Roadmapping Process

Day One Work– Examine and Prioritize …

- Energy Supply Problems/Concerns
  - Generally, and particularly where water concerns may impact energy production/generation
- Water Supply and Use Problems/Concerns
  - Generally, and where energy production/generation may impact water supply and competing users

Day Two Work – Generate Needs Statements, Quantify Gaps, and Brainstorm Solutions Approaches

Roadmapping Process

Timeframes

- Near-term (0-10 years)
  - Problems that exist today, or are visible on the horizon
  - Needs, gaps, solutions more easily detailed and quantified
- Long-term (10+ years)
  - Problems that are emerging but less well-understood
  - Needs, gaps, solutions less easily detailed and quantified

Roadmapping Process

Problems →Needs/Gaps →Solutions

- **Problems** are high-level challenges.
- **Needs/Gaps** describe a current or future requirement.
- **Solutions/Opportunities** are approaches to meeting Needs or closing Gaps, and thus solving Problems.

Roadmapping Process

Problems →Needs/Gaps →Solutions

- **Problem:** My grades and SAT scores are not good enough to get me into the college of my choice.
- **Need:** I need to improve my grades from a 'C' average to at least a 'B' average (Gap 1), and I need to improve my SAT score from a 1000 to a 1200 (Gap 2).
- **Solution:** I will…
  - Take an "Effective Study Habits" course (addresses Gap 1)
  - Enroll in an SAT review course (addresses Gap 2)
  - Stop staying up late to watch MTV reality shows (addresses both Gaps 1 and 2).

Roadmapping Process

- We recognize that …
  - Science is formulated, executed, and applied and technologies are conceptualized and developed in a complex regulatory, legislative, organizational, and social context. This context we refer to broadly as '**Institutional Issues**.'
  - At the energy-water nexus, Institutional Issues **significantly** influence the application of science and technology findings and products.
  - Science and technology can inform (and in some cases bring about change in) the Institutional Issues context.
  - Institutional Issues and economic factors must be considered when formulating science and technology development plans.

- We ask you to recognize that …
  - We are tasked with creating a Science and Technology Roadmap.
  - This Roadmap will be used by the Department of Energy to plan and direct some of its R&D programs—its R&D is driven by, rather than a driver of, external Institutional Issues.

Roadmapping Process

In light of this, the needs assessment workshop will address energy-water interdependencies generally, and specifically …

1. 'Water for Energy' problems that can be solved/significantly mitigated through the development and application of new scientific knowledge or technologies
2. Institutional issue(s) that prohibit/hamper the development and application of new scientific knowledge or technologies
3. Economic factors that prohibit/hamper the development and application of new scientific knowledge or technologies

Roadmapping Process

We have been tasked to create a quantified, referenced roadmap document, so …

- If you note a problem or need, please provide references to supporting reports or data

- When you note a problem or need, please indicate your degree of certainty …
  - Low degrees of certainty can be as useful as high degrees, in that they indicate an area where R&D may be needed to inform the debate

Roadmapping Process

We realize not everyone is an expert in all the subjects being discussed, but everyone has a contribution to make.

The roadmap will only be as good as the input received, so please give it freely. No wallflowers!

All information will be recorded and noted … there is no unimportant comment or contribution.

Group findings will be presented in plenary session at the end of day one and day two … looking for volunteers!

Roadmapping Process

6 facilitated breakout groups working in parallel

Group A—Ballroom A

Group B—Ballroom B

Group C—Executive II

Group D—Utah Room

Group E—Suite 101

Group F—Colorado Room