FutureGen Program
Pathway toward Zero Emissions

Michael J. Mudd
CEO FutureGen Alliance, Inc.

DOE Carbon Sequestration Conference
May 9, 2006

FutureGen Benefits

- Supports a ***technology-based climate change strategy***
  - Mitigates the financial risks of carbon dioxide emissions
- ***Validates the cost and performance*** of integrated near zero-emission coal-fueled power plant technology
  - Advances IGCC technology
  - Advances carbon capture, sequestration, and hydrogen-production technologies
  - Sets groundwork for CO_2 sequestration siting and licensing
- Creates the technical basis to ***retain coal*** in energy mix with a long-term goal of ***zero emissions***.
- Enables the public and private sector to ***share the cost and risk*** of advanced technology demonstration.

FutureGen
Project Features

- Commercial-scale 275-MWe Plant
- 1 million tons/year CO_2 captured and sequestered
- Co-production of H2 and electricity
- “Living laboratory” to test and validate cutting-edge technologies
- Public-private partnership
- Stakeholder involvement
- International participation
- On-line 2012

Entity Formed

FutureGen Industrial Alliance, Inc.

- **Non-profit, 501(c) (3) formed to manage the project**
- **Secured funding**
- **DOE Cooperative Agreement Signed Dec. 2, 2005**
- **9 Members with prospects to grow**

