

<b>DOCKETED</b>	
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<b>Project Title:</b>	Natural Gas Outlook and Assessments
<b>TN #:</b>	239030
<b>Document Title:</b>	Presentation - Hydrogen
<b>Description:</b>	S2.2B Venkat Venkataraman, Bloom Energy
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<b>Organization:</b>	Bloom Energy
<b>Submitter Role:</b>	Public
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<b>Docketed Date:</b>	7/27/2021

**Bloomenergy**

**IEPR Commissioner Workshop on Hydrogen to Support  
California's Clean Energy Transition**

**Bloom Energy's Vision in Decarbonization with Hydrogen**



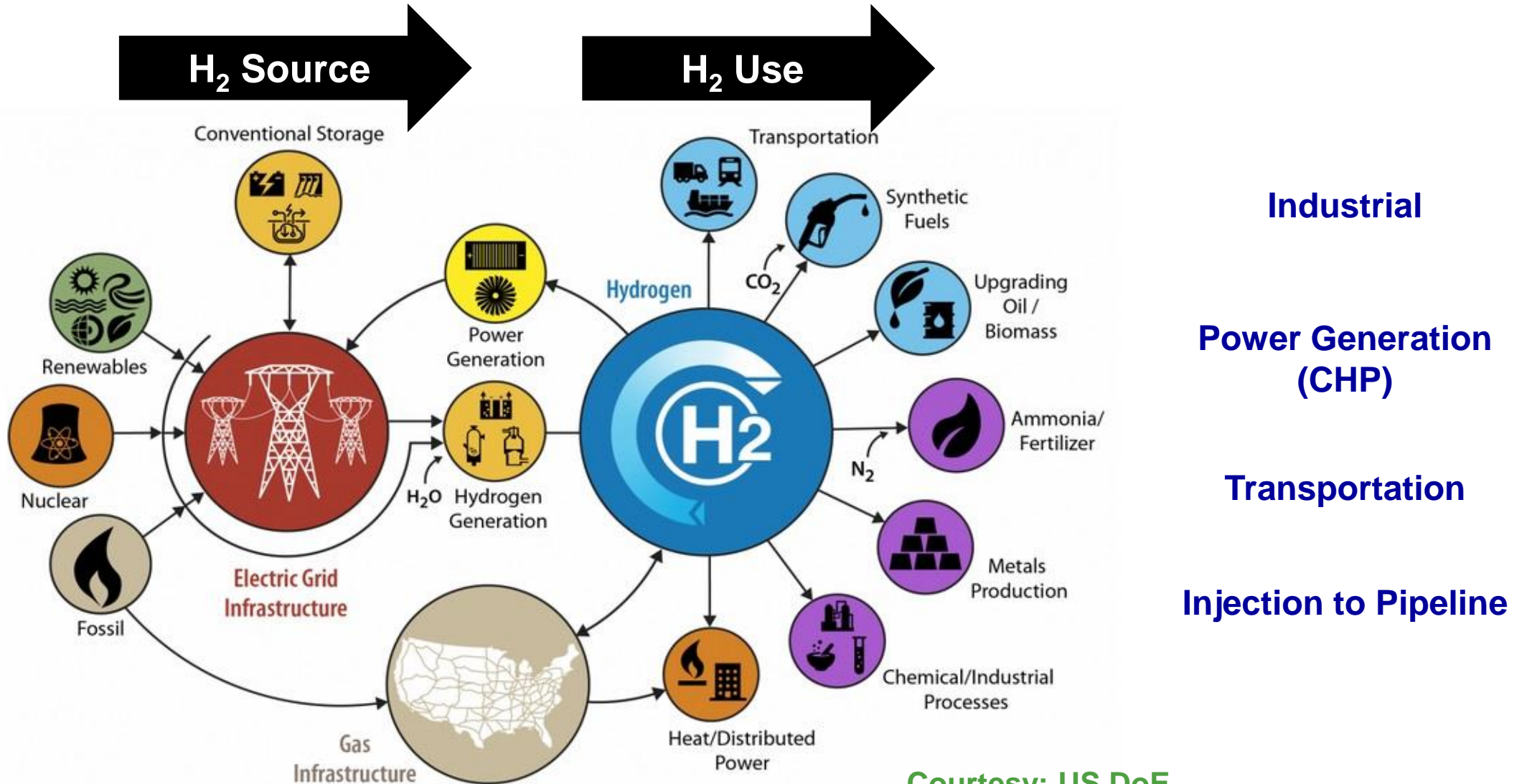
**VENKAT  
VENKATARAMAN**

Executive Vice President of Engineering  
Chief Technology Officer

**July 28, 2021**

# DECARBONIZATION WITH H<sub>2</sub>

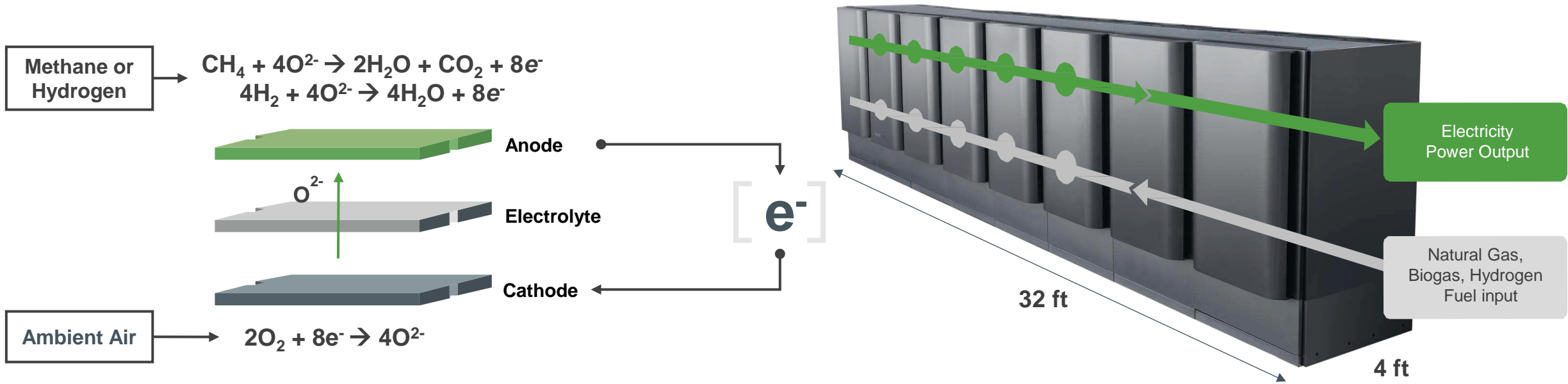
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Courtesy: US DoE

