DOW CHEMICAL COMPANY



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**TABLE OF CONTENTS**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*1) Identifying the Vision*  Page 2

*2) Locate, Analyze and Revise Mission*

 a) Current Mission Page 3

 b) 9 Components of Dow’s Mission Statement Page 4

 c) New/Revised Mission Statement Page 4

 d) Why We Changed It Page 4

*3) Evaluation*

 a) SWOT Rough Draft Page 5

b) SWOT Final Page 8

 c) Internal Factor Evaluation Matrix Page 9

 d) External Factor Evaluation Matrix Page 10

 e) Four Sustainable Competitive Criteria Page 11

 f) Porters Five Forces Page 12

 g) Competitive Profile Matrix Page 13

 h) TOWS Matrix Page 14

 i) TOWS Rationale Page 15

 j) SPACE Matrix Page 17

 k) BCG Matrix Page 19

 l) QSPM Page 20

*4) Recommended Strategies*

1. Reasoning Page 22
2. Possible Solutions Page 22
3. Wind and Solar Energy Page 22
4. Waste as a Renewable Resource Page 24
5. Feedstock Page 27
6. Homeopathic Alternatives to Medicine Page 29
7. Green Chemical Products Page 31
8. Recommendations Compared to Actual Strategies Page 33

*5) Sources*  Page 35

**IDENTIFYING THE VISION**

**VISION**

Dow’s vision is to be the “largest, most profitable, most respected chemical company in the world.” “They can do this because their size allows them to run more efficiently and their ability to leverage resources and technology gives them a distinctive competitive advantage.” Our profitability is achieved through operational intelligence which is attained by offering quality products and services to customers that others cannot which offers the greatest shareholder value. We are the most respected in our market because our actions are driven by our values of integrity and respect for people.

For more information visit http://Dow.com

**LOCATE, ANALYZE AND REVISE MISSION**

**CURRENT MISSION**

**“Mission - Why We're Here**
*To constantly improve what is essential to human progress by mastering science and technology.*

Dow's mission represents our greater purpose in society.

**Constantly improve** … This concept is and has been the bedrock of Dow's culture since H.H. Dow first said, "If you can't do it better, why do it?" It underscores our drive to continually seek the best in everything we do, and an unwillingness to settle for anything less.

**Essential to Human Progress** … The products we make find their way into products that provide people the world over with improved lifestyles. All of us at Dow understand and take pride in this contribution. We also use this concept to connect Dow with the external markets we serve. When we think in terms of the markets we serve, we become more outside-in focused and we seek growth opportunities.

**Mastering Science and Technology** … We put our science and technology to work to create solutions for our customers and for society.”

“Mission – Why We’re Here

To constantly improve what is essential to human progress by mastering science and technology.”

**9 COMPONENTS OF DOW’S MISSION STATEMENT**

1. Customers – Society and people of the world.
2. Products or Service –Dow chemical produces components that contribute to products that improve lifestyles.
3. Markets – The world.
4. Technology – Focus on mastering science and technology.
5. Concern for Survival, Growth and Profitability – Become more outside-in focused and seek growth technologies and constantly improve.
6. Philosophy – Constantly improve. Essential to human progress. Mastering science and technology.
7. Self Concept – N/A
8. Concern for Public Image – N/A
9. Concern for Employees – N/A

**NEW/REVISED MISSION STATEMENT**

Dow produces chemical components that contribute to products which improve lifestyles of people and their societies all around the world. While constantly improving our technology and modern science we are becoming more outside-in focused which will allow us to constantly improve.

Another major focus of Dow is to utilize all the skills and talents of our employees to create innovation which is essential to our growth. We strive to become the largest and most profitable organization within our market to become respected by the shareholders and improve our public image in the eyes of society.

**WHY WE CHANGED IT**

We kept the mission very similar. However, they neglected to mention their employees, public image and their self-concept. Therefore, we searched their website and found that they did not neglect these issues, they were just not included in the mission and we felt that it was important to include.

We added these components:

1. Self-Concept – Utilize employee skills, imagination and talents.
2. Concern for Public Image – Become the largest and most profitable organization within the market. Become respected by the shareholders.
3. Concern for Employees – Utilize employees to the fullest.

For more information visit http://Dow.com

**SWOT ROUGH DRAFT**

*Strengths*

1. Acquisition capability in weak economy
2. Product diversity
3. Inorganic growth through acquisitions
4. Centers available for testing and research to improve on technology
5. Ability to create renewable energy sources through technology
6. Asset-light strategy; Dow contributes the technical know-how for producing plastics and chemicals, while its partners provide low-cost feedstock’s and access to new markets
7. Strong international growth
8. 2nd Largest producer of chemicals and plastics
9. 150 plant locations in 35 countries
10. Products are marketed in over 160 countries
11. Sells raw materials as well as finished goods
12. Own salt, brine and limestone deposits across the United States
13. Breaking into insurance market
14. Revenues are diversified in case of failure of one area
15. Over 3,100 products/goods that serve a variety of customer
16. Research and Development in very active and innovative
17. Developed Omega-9 oils
18. Actively seeking healthier alternative methods
19. Worlds first plant made vaccine
20. Creation of new jobs due to acquisitions and joint ventures
21. World dominance in petrochemical joint ventures
22. Well established business
23. Government collaborations
24. Outsources some R&D to universities and independent laboratories
25. Constant growing customer base through acquisitions
26. Honored for their green chemistry-“received the Designing Greener Chemicals Award for developing a green chemical synthetic for a new insecticide called Spinetroram
27. Started using renewable energy source-methane from landfill gas

*Weaknesses*

1. Low corporate philanthropy
2. Fluctuating Cash flow
3. Fluctuating profit
4. Hurt by increased cost of raw materials, energy and transportations costs
5. Weakness in automotive and construction sectors hurts specialty chemicals and plastics
6. Specialty chemicals reliant on crude oil and natural gas
7. Decline in earnings
8. Increasing costs due to rising energy and raw material costs which increases costs to maintain production
9. Pulling away from bulk chemicals and focusing on upgrading its image for  investors by focusing in more advanced product
10. Weakness in the US which accounts for 34.1% of revenue
11. There was a 20% price increase in June plus another 25% increase in July
12. Pulling away from bulk chemicals and focusing on upgrading its image for  investors
13. Having to raise consumer’s cost due to increase in material costs
14. Numerous business lines to spread resources
15. Vulnerability to controversy due to nature of business
16. Need greater access to energy and feedstock to lower costs
17. Employee illness and injury
18. Greater earnings growth and consistency through “Transform” guiding principles
19. Over two thirds of revenues and profits are generated from overseas
20. Increased spending needed to enhance energy efficiency
21. Government collaborations

