Hydrogen's Potential in the Energy Sector

Austin A. Hastings, P.E. Senior Director

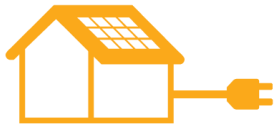
Wholesale Marketing and Business Development

Together, Building a Better California

2021 NCPA Annual Conference

How PG&E Supports

Renewable energy and a sustainable future



530,000 solar customers

~5,200 MWs generated each year

PG&E's Solar Choice gives customers the option to purchase

100% of their electricity from solar power

IN 2020

29% of PG&E's delivered electricity came from solar, wind and other eligible renewables

On track to meet the state's goals:

60% by 2030 | **100%** by 2045 to meet Senate Bill 100

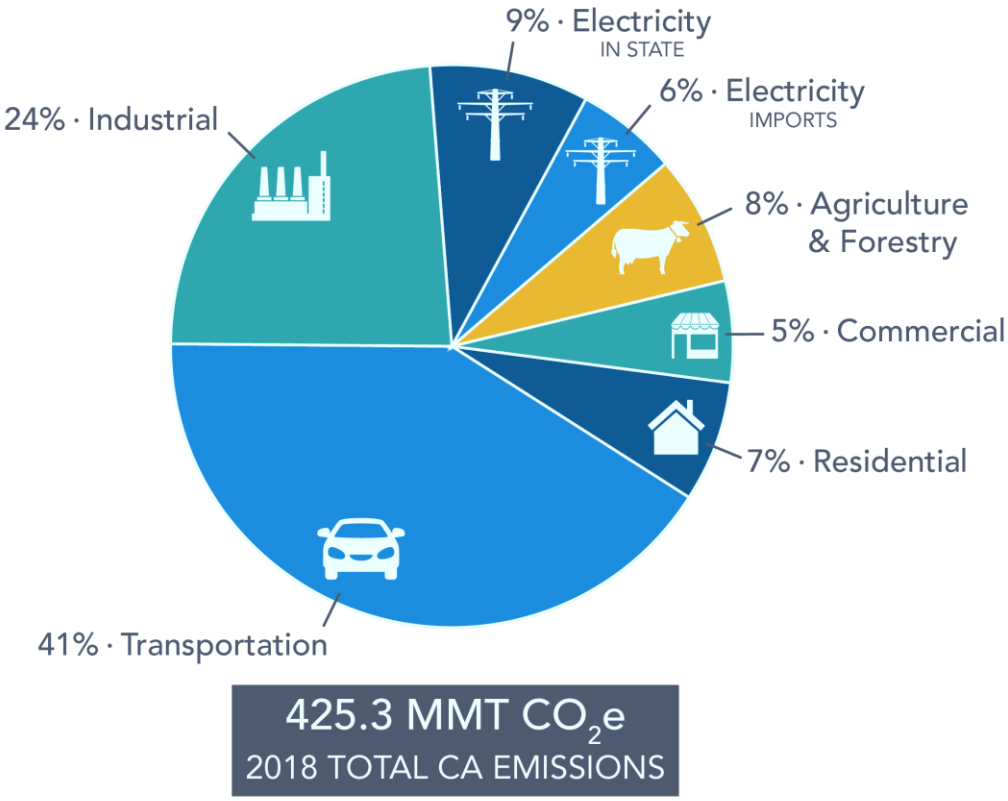
renewable and carbon-free energy

California GHG Emissions

Renewable gas, hydrogen and renewable electricity together reduce GHG emissions in all sectors