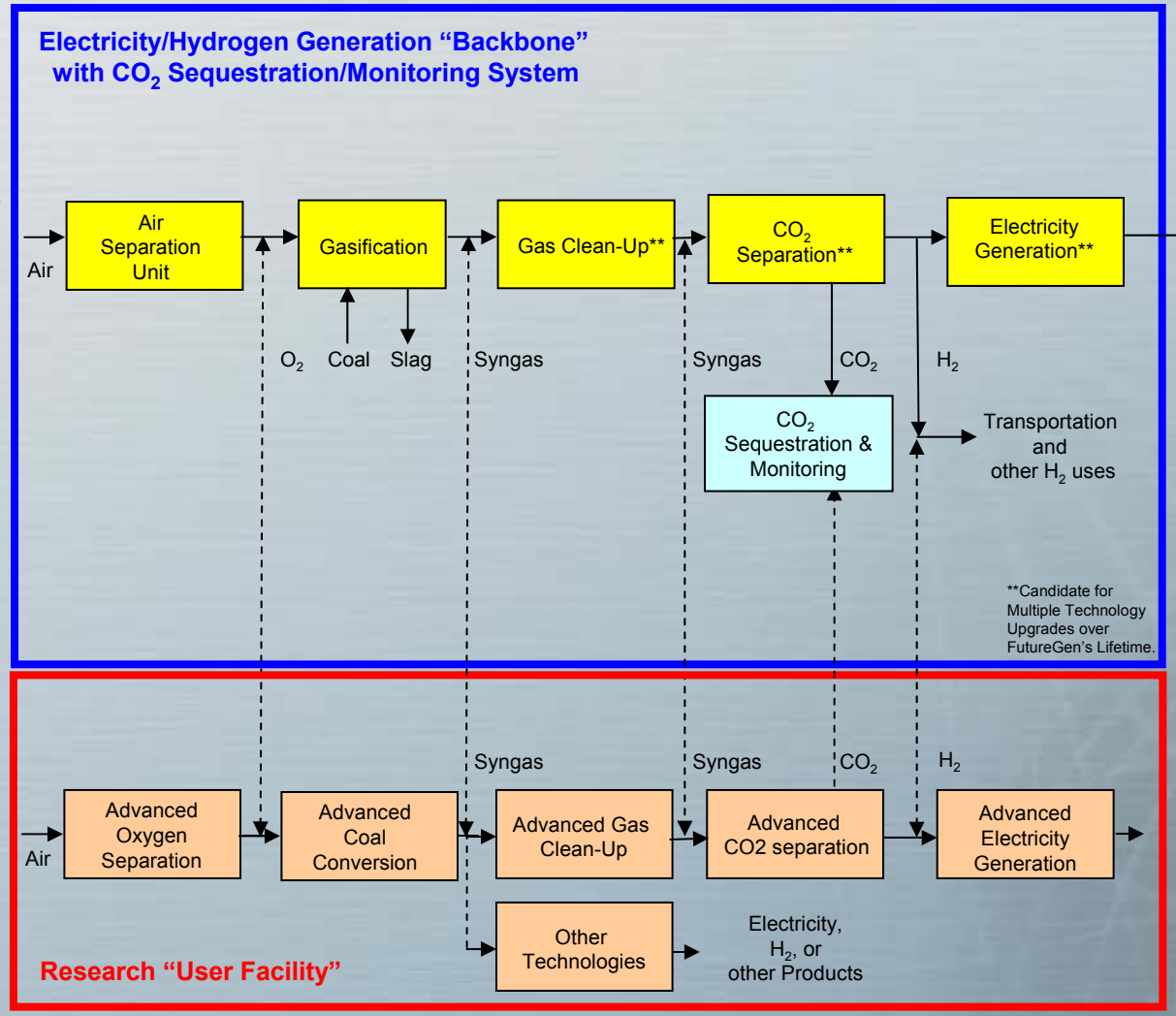
FutureGen

Industry's View of the Facility