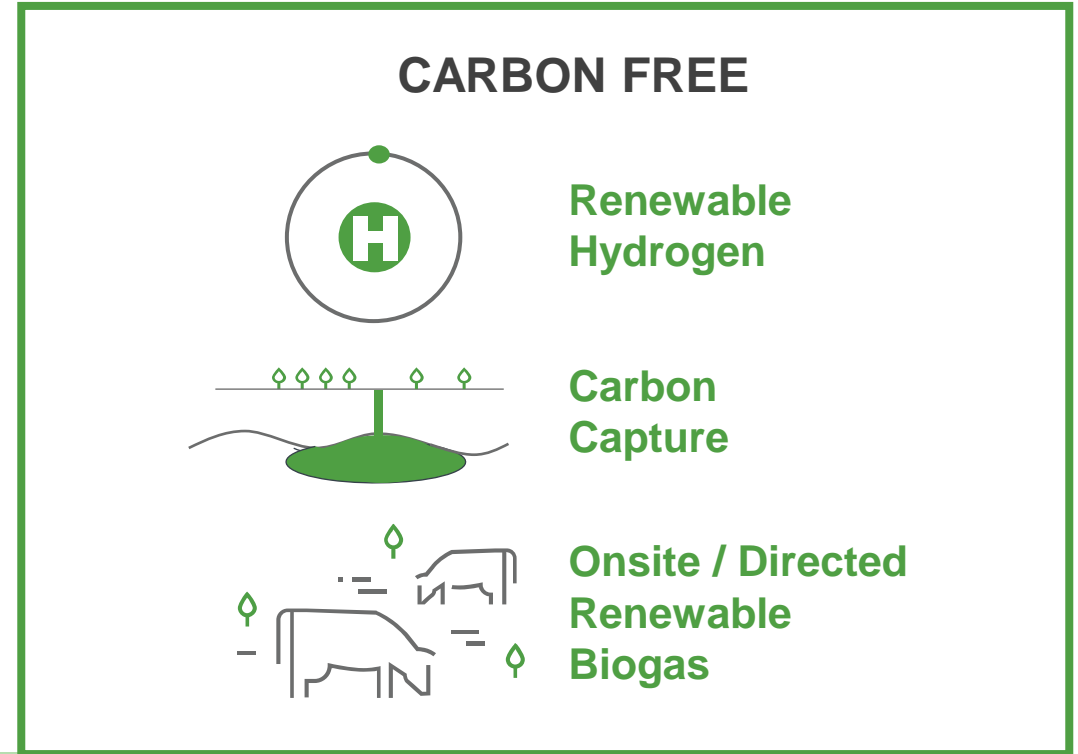
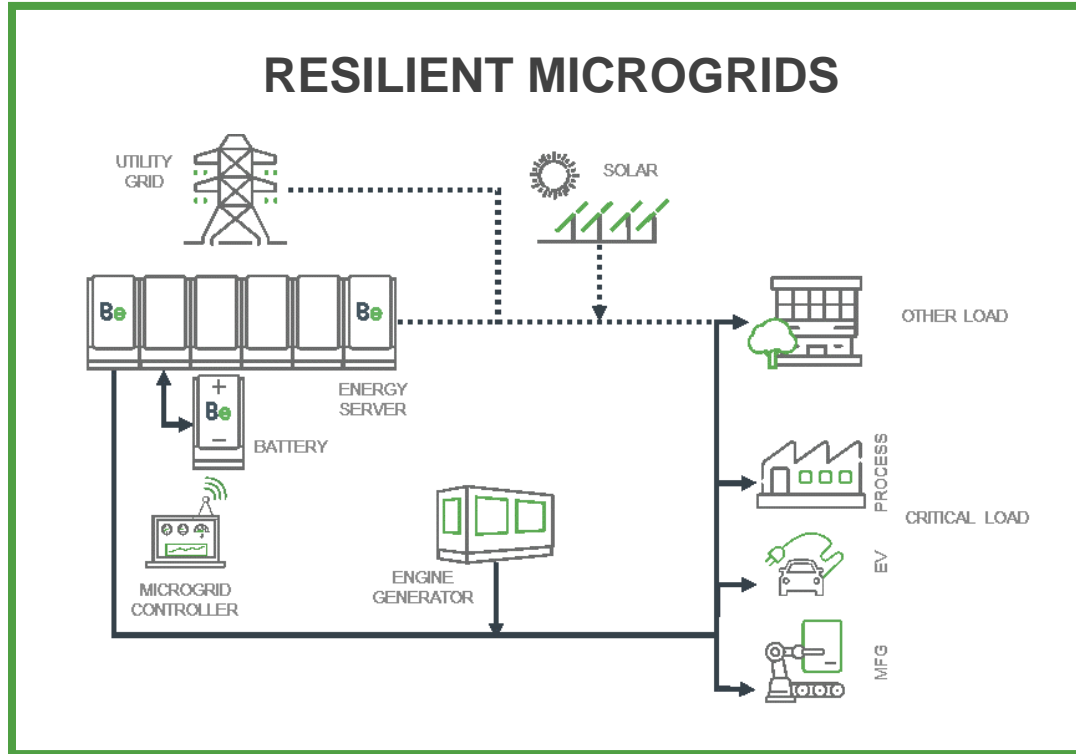
# FUEL CELL OVERVIEW

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# CARBON FREE TOTAL SOLUTION