*Opportunities*

1. Acquisition with Rohm & Haas
2. Acquisition in weak economy
3. Additional joint ventures
4. Acquired Bayer’s Wolff Walsrode via acquisition
5. Acquired Agromen Tecnologia via acquisition
6. Acquired Duo Maize via acquisition
7. Inorganic growth through acquisitions
8. Cutting edge technology for research and development
9. Push for green products (customer loyalty); benefit to the R & D team of Dow
10. Strong international growth
11. Opportunities for the basic petro-based plastics and developments in white biotechnology and the use of renewable resources.
12. Expansions in emerging regions are creating opportunity in the global biocides market
13. Open a plant at the global center for plastics in Brazil which are being made from plant-based materials
14. Increased demand for alternative fuel and energy
15. Deadly H20 needs an innovative hero (DOW)
16. Society need for plastic innovation (green)
17. Increased international demand (make up for weakness in the US)
18. Increased demand for plastic car parts
19. Sale of certain business lines

*Threats*

1. Green efforts of society
2. Negative publicity regarding chemical contaminations
3. Environmental protection costs due to hazardous waste increases costs
4. Competitors in the marketplace are performing acquisitions compliance with Environmental codes
5. US Government energy policies are being restructured
6. Large company caused internal scandal (potential sale from under CEO’s feet)
7. Pay triple penalty for petroleum because it is used as a raw material for many of Dow’s products
8. Rising cost of raw materials and energy from the economy
9. Employee betrayal, such as executives trying to execute a takeover of the company from behind the boards back
10. Increasing feedstock prices
11. Increasing price of natural gas
12. Increasing price of crude oil
13. Specialty chemicals reliant on crude oil and natural gas
14. Produces hazardous materials
15. Increasing costs due to rising energy and raw material costs; Increase costs to maintain production
16. Must raise consumer’s costs due to increase in material costs
17. Decreased plastic use (Plastic bags)
18. Internet use by environmentalists
19. Hurricane Ike – 6 Locations are affected
20. Weakened dollar
21. Potential for negative reaction to providing chemicals during wartime such as during Vietnam War
22. Lawsuits by environmental activists
23. Potential Antitrust Issues due to continued acquisitions
24. Rising gas prices

**SWOT FINAL**

**STRENGHTS**

1. Product diversity to ensure revenue in case of failure in one particular area
2. Actively seeking healthier alternative methods to create renewable energy sources
3. Asset-light strategy through acquisitions; Dow contributes the technical know-how for producing plastics and chemicals, while its partners provide low-cost feedstock’s and access to new markets
4. Strong international growth with over 3100 products marketed in over 160 countries
5. Research and Development is very active and innovative

**WEAKNESSES**

1. Fluctuating Cash flow and profit
2. Hurt by increased cost of raw materials, energy and transportations costs
3. Vulnerability to controversy due to nature of business
4. Increased spending needed to enhance energy efficiency
5. Employee betrayal, such as executives trying to execute a takeover of the company from behind the boards back

**OPPORTUNITIES**

1. Expansions in emerging regions are creating global opportunity
2. Additional joint ventures and acquisitions
3. Cutting edge technology for research and development
4. Push for green products and alternative fuel and energy
5. Sale of certain business lines to create sustained revenues

**THREATS**

1. Green efforts of society
2. Rising cost of raw materials and energy from the economy
3. US Government energy policies are being restructured
4. Weakened Dollar
5. Geographic vulnerability to external elements

|  |  |
| --- | --- |
|   | **INTERNAL FACTOR EVALUATION MATRIX (IFE)** |
|   |  |  |  |  |
|   | Key External Factors | Weight | Rating | Weighted Score |
|   | **Strengths** |   |   |   |
| 1)  | Product diversity to ensure revenue in case of failure in one particular area | 0.05 | 2 | 0.10 |
| 2)  | Actively seeking healthier alternative methods to create renewable energy sources | 0.10 | 3 | 0.30 |
| 3)  | Asset-light strategy through acquisitions; Dow contributes the technical know-how for producing plastics and chemicals, while its partners provide low-cost feedstock’s and access to new markets | 0.15 | 4 | 0.60 |
| 4)  | Strong international growth with over 3100 products marketed in over 160 countries | 0.05 | 3 | 0.15 |
| 5)  | Research and Development is very active and innovative | 0.15 | 4 | 0.60 |
|   |  |  |  |   |
|   | **Weaknesses** |  |  |   |
| 1)  | Fluctuating Cash flow and profit | 0.15 | 3 | 0.45 |
| 2)  | Hurt by increased cost of raw materials, energy and transportations costs | 0.15 | 4 | 0.60 |
| 3)  | Vulnerability to controversy due to nature of business | 0.05 | 2 | 0.10 |
| 4)  | Increased spending needed to enhance energy efficiency | 0.10 | 2 | 0.20 |
| 5)  | Employee betrayal, such as executives trying to execute a takeover of the company from behind the boards back | 0.05 | 1 | 0.05 |
|   | **TOTAL** | **1.00** |  | **3.15** |
|   |   |   |   |   |

|  |  |
| --- | --- |
|   | **EXTERNAL FACTOR EVALUATION MATRIX (EFE)** |
|   |  |  |  |  |
|   | Key External Factors | Weight | Rating | Weighted Score |
|   | **Opportunities** |   |   |   |
| 1)  | Expansions in emerging regions are creating global opportunity | 0.10 | 3 | 0.30 |
| 2)  | Additional joint ventures and acquisitions | 0.10 | 4 | 0.40 |
| 3)  | Cutting edge technology for research and development | 0.15 | 4 | 0.60 |
| 4)  | Push for green products and alternative fuel and energy | 0.10 | 2 | 0.20 |
| 5)  | Sale of certain business lines to create sustained revenues | 0.05 | 1 | 0.05 |
|   |  |  |  |   |
|   | **Threats** |  |  |   |
| 1)  | Green efforts of society | 0.10 | 2 | 0.20 |
| 2)  | Rising cost of raw materials and energy from the economy | 0.15 | 4 | 0.60 |
| 3)  | US Government energy policies are being restructured | 0.15 | 3 | 0.45 |
| 4)  | Weakened Dollar | 0.10 | 2 | 0.20 |
| 5)  | Geographic vulnerability to external elements | 0.05 | 2 | 0.10 |
|   | **TOTAL** | **1.05** |  | **3.10** |
|   |   |   |   |   |

**FOUR SUSTAINABLE COMPETITIVE CRITERIA**

**1) Is it rare?**

Yes. Dow has a magnitude of resources and technology available to it such as, Dow:

* Is one of the few companies who owns its own resources (salt, limestone and brine deposits),
* Has the ability to continually keep up to date on technology advances,
* Holds the ability to excel in any international market they enter, and
* Has a very diverse line of products and diversifies within their projects of innovation.

