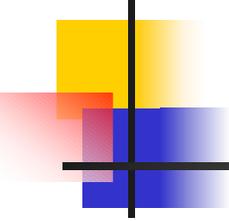


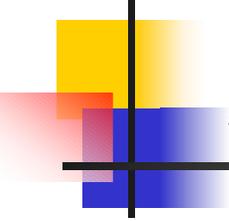
Power Park

***Pinnacle West Capital
Corporation***



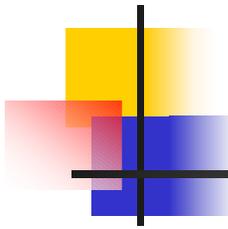
Objectives

- *Economic hydrogen production*
- *Renewable Energy Opportunities*
- *Integration of distributed generation and transportation fuel production*
- *Incorporation with existing Energy Assets*
- *Scalability (small, medium, large)*
- *Integrated Business Opportunities*
- *Identification of technical barriers*
- *Identification of market opportunities*



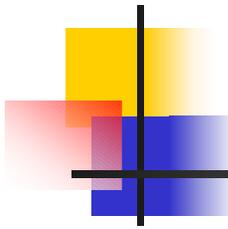
Approach

- Safety & Economics
 - Deflagration & detonation of hydrogen
 - Codes, engineering, modeling, fabrication
 - Building block design
- Economic new technology
 - Solar reforming of natural gas
 - Low cost electrolysis opportunities
 - Identify hydrogen purity requirement
 - Heat energy recovery
 - Chemical by-products



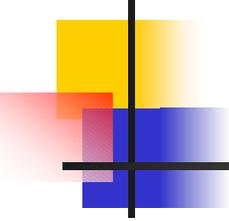
Approach (continued)

- Subsystem test & development
 - Zero emission Genset
 - 55 % thermal efficiency with Genset system
 - Vehicle refueling model
 - Low hazard compression & storage model
 - Electrolysis & compression model
 - Integration with host site models
 - Hydrogen storage models
 - Chemical by-product management model
 - Pilot Solar reforming of natural gas model



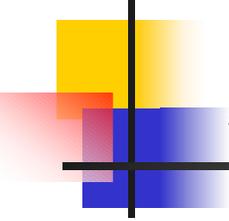
Approach (continued)

- Operational analysis of system elements
- Integration of system elements
- Marketing Opportunity
- Economics of Market Opportunity
- Summary of Barriers
 - **Technical**
 - **Code**
 - **Zoning**
 - **Other**



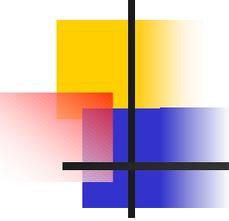
Project Timeline

- Get Contract in Place



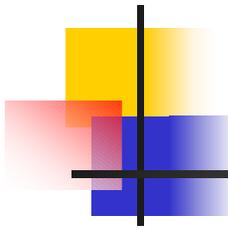
Accomplishments to Date

- Pilot hydrogen production and motor vehicle refueling facility in place and operating.
- Solar Panels in place & operating.
- 100 KW Genset unloaded operation on hydrogen.
- Prototype methane solar reformer operating.
- Refueling Motor vehicles with hydrogen & blends.



Collaborations

- APS (Arizona Public Service)
- Collier Technologies
- ETEC
- Energy CS
- Boyle & Associates
- Distributed Utility Associated
- University of Colorado
- INTEL

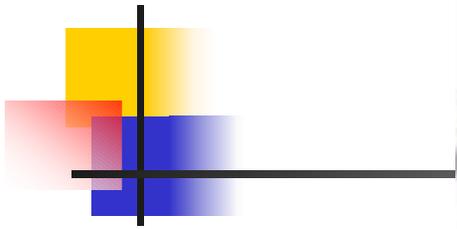


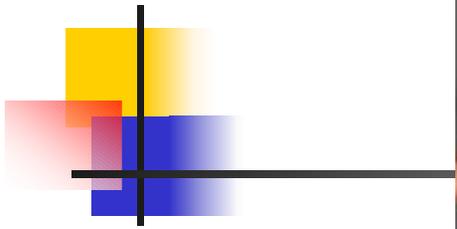
Plans Future Milestones

- Minimize Genset Emissions (NO_x).
- Genset Thermal Efficiency to 55% including heat recovery.
- Quantification of chemical by-products
- Perform heat balance on modeled integrated facility.
- Motor vehicle refueling beyond test fleet.
- Market opportunities