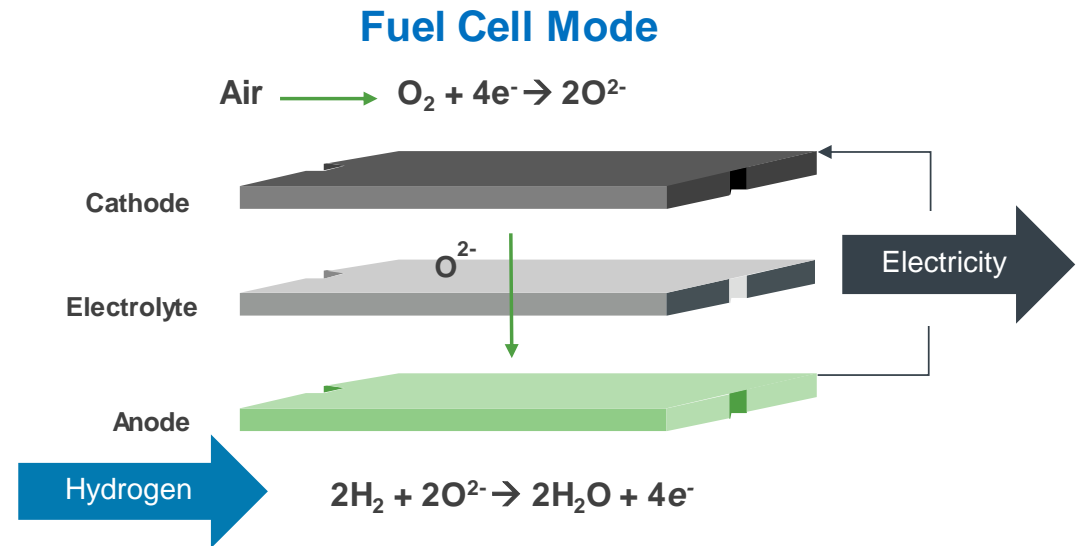
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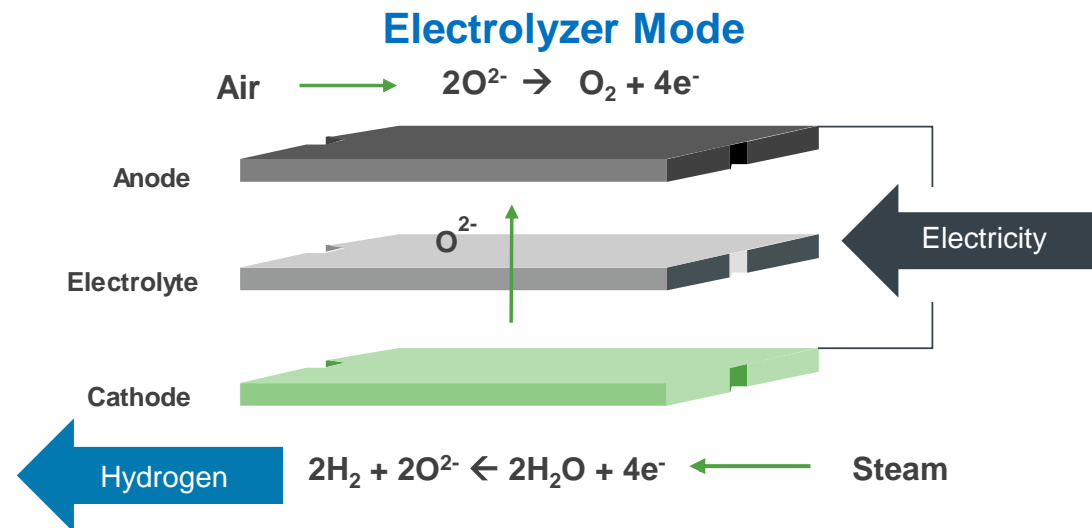
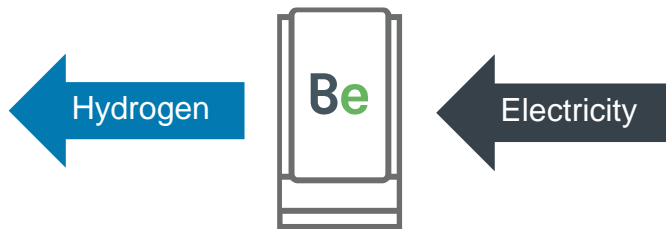
# REVERSIBLE CELL

