



Alternative Energy Sources for Dow – Challenges for a Large User



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The Dow Chemical Company

- A science and technology leader with sales of \$40 BN
- Founded in 1897 by Herbert H. Dow in Midland, MI, USA
- Supplies >3300 products to customers in 175 countries
- From 165 manufacturing sites in 37 countries
- Employs 43,000 people globally
- Committed to the principles of Sustainable Development (seeking to balance economic, environmental and social responsibilities).

more info: www.dow.com



Dow & Energy

- Dow's global energy consumption: **3500 MW**
- 54% own generation, thereof 75% co-generation
- 43% of costs from energy & feedstocks

- Challenges:
 - High & volatile prices for energy
 - environmental impact of energy production & consumption

→ Energy = a **critical** issue for Dow !



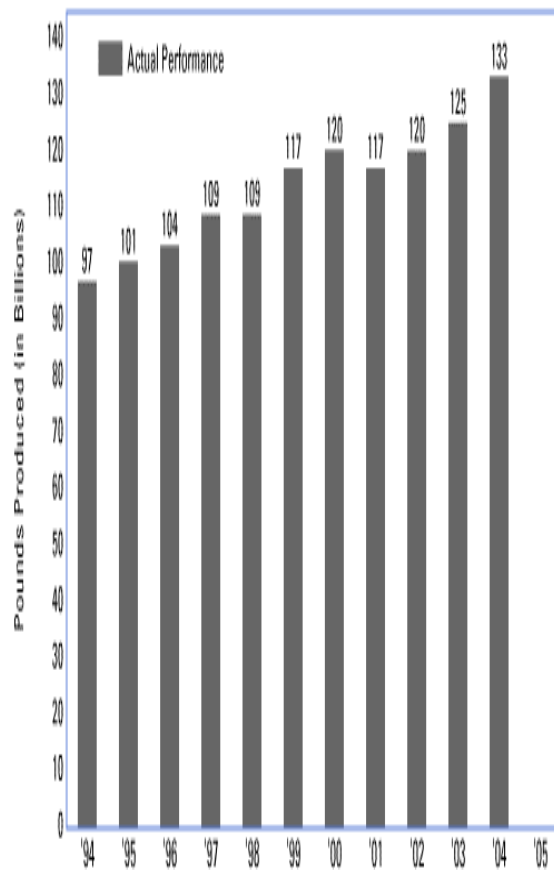
Dow's Energy Strategy

As the industry will continue to deliver performance - safety, production, reduction of emissions, etc...

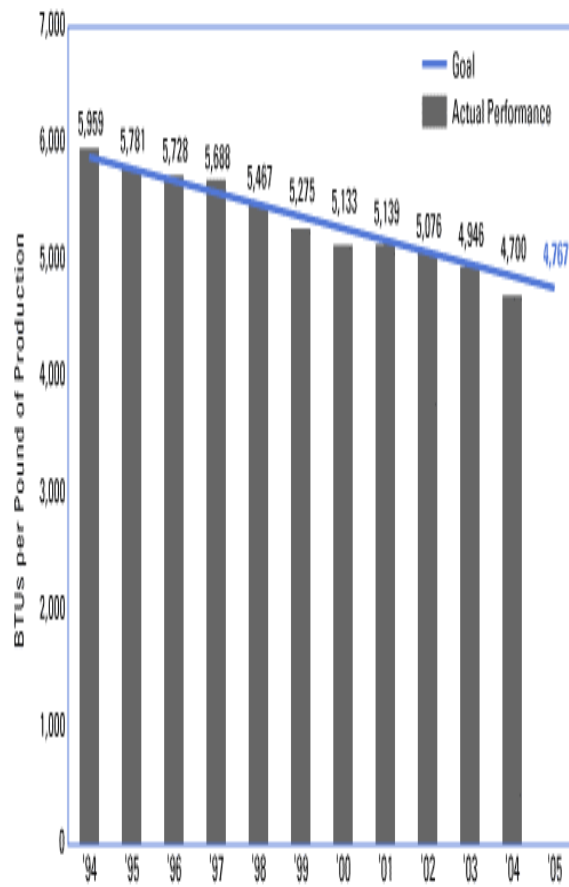
- continue reducing energy intensity
- secure & diversify supply
- take global view – consider regional aspects
- evaluate R&D, new technologies, alternative feedstocks & renewables as part of the solution