**2) Is it valuable?**

Yes. There is high demand of products produced and Dow thrives in many markets including:

* “Agricultural and food,
* Automotive and transportation,
* Building and construction,
* Electronic and Appliances,
* Fiber/textile and footwear,
* Furniture and bedding,
* Flooring,
* Health and Medical,
* Oil and gas/ chemical Processing,
* Packaging and Films,
* Water, and
* Wire and Cable.” (Dow.com)

**3) Is it hard to copy?**

Yes. Continuous enhancements of innovative research and technological capabilities prevent the likelihood of duplication; this is even more difficult to copy because of the fact that Dow also has its own research and development division. Dow also has a “substantial number of licenses, patents and other technology agreements that helps prevent duplication (Dow.com).” All of this combined will make it very difficult to duplicate Dow’s efforts.

**4) Is it non-substitutable?**

Yes. Substitution is challenging because no other company is as diverse as Dow with their product lines. Therefore, as a whole, Dow is the most unique company in the markets in which they produce products.

**PORTERS FIVE FORCES**

**1) General Economic Conditions**

Dow has a leg up on its competitors and other corporations due to international diversification of production and sales due to inorganic growth through acquisitions and the use of asset light strategy through joint ventures.

**2) Legislative/Regulative**

Regulations continue to hinder corporation due to new government policies being put into effect; this can limit production as well as budgets.

**3) Population Demographics**

Dow has an extreme global presence; they have 150 plants in 35 countries with products that are marketed in over 160 countries. This captures a large share of the global demographics. Therefore, Dow’s products reach a large percentage of the global population.

**4) Societal Values**

Dow provides improved lifestyles globally through innovative products and renewable resources. Their green efforts are being pursued currently in order to continually remain in the mainstream of societal expectations.

**5) Technology**

Innovative research and development provides Dow with continual advancements in technology to provide the most cutting edge products to maintain its competitive advantage. Dow’s asset light strategy stems from Dow’s ability to provide the technological knowledge while the partner provides the cash budget.

**6) Global**

There is a global focus on renewable resources. As a result of their presence in the marketplace, Dow has an extreme global presence in countries across the world along with expansions in emerging regions creating global opportunities.

|  |  |
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|   | **COMPETITIVE PROFILE MATRIX** |
|   |  |  |  |  |  |  |  |  |
|   |  | **BASF** | **Eastman Chemical** | **Dupont** |
|   | **CRITICAL SUCCESS FACTORS** | Weight | Rating | Weighted Score | Rating | Weighted Score | Rating | Weighted Score |
|   |  |   |   |   |   |   |   |   |
| 1)  | Global Expansion | 0.10 | 4 | 0.40 | 3 | 0.30 | 4 | 0.40 |
| 2)  | Market Share | 0.05 | 4 | 0.20 | 2 | 0.10 | 2 | 0.10 |
| 3)  | Customer Loyalty | 0.10 | 3 | 0.30 | 3 | 0.30 | 3 | 0.30 |
| 4)  | Natural Resources | 0.20 | 2 | 0.40 | 1 | 0.20 | 1 | 0.20 |
| 5)  | Financial Position | 0.10 | 3 | 0.30 | 1 | 0.10 | 1 | 0.10 |
| 6) | Management | 0.10 | 2 | 0.20 | 3 | 0.30 | 2 | 0.20 |
| 7) | Research & Development | 0.20 | 4 | 0.80 | 3 | 0.60 | 4 | 0.80 |
| 8) | Environmental Efforts | 0.15 | 4 | 0.60 | 3 | 0.45 | 2 | 0.30 |
|   | **TOTAL** | **1.00** |  | **3.20** |  | **2.35** |  | **2.40** |
|   |   |   |   |   |   |   |   |   |

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| **TOWS MATRIX** |
|  | **Strengths--S** | **Weaknesses--W** |
|  | 1. Asset-light strategy through acquisitions; Dow contributes the technical know-how for producing plastics and chemicals, while its partners provide low-cost feedstock’s and access to new markets | 1. Fluctuating cash flow and profit |
|  | 2. Research and Development is very active and innovative | 2. Hurt by increased cost of raw materials, energy and transportations costs |
|  | 3. Actively seeking healthier alternative methods to create renewable energy sources | 3. Increased sending needed to enhance energy efficiency |
| **Opportunities--O** | **SO Strategies** | **WO Strategies** |
| 1. Cutting edge technology for research and development | Cutting edge technology will further enhance Dow's already innovative Research and Development. (S2,01) | Although Dow is spending more to enhance their energy efficiency, they are gaining a better social reputation as they push for green products and alternatice energies. (W3,O3) |
| 2. Additional joint ventures and acquisitions | Dow's focus on creating renewable energy sources will compliment society's push for green products and energies. (S3,O3) | Dow is able to stabalize their cash flow and profit through strategically placed joint venture and acquisitions. (W1,O2) |
| 3. Push for green products and alternative fuel and energy |   |   |
| **Threats--T** | **ST Strategies** | **WT Strategies** |
| 1. Rising cost of raw materials and energy from the economy | With government policies being restructured, we are seeking alternative methods of creating renewable energy. (S3,T2) | Hurt by increased cost of raw materials, energy and transportations costs, Rising cost of raw materials and energy from the economy. (W2,T1) |
| 2. US Government energy policies are being restructured | Being able to actively seek healthier alternative methods for renewable energy is a positive effect on society. (S3,T3) | Increased spending needed to enhance energy efficiency, US Government energy policies are being restructured. (W3,T2) |
| 3. Green efforts of society |   |   |

**RATIONALE FOR TOWS MATRIX**

**S2 (Research and Development is very active and innovative), O1 (Cutting edge technology for research and development)**

Dow's R&D sets it apart from the competition.  The new cutting edge technologies in the marketplace coupled with their innovative team will give it a competitive advantage.