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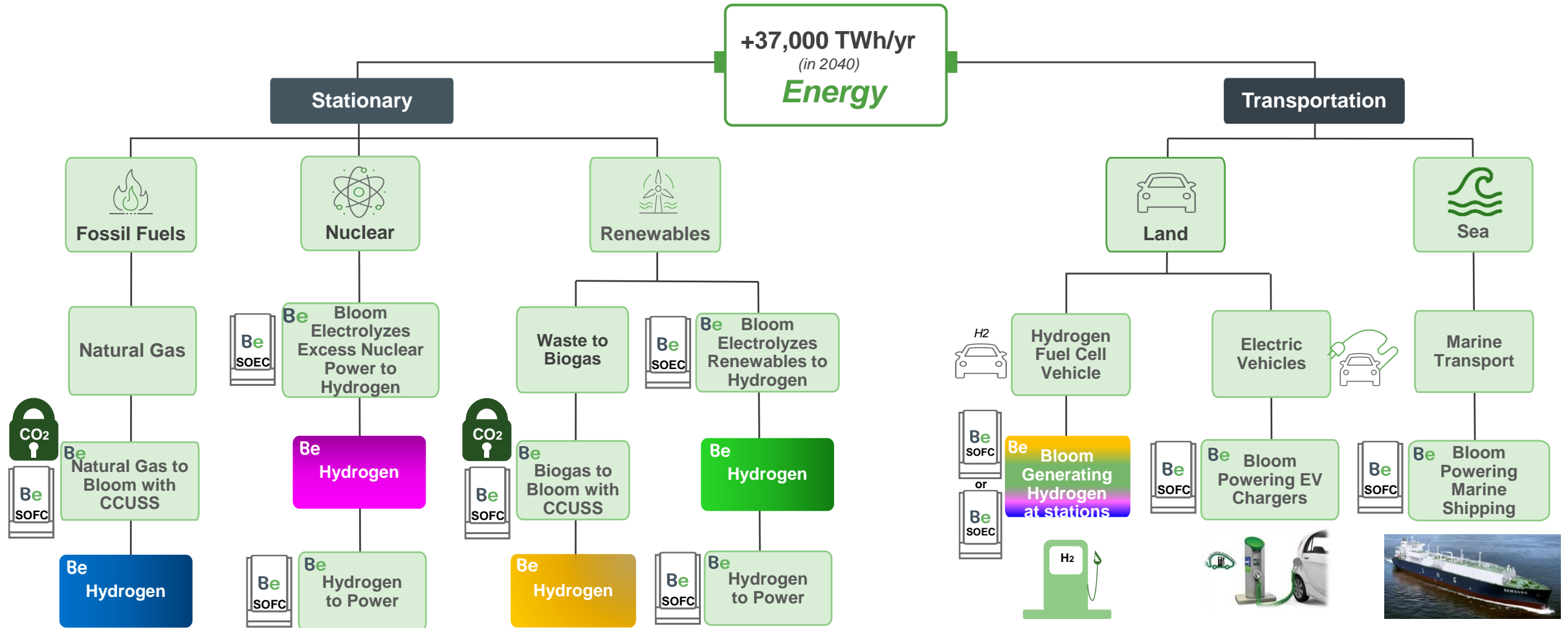
## Fuel Cell Mode



