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CORPORATE VENTURING AT DOW BRASIL: ACCELERATING INNOVATION

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INTRODUCTION

Dow is a world leader in the chemical industry. Having amassed a diversified portfolio in Special Chemicals, Advanced Materials, Agricultural Sciences, and Plastics, the company offers an extensive variety of technology-based solutions and products in more than 160 countries and in fundamental industries such as water, energy, infrastructure, health and consumer goods.

Ever since its inception in 1897, Dow has had innovation as an important part of its mission. As highlighted by Pedro E. Suarez, Dow's president for Latin America "Dow's raw material has always been innovation. Innovation is present in Dow's DNA and is the fuel and the engine for the changes promoted at Dow and by Dow."

The company is acclaimed for its investments in research and development, which yielded countless industrial and domestic application products, such as plastic resins (barrier resins such as Saran, for example), polyols from vegetable oils, water treatment systems and the production of polyethylene from sugarcane ethanol.

In the past few years, the company has promoted a change in its business portfolio, seeking a stronger activity in the specialty market. The objective is to diversify its product line, pursuing higher-profitability market segments and reducing its dependence upon petroleum products. The main movement in this direction was the acquisition of the company Rohm and Haas, in 2009. Rohm and Haas's line is diversified and not very dependent upon oil price variation, including toiletry, foodstuff, packaging and pharmaceutical ingredients

With this acquisition, Dow created a leading global company in specialty chemicals and advanced materials, through a combination of leading technologies of both companies.

Dow is a transformed company today, with most of its business coming from specialty divisions, including advanced materials, agricultural sciences, performance products and performance plastics. The company's raw materials and energy division, whose prime objective is backward vertical integration vis-à-vis specialty businesses, still yields annual revenues amounting to US$11.3 billion. (Annex 1)

INNOVATION STRATEGY

Dow's quest for innovation is aligned to four megatrends related to its business: Health & Nutrition, Energy, Infrastructure, and Transportation & Consumption.

In the Health & Nutrition area, Dow's interest is veered towards the functional foodstuffs, seeds and crop protection growth trend. In the energy area, the growing markets for clean technologies, solar and wind energy, and energy storage equipment area the main drivers. In the consumption are, Dow wants to serve the electronics and communications industries, personal and home products, and household utensils that show growth trends, especially in emerging markets. In the transportation and infrastructure

area, the focus is upon the automotive, construction (due to the increase in transportation infrastructure investments made by certain countries) and sustainable solutions for water (as required by population increase) (Annex 2)

DOW'S INNOVATION ACCELERATION STRUCTURE

Besides its R&D activities, Dow has three fronts dedicated to innovation and breeding new businesses: Venture Capital, V&BD (Venture & Business Development) and Licensing.

The Venture Capital area is responsible for the development of new business, through investments in private, generally embryonic companies with a high growth potential, where Dow can make a contribution as a strategic investor. In this case, the business's financial parameters and strategic objectives are the main criteria for the investment decision.

In Dow's Ventures & Business Development, the objective is to feed the innovation funnel and manage a portfolio of technological and business opportunities that will poise the company for growth.

Value-creation and strategic alignment with Dow's businesses are essential in the investments made in this area

> The V&BD group works as a business catalyst. The purpose of the investment may be the development of some technology that will help in some project under way at Dow or the creation of a new business for the company, highlights Marcelo Pasquali, Dow Brasil's M&A director.

Attributions of the company's V&BD team, which includes technical, commercial and financial analysts, are the following

- To identify/analyze new technologies and quantify new market opportunities for Dow;
- To provide Dow with a flow of new concepts and evaluations;
- To interact with emerging technology sources, focusing on the development of strategic relations;
- To identify and interact with technology-based emerging opportunities. For such, they count on the support provided by Dow's Technology Scouting group.

Dow's Technology Scouting group is linked to the emerging technologies market, identifying opportunities for value creation at an embryonic stage. "The objective is to combine market needs with technological inventions", explains Marcelo Pasquali. In this sense, it seeks to network with several entities, such as incubators, matchmaking programs, national and university research centers, as well as startup companies bred in these laboratories. The efforts put forth by this group are customized by geographic region.

After incubating and promoting the commercialization of the businesses in which the V&BD area invests, Dow incorporates them or transforms them into new businesses for the company.

The Licensing area manages the transfer of intellectual assets and technologies inward and outward the company, considering financial return, intellectual property and freedom to operate as selection criteria.