**S3 (Actively seeking healthier alternative methods to create renewable energy sources), O3 (Push for green products and alternative fuel and energy)**

Dow's ability to create renewable energy sources will help the company to be environmentally friendly while finding more cost effective methods to utilize it's resources.  It will also have a positive impact on society who is focused on "Thinking Green" to protect the environment.

**S3 (Actively seeking healthier alternative methods to create renewable energy sources), T2 (US Government energy policies are being restructured)**

Dow has the technology and knowledge to be able to constantly adjust to the new government policies that are being created every year.  They are seeking new ways to create renewable energy through healthier or "greener" methods..

**S3 (Actively seeking healthier alternative methods to create renewable energy sources), T3 (Green efforts of society)**

Society is constantly looking for a product and/or company that is concerned with the effects of the environment that they cause and/or help.  Dow has the ability to contribute positively to the environment through their research and technology.

**W3 (Increased sending needed to enhance energy efficiency), O3 (Push for green products and alternative fuel and energy)**

Dow sees the opportunity to gain a better societal image by pushing for green products and alternative fuel and energy; however, in doing so they are increasing their spending.

**W1 (Fluctuating cash flow and profit), O2 (Additional joint ventures and acquisitions)**

Dow financial records have shown to be unstable over the past few years and by strategically picking smart joint ventures and acquisitions they should be able to reduce the fluctuation in their cash flows and profits.

**W2 (Hurt by increased cost of raw materials, energy and transportations costs), T1 (Rising cost of raw materials and energy from the economy)**

The rising costs of raw materials, energy and transportation of the economy may hurt revenue of DOW due to increased fixed costs.

**W3 (Increased sending needed to enhance energy efficiency), T2 (US Government energy policies are being restructured)**

Due to the fact that the government is implementing many more policies that must be abided by to enhance to environment, DOW needs to increase their spending in order to abide by these new policies being implemented.

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| **SPACE MATRIX**  |
|  |  |
| **Financial Strength** | **Ratings** |
| Return on investment is decreasing | 2.0 |
| Increased prices for natural resources | 1.0 |
| DOW's debt to to total equity is 0.50, below the industry standard of 0.59 | 4.0 |
| Cash flow is challenged | 2.0 |
|  | 9.0 |
| **Industry Strength** |  |
| Great growth potential with green movement | 5.0 |
| Ability to strategically enter acquisitions | 6.0 |
| Large profit potential through joint ventures | 5.0 |
| Innovative R & D | 6.0 |
|  | 22.0 |
| **Environmental Stability** |  |
| Strong demand for DOW's products because of large market share | -2.0 |
| Leaders in technological innovation | -2.0 |
| Strong sales in overseas markets | -3.0 |
| Natural resources and financials have placed a high barrier to entry for new entrants | -3.0 |
|  | -10.0 |
| **Competitive Advantage** |  |
| 2nd largest distributor for market | -1.0 |
| Strong and innovative R & D | -1.0 |
| Complete control over all products and distribution of products | -3.0 |
| WSill be a constant need for DOW's products/constantly enhancing their product line | -3.0 |
|  | -8.0 |
| **Conclusion** |  |
| ES average is: -10/4 = -2.5 |  |
| IS average is: 22/4 = 5.5 |  |
| CA average is: -8/4 = -2 |  |
| FS average is: 9/4 = 2.25 |  |
| Directional vector coordinates: |  |
| x-axis is: -2 + (5.5) = 3.5 | 3.5 |
| y-axis is: -2.5 + (2.25) = -0.25 | -0.25 |
| Dow should pursue competitive strategies |  |

**BCG Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Company** | **Revenues (000's)** | **Percent Revenues** | **Profits (000's)** | **Percent Profits** | **Percent Market Share** | **Percent Growth Rate** |
| DOW | 53,500,000 | 8.46% | 2,900,000 | 4.47% | 35.40% | 9.00% |
| BASF | 52,610,000 | 8.32% | 3,215,000 | 4.95% | 40.20% | 11.20% |
| Eastman Chemical | 6,830,000 | 1.08% | 1,192,000 | 1.84% | 2.30% | 4.20% |
| Du Pont | 30,454,000 | 4.82% | 2,988,000 | 4.60% | 10.70% | 2.50% |
| Air Product Chemical | 10,037,800 | 1.59% | 3,499,600 | 5.39% | 5.70% | 23.50% |
| ROHM HAAS | 8,897,000 | 1.41% | 2,879,000 | 4.43% | 3.20% | 3.80% |
| **Total** | 162328800 | 25.68% | 16673600 | 25.68% | 97.50% | 54.20% |

|  |
| --- |
| **QSPM** |
|  |  |  |  |  |  |
|  |  | **Strategic Alternatives** |
|  |  | ***Cutting edge technology will further enhance Dow's already innovative Research & Development.*** | ***Dow's focus on creating renewable energy sources will compliment society's push for green products and energy.*** |
| ***Key Factors*** | ***Weight*** | ***AS*** | ***TAS*** | ***AS*** | ***TAS*** |
| ***Opportunities*** |   |   |   |   |   |
| 1. Expansions in emerging regions are creating global opportunity | 0.05 | - | - | - | - |
| 2. Additional joint ventures and acquisitions | 0.05 | - | - | - | - |
| 3. Cutting edge technology for research and development | 0.15 | 4 | 0.6 | 3 | 0.45 |
| 4. Push for green products and alternative fuel and energy | 0.15 | 3 | 0.45 | 4 | 0.6 |
| 5. Sale of certain business lines to create sustained revenues | 0.05 | - | - | - | - |
| ***Threats*** |   |   |   |   |   |
| 1. .Green efforts of society | 0.15 | 2 | 0.3 | 4 | 0.6 |
| 2. Rising cost of raw materials and energy from the economy | 0.15 | 2 | 0.3 | 4 | 0.6 |
| 3. US Government energy policies are being restructured | 0.15 | 1 | 0.15 | 3 | 0.45 |
| 4. Weakened Dollar | 0.05 | - | - | - | - |
| 5. Geographic vulnerability to external elements | 0.05 | - | - | - | - |
|  | 1.00 |   |   |   |   |
|  |  |  |  |  |  |
| ***Strengths*** |   |   |   |   |   |
| 1. Product diversity to ensure revenue in case of failure in one particular area | 0.05 | 1 | 0.05 | 1 | 0.05 |
| 2. Actively seeking healthier alternative methods to create renewable energy sources | 0.15 | 3 | 0.45 | 4 | 0.6 |
| 3. Asset-light strategy through acquisitions; Dow contributes the technical know-how for producing plastics and chemicals, while its partners provide low-cost feedstock’s and access to new markets | 0.10 | 3 | 0.3 | 1 | 0.1 |
| 4. Strong international growth with over 3100 products marketed in over 160 countries | 0.05 | - | - | - | - |
| 5. Research and Development is very active and innovative | 0.15 | 4 | 0.6 | 3 | 0.45 |
| ***Weaknesses*** |   |   |   |   |   |
| 1. Fluctuating Cash flow and profit | 0.05 | - | - | - | - |
| 2. Hurt by increased cost of raw materials, energy and transportations costs | 0.15 | 2 | 0.3 | 4 | 0.6 |
| 3. Vulnerability to controversy due to nature of business | 0.05 | - | - | - | - |
| 4. Increased spending needed to enhance energy efficiency | 0.20 | 3 | 0.6 | 4 | 0.8 |
| 5. Employee betrayal, such as executives trying to execute a takeover of the company from behind the boards back | 0.05 | - | - | - | - |
| **Sum Total of Attractiveness Score** | 1 |   | 4.1 |   | 5.3 |