"State-of-the-Art Gasification Technology"

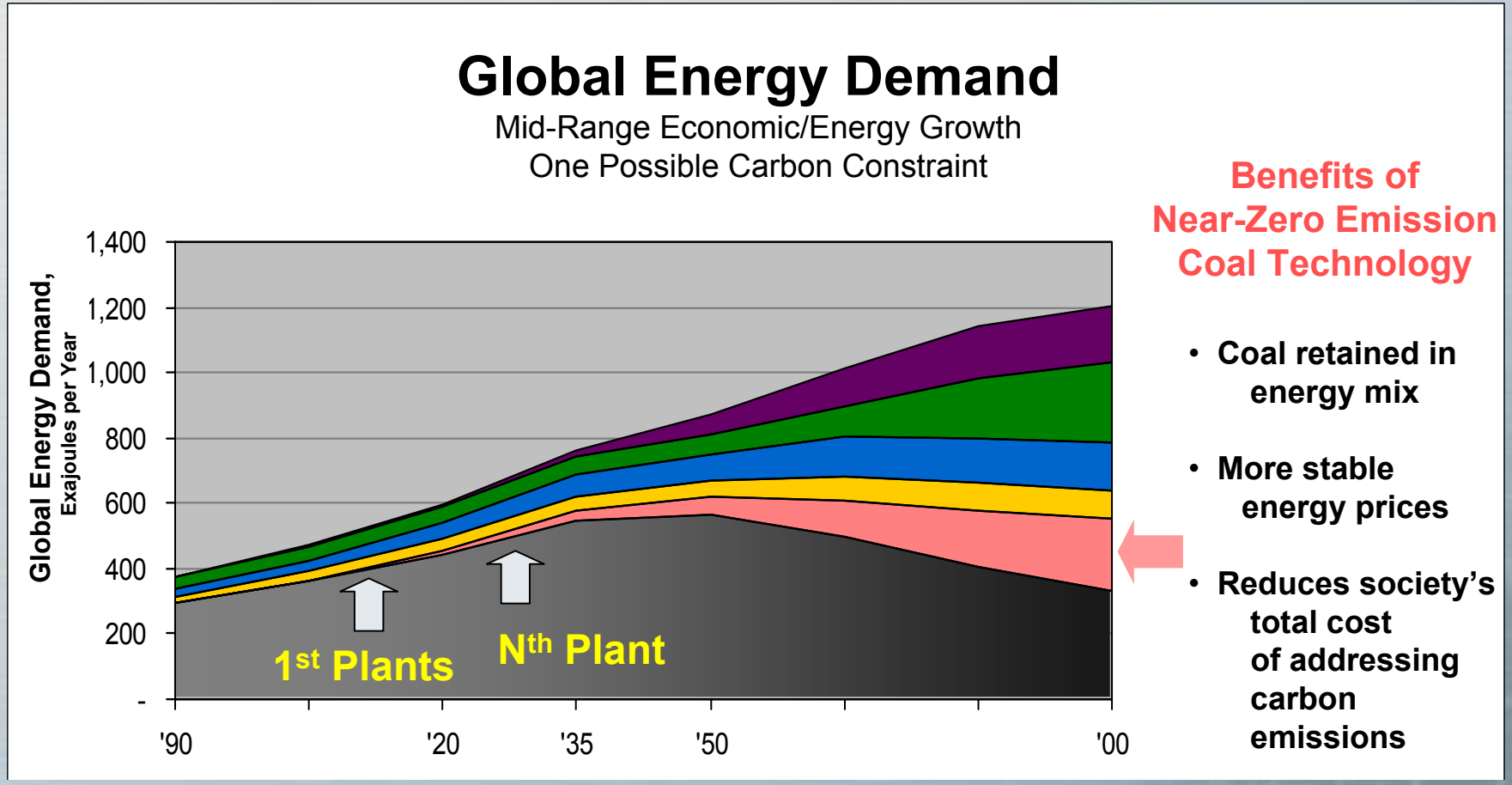
"Sequestration"

