WIVA P&G
Hydrogen Initiative Model Region Energy Austria

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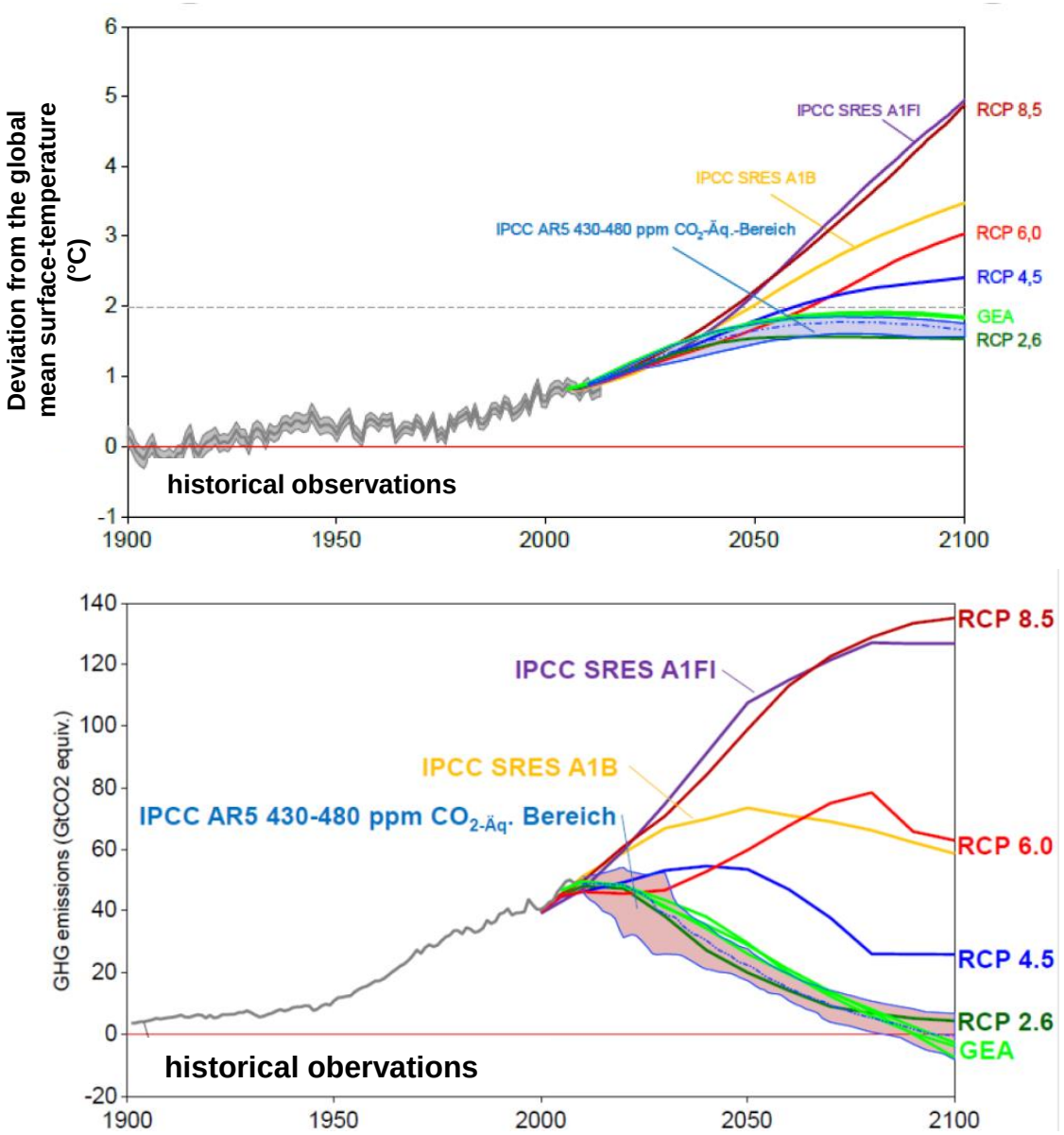
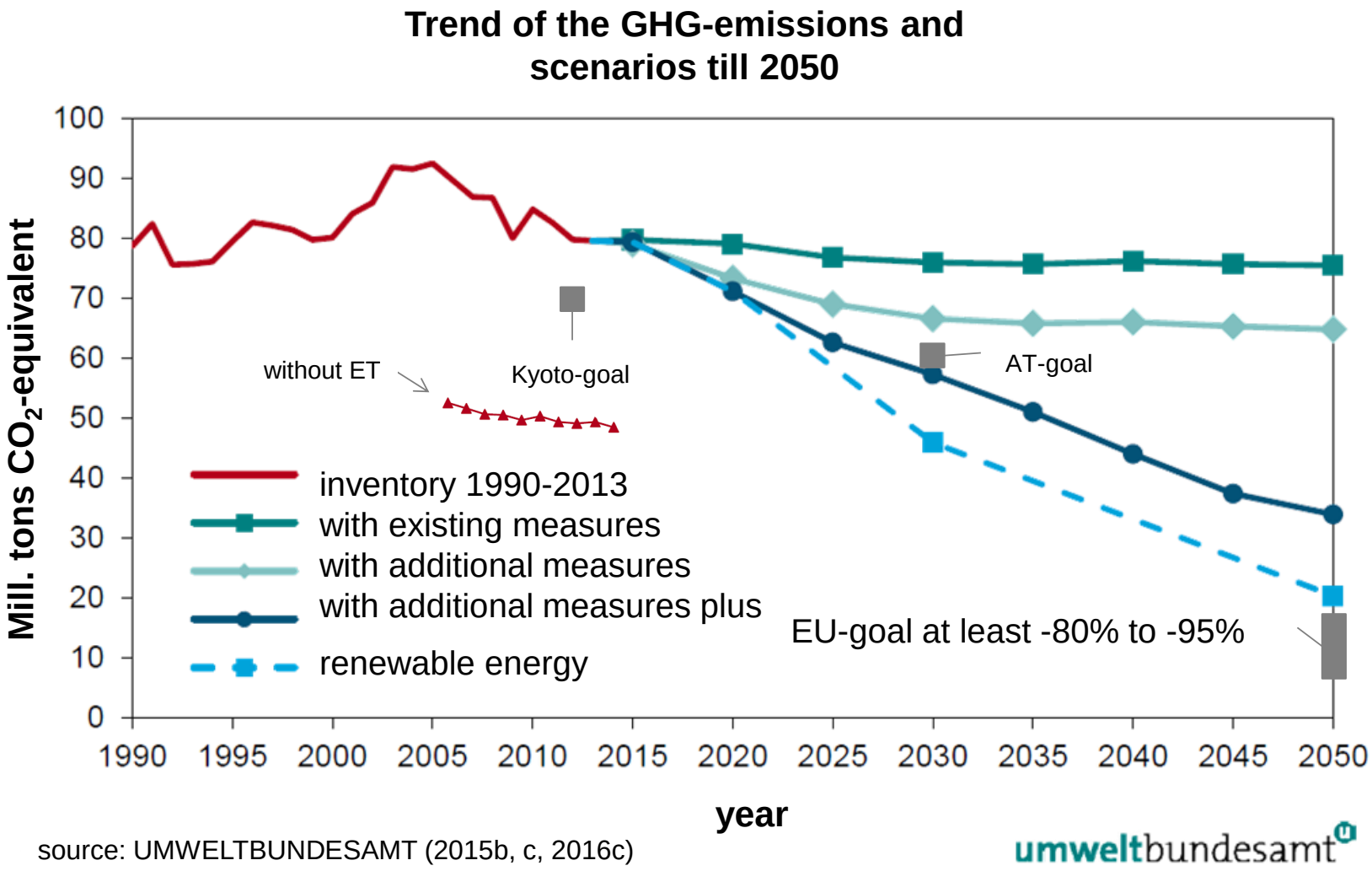
Vienna, A3PS 18. Oktober 2016