**RECOMMENDED STRATEGIES**

**Reasoning**

 The following ideas have been identified to be the most critical to concentrate on in order to enhance our awareness to the societal shift towards green efforts. The following are listed along with the reason why these are the best alternatives and their costs associated with making these changes.

The most important aspect of using these alternative sources of energy is that it will follow our recommended strategy to pursue green alternatives within our business. Not only will these steps towards being green create a better environment for everyone, but it will show that Dow is responsible and will ultimately prove to investors that Dow is taking necessary steps to be an asset to the markets in which Dow produces. As a result, shareholder will be more likely to invest in Dow.

**Possible Solutions**

 After analyzing green opportunities, the following were ideas to utilizes our renewable resources and promotes the green efforts of society:

* Wind Mills,
* Solar Energy,
* Hybrids ,
* Healthier gas alternatives ,
* Convert waste into a renewable resource ,
* Recycle unused parts during production,
* Recycle bins,
* Price of feedstock is rising ,
* Homeopathic methods of medicine ,
* Flooring and furniture ,
* Green chemical products , and
* Plastic bags.

**Wind and Solar Energy**

*Objective*

Due to rising costs of energy, it makes a lot of sense to create your own energy at a lower cost. Solar and Wind energy seem to be the new and upcoming solutions to the problem; not to mention that the more residential and commercial locations that use these alternative sources of energy, the less dependence our country will have on foreign energy sources.

Solar and Wind energy will allow Dow to have a non-fluctuating/rising energy costs within their brick and mortar locations. This will allow for more stability within the financial statements and will ultimately allow for Dow to use their money saved to invest back into their business.

The most important aspect of this alternative is the impact it will have on the environment in which Dow operates. Wind turbines and solar panels do not produce any kind of pollution and will also “offset pollution that would have been generated by your utility company ([www.awea.org)](http://www.awea.org)).” For example “a *small residential* wind turbine can offset approximately 1.2 tons of air pollutants and 200 tons of greenhouse gases, carbon dioxide and other gases which cause climate change ([www.awea.org](http://www.awea.org))”

 Now, imagine what kind of a positive impact Dow could have on our environment if they implemented this change to all of their 150 plants worldwide! The benefits to our environment would be astronomical.

*Costs*

 The initial set-up costs for both Wind and Solar energy may be very large. However, a few things must be considered before panicking over the initial costs:

* There return on your investment will only take 3-4 years (this could also be shorter when taking fluctuating energy costs into consideration)
* All the energy you produce is FREE, you do not have to worry about fluctuating and rising energy costs
* The company will receive a 30% Investment Tax Credit
* You can receive a “10-year labor and 25-year manufacturer warranty ([www.solarelectricsystems.com](http://www.solarelectricsystems.com))” on your solar system
* Every dollar saved on annual utility bills can add $20 to the property’s market value ([www.ips-solar.com](http://www.ips-solar.com))
* The company can sell any unused energy to their electric company for cash
* You are locking in energy prices for 30+ years with a solar system

After considering all these facts, it can be concluded that while the initial costs to set-up Wind and Solar energy units can be high (residential Solar Systems start around $20,000 per unit and residential Wind Systems can start around $60,000 per unit according to [www.ips-solar.com](http://www.ips-solar.com)) , the long term benefits clearly outweigh the initial costs.

*Itemize For Projected Years*

 The return on investment period for Solar Panels is about 3-4 years and the return on investment period for Wind Turbines is about 20 years ([www.solarelectricalsystems.com](http://www.solarelectricalsystems.com) and [www.ips-solar.com](http://www.ips-solar.com)). However, these numbers are more than likely lower due to the 30%-40% annual rising energy costs.

*Implementation*

 It is suggested that each brick and mortar location, depending on their investment budget, initiate this change as soon as possible. If they cannot afford to create these changes right away, there are a few options to consider:

1. Create a savings account dedicated to this fund
2. Take advantage of Government loans available for projects such as this
3. Install the systems in small section and build each year.

*Timetable/Agenda for Action*

 It is expected that these projects could be implemented within the next 10 years. The sooner this plan is implemented, the sooner Dow can work towards their ROI and receiving free and environmentally friendly energy.

*Recommend Specific Annual Objective and Policies*

It would be a good financial decision to use the next few years of budgeted energy costs to use towards setting these systems up rather than investing in their local energy companies who contribute to greenhouse emissions, carbon dioxide and other harmful gases.

*Evaluation*

 A good rule of thumb for evaluating this plan is to ensure that each location is working towards one of the options listed above within the first year. If this is not attainable, then debt financing will be required in order to work towards this common goal.