"Research User Facility"

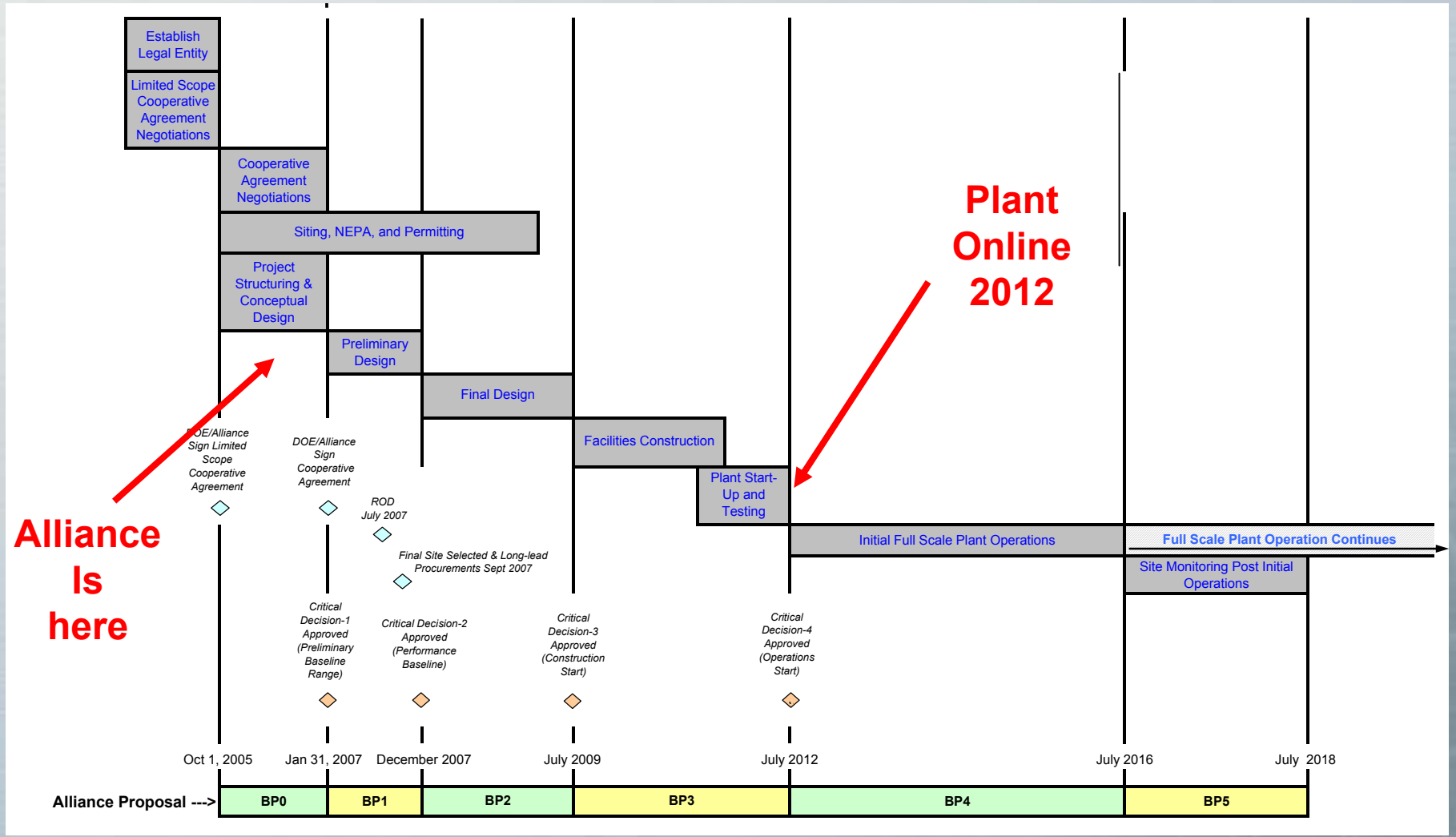


Source: FutureGen Industrial Alliance

One Possible Energy Future
With Near-Zero Emission Coal Technology



FutureGen
Schedule



FutureGen
Current Activities

- Management Functions
  - Stakeholder outreach
  - Web page ***www.FutureGenAlliance.org***
  - Routine member company engagement in project activities
- Site RFP
  - RFP Issued: Proposals received May 4
  - Down selecting to primary candidate sites by mid-summer
- Conceptual Plant Design
  - Engagement with major technology suppliers
  - Identified alternative facility configurations
  - A&E bid package issued for conceptual design and cost estimate

Milestone dates

- Site Selection Process
  - Siting Process announced (2/8/06)
  - Draft RFP released (2/13/06)
  - Public comment period on Draft RFP ends (2/28/06)
    - ~100 comments received; summarized and answers posted on website
    - Final RFP issued (3/7/06)
  - Proposals received (5/4/06)
    - 12 proposals from 7 states