## Electrolyzer Mode



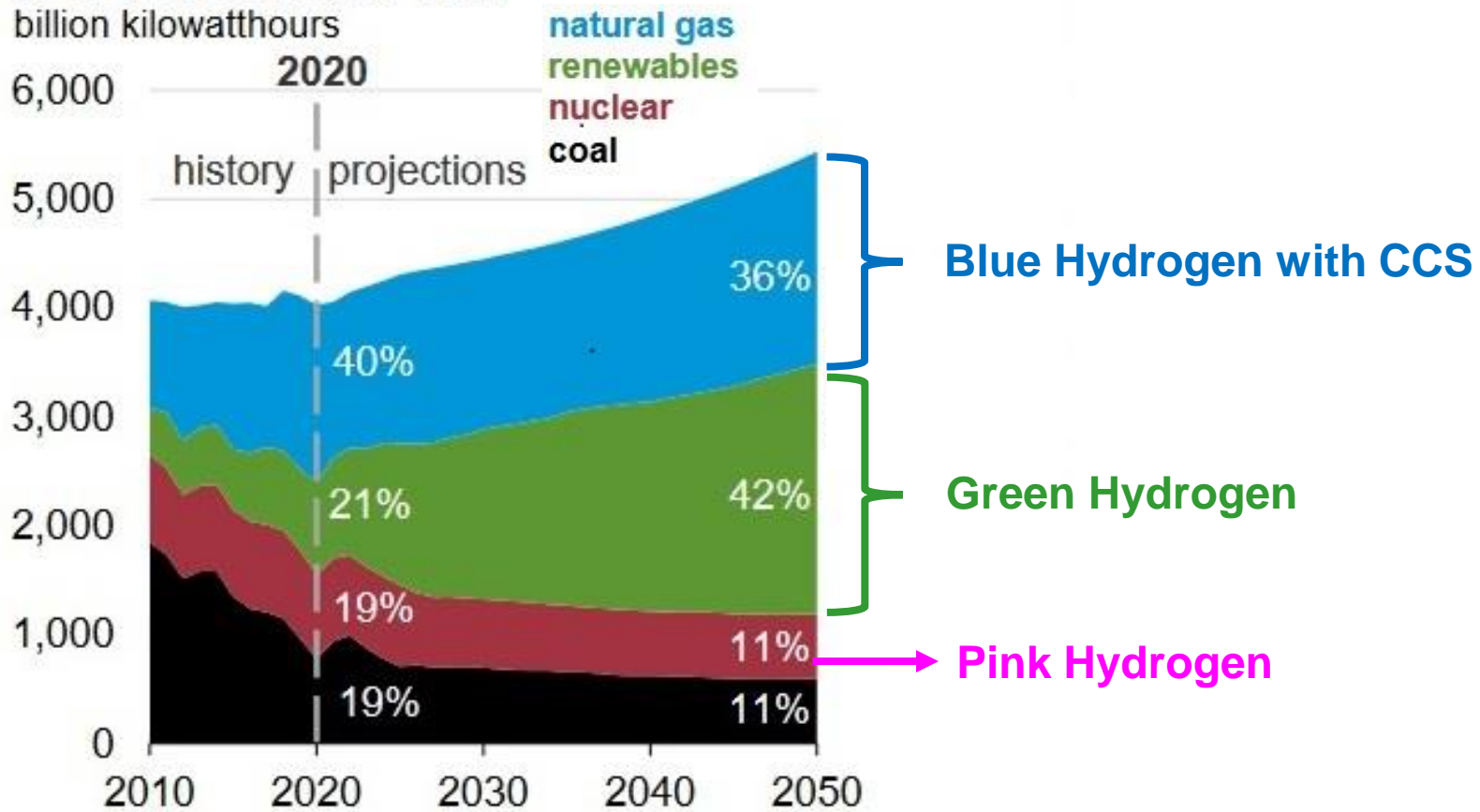
# BLOOM'S VISION ON ENERGY TRANSFORMATION **Be**



- H<sub>2</sub>** “Blue Hydrogen”, Hydrogen generated during carbon capture of Natural Gas
- H<sub>2</sub>** “Pink Hydrogen”, Hydrogen generated by electrolyzing excess Nuclear Power
- H<sub>2</sub>** “Gold Hydrogen”, Hydrogen generated during carbon capture of Biogas Gas
- H<sub>2</sub>** “Green Hydrogen”, Hydrogen generated by electrolyzing excess renewables
- H<sub>2</sub>** Hydrogen generated by BE SOFC or SOEC from any of the above means