Global Background / GHG



Austrian Background / GHG



source: UMWELTBUNDESAMT (2015b, c, 2016c)

Decarbonisation why?

A sustainable emission-free and closed-loop energy circle with electricity and hydrogen is possible

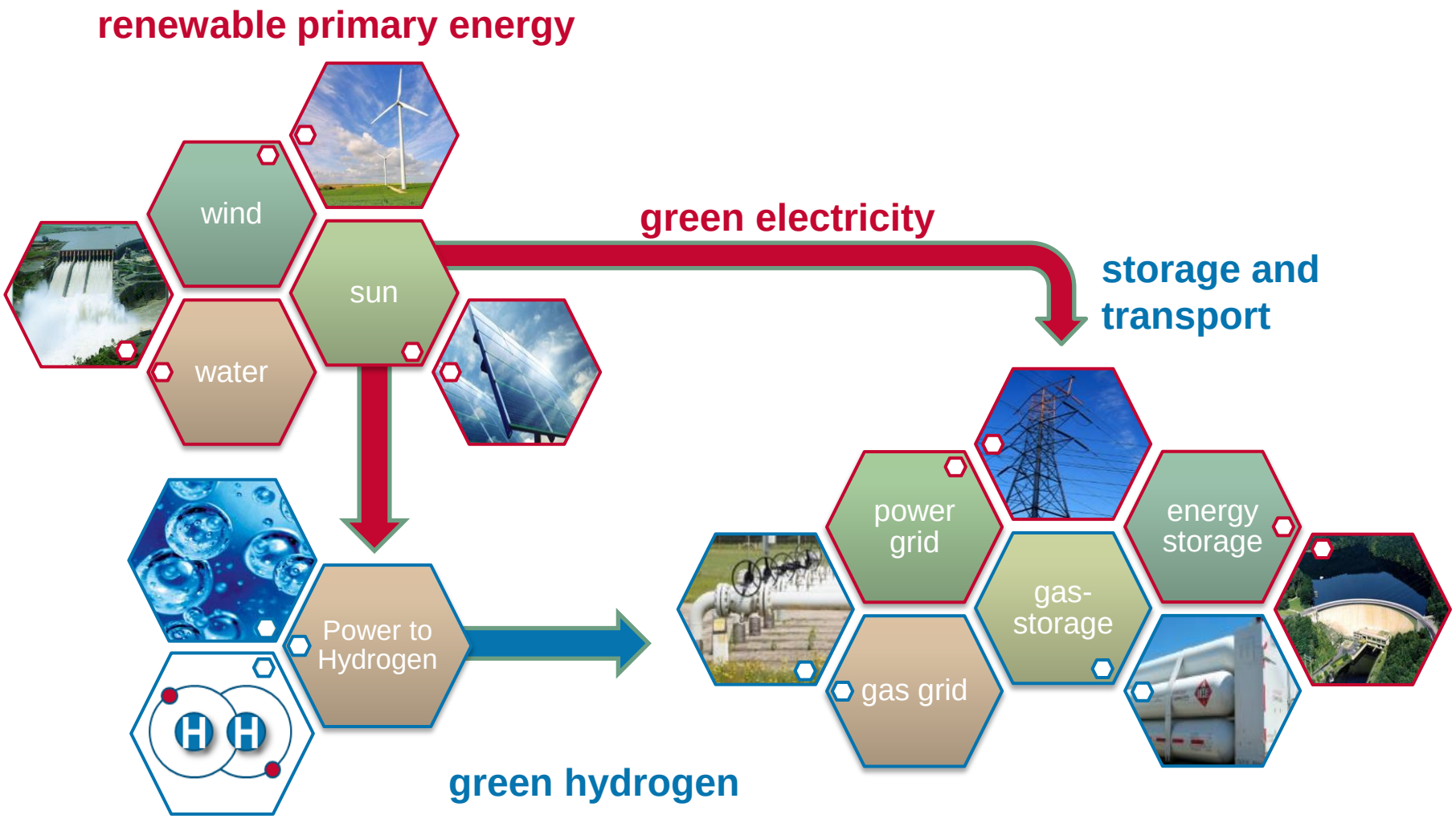
- Reduction of the emission of pollutants, noise, and GHG
- Reduction of imports of fossil energy (400 b€ / year in EU from political instable countries)
- Reduction of climate damage (weather extremes, climate refugees)
- Increase of efficiency (electrochemical cell instead of heat engine with Carnot efficiency)

Hydrogen why?

A sustainable emission-free and closed-loop energy circle with electricity and hydrogen is possible