Embrace multiple solutions to enable climate change

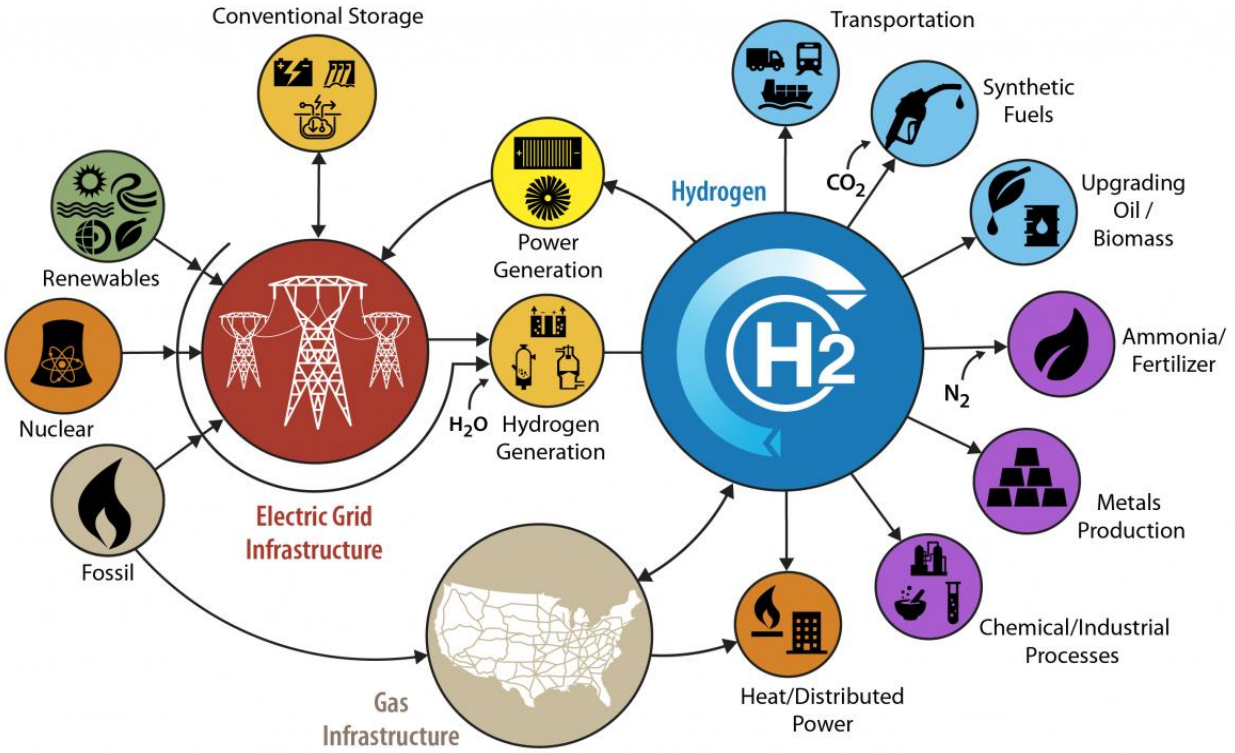
- Electric grid resiliency
- Clean firm generation
- Seasonal and intraday storage of renewable energy sources
- Reduction of GHG emissions
- Carbon capture and sequestration