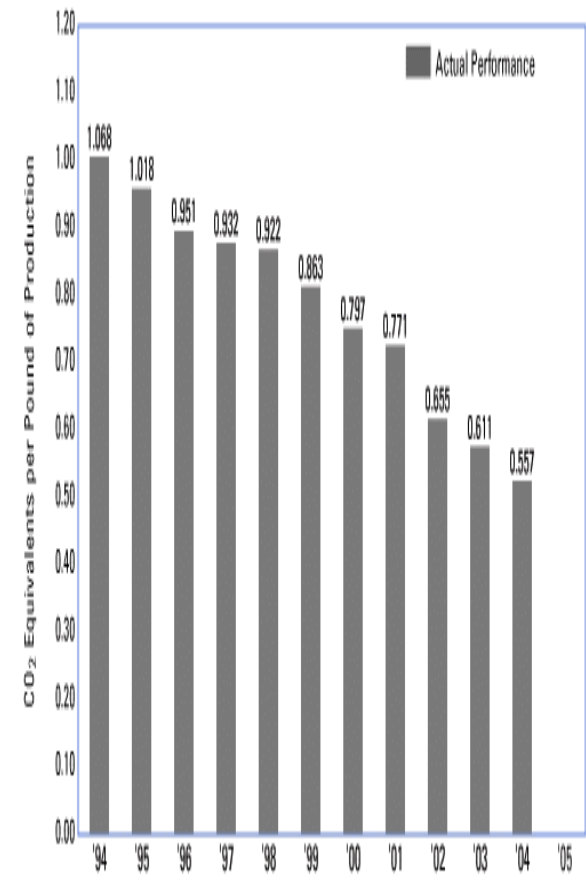
Production Output - Energy Intensity - GHG Emissions



D. Herzog



Proprietary Classification



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Only A Few Examples on Alternative Feedstocks ...

- (New) Polymer from corn-starch (commercial);
- Polyurethane foam from soy-oil (development project);
- World's largest fuel cell project (35 MW by 500 H₂-fuel cell units from GM) in Dow site Freeport, USA;
- JDA with SHENHUA (China) on coal-to-olefins;
- Part of WRI's Green Power Market Development Group;
- Lol with SEPA (China) on Clean Production;
- Venture Investment in MCEL (USA) for fuel-cells;

Criteria for Alternative Feedstocks

- Cost Competitiveness !!!
 - relative, total costs, long-term, limited price volatility
- Security of Supply
 - long-term availability, scalability, duplicatability
- Reduced Environmental Impact
 - entire chain, all emissions or by-products, ...



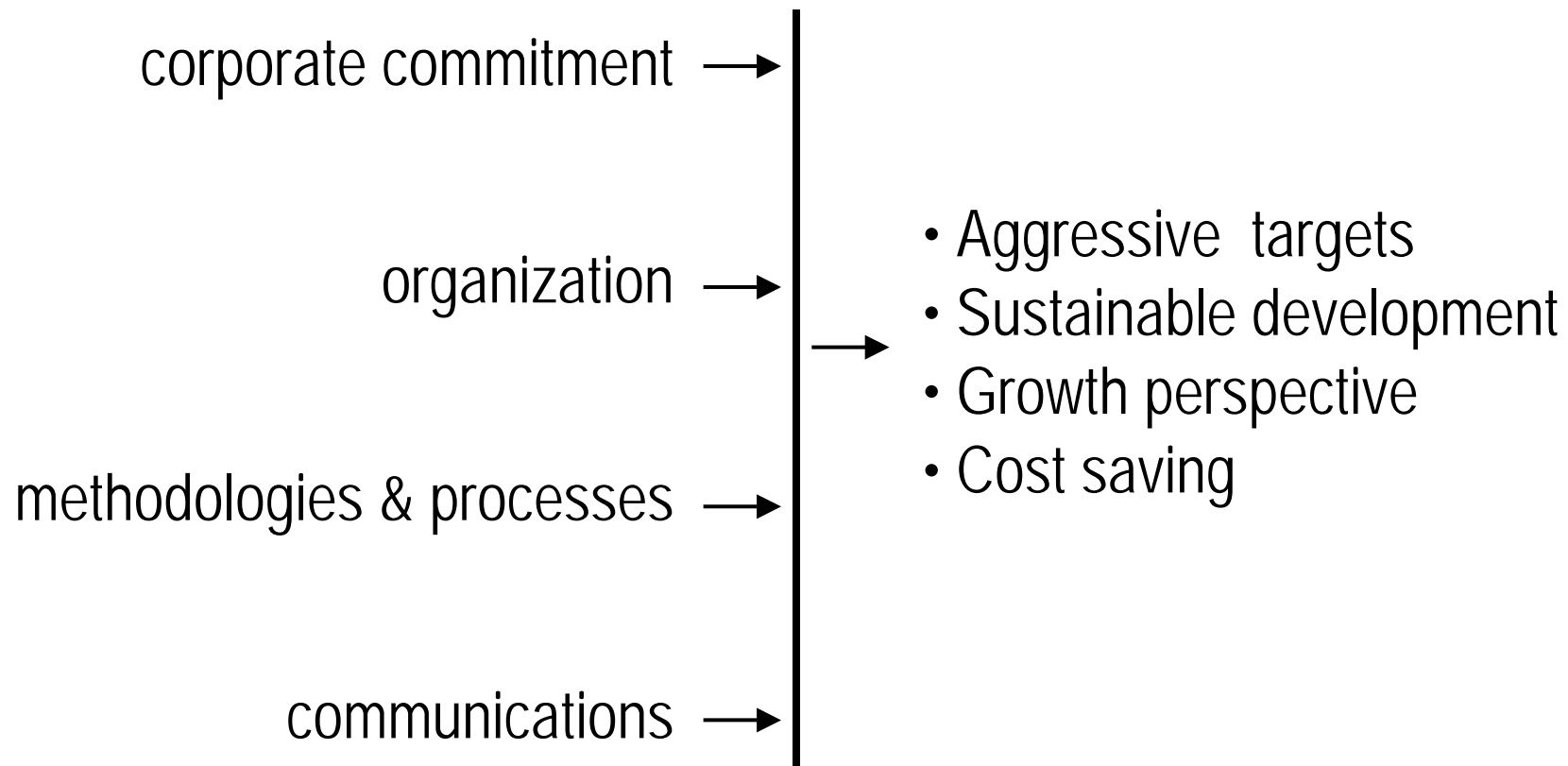
Dow's Approach towards Alternatives in Energy & Feedstocks

