CORPORATE SUSTAINABILITY CASE STUDIES 2016
Featuring: Singapore Sustainability Awards 2015 Winners
Foreword

Sustainability scored two huge global wins last year. First, it was the successful renewal of commitments towards sustainable global growth through the Sustainable Development Goals. Second was the Paris Agreement where governments finally came to an agreement and brokered a deal that is accepted by all nations, to recognise and combat the real threats of climate change. On both wins, the business community played a pivotal role in enabling the negotiations through the sharing of their technology, economic case and community influence in countries they operate in.

In Singapore, the two international efforts also led to significant milestones with sustainability as the national agenda. At the governmental level, we saw the revised version of the Sustainable Singapore Blueprint and the launch of Singapore’s Climate Action Plan by our President. In the private sector, we witnessed the implementation of the “Comply or Explain” sustainability-reporting requirement by the Singapore Exchange, the regulatory body of Singapore listed companies.

With the global and local sustainability agenda taking centre stage, early business adopters are already benefiting from this shift complementing the increasing demand by the informed consumers to vote with their dollars for sustainable businesses. As this trend is set to grow, the businesses community will have to adapt or risk being eliminated. Companies must look into sustainability beyond just ticking the box, but truly integrate it into their business modus operandi.

However, the road to achieving sustainability is not a simple or straightforward one. It differs from company to company depending on the nature of their business. Therefore, this annual book of case studies becomes increasingly important for businesses, both big and small, to find out more what has been done and adapt it for themselves as part of their sustainability journey.

We would like to express our sincere thanks to the Nanyang Business School, Nanyang Technological University for its continual support for the Case Studies Handbook project. We are grateful to them for the time and effort put into documenting these sustainability best practices, in hope that other businesses can be both inspired and learn from our winner’s respective stories.

At the same time, we would like to acknowledge the winners of Singapore Business Federation’s Singapore Sustainability Awards 2015 that have kindly contributed their stories to this publication. Their willingness to share their experience with the business community will greatly benefit the readers and for that, we would like to express our sincere and heartfelt gratitude towards them.

As we enter into a new decade of the sustainability movement in Singapore, Global Compact Network Singapore (GCNS) is committed to serve the business community in Singapore towards achieving sustainability. The integration of SBFs Sustainable Development Business Group and GCNS will provide the resources needed to better serve companies by equipping them the necessary competitive advantage needed in the face of the new global agenda.

Mr Wilson Ang
Executive Director
Global Compact Network Singapore
Foreword

By The Dean, Nanyang Business School, Nanyang Technological University (NTU).

The Nanyang Business School is delighted to partner with the Global Compact Network Singapore (GCNS) to jointly publish this handbook featuring case studies of business organizations that won the Singapore Sustainability Awards in 2015.

Sustainable Earth is one of the peaks of excellence and key research areas at NTU. Since 2005, NTU has secured grants to the tune of $1.3 billion for research related to sustainability. Two of our flagship research centres are the Energy Research Institute @ NTU (ERI@N) and the Nanyang Environment & Water Research Institute (NEWRI). ERI@N focuses on research related to renewable energies and sustainable urban mobility solutions. NEWRI focuses on research related to sustainable water technologies both for developed and developing countries. NTU organizes the Singapore Sustainability Symposium annually which focuses on thought leadership and policies for Sustainable Cities. NTU also has many corporate laboratories setup in collaboration with global corporations, that focuses on research related to sustainability. For example, the corporate lab setup with BMW focuses on e-mobility.

At the Nanyang Business School, we host the Centre for Business Sustainability. This centre is a platform for exchange of interdisciplinary research ideas. The centre hosts interdisciplinary research seminars that focus on business sustainability by leading global scholars and academics, as well as industry leaders. The centre also initiates interdisciplinary research focused on business aspects of sustainability with the Engineering Schools and research centres within NTU.

We are pleased to see a varied line up of award winners from both Sustainable Business and Green Technology category that include multinational corporations, an SME as well as a government statutory board. These organizations displayed great enthusiasm throughout the process of award evaluation, selection and case writing, where they eagerly shared their sustainability stories with our research team about their practices and efforts.

