2015) World Energy Outlook Special Report on Energy and Climate Change, IEA ETP 2016, ECCE 2016

Four major levers are needed to enable the energy transition

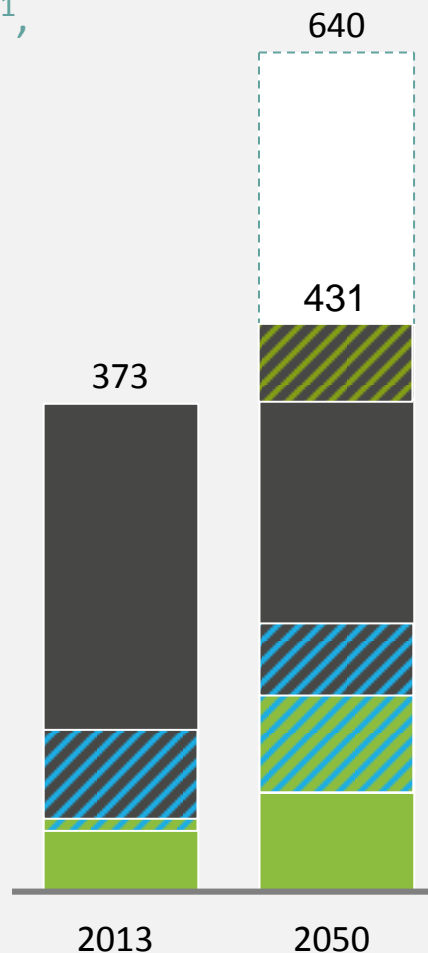
Final energy consumption¹, 2013 and 2050, in EJ

Energy demand w/o efficiency improvements²

Carbon capture and storage (CCS) or utilization (CCU)³

Fossil fuels

Power sector – Fossil fuels⁴
Power sector – Renewables
Biomass and waste



1. **Increasing energy efficiency**
limits the rise of energy consumption
2. **CCS/U** decarbonizes the use of fossil fuels
3. **Switch to zero emission energy carriers**,
e.g., electricity or hydrogen
4. **Renewables** replace fossil fuels

¹ Final energy consumption within the 2°C scenario of the IEA

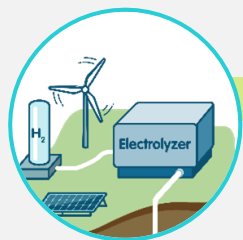
² Increase of energy demand is determined via the relative increase of CO₂ emissions w/o energy efficiencies

³ The fossil fuels amount processed using CCS/U was determined to be 25% of the total amount of fossil fuels by relating the CO₂ emission reduction compared for the 2DS and 6DS scenario

⁴ The fossil fuel power sector also includes nuclear energy

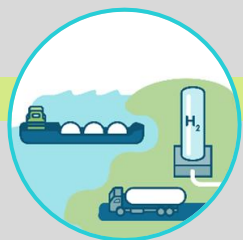
Hydrogen has seven roles in the energy transition

SOURCES OF ENERGY

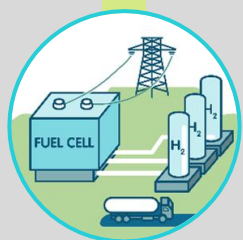


1. Enable **large-scale, efficient renewable energy** integration

BACKBONE OF ENERGY SYSTEM

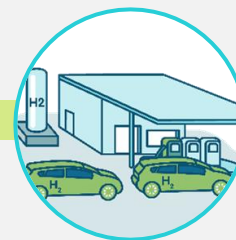


2. **Distribute** energy across sectors and regions

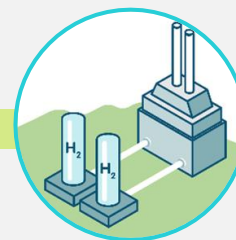


3. Act as a **buffer** to increase system resilience

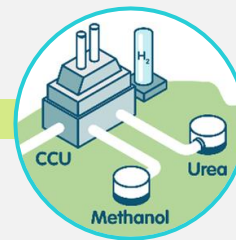
END USES



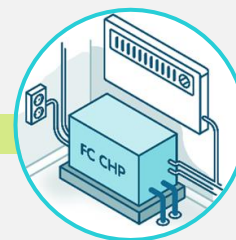
4. Decarbonize **transport**



5. Decarbonize **industry** energy use



6. Serve as **feedstock** using captured carbon



7. Help decarbonize **building heating**

Energy vectors

Hydrogen

Barriers need to be removed to fully unlock the potential of hydrogen

Many hydrogen **investments** require a **long horizon** of 10 to 20 years

Competing technologies have benefitted from **clear regulatory guidelines** on financial stimuli