- Source of better solutions is irrelevant
(no preference for inside or outside)
- Dow Ventures is "point-of entry"
(evaluation/development in collaboration with Energy & Feedstock Group)
- Proposals must (promise to) meet the criteria
(see previous slide)
- "Staged commitments" *(in line with progress, milestones, ...)*
- Open for any model of alliance *(in-licensing, JDA, JV, JMA...)*



Back-Up

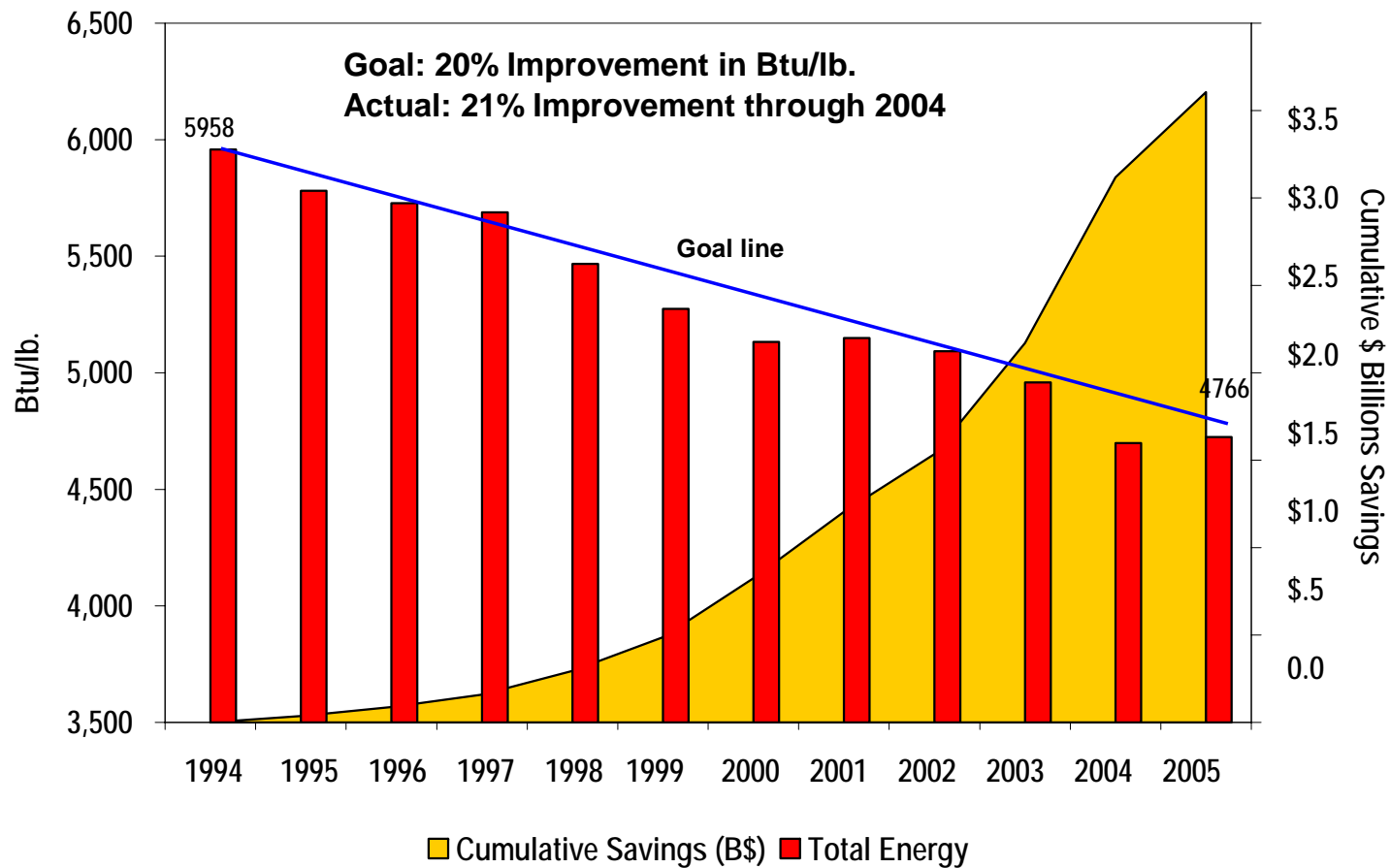
Energy Conservation Implementation Vehicles



