



NGNP Industry Alliance

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The Dow Chemical Company



Agenda

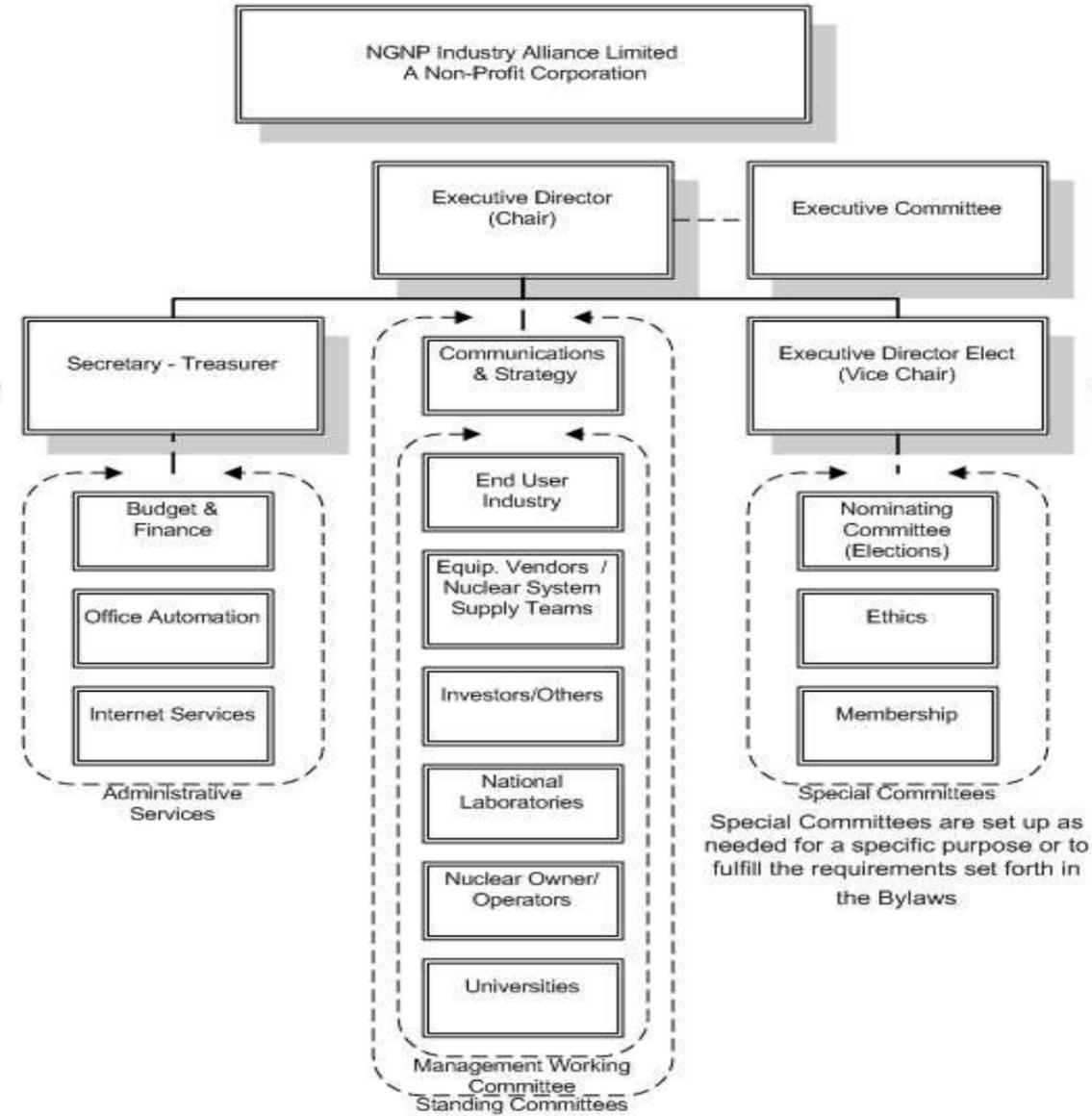
- Chemical manufacturing, and growing demand
- Dow chemical products, energy needs, global energy demands
- Carbon: Increasing regulation, decreasing supply of available carbon, atmospheric impact
- Advantage of Gen IV reactors Need for innovation



- Mission -
"To work with Government to commercialize High Temperature Gas-cooled Reactor technology expanding the use of clean nuclear energy and significantly reducing the dependence on premium fossil fuels."