**Waste as a Renewable Resource**

*Objective*

Waste-to-energy plants offer two important benefits of environmentally safe waste management and disposal, as well as the generation of clean electric power. Waste-to-energy facilities produce clean, renewable energy through thermochemical, biochemical and physicochemical methods. The growing use of waste-to-energy as a method to dispose off solid and liquid wastes and generate power has greatly reduced environmental impacts of municipal solid waste management, including emissions of greenhouse gases. Waste-to-energy conversion reduces greenhouse gas emissions in two ways. Electricity is generated which reduces the dependence on electrical production from power plants based on fossil fuels. The greenhouse gas emissions are significantly reduced by preventing methane emissions from landfills. Moreover, waste-to-energy plants are highly efficient in harnessing the untapped sources of energy from a variety of wastes.

An environmentally sound and techno-economically viable methodology to treat biodegradable waste is highly crucial for the sustainability of modern societies. A transition from conventional energy systems to one based on renewable resources is necessary to meet the ever-increasing demand for energy and to address environmental concerns.

*Trash to Diesel*

Green Power Inc (GPI) has developed a method of inexpensively converting biomass and household waste into high grade diesel fuel, a process they call "NanoDiesel" that could go a long way toward solving the world's energy and waste problems at the same time, without upsetting the CO2 balance.

In March of 2008, GPI completed their first production prototype that is capable of processing 100 tons of municipal and other waste per day in a low heat and low pressure, proprietary catalytic system, converting the feedstock into high grade fuel, including diesel, kerosene, and fuel oil; as well as electricity and an asphalt component.

The preparation of incoming waste stream includes chopping, extraction of metals, glass, and sand, so that approximately 2/3 of the feedstock is able to be run through the unit to produce fuel and electricity.

The key to the system is the catalyst (trade secret) which is made from environmentally benign components.

A 100 ton/day facility will employ approximately 5 people per shift, in three shifts per day. Methane generated in the process is used to run a generator to power the facility, with 1 Megawatt excess available for distribution.

The raw costs of producing the diesel is about $0.60/gallon. Covering capitalization, maintenance, marketing, decommissioning and other costs will place the actual cost much higher, but still competitive with fossil-based fuel.

The conversion of input waste to fuel output is around 25-30% efficient. One ton of input waste will produce around 120 gallons (~3.8 barrels) of diesel. Materials that can be converted to diesel fuel through this process include plastics (including PVCs), rubber, waste oils, agricultural wastes (food and animal waste) and wood. The diesel produced is not [biodiesel](http://peswiki.com/index.php/Directory%3ABiodiesel), but is a pure hydrocarbon diesel, equivalent to what comes out of the oil fields.

*Costs*

 The raw costs of producing the diesel is about $0.60/gallon. Covering capitalization, maintenance, marketing, decommissioning and other costs will place the actual cost much higher, but still competitive with fossil-based fuel. A 100 ton/day facility will employ approximately 5 people per shift, in three shifts per day. Methane generated in the process is used to run a generator to power the facility, with 1 Megawatt excess available for distribution.

*Itemize For Projected Years*

A cost of 2 Billion dollars will allow Dow to implement the trash conversion to diesel with a timeframe of 6 years to get all plants utilizing the new technologies. This excessive cost will allow Dow to recoup their cost via energy savings withing 4 years.

*Implementation*

 The implementation would be location dependent due to Dow’s broad spectrum of products and services. Systems will need to be put in place to separate waste which will enable those wastes to be reused to create energy or diesel for their facilities. Extensive training will also be required.

*Timetable/Agenda for Action*

These processes could be finished being developed and tested over the next 10 years. As each facility utilizes the renewable resources and biomass, Dow as a company will see a drastic decline in expenditures.

*Recommend Specific Annual Objective and Policies*

At the objective should be reaching by the end of each year, of converting a process using renewable resources. This will help with the transition of the company as a whole to become more environmentally friendly. There should also be new policies in place that restrict the amount of hazardous material that Dow allows to be releases into the environment. These policies will inspire new innovation ways to decrease the emissions that are produced by their processes.

*Evaluation*

There should be a semi annual review of the amount of emission that Dow produces and releases in the environment. This can be measured on a continual basis each time the chemical process is completed. Then a standard can be established for future testing. This will determine if Dow has decreased or increased in the emissions that that they produce.

They should also compare the cost of producing diesel through the use of waste with the cost of purchasing petroleum diesel on the street. While it is doubtful that purchasing diesel will be cheaper, it is essential to ensure that the reuse of renewable energy is cost effective.

**Feedstock**

*Objective*

Feedstock is a “raw material that is acted upon or used by [organisms](http://en.wikipedia.org/wiki/Organisms) or an [industry](http://en.wikipedia.org/wiki/Industry) for [the] use as a [building material](http://en.wikipedia.org/wiki/Building_material) to create a product or [structure](http://en.wikipedia.org/wiki/Structure). Often the term [feedstock] is used to denote material that came from [nature](http://en.wikipedia.org/wiki/Nature) and is still in an unprocessed or minimally processed state. [Iron ore](http://en.wikipedia.org/wiki/Iron_ore), [logs](http://en.wikipedia.org/wiki/Lumber), and [crude oil](http://en.wikipedia.org/wiki/Crude_oil), would be examples. A non-human related raw material would include [twigs](http://en.wikipedia.org/wiki/Twig) and [found objects](http://en.wikipedia.org/wiki/Found_object) as used by birds to make [nests](http://en.wikipedia.org/wiki/Nest).” Feedstock prices have been drastically increasing over the last several years. An increase of $1.7 billion occurred in the fourth quarter of 2007 compared to the year before. This increase in feedstock costs has continually risen due to the increase of the economy each year. Due to the rising cost, Dow has entered many of the global market through joint ventures that are able to provide lower feedstock prices. A couple of possible alternatives to feedstock are biomass and renewable resources.

 Biomass is a “process [that] will use non-food ingredients such as the leaves from a corn plant or wood wastes, and convert the bio-based material through a gasification process to synthesis gas. Dow’s technology [will] help [to] convert the synthesis gas into a mixture of alcohols including ethanol that can be used as transportation fuels or chemical building blocks.” Biomass can also be used in electricity, which has great greenhouse gas benefits. Furthermore it can be used as an alternative fuel for heating systems which also proves extremely inexpensive. A renewable resource that could replace feedstock would be the “RENUVA™ Renewable Resource Technology that Dow has developed. It is a proprietary process that helps polyurethane manufacturers make products that are performance-based and reduce the impact on the environment. Distinct in the chemical industry, RENUVA™ technology is used to produce bio-based polyols with high renewable content in the finished product with performance that rivals petroleum-based polyols. An analysis shows that this new process to be greenhouse gas neutral and to use 60 percent fewer fossil fuel resources than conventional polyol technology.” Other renewable resources would be to produce polyethylene from sugar cane, new process for propylene oxide, which uses less water, less energy, and generates no co-products, and methane gas from local landfills.