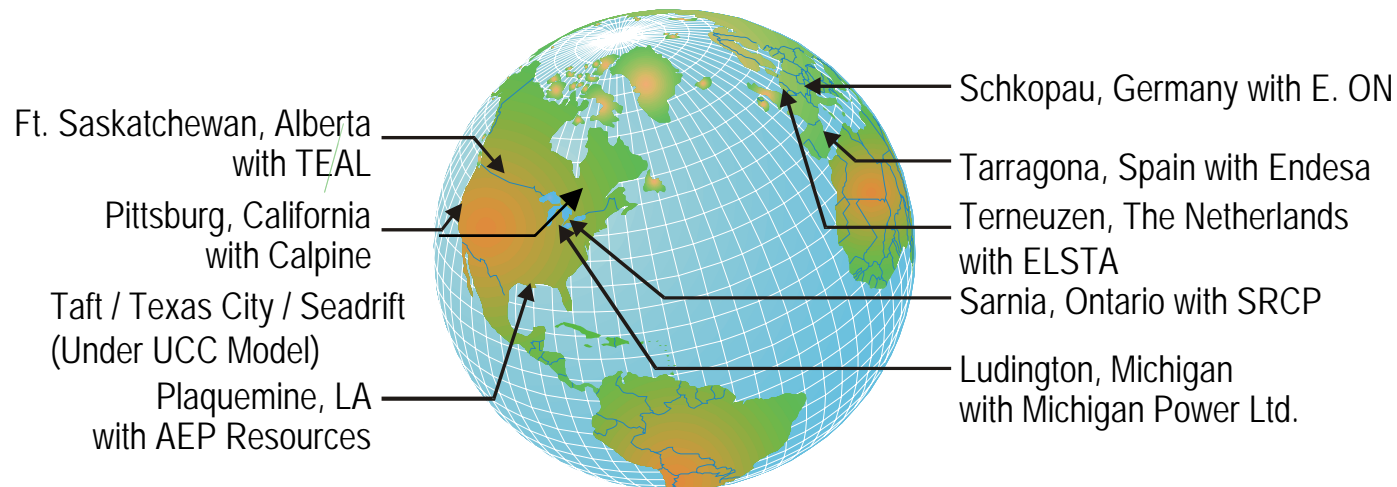


10-Year Energy Intensity Goal Set in 1994

Savings based on Dow weighted average natural gas price each year



Cogeneration Facilities



Eleven New Cogeneration facilities since 1994

- 2004 savings an equivalent of 32.6 Trillion Btu/year
- 75% of Dow's electricity from cogeneration



Achievements 1994-2004

- Met the 1994-2004 energy efficiency targets
- Implemented >500 efficiency projects
- Savings >150Trillion BTU
- Saved more than \$3.0 billion cumulative on energy cost
- Reduced CO₂ emission by 24 Million MT