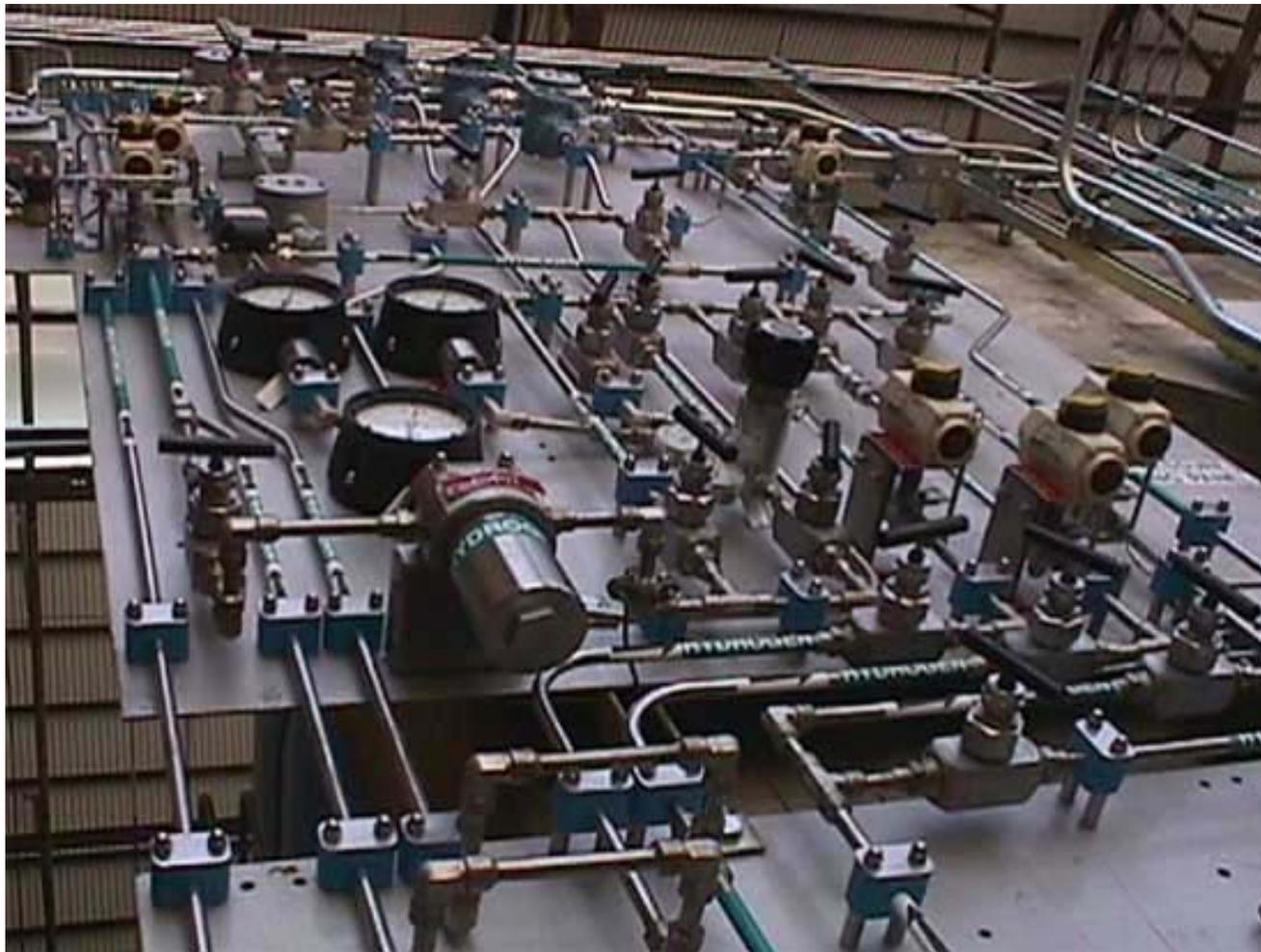




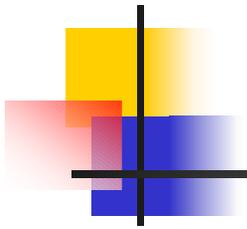












POWER PARK