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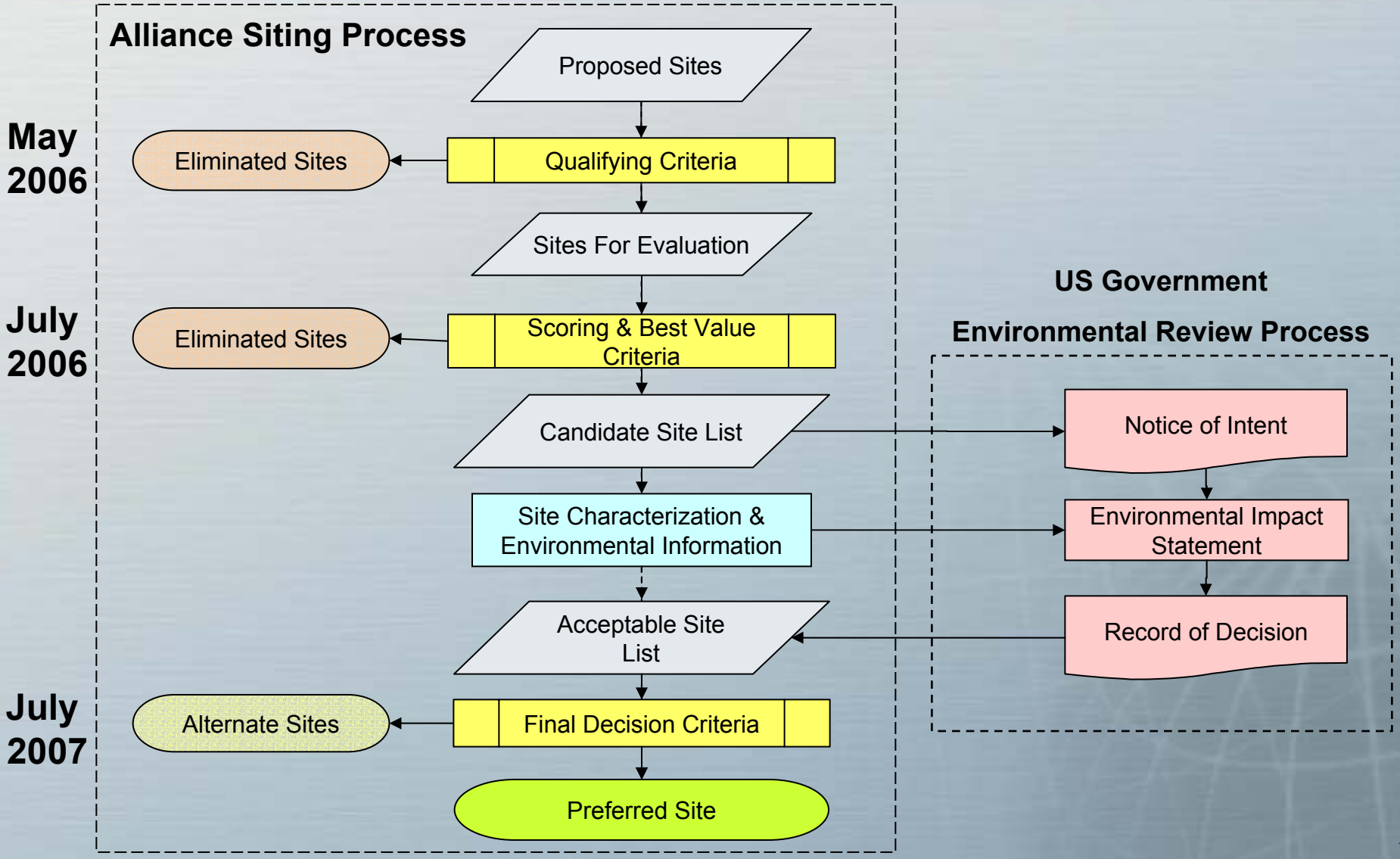