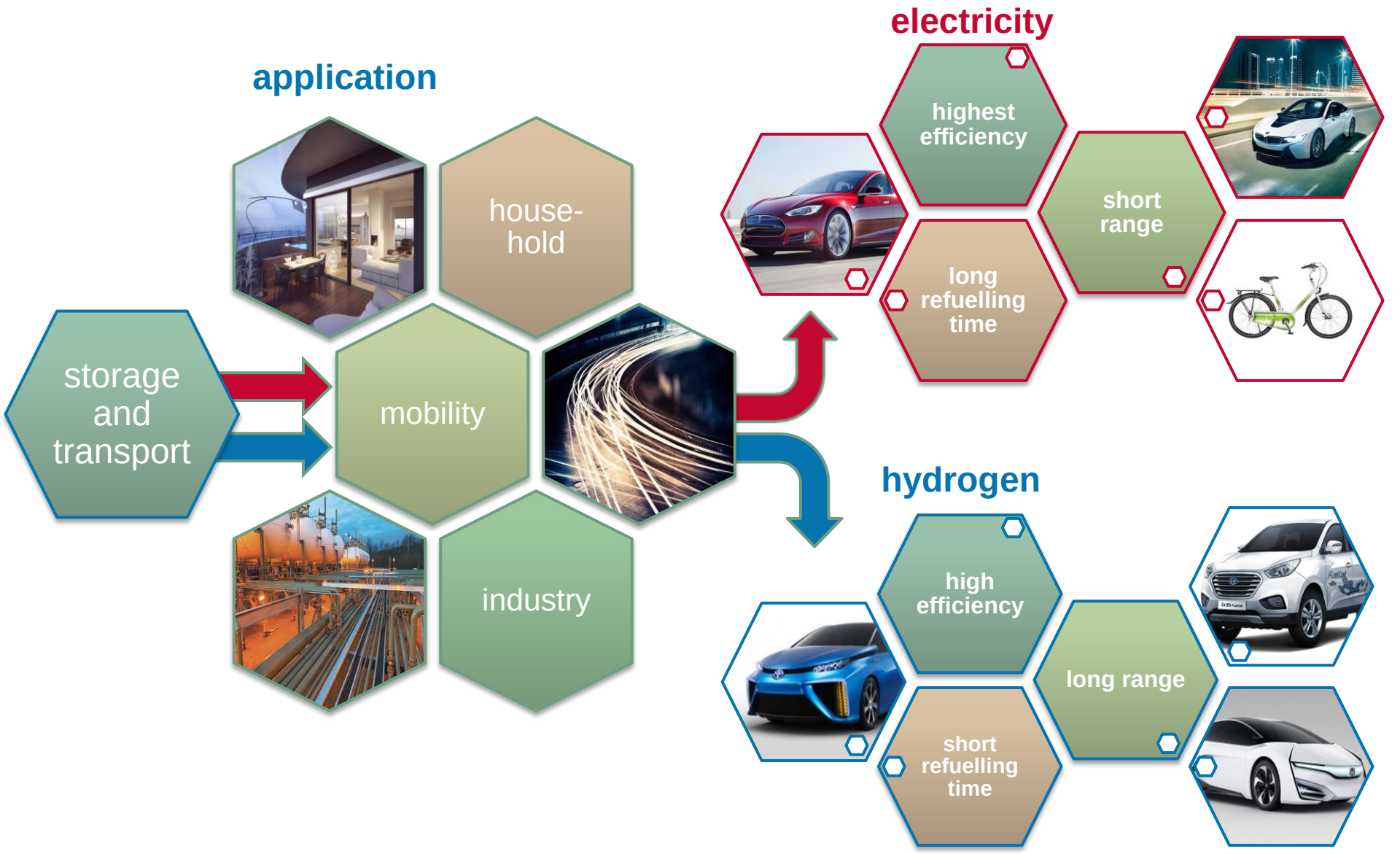
- Storage of electrical energy difficult
- Fluctuating electricity production needs hydrogen as energy storage
- Distribution of energy needs electrical PLUS gas grid
- application in all sectors of traffic, industry, and households
- Mobility: long-range electromobility with short refuelling times