Communications & Strategy Committee
 Recommend the following:
 Keith Belton / Peter Molinaro - Dow Chemical
 Allison Graves / George O'Connor - Entergy
 Mark Haynes - Concordia Power

Management Working Committee:
 Finis Southworth - AREVA
 Fred Moore - Dow Chemical
 Don Halter - ConocoPhillips
 TBD - Eastman Chemical
 John Mahoney - Entergy
 Phil Hildebrandt - BEA INL
 Layla Sandell - Westinghouse
 James Hobbs - B&W



Standing Committees serve to meet the the objectives and fulfill the obligations of the Alliance



The Dow Perspective



Growing Demand for Chemical Industry

[ACC: Industry is both optimistic, cautious about 2011](#)

Chemical producers see a bright year ahead... Stocks have risen to the range they had been in before the recession



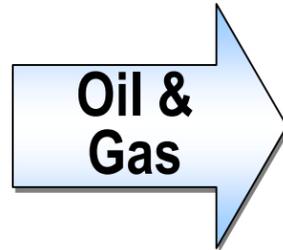
About Dow

- Diversified chemical company, harnessing the power of science and technology to improve living daily
- Founded in Midland, Michigan, in **1897**
- Supplies more than **5,000 products** to customers in **160 countries**
- Annual sales of **\$45 billion**
- **52,000 employees** worldwide
- Committed to **Sustainability**



Dow Energy Uses

**900,000 BBL
 Oil Eqiv / Day
 Or 0.3%
 of the
 World's
 Energy**



**(Greater than
 3/4 of the
 countries in
 the world, or
 Puerto Rico,
 Ireland, and
 Israel
 combined)**

Feedstock
 Ethane, Propane
 Butane, Naphtha

Steam

Power

600 trillion Btu/yr



Power, Heat & Steam Generation

- 4 GWs of self generated electricity
- More than 22 million pounds per hour of self generated steam
- Enormous direct fired process heating loads
- A typical large Dow Site consumes:
 - 1200 Mlb steam/hr (~400 MWt)
 - 400 MW of electricity (~1200 MWt)



Energy Crossroads: nations must address them all

- **Energy Security**
- **Feedstock Security**
- **National Security**
- **Climate Change**



Energy + Carbon = Value

- **Carbon constrained economy exists today**
- **Companies that can adapt and partner to **provide total solutions** will win**
- **Requires a **new paradigm** and creative business models**



Climate Change

“Dow’s position is **consistent with the best understanding the scientific community and the work of leading climate scientists** and the conclusion of the U.S. National Academy of Science, the American Meteorological Society, and the American Geophysical Union, the Geological Society of America, the American Association of Petroleum Geologists, as well as the leading Science Academies of Europe and Asia.”

Recent Headlines

- 12/24/2010 - [EPA moves unilaterally on greenhouse-gas emissions](#)
The Environmental Protection Agency said it will act unilaterally to develop new greenhouse-gas emissions standards for refineries and power plants.
- 12/21/2010 - [EPA to announce major emission standards for industrial facilities](#)
The Environmental Protection Agency may soon announce a major greenhouse-gas emissions policy for the country's refineries and power plants, indicating its effort to pursue emission limits despite congressional opposition. Under EPA's rollout schedule, a draft of performance standards for U.S. industrial facilities will be complete by July 2011, with final rules expected by May 2012. The EPA is already set to begin the regulation of new and upgraded facilities on Jan. 2, but the pending policy would impose an industry-wide standard that would cover even the oldest carbon-emitting facilities.
- 12/10/2010 - [Court denies industry bid to freeze EPA climate rules](#)
A federal court on Friday declined to halt looming Environmental Protection Agency climate change rules while legal challenges brought by a suite of industry groups, states and conservative activists wind their way through the system

Dow Energy Plan

Four fundamentals make the transition to a **sustainable energy future** possible.

- Aggressively pursue energy efficiency and conservation
- Increase, diversify and optimize hydrocarbon energy and feedstock supplies
- Accelerate development of alternative and renewable energy and feedstock sources
 - Finally, Dow supports the federal government's efforts to provide financial support to enable leadership in advancing development of new nuclear power technologies. One promising example is the High Temperature Gas Reactor (HTGR), which has the potential to produce synthetic fuels and feedstocks when combined with gasification of coal or other domestic carbon sources.
- Transition to a low carbon economy

Post Copenhagen

- World must shift thinking to Energy solutions
- Any climate policy must be linked to comprehensive Energy strategy
- Technology, innovation are the only levers to reduce CO2 economically
- World needs a price on carbon
- Market-based system is most environmentally effective, economically sustainable approach



Why HTGR?

- Inherent safety – co location
- N-X reliable process heat & electricity
- Superheated process steam supply
- Neutral cost without cost of carbon
- Addresses all key energy policy issues
 - Energy security
 - Carbon footprint
 - National security
 - Jobs

What Next?

- Need innovation: regulatory framework, high temperature metallurgy (>850 deg C), cost reductions
- Need to educate the public: the public lacks perspective on the real risk
- Need to overcome legislative hurdles