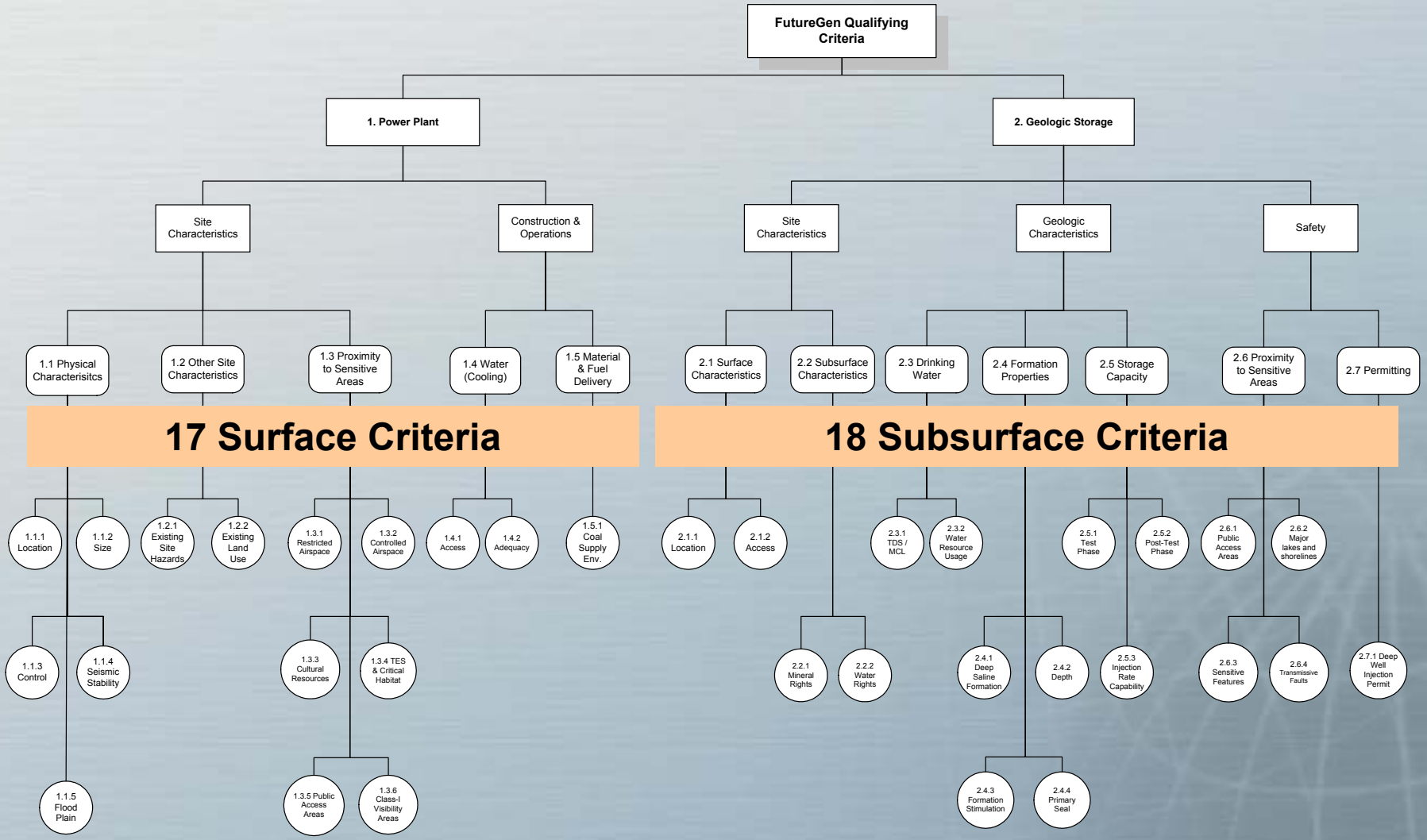
Siting Process Flow