Vision Hydrogen Economy



Vision Hydrogen Economy Mobility

HyCentA HYDROGEN CENTER AUSTRIA



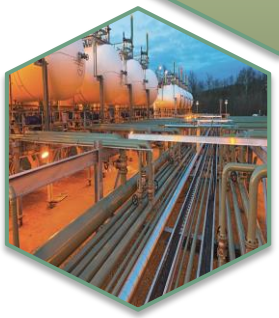
Vision Hydrogen Economy Household

application

house-hold

storage and transport

mobility



industry

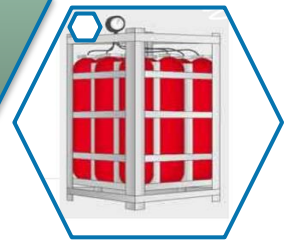
energy autonomic household

photo-voltaics

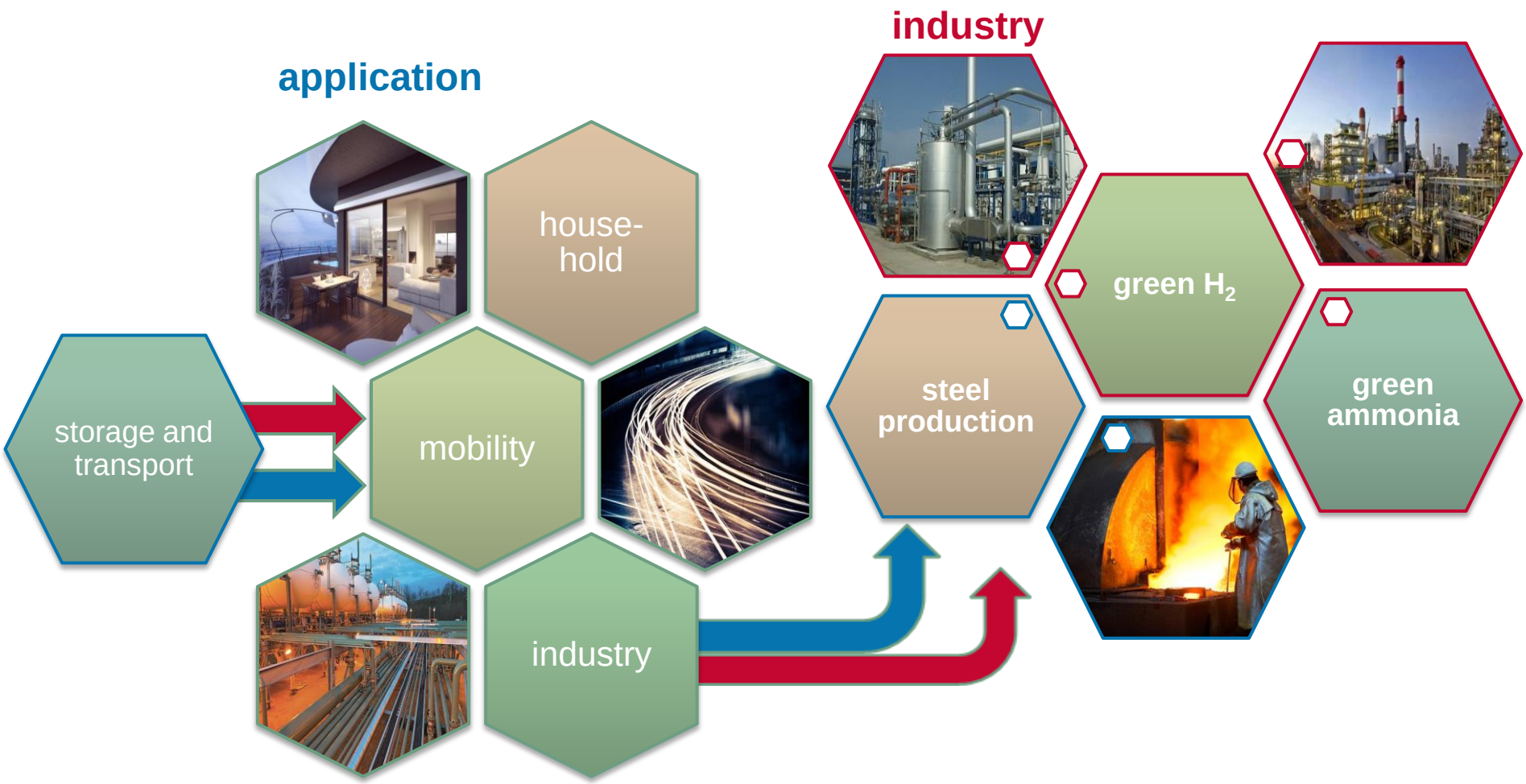
power generation

electrolysis

energy storage

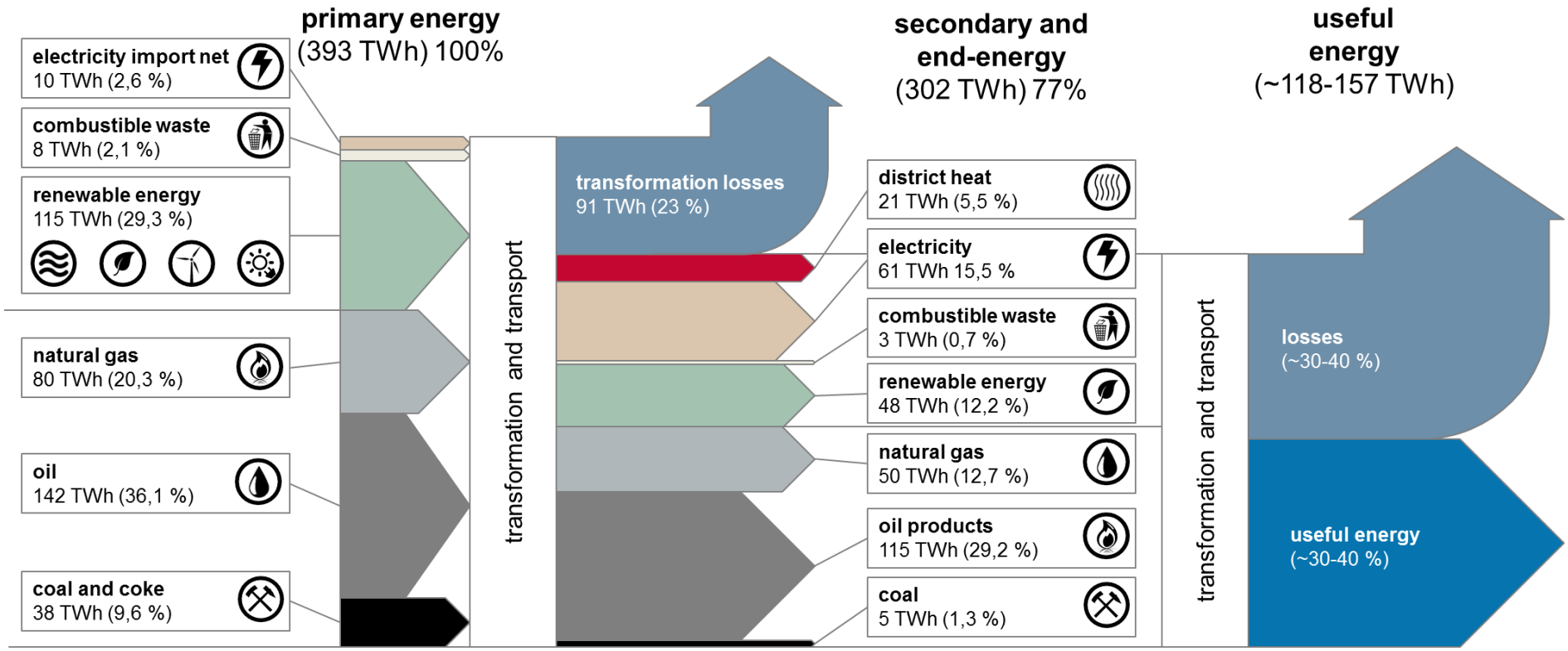


Vision Hydrogen Economy Industry



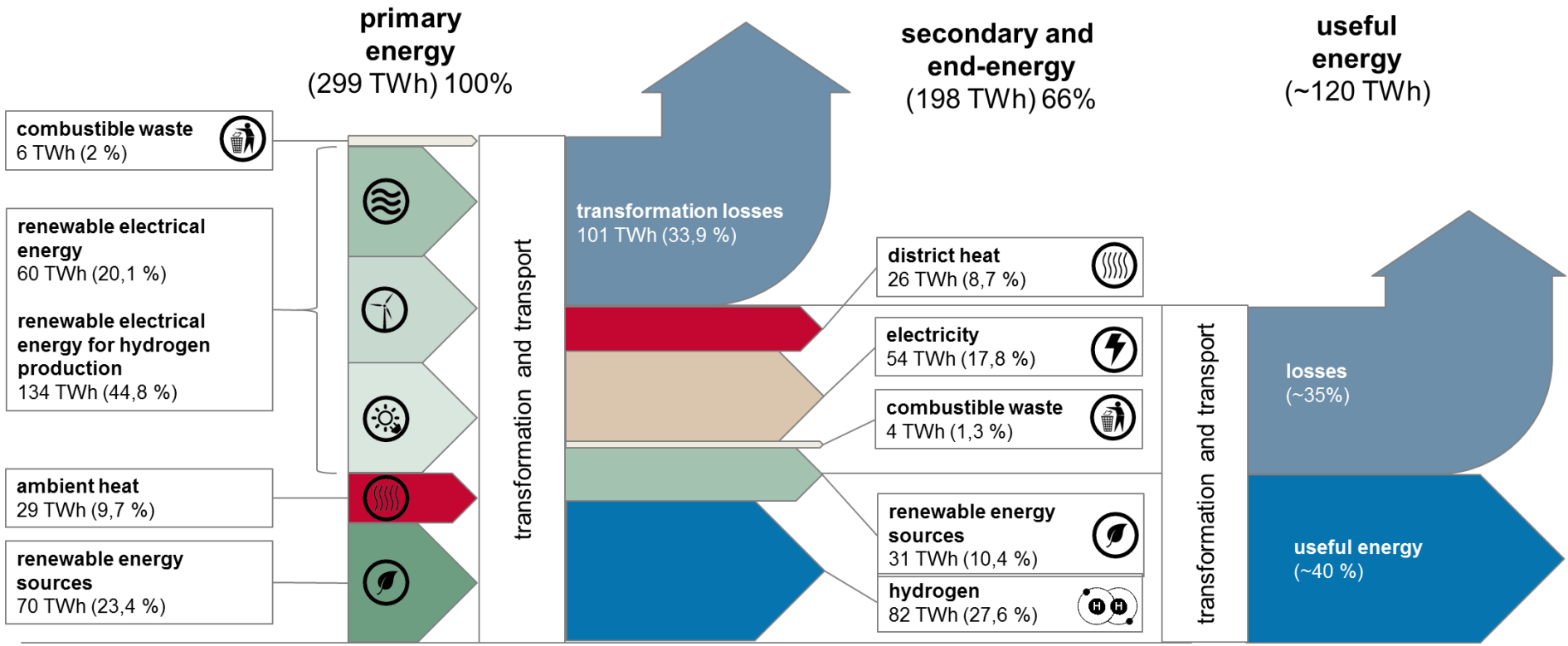
Energy System Today A

