

SuperGrid 2: Hydrogen Breakout Session

Tuesday, October 26

Panel Members

- **Wes Myers**
- **Balu Balachandran**
- **Allan Jacobson**
- **Ben Russ**
- **Finis Sonthworth**
- **Jim Stubbin**
- **John Maulbatsch**
- **Robert Schainker**

Topics Discussed

1. **Trade-Off Studies Alternative Concepts**
2. **Stakeholder Roles**
3. **Time Line Vs Work Scope**
4. **Ways to Work Together**
5. **One Wish From Each Panel Member**

1. Trade-Off Studies / Alternative Concepts

- **Perform Value Proposition and Trade-Off Analyses of Alternative Approaches**
- **Main Benefit of SuperGrid, As Apposed to HV-DC Systems Is That the Hydrogen In Cable Can/Will Be Used To Reduce CO2 Produced From Transportation Sources**
- **Choose “Best” Form and Pressure of H2 (Gas or Liquid) To Be Used**
- **What If Global Warming Is Not Caused By CO2? Thus, Answer Question Whether SuperGrid Is Still Needed. Quantify Benefits of SuperGrid; e.g.,**
 - **Reduced Imports of Fossil Fuels**
 - **More Efficient/Robust/Stable Grid Backbone**
 - **Assists Use and Penetration of Renewables**
 - **Provides Energy Storage As Part Of Grid At Significant Level, Which Has Quantifiable Benefits (Stability, Load Leveling, Energy Management)**

2. Stakeholder Roles

Fed Agencies (DOE, NSF, DOD)

- Large Role Near Term, Declining Role Over Mid to Long Term
- Use Analogy To Fed's Role When Interstate Highway System Was Established, which provide 'backbone' to State Highway System

State / Local Agencies

- Get The National Assoc. Of Energy Offices (NASIO) Involved (+ Others Org's)

EPRI

- Set Up Collaboratives To Fund Pilots. Refine Roadmap With SuperGrid Spelled Out In More Detail. Identify Possible Transmission Bottlenecks Throughout US For Possible Application Of SuperGrid Pilots/Demos.

Utilities (Gas & Electric Utilities)

- Do Pilot At G&E Utility And/Or Hydro Based Utility

Oil / Air Product Companies

- Get Them Involved In SuperGrid "Steering" Committee
- Learn From Their Experience/Technology In H2

Auto Companies (e.g., GM, Ford, Honda, BMW, Toyota, D-Chrysler)

- Get Them Involved

Potential Contractors (eg, Am.Superconductor, ABB, Piping, Construcion Co's.)

- Cost Share, Cofund R&D, Involve In Trade-off Studies

Government Labs

- Perform Basic R&D, Testing (Large And Small Scale), Do System And Socio-Economic Studies With Utilities And Private Sector Companies.

Universities

- Basic And Applied R&D

3. Time-Line Vs Work Scope

- **Near-Term (1 to 2 years)**
 - **Scoping / Trade-off / Conceptual Design**
 - **Value Proposition Analyses**
 - **Bring In Other Stakeholders Into These Efforts**
 - **Set-Up Outreach and Education Programs (e.g., University Consortiums To Train Students)**
 - **Find Home/Champion For SuperGrid (e.g., EPRI)**
- **Mid-Term (3 to 10 years)**
 - **Lab Testing (Identify which Testing Is Needed)**
 - **Design Prototypes**
 - **Continue Outreach and Education Programs**
- **Long-Term (11 to 30 years)**
 - **Build and Test Prototypes with Private Sector Partners**
 - **Build “One Spoke” or Pt. to Pt. Demo**
 - **Continue Outreach and Education Programs**

4. Ways To Work Together

- **Identify “Home/Champion” For SuperGrid**
- **DOE Hdq. Needs To Appoint A Lead National Lab**
- **Appoint SuperGrid Steering Committee**
- **Lobby for \$’s (Sell Value Proposition's)**
- **Conduct Workshops/Conferences**
- **Perform Outreach To State/Federal Agencies and Utilities (Gas & Electric) and other Stakeholders**
- **Focus on Three Actions**
 - **Get Funding**
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5. One Wish From Each Panel Member

- **Conduct Workshop On Underground Nuclear Park Concept, As Part of SuperGrid Activities**
- **Obtain \$'s to Jump Start Whole Process. With First \$50M Make a Superconducting Cable, Install in Underground Site and Perform Tests.**
- **Obtain \$'s to Establish University Consortiums that Focus on Each Key Component; e.g., superconductor, inverters, underground, hydrogen, etc.**
- **Start & Obtain Public & Political Support for Nuclear and Hydrogen Projects. The End Product is a Educated, Supportive Public for Nuclear and Hydrogen (e.g., Develop Discovery Channel / Nova Videos)**
- **Obtain \$'s To Do First Step (i.e., Value Proposition & Scoping Study) Using INEEL, Constructors, University and Other Stakeholder Staff**
- **Obtain \$'s and Political Commitment to Perform Near and Mid-Term Research, Development, Testing, and Demo Work**
- **Find and Employ a 40-50 Year Old "Chauncey Starr" Clone to Lead Effort**
- **Need Energy Policy Passed by Congress That Includes \$'s for the Development, Testing, and Demo's of the SuperGrid**