DOW'S NEW BUSINESS EVALUATION PROCESS

Dow has a well-disciplined process to assess opportunities, based on data and divided into the following stages:

- 1st stage: Proof of value

At this stage, the institution conducts a quick evaluation of the enabling technologies and market opportunities. The market scope is also defined.

- 2nd stage: Developing options

"During the options development stage the key is with the business models", notes Marcelo Pasquali, Dow Brasil's M&A director. At this stage, equity interest holding options are developed for Dow seeking an adequate investment model, be it made by the Venture Capital or the V&BD areas. Concomitantly, the financial and technological plans for the business are drawn.

- 3rd stage: Implementation

The last stage in the process includes the final market test and launching new products (Annex 3).

All Dow equity investments must be approved by Dow's CEO and by the CFO. In some cases, Board approval is also required.

Dow seeks some level of interference in its investments. In small companies, their main concern involves financial management. Normally, one financial manager handles several Dow joint ventures.

SUCCESS CASES

Some examples of innovative solutions illustrate Dow's successful Corporate Venturing practices in many ways, such as venture capital investments, joint ventures, partnerships and joint development projects.

The DOW™ POWERHOUSE ™ Solar Plate roof tiles are one such example. Nominated as one of the "50 Best Inventions in 2009" by Time magazine, these tiles in photovoltaic plates permit a allow batter development of solar energy in homes. They are differentiated because they are integrated to the traditional asphalt tiles, installed in 90% of all American homes, making them more agreeable in aesthetic terms and neighborhood-friendly that the solar-panel option. Besides, solar plate tiles can be installed at the same time that asphalt tile roofing is installed, therefore being a single-stage application.

Dow Powerhouse is a consequence of Dow's investments in Solar Solutions. In 2007, after receiving a $20 million loan from the US Department of Energy to develop solar energy generation products for civil construction, Dow established the Dow Solar Solutions business unit. Within this unit came the idea of developing roof tiles in photovoltaic plates, but Dow needed to develop technology to make this project feasible. "The challenge was to develop something marketable", explains Marcelo Pasquali. Therefore, Dow made a Venture Capital investment in NuvoSun, specialized in fine photovoltaic film technology that uses Copper – Indium – Gallium - Selenide (CIGS) material . Then, this technology was brought into Dow's business unit, which made the new product development feasible.

Dow also innovated via the joint venture Dow Kokan, established in 2009 to develop and produce technologically advanced and economically feasible solutions for industrial companies (especially automotive), the medical, transportation and defense industries. The joint venture united Dow, TK Advanced Battery LLC (a battery maker) and Dassault (a battery user), promoting a technological innovation with the development of a more efficient battery. "This initiative is within the megatrend identified by Dow, focused on energy storage", notes Marcelo Pasquali.

Also focusing this megatrend, Dow entered a partnership with Solazyme, a leading company in bioproducts and renewable oils. With Solazyme, Dow invested in the development of oils with electrical characteristics, produced from algae, to use in dielectric isolating bio-based fluids, important for the operation of transformers and other electrical devices.

Dow entered another partnership in 2011, this time with Opxbio, a biotechnology company, to prove the technical and economic feasibility of a large-scale industrial process (genetic development technology) to produce acrylic acid from fermentable sugar (i.e., corn and/or sugarcane sugar) as raw material. This joint project to develop acrylic acid from a renewable source prompted Dow and Opxbio to seek the same performance of petroleum-based acrylic acid, creating a direct substitution option in the market. Acrylic acid is a chemical used in several consumer goods, such as paints, adhesives, diapers and detergents.

INVESTMENTS IN BRAZIL

Despite Dow's global Corporate Venturing coordination (investment decisions must be approved by headquarters), HQ recently noticed that growing markets required greater attention from Dow, and promoted a decentralization of its CV activities. In this process, the company established a V&BD team for Latin America in 2011. This team, based in Brazil, has sought opportunities for Dow's growth in the region, especially in the following industries:

- Energy: plastic innovations, including renewable energy alternatives; lighter automotive materials.
- Health & Nutrition: agriscience, (germplasm development).
- Consumerism: sustainable beverage packaging, home and personal care products
- Transportation & Infrastructure: roofing and insulating adhesives (government investments in infrastructure and middle class growth have contributed to the increase of the market for these products), production of robust automobiles.

In Brazil, sustainability steers innovations. Dow's recent investment in sugarcane ethanol production in a joint venture with Mitsui in this country illustrates this guidance.

The joint venture's objective is to create a platform for the production of biopolymers to meet the requirements of the markets for hygiene, medical and packaging products. The novelty in this project vis-à-vis investments made by other companies in biopolymers (i.e., Braskem's plants) is the integration between plantations with the plant and the resin factory.