~ 2/3 of the primary energy consumption are based on fossil energy sources



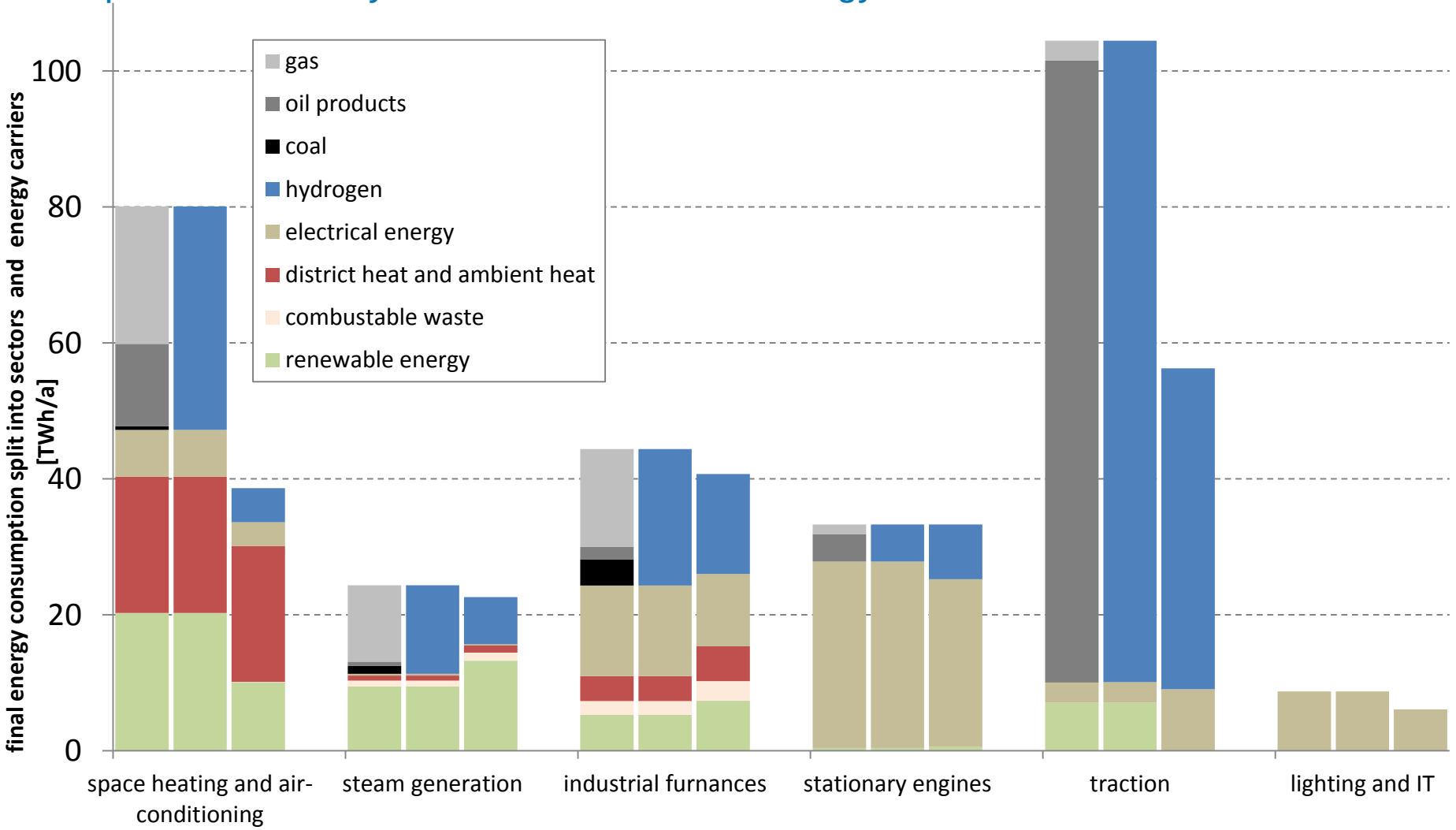
Energy System H instead of C, optimized

- **Primary energy consumption without fossil energy sources**
- **Optimisations analog to the Federal Environment Agency**

