

# Chemical Vision2020 Challenge

## An R&D Competition to Foster Innovation

### A Concept Proposal

Vision 2020 roadmaps have defined the R&D that could have a broad impact on the chemical industry. To foster innovative problem solving in these priority R&D areas, Vision2020 proposes an industry-driven R&D competition, called the Chemical Vision2020 Challenge, funded by industry and the Department of Energy's Office of Industrial Technologies (OIT).

By offering financial incentives for breakthrough technology developments, the Chemical Vision2020 Challenge would broaden the range of technical expertise available to help solve industry's toughest problems. Entrepreneurs, small businesses, suppliers, A&E firms, universities, national laboratories, and chemical companies would all be welcome to submit proposals and benefit from Challenge awards. In turn, companies who fund the Challenge would enjoy increased R&D activity, improved processes, enhanced public perception, low cost licensing, and early adoption.

To implement the Challenge, Vision2020 must first define its objective. The Challenge objective must reflect high-priority needs that are of broad interest to the industry and will result in a number of proposals. Before issuing a call for research proposals, Vision2020 must also design its selection criteria (e.g., economic merit, applicability to other processes, and novelty of the solution) and determine the Challenge incentives. Once proposals have been selected, the OIT Chemical Industry of the Future Program would fund initial Phase I technology development, such as conceptual designs and proof of concept technical feasibility. Vision2020 would coordinate industry-funded Phase II development, which might include applied R&D, pilot plant demonstrations, implementation, and commercialization.

To make this Challenge a success, Vision2020 is seeking assistance from corporate leaders for concept design and selection of objectives. The Challenge design must allow for companies that fund the competition to benefit financially and for federal funds to be directed towards R&D that can provide significant energy savings, increased productivity, and improved energy efficiency and environmental performance. Objectives to consider include the following topics:

- Develop "leap-frog" technologies with reduced annual cost and radically improved energy efficiency and environmental performance to replace existing technologies used to produce top volume chemicals
- Design a system to significantly reduce the total annual cost for the top five energy-using chemicals
- Improve specific unit operations such as distillation columns and fired heaters
- Develop enabling technical tools such as physical property databases and fundamentals-based computational models/simulations, both of which are priority cross-cutting technology needs identified in roadmaps
- Develop alternative feedstocks to replace fossil fuel for top volume chemicals

#### **Roles in Developing the Challenge Concept:**

**Chemical Industry** – selects topics, commits to future technology development, captures productivity benefits from new technology

**Technology Developers** – innovates new technology with multidisciplinary teams, receives financial award for developing new technology

**Federal Government** – funds high-risk innovative R&D, validates promising new technology, assists in technology replication

**Monsanto Challenge Successes:** In 1996, Monsanto offered a \$500,000 challenge to fund technology development for Acrylonitrile, with the promise of an additional \$500,000 for successful demonstration. Process specifications were included and used as the selection criteria: recovery of ammonia for target stream, <1% of SARA toxics left in exit stream, economic merit, applicability to other streams, freedom from restriction to practice the technology, and novelty of solution. Monsanto received 2300 inquiries and 183 final proposals. One of the technologies worked well and was funded for further development into a licensable technology. A second challenge was issued for herbicide production, which received 200 inquiries and 60 formal proposals. A new business based in part on the technology received \$2 million in startup funding to market the technology.

