**SCG ESG Factsheet : Environmental**

**Innovation for the Environment, Enhancing the Quality of Life**

SCG is dedicated to the development of innovative products, services, and solutions that contributes to easing greenhouse gas emission whilst enhancing people’s quality of life. This is our attempt to tackle climate change and achieve the net-zero target by 2050. This is accomplished by applying the circular economy framework throughout the product manufacturing process, thus, helping with efficient use of natural resources and energy reduction while enhancing or maintaining the products’ attributes. The products are to gain a longer product lifespan, be reused or recycled, help reduce waste, and endorse environmental friendliness. This is in accordance with the E in Environment under the Environmental, Social, and Governance (ESG) guidelines.

**...These are SCG’s highlighted R&D innovations, solutions for a sustainable world…**

**Innovation that eases greenhouse gas emission, reduces energy use, and lessens natural resources consumption**

**SCG Solar Roof Solution, the innovation to relieve global warming, a now normal life solution**

Solar roof installation for household use or small enterprises may sound troublesome and costly. Nevertheless, in the past year, consumer behavior shifted, and people are spending more time indoors to avoid the pandemic as well as the PM 2.5. This increased demands for home electricity consumption.

In the afternoon, the electricity usage in a medium-sized, single-detached house that turns on two air conditioners and uses appliances such as the refrigerator and television, can increase the average electricity cost by 30-50% or approximately 3,500-4,500 Baht increase per month. However, with the  **SCG Solar Roof Solution,** the long-term costs can see a 1,400-1,900 Baht decrease each month.

The expert services include the installation design for best electricity generation and on-site roof inspection prior to the installation. Also, with the Solar Fix innovation, the solar roof installations can be completed without drilling the roofs, thus, future leakage is not a risk. Additionally, SCG assists in all the installation permission applications as well as after-sales services that last with the 25-year warranty.

This innovation not only reduces the electricity cost up to 60% and offers a return on investment in 7-10 years, but homeowners can also gain from the government energy buyback schemes. It is truly the power production innovation that creates value and eases greenhouse gas emissions.

**SCG Hybrid innovative eco-friendly cement for the structural finish,**

**striving for reduction to at least 300,000 tons of CO2 by 2022**

“SCG Hybrid structural cement” adopts a new standard for eco-friendliness while reducing CO2 emission in the manufacturing process. Moreover, it surpasses or maintains the sturdiness, durability, and compressive strength compared to that of the general portland cement. It embraces material science technology and innovation adjusted for product development with active ingredients of strong qualities. It is accredited for the TIS 2594-2556 industrial standard, the first hydraulic cement standard in Thailand. Moreover, in the production process, alternative energy replaces coal usage at 18% of the heat energy and reuses hot air from the production to reduce energy consumption by 38%. The production of a ton of hydraulic cement can reduce CO2 emission by 0.05 tons of CO2 with the aim to achieve a reduction to 300,000 tons of CO2 by the year 2022. The product is appropriate for basic infrastructure, roads, bridges, or mega projects such as building structures and general housing. This also extends to contractors and project owners who are seeking the green building standard of LEED and Green Buildings in the future. Moreover, it is also certified by the Green Label, Carbon Reduction Label, Carbon Footprint Reduction, Carbon Footprint Product, and SCG Green Choice standards.

**CPAC Green Solution, uplifting Thailand’s construction landscape with digital technology for quick operations, less waste, and eco-friendly solutions.**

Reducing waste from construction is among the ways to efficiently manage resources for utmost value. The concept of building on value is practiced by turning waste into wealth throughout the construction process. This is part of the attempt to uplift the standard of construction and the sustainability for the housing sector in Thailand and ASEAN, aspiring for sustainable development.

* The **innovative construction in “3D cement printing”** with state-of-the-art 3D cement printing technology. This innovation supports complex structures or forms in building constructions, reduces time, involves less labor, and decreases waste at the construction site.
* **CPAC BIM is adopting the Building Information Modeling (BIM)** in the construction’s plan, design, and materials selection phase. This helps to calculate energy consumption, optimize time management and explore the site virtually with the VR walk-through. The operations work on a collaboration platform, thus, assisting designers, architects, engineers, contractors, and homeowners. They can synchronously view the structure, architecture, and systems via a 3D model prior to the actual construction, thus, helping to enhance efficiency in the working process.

**SCG Floating Solar Solutions,** Thailand’s first floating pontoon and solar cell installation system, turning solar into electricity. This helps with cost reduction and efficient management of water surfaces whilst creating business opportunities for clean energy. At present, SCG has delivered floating pontoons for installation for over 40 floating solar farm projects. The product lifespan extends for 25 years with the pontoons capable of being recycled for PCR plastic production. Their combined generation capacity totals to approximately 49.16 megawatts, reducing greenhouse gas emissions by over 34,412 tons per year or equally to planting 36,231 rai of trees (as of October 31, 2021). *(Every megawatt of the generation capacity reduces 700 tons per year of greenhouse gas emission, which equals the plantation of 737 rai of trees).*

**SCG GREEN POLYMER™,** innovative plastic solution targeting global warming, circulating resource values back to life, and addressing 4 aspects as follows.