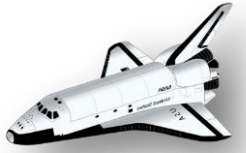


Final Consumption H instead of C, optimized

Improved efficiency and substituted fossil energy carriers



Application of H_2

















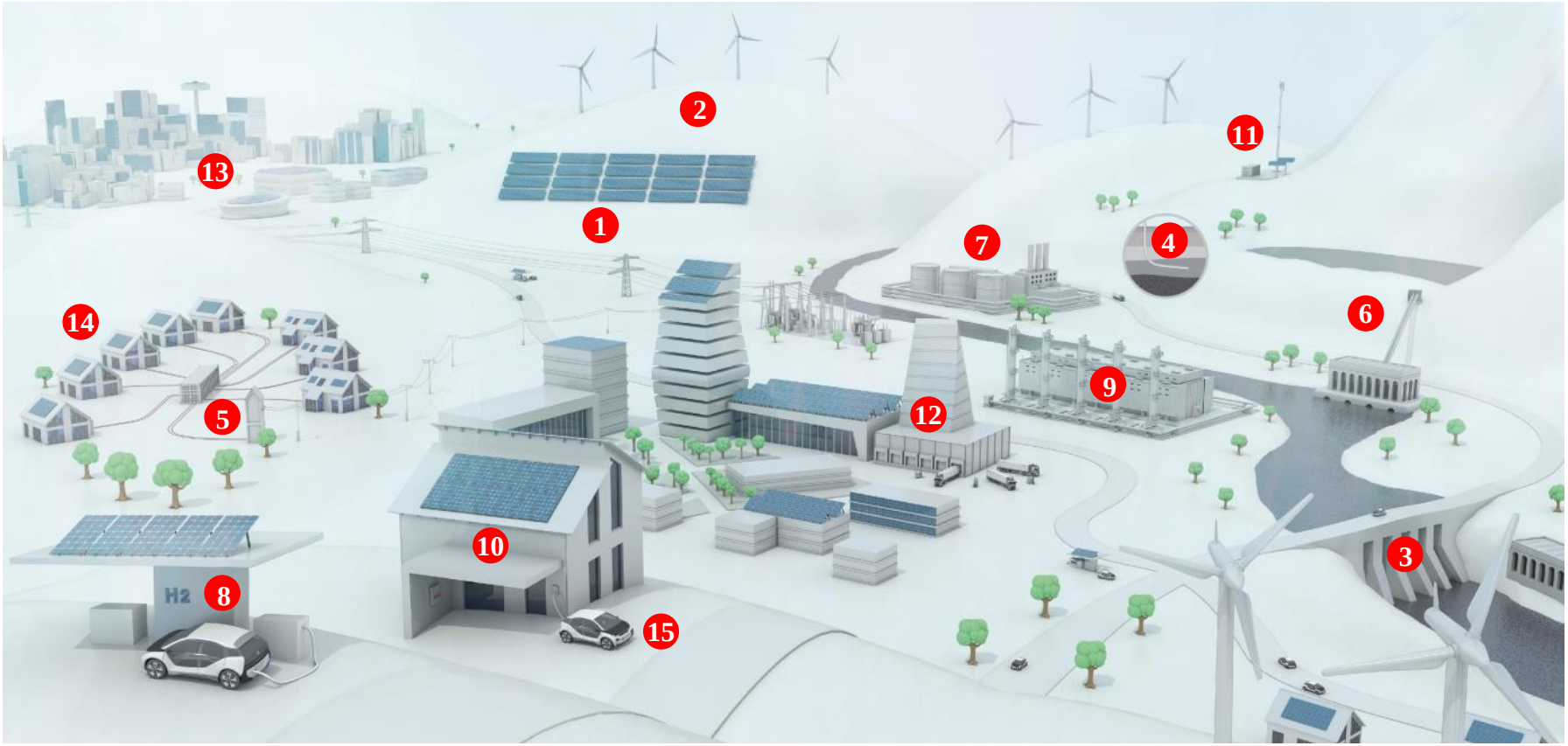


Today‘s Technology!

Flagship Energy Region WIVA P&G

- **Increase of renewable energy production**
  - Transition to renewable energies requires regionally adjusted solutions
  - High potential of wind and sun energy, though fluctuation is very high
- Sustainable energy based on renewables requires respective **energy storage**
- **Hydrogen and synthetic methane** represents an ideal energy storage

Hydrogen Economy in A



***Energy supply**: 1. photovoltaic power plants, 2. wind power plant, 3. hydroelectric power plant*

source: Fronius

***Energy distribution and storage**: 4. natural gas/hydrogen pore-storage, 5. gas distribution with municipal storage, 6. pumped-storage power plant, 7. central electrolysis-/methanation system*

***Energy Consumption**: 8. gas- / hydrogen- / electric filling station, 9. gas power plant, 10. energy-self-sufficient single-family house, 11. energy-self-sufficient radio station, 12. green intra logistics including heavy traffic, 13. Smart City, 14. Smart Village and small businesses, 15. electromobility (accumulator and fuel cell)*

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Vision

Das HyCentA (Hydrogen Center Austria) fördert die Nutzung der von Wasserstoff als regenerativem Energieträger. Mit einem Wasserstoffprüfzentrum und der ersten österreichischen Wasserstoffabgabestelle fungiert das HyCentA als Kristallisationspunkt und Informationsplattform für wasserstoffbezogene Forschungs- und Entwicklungsaktivitäten.