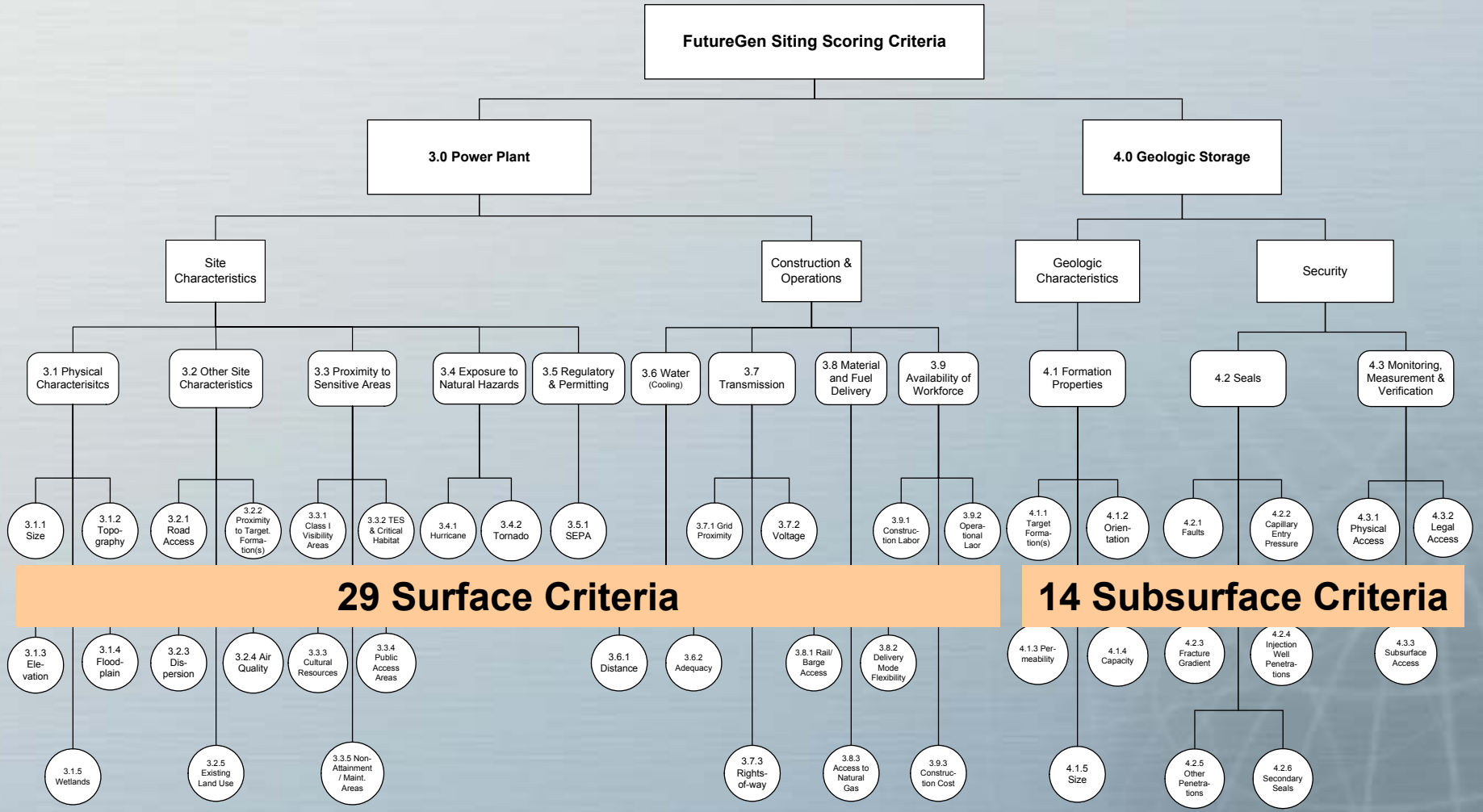
Site RFP
Criteria

- Qualifying Criteria
  - Each proposal will be evaluated against certain qualifying criteria (Y/N)
- Scoring Criteria
  - Each proposal will be scored on each criteria against a predetermined scale
  - Weighting system will be used to roll-up criteria scores
  - Scales and weights will not be publicly released
- Best Value Criteria
  - Each proposal will be qualitatively evaluated against these criteria

Site RFP
Qualifying Criteria



Site RFP
Scoring Criteria



Site RFP

Best Value Criteria

- Land Cost
- Availability / Quality of Existing Plant and Target Formation Characterization Data
- Land Ownership
- Residences or Sensitive Receptors above Target Formation
- Waste Recycling and Disposal
- Clean Air Act Compliance
- Expedited Permitting
- Transmission Interconnection
- Background CO_2 Data
- Power Sales
- Market for H_2
- CO_2 Title and Indemnification
- Other Considerations

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Siting – Sequestration Expertise

- Alliance team is a "Who's Who" of the world's sequestration experts:
  - all seven members of the Alliance's independent sequestration advisory group are internationally recognized
  - Multiple members of the Alliance's technical support team are among the world's foremost experts
  - No experts are participating on site proposal teams. They are objective.

- Advisory Group
  - **Dr. Peter Cooke**. Director of the CO2 Cooperative Research Center, Australia's premier institution for sequestration science. 30+ years of petroleum industry experience. Co-author of the IPCC's state-of-the-science assessment on CO2 capture and sequestration.
  - **Dr. Sally Benson**. Deputy Director of Lawrence Berkley National Laboratory. 20+ years of experience as a hydrologist. Extensively involved in multiple sequestration pilot projects, including the Frio project. Co-author of the IPCC's state-of-the-science assessment on CO2 capture and sequestration.
  - **Dr. Julio Freidman**, Lead sequestration scientist at Lawrence Livermore National Laboratory. 20+ years of experience as a geophysicist primarily with Exxon-Mobil.

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Siting – Sequestration Expertise

- Advisory Group (contd.)
  - **Dr. Lee Spangler,** Director of the Zero Emission Research and Technology Center (ZERT), a multi-institution center headquartered at Montana State University. ZERT is the nation's premier research center for basic sequestration science and monitoring.
  - **Anhar Kwajime**, Head of Sequestration Program for the U.S. EPA.
  - **John Gale**, Program Manager for the International Energy Agency's Greenhouse Gas Programme.
  - **Howard Herzog**, Director of the M.I.T.sequestration research program

- Alliance Technical Support Team (Battelle)
  - **Dr. Pete McGrail**, Chief Sequestration Scientist at Battelle and the Pacific Northwest National Laboratory. 25+ years experience in subsurface science. World's foremost expert on sequestration in saline, basalt formations. Pioneer in developing novel CO2 capture technologies.
  - **Dr. Neeraj Gupta**, Chief Sequestration Field Engineer at Battelle. 20+ years experience. Project manager for AEP Mountaineer Plant sequestration project.