The case studies featured in this handbook look at specific sustainability topics that are unique to each company and/or industry. The cases will appeal to a wide audience – both sustainability practitioners and academics. Here are some of the highlights of the case studies:

- **Ardente** is a leader in providing chip and wafer testing services for integrated manufacturing devices (IMDs) and showcases its cutting-edge technology to provide top solutions for their customers.

- **Buckman Laboratories** has developed innovative chemical solutions for their target markets that help customers with resource optimization and environmental impact reduction.

- **Maritime and Port Authority of Singapore (MPA)** has used sustainability as an industry growth strategy and leadership culture to promote green shipping practices to the maritime business community.

- **Canon Singapore**: This case focuses on Canon’s advanced green technology products that are unique in providing the least environmental impact with durable energy-efficient office network machines.

- **Elmich Pte Ltd** is a case that demonstrates how the green building industry has the potential to be a game-changer in reducing emissions and heat from buildings by using products from natural sources and recycled plastics.

We hope that you will find this Case Study handbook, produced jointly by GCNS and Nanyang Business School, with its varied sustainability themes, both enlightening as well as inspiring and help start (or further continue) your own sustainability journeys.

Dr. Neo Boon Siong
Canon Professor of Business and Dean
Nanyang Business School
Nanyang Technological University
In view of resource scarcity and evolving consumer environmental awareness, the sustainability movement has encouraged the building industry to adopt the “green” approach. As green buildings provide quantifiable and tangible environmental benefits, the industry has great potential to positively impact global environmental and energy resource issues.

**Evolution of green building industry in Singapore**

The green building transformation started in 2005 with the birth of the Green Mark Scheme, a building rating system launched by the Building and Construction Authority (BCA), a government statutory board. It is also the responsible agency for championing Singapore’s green building initiatives. In the third Green Building Masterplan released in September 2014, BCA aims to have 80% of buildings in Singapore to be certified under the Green Mark Scheme by 2030.

BCA plans to work collaboratively with industry partners, practitioners and developers towards achieving an integrated built-up environment that serves the needs of a dynamic community and protects environmental resources. Coupled with innovative green technologies, sustainable building materials have helped green building developers to achieve new feats. Elmich is an excellent example of a company that capitalized on this trend and provides green building solutions across various building functions.

**COMPANY BACKGROUND**

Elmich Pte Ltd is a leading green landscape engineering solutions provider headquartered in Singapore with global offices in Australia, Germany, Switzerland and the USA. Founded in 1985, the company collaborates with a network of partners in over 27 countries and provides landscape engineering, waterproofing, drainage and stormwater management products and solutions to its varied range of customers such as building developers, contractors, and architects around the world.

Elmich’s founders Mr Alan Lee and Mr Michael Teh started the Company primarily as a distributor of bitumen coating products for public housing projects in Singapore. The Company gradually expanded and developed its product range that contained thermoplastic membranes, drainage sheets and complimentary computer-aided-design (CAD) drawings for its customers. Elmich began to assist architects and engineers with supplementary knowledge about their product to aid in building projects.
The Company adopted sustainability in its core business and made it central to its product development process. With over 30 years of experience and a strong management team, Elmich strives to address climate change issues facing businesses and devote resources to better its research and development capabilities to be a pioneer in the green building materials industry.

**GREEN TECHNOLOGY INNOVATION AT ELMICH**

Elmich's thrust for green technology innovation comes from a vision to implement sustainable building solutions in cities, in line with its corporate message, where urban meets nature. This approach hits home as Singapore is a highly urbanized metropolis with changing demographic and landscape needs. The company categorizes its business in two main functions: landscape engineering and waterproofing. They work hand in hand to provide a complete building solution package for customers that allow them to enjoy environmental benefits.

Elmich develops and manufactures a myriad of products which include green walls and roofs, stormwater tanks, surface drainage modules, protective membranes and sealants. These products are environmentally friendly as they use recycled plastic and harness natural forces in terms of water retention. For example, green walls and roofs help to mitigate urban heat in buildings and transform underutilized space into green spaces. Additionally, rainwater is channeled and reused for various washing purposes, thus ensuring minimal wastage. The lush green façade also traps carbon dioxide, providing a much fresher atmosphere. Over the years, Elmich has obtained over 130 patents both locally and internationally as at December 2014.