# DECARBONIZATION STRATEGY WITH H<sub>2</sub>

**U.S. electricity generation from selected fuels**  
**AEO2021 Reference case**

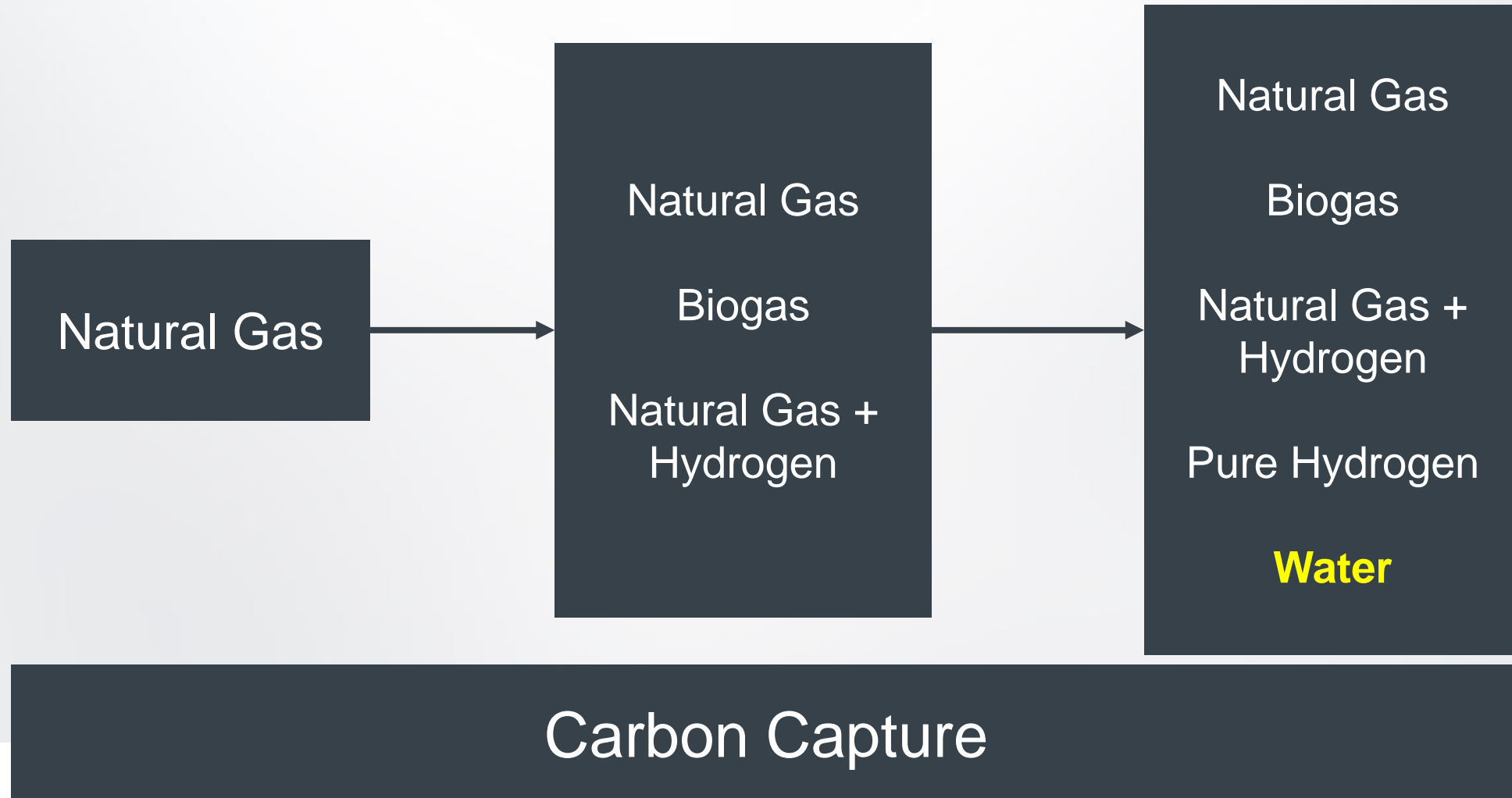


 Source: U.S. Energy Information Administration, *Annual Energy Outlook 2021* (AEO2021)



# DECARBONIZATION BY FUEL SELECTION

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