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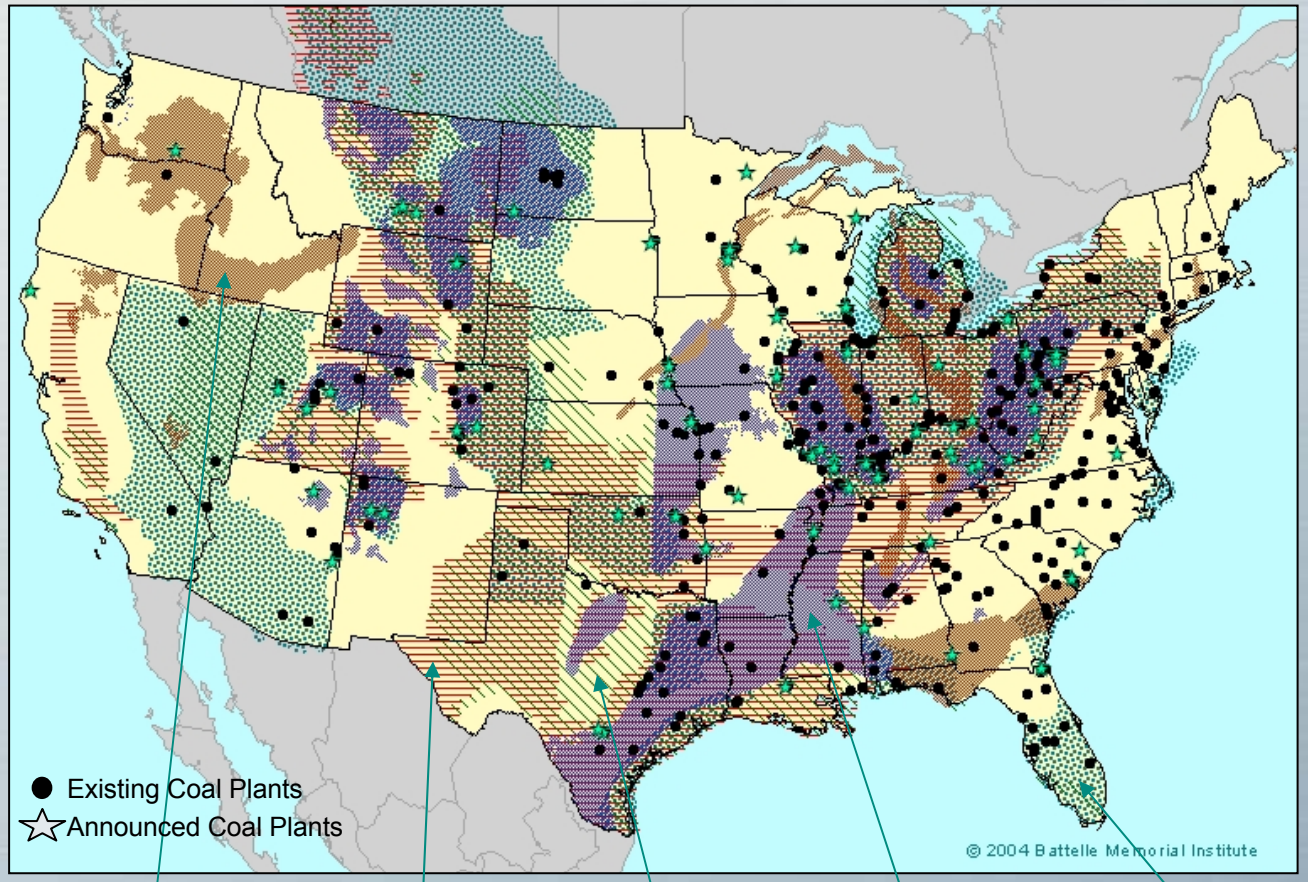
Siting – Sequestration Resources



Source: Battelle

- FutureGen will investigate the viability of sequestration in abundant saline formations & perhaps others at the same site.
- Final site chosen must provide globally transferable results

Summary

- **FutureGen is real and *moving forward fast***

- **FutureGen *creates significant value***
  - Supports a technology-based climate change strategy, which mitigates the financial risk of climate change while protecting the environment
  - Validates the cost and performance of an integrated "zero-emission" coal-fueled power plant
  - Creates the technical basis to retain coal in global energy mix with a long-term goal of zero emissions.

- **FutureGen is an opportunity to *share the cost and risk* of "zero emissions" technology development**

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