*Costs*

The costs are not as large as you would think they are. This is due to the technology that Dow already possesses, and continually is developing. Most of the cost would be contributed to the cost of the material or natural resource that is needed.

* Approximately 85 percent of ethanol production capacity in the United States relies on corn feedstock. The cost of producing ethanol from corn is estimated to be about $1.10 per gallon
* The production of ethanol from cellulosic feedstocks such as agricultural wastes, grasses and wood, the estimated production cost using these feedstocks is $1.15 to $1.43 per gallon.
* Dow’s ability to generate electricity from landfill gas is cost-competitive with natural gas power generation. The estimated cost is 2.9 to 3.6 cents per kilowatt-hour
* To produce polyethylene from sugar cane, an annually renewable resource, emitting 85 percent less CO2 over the life cycle.

*Itemize For Projected Years*

You will immediately see the decrease in the expenditures for renewable resources versus feedstock. The amount is hard to estimate due to the fluctuation in price and the variety of the natural resource that is available to be used. There are several different ways that can be changed to reduce cost through Dow’s technology.

*Implementation*

The implementation would depend on the processes used at each of the facilities. A few suggestions that would need to be changed immediately to start seeing the difference would be:

* Utilize the local landfills that are surrounding your area, and gather the methane gas for electricity.
* To produce ethanol from agricultural wastes, grasses, wood, or corn
* Produce polyethylene from sugar cane

*Timetable/Agenda for Action*

These processes could be finished being developed and tested over the next 10 years. As each facility utilizes the renewable resources and biomass, Dow as a company will see a drastic decline in expenditures.

*Recommend Specific Annual Objective and Policies*

At the objective should be reaching by the end of each year, of converting a process using renewable resources. This will help with the transition of the company as a whole to become more environmentally friendly. There should also be new policies in place that restrict the amount of hazardous material that Dow allows to be releases into the environment. These policies will inspire new innovation ways to decrease the omissions that are produced by their processes.

*Evaluation*

There should be a semi annual review of the amount of omission that Dow produces and releases in the environment. This can be measured on a continual basis each time the chemical process is completed. Then a standard can be established for future testing. This will determine if Dow has decreased or increased in the omissions that that they produce.

**Homeopathic Alternatives to Medicine**

*Objective*

Due to the rising of using chemicals in Medicine and Medications which it raised the possibility of those productions to be unhealthy. The necessity of finding alternatives of those chemicals Medicine is raised and became very important. Homeopathic would be the most recommended solution to reduce the use of chemicals in Medicine. Homeopathic is green and more healthy. This healthcare provides and improves the health and welfare of the individuals, giving each individual the tools and information he or she may need to improve and work with the life force energy. Also, it would be for sure to maintain uniform standards of high quality [medical](http://en.wikipedia.org/wiki/Medical_education).

*Costs*

It is clear this is not going to be easy to accomplish. It will take time which is considered the highest cost. Researches and budgets to provide for instructions and training in branches of learning as it may determine in the field of medical sciences.

The limitations of this study are that it is based on one GP's work, with a small number of patients so definite and general, conclusions cannot be drawn. Moreover, calculated costs in this study are based on drugs only; it does not take into account doctor's time, special investigations and time off sick. Future work needs to be carried out to include all of these points for a comprehensive economic analysis.

*Itemize For Projected Years*

The projected might take a quite 5 years in order to implement the researches. Once this succeed it is going to be very strong tool to complete in the market. The total cost will be around 5 to 10 millions.

We should have research on cost-effectiveness of homeopathy in General Practice. This study aimed to compare the costs of homeopathic prescribing with conventional drugs prescribing. Data could be collected for 4 years on all patients who will be treated homeopathically. Costs of homeopathic remedies and costs of conventional drugs which otherwise will be prescribed for these patients can be calculated for the total duration of treatment. We can have a sample of one hundred patients included in the study. Then we will have an average cost savings per patient “individual”.

*Implementation*

The recommendations are to have branches in some different places and go through the practical practices. It will depend on the total budget assigned.

*Timetable/Agenda for Action*

The total time it will consume is about 8 year. It should be applied right now because it would be a great opportunity to have for Dow after this project will be successful.

*Recommend Specific Annual Objective and Policies*

The best thing to do right now is have the chance to be the only one how has the Homeopathic as alternative to the Medicine. That will reflect high revenue and to Dow and green efforts to the environment where the chemical use will decreases.

*Evaluation*

To ensure the project of implementing this project it must be followed under the steps and the recommendations were suggested above with the beginning of the next year. This goal will take a huge amount of effort and time but the results will be very great, and by achieving this Dow will be the leader in this field of having the Homeopathic as alternatives to Medicine.

*Additional Information*

“The homeopathic remedy costs about $10. It can be a daily liquid or one time only pellets to be taken under the tongue. The daily liquid is a one month supply. The first visit  takes 1 1/2 to 2 hours in the office with Dr. Valeria plus additional doctor’s time for studying the case and matching it to a remedy.

Regular homeopathic follow ups to assess the action of the remedy increases the success of the treatment. The first follow up is usually done at one month.  Some people require a sequence of remedies for their healing, others need additional naturopathic therapies to support the body in healing and removing obstacles to cure. Homeopathy requires an initial investment of time and money, so the doctor can learn to know you very well. This can result in understanding the source of the problems. As a result of getting to the root, tremendous improvements in your health and well-being can occur. Your health is something of almost priceless value. Homeopathy, like many natural medicines, is cost effective over the long run because it brings you to greater health. “

**Green Chemical Products**

*Objective*

Recently, there has been large swing in popularity towards green products. Green products have significant benefits over chemically infuse products, there being: less irritation to eyes, skin, or respiratory system; less chemical related sensitivities such as nausea, headaches, and allergies; and also people tend to be happier and healthier. Therefore, consumers are seeing that these benefits make more sense to them and their lifestyle. (http://www.vibraclean.com/greencleaning2008.html)

Not only do green products have benefits for the individual consumers but also for the environment. Since consumers are beginning to convert to green products in order to erase their carbon footprints, DOW will be able to offer them a wide range of products in diverse categories. Currently, DOW’s production categories are as follows:

* Agriculture and Food
* Automotive and Transportation
* Building and Construction
* Coatings and Adhesives
* Electronics and Appliances
* Fiber/Textiles, Footwear
* Flooring
* Furniture and Bedding
* Health and Medical
* Home and Personal Care
* Oil and Gas/Chemical Processing
* Packaging and Films
* Water
* Wire and Cable

Within seven years DOW is planning on implementing a very intensive plan to convert 40 percent of products within each production category into green products.