Manufacturing green building materials are complex and at any point of time, the quality of product takes top priority in order to deliver better products than industry competitors. As such, Elmich focused on quality assurance from 1998 when it became the first company in Singapore to obtain the ISO 9001 Quality Management System certification for Design and Supply of Waterproofing Systems for Roofing. This was followed by a merger with Elm Industries in 2011 after which, Elmich began using mainly recycled plastics in its green roof and other landscape products.

**ELMICH’S SUSTAINABILITY PILLARS**

Elmich's corporate pillars of sustainability are founded on 4 P’s, namely:

**People** – Elmich values investing in people as the right way to move forward. Human resources are vital to the company and employees are given adequate awareness training on environmental and water conservation issues. Employees involved in the manufacturing process participate in specialized training programs such as the Carbon Footprint Assessment course and the Public Utilities Board (PUB) ABC Waterways Management Course. These extensive programs equip Elmich employees with the technical know-how to integrate sustainability in developing its products.

**Processes** – Manufacturing processes at Elmich are made lean and resource saving. Using raw materials from naturally derived sources and recycled plastics provides a strong platform for the company to achieve energy reduction and resource conservation. Elmich uses modern technology such as 3D printing to make prototypes of products for testing purposes in order to reduce wastage from manufacturing.

**Products** – Elmich’s products are made modular, scalable and easily transportable. The company gives its customers flexibility and caters accordingly to respective customer needs. The versatility of its products showcases as Elmich’s unique selling point. The stormwater solution and landscaping products come in different shapes, sizes and volumes, allowing the end customer ample leeway in deciding on best location and usage for optimum results.
Planet – As businesses aim to provide goods and services to its customers, it is inevitable that resources will deplete and result in land use changes. Elmich manufactures products that aim to return surrogate greeneries, ecosystems and even flourish biodiversity. The Company has successfully achieved this in multiple local and international projects and emphasizes on an environment-centric business approach to merge sustainability, science and technology for a better environment.

CORE BUSINESS STRENGTH
Elmich’s core business strength is in its expertise and experience in manufacturing high-quality sustainable building materials. Since its founding, the Company has completed projects in various segments of the building sector such as landscape design, green roofing, green ceiling walls and pavement support. Pioneering the manufacture of green building products in the region, it has established a brand name renowned for its quality.

Elmich believes that this enabled the company to go global and venture into overseas markets. It prides in a management team that works hands-on with designers, researchers, engineers, architects and developers to derive the best products for optimum use.

The Company actively promotes use of green technologies by:
• Delivering environmentally safe, innovative and cost-effective urban greening solutions certified by local and international green label certifications and product schemes.

Quality-conscious growth
Quality plays an integral part in the performance of green building products. Elmich strives to develop a unique product line so its customers can enjoy high quality and environmentally conscious materials. The company scrutinizes its manufacturing of products and has a stringent quality assurance system in place. All manufactured products are required to satisfy quality checks by its quality assurance engineers before they are used in projects. In terms of logistics, Elmich partners with suppliers located closer to the Singapore office to reduce transport emissions and eliminate delivery delays. It outsources its product manufacturing to ISO certified manufacturers in neighboring countries and ensures adherence to quality through scheduled and surprise audits.

ENVIRONMENTAL STEWARDSHIP IN PRODUCTS AND SOLUTIONS
Elmich’s business focus has always been pro-environment. The Company strongly believes in the philosophy where urban and industrial needs of customers are met with sustainable products derived from recycled and natural sources. Utilizing natural features in its products is what drives the company to grow. As manufacturing sustainable products involve a robust research and development structure, Elmich’s R&D team comprises professional civil, environmental, electrical and electronic, and material science engineers who work together to bring out top of the line products. The team combines its relevant knowledge and develops innovative products to advance the company’s environmental sustainability vision.