"Facilities will be fully integrated with renewable sugarcane, enabling the environmentally-sustainable production of high-performance plastics, with a reduction of the carbon footprint", said Dow's green alternative businesses and new business development director for Latin America, Luís Cirihal

Luís Cirihal also highlighted that the project will be globally competitive and that the technology has a great potential to advance, mainly in the development of new technologies for the green resin route and research into sugarcane. "The commercial productivity of sugarcane, which is between 90 to 100 tons per hectare/year in the most competitive regions, may reach between 180 to 200 tons per hectare/year within 10, 15 or 20 years", said the Jaime Finguerut, strategic development manager of the Sugarcane Technology Center. According to the specialist, sugarcane has the capacity to yield twice the biomass of corn on the average, corn being the closest competitor.

Dow's objective is having a financially feasible product, capable of broaching new markets for the "green" resin. "The future of renewables cannot be niche-dependent. The green plastic produced by Dow do Brasil will be competitive compared to fossil plastic", explains Marcelo Pasquali, director of M&A at Dow Brasil.

While the investment in biopolymers at Dow do Brasil represents backward integration vis-à-vis its specialty businesses, its remaining V&BD businesses do not have this characteristic. The portfolio includes investments in the development of germplasm in Brazil (using agriscience technology as developed at Dow's HQ) and resins for water treatment.

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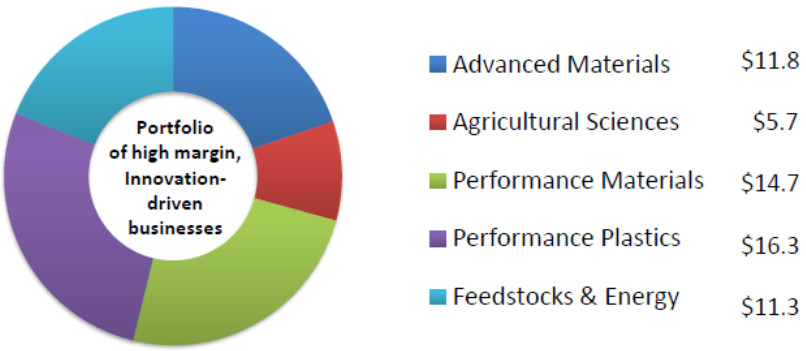
Dow Kokam's Website