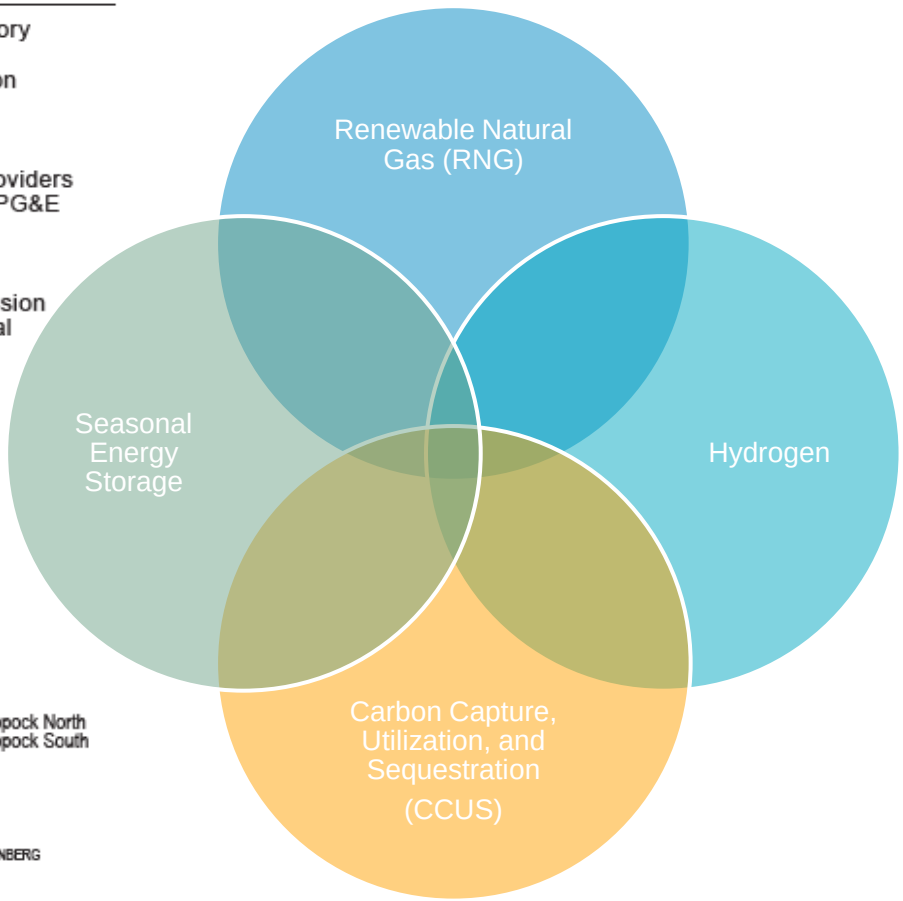
Role of Hydrogen

Hydrogen in Carbon Neutral Future

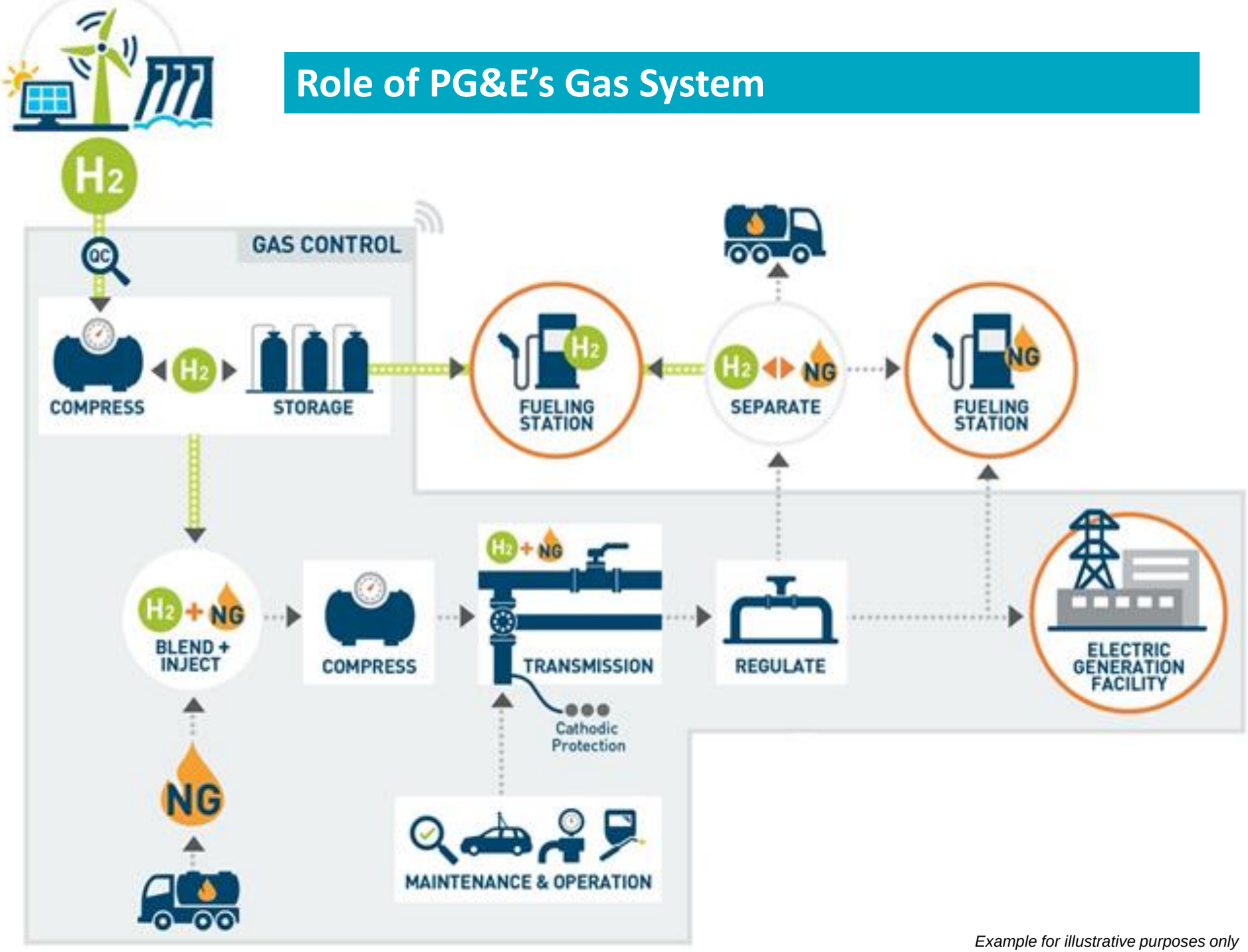
- Unique zero-carbon energy carrier, has potential to de-carbonize
- Long-term and large-scale energy storage to help meet clean energy goals in California
- Infrastructure needs for hydrogen delivery, storage and utilization
- Many barriers to overcome