ELMICH’S SUSTAINABILITY STATEMENT
“Providing sustainable building solutions to create cities, where urban meets nature through delivery of environmentally safe, innovative and cost-effective urban greening solutions to building developers, contractors, and designers around the world” – Elmich.
## ELMICH’S GREEN PRODUCT LINE

<table>
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<th>Green Products/ Solutions</th>
<th>How it works</th>
<th>Products</th>
<th>Benefits / Advantages</th>
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| Green roofs               | Roof of a building is partially or fully covered with vegetation and a growing medium, usually planted over a root resistant waterproofing membrane. | VersiDrain® 25P water storage & drainage sheet VersiCell® sub-surface drainage module | • Mitigates urban heat in buildings  
• Transforms an under-utilized or unused space into green spaces, promotes biodiversity  
• Reduces dust and smog particles  
• Channels rain water  
• Eliminates stagnant water build up |
| Green walls                | Walls are covered with plants creating a lush green façade. Uses drip irrigation system to ensure delivery of water and nutrients to plants on the surface and wall. | VersiWall® GM modular living wall system | • Mitigates urban heat in buildings  
• Transforms an under-utilized or unused space into green spaces, promotes biodiversity  
• Reduces dust and smog particles |
| Stormwater management      | Utilizes urban design features to reduce impact from stormwater on individual water bodies downstream. | VersiTank® modular stormwater tanks | • Enhances water retention  
• Ensures filtration of particles before discharge  
• Reduces stormwater runoff  
• Requires low maintenance and is cost effective |
| Drainage for sub-surfaces | Positioned between structural slab and cement | VersiDrain® 6P under-screed drainage sheet | • Aesthetic value in structures  
• Efficient drainage under screeds |
| Pedestals for paver & bearer support | Positioned under pavers and timber bearers | Versijack® SpiraPave® VersiPave® | • Prevent algae formation on pavers  
• Facilitate rapid drainage of surface water |
HELPING CUSTOMERS TO REDUCE ENVIRONMENTAL IMPACT

Consideration for sustainability in building materials begins at the design stage for Elmich. Its designers and engineers prioritize the functionality and reliability of its products for landscape engineering and urban greenery solutions as they are manufactured with focus on environmental stewardship, ecological responsibility and sustainable development.

Reducing energy demand
The MEP (modular extensive planting) Tray is an innovative green product which acts as a plant-based filtration medium. It is typically used to cover roof space in buildings which reduce its heat absorption capacity. In a research study conducted by the National University of Singapore for over 9 months, Elmich’s MEP tray products have been successful in reducing temperatures by an average of 20°C in green roofs compared to bare roofs.

Reducing water footprint
Elmich’s premium stormwater tank product is the VersiTank®. It allows customers to enjoy cost savings by harvesting rainwater and reducing water consumption for non-potable applications. VersiTank has a short payback period of only two years as depicted in the return on investment (ROI) calculation below:

ROI for installing VersiTank:

Rainwater harvesting tank for typical HDB buildings:

Average water consumption = 2800 m² x 4L/m² = 11.2 m³ / day
Cost of NEWater = 11.2 m³ x $1.43
+ 11.2 m³ x $0.55 = $22.30 / day
Cost of Rainwater Harvesting Tank at 24m³ = $16,800
Payback period = 2.06 years

Reducing CO₂ emissions
Elmich’s products enable customers to enjoy energy and water savings, improving their environmental performance. For its own product development, the SpiraPave® T22 paver support product has reduced its carbon footprint significantly in the last 5 years. Using technological advancements and improvements in manufacturing process, the SpiraPave® T22 produced a footprint of 0.62 kg CO₂e (carbon dioxide equivalent) at the beginning of 2016 (see Figure 1) compared to 1.98 kg CO₂e in 2010, a reduction of 68.7%!

INTERNAL SUSTAINABILITY PRACTICES

Elmich’s green technology policy entails that the company is driven by one passion – to enhance lives for future generations. It promotes sustainability practices in its operations and adopts the following:

Innovate and optimize existing resources
Elmich values continuous improvement in its activities and emphasizes on reduced usage of natural resources as they are increasingly becoming scarce. As a conscious corporate citizen, the company aims for maximum resource conservation and encourages its engineers and designers to adopt this approach in product development. The VersiTank® and the VersiWall® are examples of product ingenuity as both use fewer resources than their earlier models and are more durable, evidenced by having a return rate of zero percent since 2008.