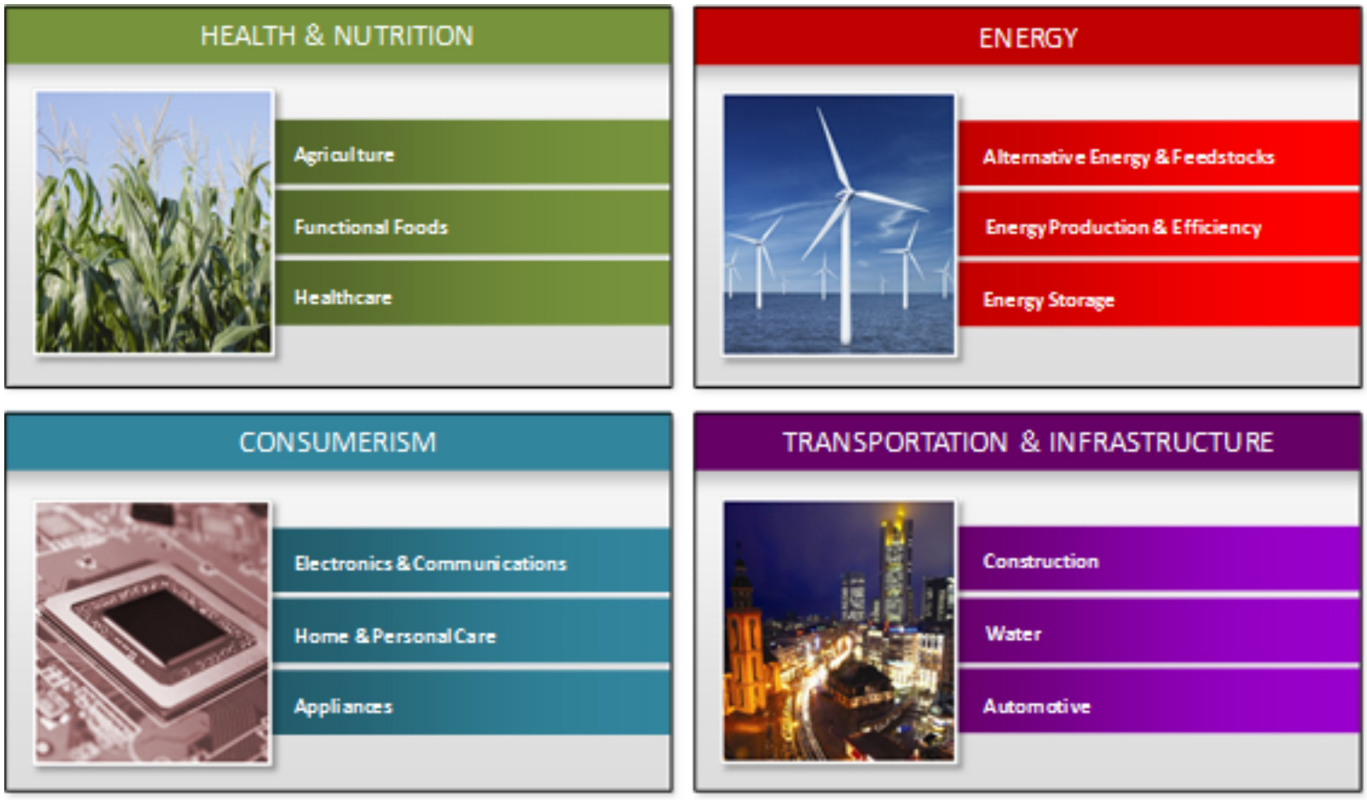
ANNEX 1

REVENUES BY DOW DIVISION IN 2011



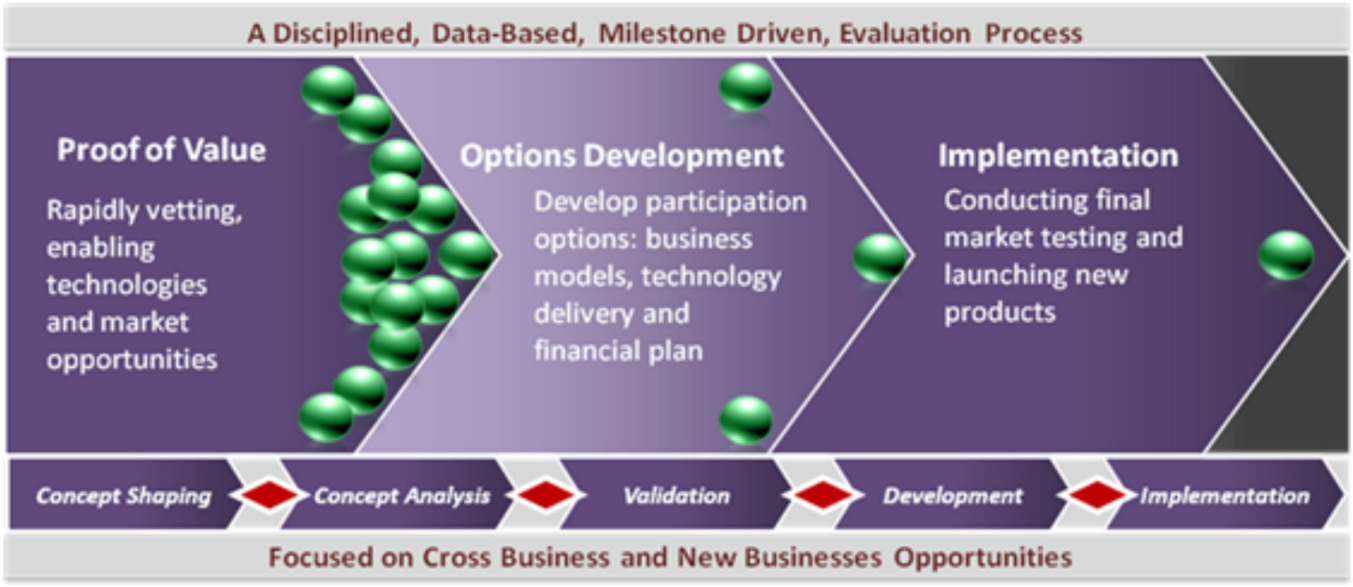
Source: Dow Annual Report 2011.

ANNEX 2
INNOVATION STRATEGY FOCI AT DOW



Source: Presentation delivered by Dow Brasil. Making Innovation Move: Connecting, Cultivating, Commercializing. FDC/ABDI Seminar on Corporate Venturing in Brazil. October 2011.

ANNEX 3
THE NEW BUSINESS EVALUATION PROCESS AT DOW



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