Gas System is Critical in Transition

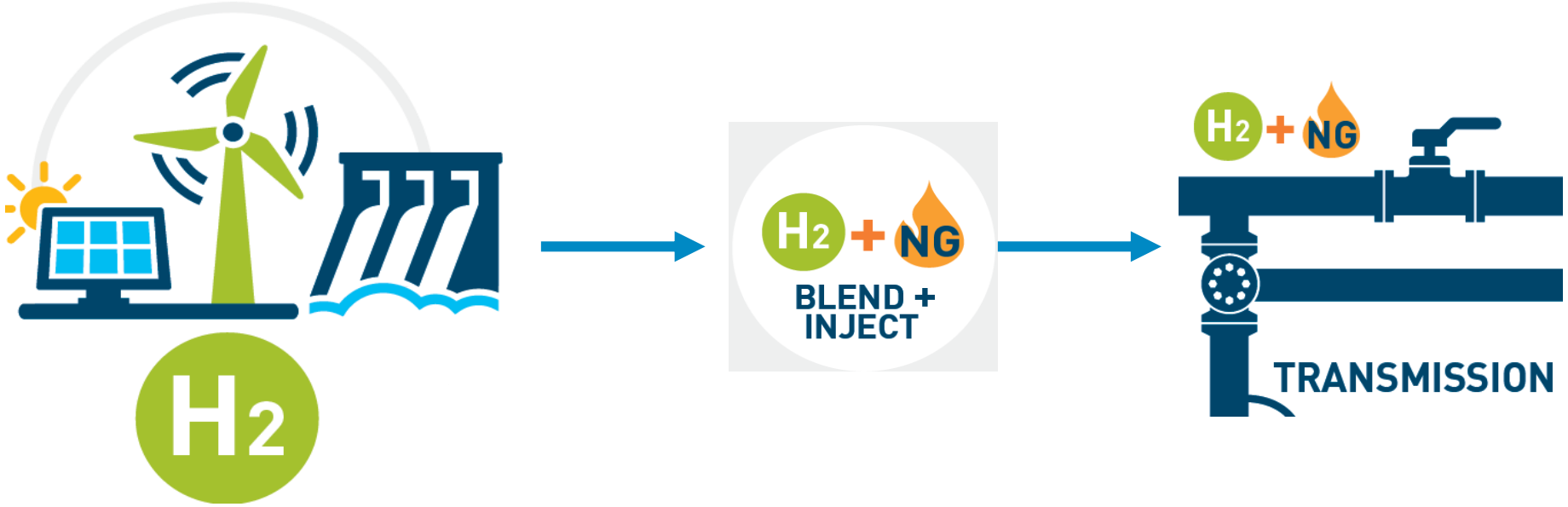


Role of PG&E's Gas System



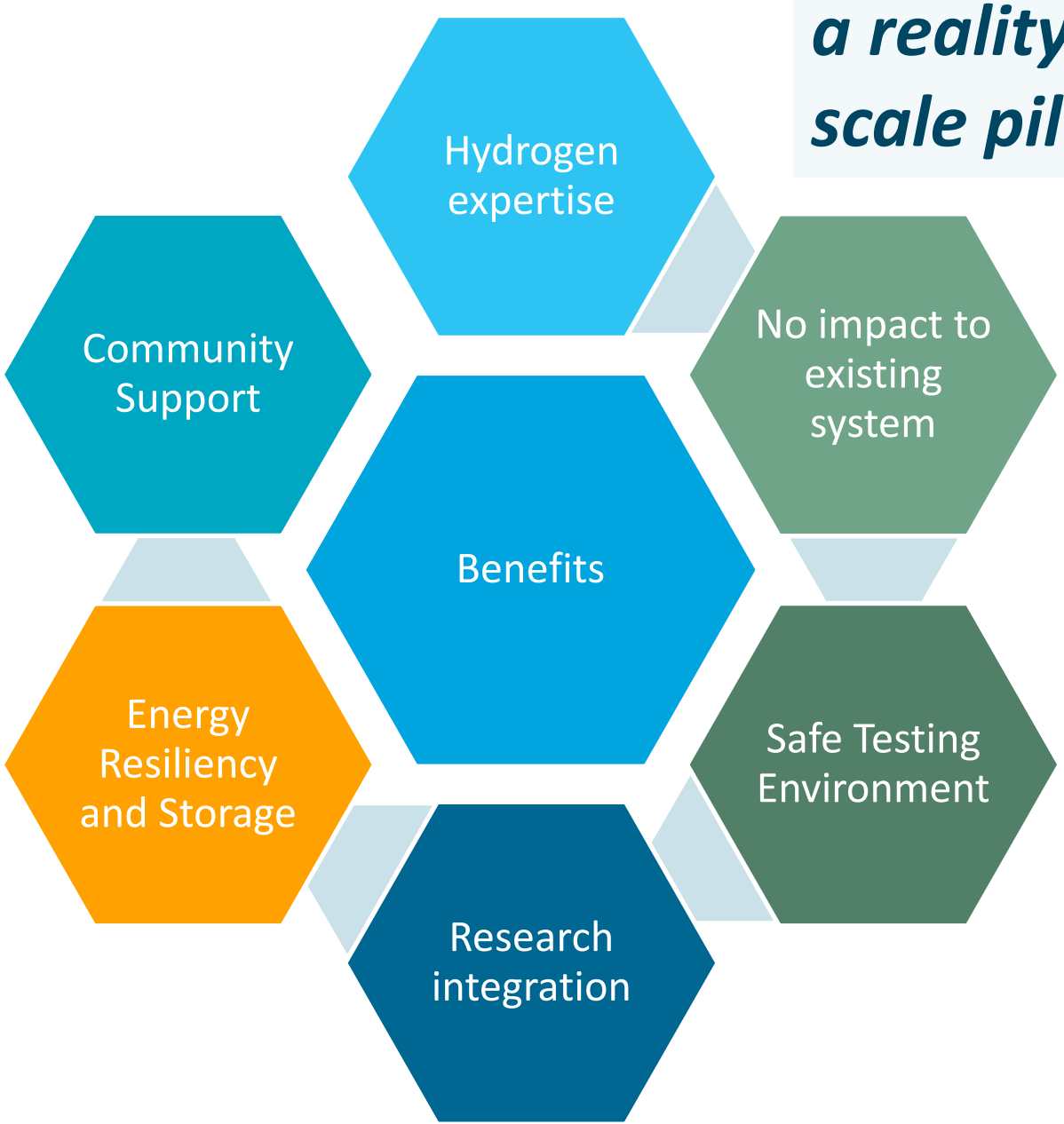
Example for illustrative purposes only

Hydrogen Blending Issues and Concerns



- Material compatibility
- Gas quality
- Hydrogen sources
- Measurement, control and detection
- Safety/Hazards: leaks, flammability, handling
- System design
- Relevant operation and maintenance procedures
- Storage
- Regulation and compression
- End user appliances/equipment compatibility
- Rate structure and billing

Making decarbonization a reality through large scale pilots



Collaborate for Success

- Critical component for success of hydrogen: collaboration among regulatory agencies and utilities
- Align priorities, research and development, support climate change

Market Transformation

- Identify attributes needed to achieve climate goals
- Allow a broad range of solutions with attributes
- Encourage innovation

Build solutions

- Test and pilot emerging technologies
- Open pathways to drive major breakthroughs
- Scale deployment to reduce costs

Leverage existing pipeline and generation infrastructure

- Utilize capital investments already made, including third-party pipelines
- Repurpose and upgrade existing assets to support future decarbonization

Questions?

Austin A. Hastings, P.E.
Senior Director, Wholesale Marketing & Business Development
Austin.hastings@pge.com
559-246-0485