Selective raw material choice for manufacturing
The principle raw material used in landscape engineering products is recycled plastics (technical name polypropylene). During procurement, Elmich gives importance to distance and delivery time to their contracted facilities to optimize transport times and reduce transport related emissions. Suppliers are required to be certified under ISO 14001 Environmental Management System certification, followed by an on-site audit before the company formally engages in business with them.

Figure 1: CO₂ reduction capacity of SpiraPave T22 product.
Elmich has obtained the ISO 9001 Quality Management System standard and the ISO 22301 Business Continuity Management standard certification for its processes. The company ensures its product quality in the supply chain as it works with ISO 14001 certified manufacturers wherever possible.

Supporting government and industry to achieve sustainability
Communicating the benefits of using green building solutions is how Elmich increases collaborative partnership in the industry. The company believes in a combined effort to have a significant impact on the environment, therefore Elmich works together with government agencies and like-minded SMEs which enable sharing of best practices.

WORKING WITH PARTNERS
Educational outreach programs
Elmich’s forte lies in knowledge and expertise in providing sustainable building solutions. As such, the company shares this knowledge with educational institutes through outreach programs. This enables the future youth to learn more about sustainable living and also be passionate to innovate and do more with green technology.

Elmich partners with NUS, Temasek Polytechnic, Singapore Institute of Architects and also government bodies like NParks and PUB. The company also partnered with National Geographic Channel’s Young Explorer Programme aimed at exciting primary school children about environmental protection and sustainable design.

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Certifications
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Community programmes
Elmich’s employees contribute to community engagement activities. A group of employees participated in the Green Thumbs, an event joint organized by the Landscape Industry Associate of Singapore (LIAS) and NParks Centre for Urban Greenery and Ecology (CUGE). The programme celebrated success of productivity and process innovation across the landscape industry.

FUTURE TARGETS
Elmich is hoping to develop a framework that can assist customers to assess the measureable and tangible benefits from its products. In addition, the company plans to implement a monitoring and tracking system that will help its customers and regulatory agencies have shared access to energy and water saving building products.

The company aims to adopt sustainability reporting in the future to actively share its environmental sustainability initiatives and practices with its stakeholders. It plans to implement a reporting mechanism and bolster its research and development capabilities by developing the following products:

State-of-the-art filtration medium
A filtration medium is in the development phase which can be used in the VersiTank® products. The medium will ensure that contaminated water is cleansed before entering the waterways. This will help customers to filter water at low cost and utilize it for irrigation and communal washing purposes.

Decentralized small-scale water treatment plant
Elmich has partnered with a local small and medium enterprise (SME) to develop a small-scale water treatment plant which can be placed anywhere in Singapore. The project is currently in progress and will be adopted by the Housing Development Board (HDB) and the Public Utilities Board (PUB) after completion. The small-scale treatment plans will be ideal for open spaces and parks, where the gray water will be essential for non-drinking purposes.

New-age planting media
Elmich is working to incorporate a revolutionary lightweight planting media in its green roof and green wall systems. It aims to work on all types of roof structures and will help to further reduce the thermal absorption of roofs.
Use of bio-plastics
In partnership with a Japanese firm and the Nanyang Technological University, Elmich is working to develop new biodegradable and recyclable bio-plastics from agricultural waste as raw materials to reduce reliance on fossil resources. Using bio-plastics will enable its products to truly be known as sustainable building materials.

CONCLUSION
Elmich’s desire and drive to protect the environment and utilize natural resources in its business activities reflect a healthy long-term sustainability oversight. As the green building industry grows, so does the need to incorporate sustainable materials that produce multiple benefits from heat reduction, reduced energy demand, reduced CO₂ emissions and user satisfaction.

With the company’s innovative green roof and green wall products that allow a significant reduction in energy and water consumption, Elmich has potential to grow and venture into newer markets. Promoting its products in building projects will enable end customers to choose environmentally conscious products and do their part to save natural resources.

*All data and information about the company has been obtained from 1) publicly available resources, 2) company websites and reports, and 3) company representatives.

Acknowledgements

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