Mobility applications require a **coordinated effort across industries**

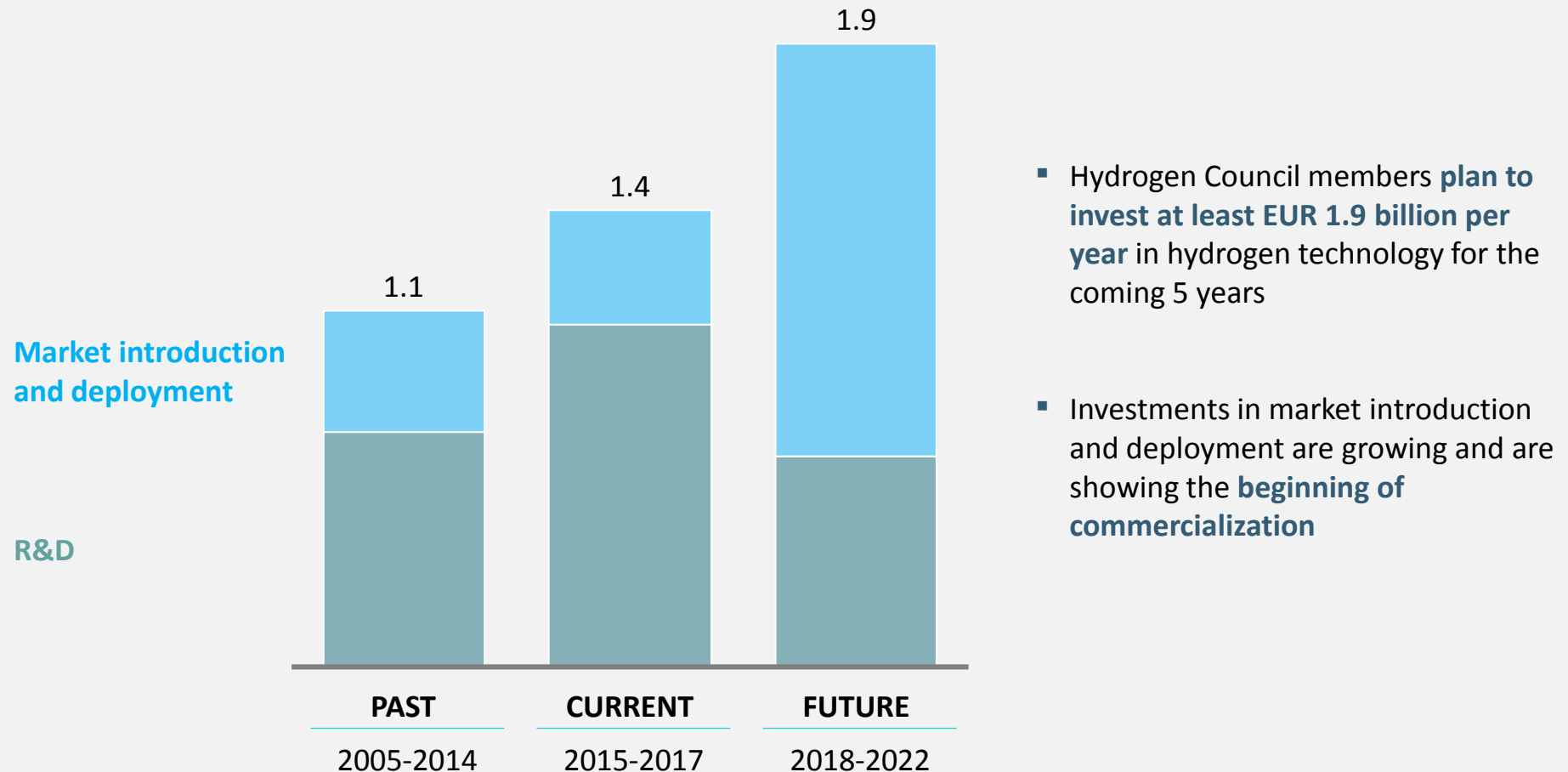
Industry standards are needed to drive economies of scale

Potential of **hydrogen as enabler for the energy transition** fully unlocked and **self-sustainable industry created**

FINISH

The members of the Hydrogen Council already plan to orient their increasing annual investments towards hydrogen on market development

Investments planned by Hydrogen Council members, in EUR billions per year



Source: Hydrogen Council

A collaborative approach of policy makers and industry is needed today to enable the full potential of hydrogen in the energy transition



Provide long-term and stable policy frameworks to guide the energy transition in all sectors



Develop hydrogen-specific coordination and incentive policies to encourage early deployment of hydrogen solutions and sufficient private-sector investments.



Facilitate harmonization of industrial standards across regions and sectors to enable hydrogen technologies and take advantage of scale effects and decrease costs.

Thank you