*Costs*

There will be significant costs initially in effect to convert product lines into green product lines. However, the old product lines that are being replaced are the unstable one and this will therefore begin stabilizing DOW’s balance sheets. The following shows the projected costs and savings for DOW (in billions):

 Year 1: Costs-$60 Savings-$15

 Year 2: Costs-$55 Savings-$25

 Year 3: Costs-$30 Savings-$35

 Year 4: Costs-$20 Savings-$50

 Year 5: Costs-$20 Savings-$50

Year 6: Costs-$20 Savings-$50

 Year 7: Costs-$20 Savings-$50

 Overall: Costs-$316 Savings-$359

DOW can expect to see a similar pattern past year seven as they continue developing new products. It is obvious that the savings will eventually outweigh the costs and it will remain a significant difference.

*Itemize for Projected Years*

The implementation of the initial green product lines will have a return on investment period of six years. This is because of the conversion period and switching of production. The staggered green product lines will have a shorter return on investment period, four years. This is because DOW will be eliminating the less profitable lines and replacing them with the green product lines.

*Implementation*

DOW will gradually add their green product lines into 40 percent of their factories in order to cover their global consumers. First, the product lines will be added in areas that already have high interest and potential with green products. In order to get other regions more interested in DOW’s green product lines, it would be beneficial to acquire some marketing firms in the regions of interest in order to properly sell the “new product concept” to the consumers in those regions.

DOW will continue to devote an intensive amount of research and development into the green product lines because of the obvious benefits. This will ensure newly innovative products. This will allow them to keep their keen reputation as innovators, as well as giving them rights to patents.

*Timetable/Agenda for Action*

First, DOW will do brief surveys in the regions of their manufacturing locations to see which target markets to pursue first. Once that has been established, within the first year they will acquire the necessary materials to begin production. Over the first two year span, DOW will be implementing intensive research and development into their green product lines. Then, by year two they will begin production of basic product lines in the regions with the most interest in using green products. Within the next five years, DOW will continue intensifying the green product lines. They will introduce the products in area that are not as familiar with the concept, perhaps acquiring some marketing firms in the area to really target market those regions. Along with this they will be bringing more innovative products to the markets they originally started in to keep their reputation not only as one of the most innovative and top of the line companies but also one of the most environmentally friendly one. DOW will then have all areas covered over a seven year period and will continue to produce new products on a regular basis there after.

*Recommend Specific Annual Objectives and Policies*

With the intensive overhaul in the green product lines, DOW will first consider other product lines that are perhaps hindering their financial stability. Once these have been established DOW will cut or limit their production and convert the time, money, and man-power toward the green product lines.

By year seven, DOW will have green products as 40 percent of their overall product line. Research and development teams will continue pursuing new ideas and alternatives for their other product lines. DOW wants to enter the green market strong and in doing so they will to remain on the top.

*Evaluation*

Based on the information discussed, it would be a smart decision to integrate green products into their product lines. There seem to be significant financial, environment, and reputable benefits to providing these products. There will be a significant capital investment need at first, but within the project’s seven year start-up period it will be profitable. The key to DOW’s success is their research and development, and their innovative minds.

**Recommendations Compared To Actual Strategies**

While searching for information on Dow.com, this was discovered, “Over 90% of the products made have some level of chemistry in them, so no one has more at stake in the solution - or more of an ability to have an impact on - the overlapping issues of energy supply and climate change than we do… As a world leader in chemistry, Dow is uniquely positioned to continue to provide innovations that lead to energy alternatives, less carbon intensive raw material sources, and other solutions not yet imagined. In fact, our science and technology has been contributing solutions to the global climate change and energy challenges since 1990.”

When we were considering which of our key factors to focus on, our process took us to the environmentally friendly green concept. Upon reviewing Dow’s third quarter earnings call dialogue, we find it interesting that in the address by all of Dow’s leadership, the environmental factors do not seem to be a focus at all.

We have on the other hand, identified multiple alternative energy sources that can have a significant impact on the overall bottom line. While Dow offers green products, they do not implement the green mentality in their operations.

**SOURCES**

Dow.com

Chemical Week Custom Publication – dated 11/21/07 – “The Dow Chemical Company: Growing Up in Michigan’s Heartland

“Update 1-Dow Chemical explores sale of some businesses” 9/10/08 – Reuters

“Dow Jacks Prices, Blames Washington” – Miriam Marcus 5/28/08 – Forbes/Reuters

“Dow Chemical Down, But Not out” – 4/24/08 – Maurna Desmond – Forbes

“Thinking outside the box” – 7/7/08 Ruthie Ackerman – Forbes

“It’s All About Who You Know” – 6/26/08 Joann Muller – Forbes 7/21/08 issue

“Dow Chemical Looks Less Volatile” – Maurna Desmond 4/25/08 – Forbes

Wikipedia

Employee Surveys: www.vault.com/companies/company\_main.jsp?co\_page=10&product\_id

http://www.stanford.edu/group/SICD/DowChemical/dow.html

http://moneycentral.msn.com/news/ticker/sigdev.aspx?Symbol=DOW

International Herald Tribune “4 US parents file federal lawsuit against companies over use of chemical in baby bottles” – June 19,2008

Dow Chemical’s 2007 Corporate Report

Dow Chemicals 2007 Annual Report

Brown, Penelope.  Shipping Digest.  7/28/2008. Vol. 85, Issue 4457. p 94

Chemical Engineering. August 2008.  Vol. 115, Issue 8. p 16 & 18

http://finance.yahoo.com/q?s=DOW

http://ceoexpress.com/default.asp

http://www.reuters.com/article/ousiv/idUSWEN689620080724?sp=true

<http://www.abc.net.au/news/98/09/02/980902_45.htm>

Research Analysis

<http://www.gettingpeoplewell.com/homeopathic_medicine.htm>

<http://www.drvaleria.net/hom.htm>

[http://www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov/)

<http://www.tnmmu.ac.in/aboutus.htm>