* **Reduce:** Offer solutions to reduce resources consumption and maximize resource efficiency via the SMX™Technology for high-quality plastic resin production. This process supplies special HDPE that balances high strength and stiffness. It results in less plastic for product manufacturing whilst maintaining the strength level. With such attributes, the technology unlocks various types of products ranging from lightweight CSD caps, high-impact films for industrial purposes, to SCG Green Choice standard extra-strong large chemical tanks. Above all, the item better reduces greenhouse gas emissions in the production process when compared to general plastic resins.
* **Recyclable:** The solutions are designed for recyclability, shifting from prevalent yet difficultly recycled multi-material packaging to mono-material PE or PP packaging which allows efficient recycling while embracing functional and aesthetic attributes aligned with brand owner needs.
* **Recycle:** The solution facilitates the recycling of Thailand’s post-consumer plastics, thus, reducing waste and resources consumption. In the procedure, sorted and cleaned post-consumer plastics are processed to become high-quality Post-Consumer Recycled Resin: PCR resins possessing qualities that meet consumer demands. The PCR resins are certified by the Global Recycled Standard (GRS), a global standard for the sources of raw materials for the production of recycled plastic resins. Also, in the determination to develop and expand the recycled plastic market to other regions, SCG Chemicals has collaborated with local and international expert partners in recycling. The venture involves Teamplas, Thailand’s leading manufacturer of recycled plastic pellets for 30 years, Suez, Europe’s forefront in recycled plastics, and Sirplaste, the largest plastic recycler in Portugal.

Additionally, the plastics that are hard to be recycled are processed in the Advanced Recycling technology or chemical recycling. Here, they turn to recycled feedstock in petrochemical plants for plastic resins production. Their properties are on par with virgin plastics and are accredited in the ISCC PLUS standard by the International Sustainability and Carbon Certification (ISCC). This is Thailand’s first company to obtain this leading internationally acclaimed sustainability certificate.

* **Renewable:** The solution that delivers bio-compostable compound plastics. This is SCG Chemicals’ ready-made formula which can be promptly extruded into film products for household and industrial use, adding to the molding convenience and efficiency. Moreover, they offer prime attributes that target consumer needs and have been certified as being bio-compostable compound by the world’s leading institution, DIN CERTCO in Germany. In addition, another solution to reduce the dependence on depleting fossil-based resources in the plastic production process is shifting to bio-based resources which can be replaced with plantations. This will contribute to reducing greenhouse gas emissions and alleviate the impact on global warming. At present, there are collaborations with Braskem, the world’s bioplastic leader in Brazil, for a feasibility study of ventures to build a bio-ethylene plant for bioplastic production in Thailand.

**Zyclonic™ by SCG, the modular waste and wastewater treatment system**

Uplifting sanitation for Thailand and the world, with products for the treatment of toilets and households’ wastewater. The innovation aims for pathogen-free waste and elimination of the breeding grounds for diseases such as diarrhea, cholera, and typhoid, which are taking up to 500,000 lives of children below 5 years old worldwide annually. This innovative waste treatment unit, Zyclonic™, is compact and allows easy assembly, without having to connect to the central electricity system. The waste and wastewater treatment makes it pathogen-free and eliminates odor, thus, allowing resources to be reused. The reusable waste can be used as a soil conditioner, toilet flush, for watering plants, and other irrigation purposes. Moreover, the treated wastewater can be released to natural bodies of water, without affecting the environment and sanitation of the surrounding communities.

**Fest Chill, food safety packaging**

The food delivery business that has greatly sored during the pandemic has contributed to the tremendous food packaging waste. SCGP steps up to introduce the food packaging from eucalyptus pulps from commercial forest plantations. The product is coated with a film that can contact and withstand food heat of up to 130°C. Moreover, after use, the films can be peeled off for further recycling while the packaging is naturally degradable after 60 days. Also, the product offers durable qualities as they can be stacked in multiple layers, thus, offering convenience for large volume transports.

**OptiBreath®**, the packaging to prolong fruits and vegetable freshness

The shelf life of fresh fruits and vegetables is limited, thus, troubling entrepreneurs or stores who fail to sell them in time before becoming food waste and increasing their costs. SCGP’s innovation, the OptiBreath® packaging, can store and extend the shelf life of fruits and vegetables for a longer period when compared to normal packaging. It is made from flexible packaging and adopts the packaging development technology with the special materials and systems called the Modified Atmosphere Packaging (MAP). In the process, the selection of materials and production of the film is designed to match the different fruits and vegetable packaging. This helps to maintain the items’ freshness with utmost efficiency. Also, holes are created to control the balance of the atmosphere inside the packaging and provide the appropriate oxygen absorption and transpiration, in turn, this prevents fogging and protects against contamination. As a result, stores and consumers can store items for longer while preserving freshness, color, smell, and taste as well as slowing down the growth of microorganisms.

**SCGP Recycle**

“SCGP Recycle” is solutions that will assist in sorting waste at starting points so it can be recycled as much as possible. This is achievable when consumers bring sorted recyclable wastes such as paper boxes, aluminum cans, glass bottles, or plastic bottles to the drop point near homes. These areas are where the SCGP Recycle project has partnered with stakeholders such as shopping malls, housing development projects, gas stations, office buildings, and many other places that shall be added in the future. Also, the SCGP Recycle mobile application was recently developed to facilitate and show the locations of the drop points. This system is dedicated to efficient management, convenience, and credibility, thus, consumers can trust that the recyclable wastes are distributed back into the cycle for utmost benefit. They may become raw materials or be added value to become various other products. This contributes to lessening waste and reducing the cost of waste collection. Moreover, such wastes will not require incineration or landfills, a process that adds to pollution, greenhouse gas emission and is the reason behind global warming.

**EV Solution Platform****, services and solutions for every EV need.**

**1. EV sourcing services by selecting from expert manufacturers** toserve businesses and organizations. The products range from EV forklift, EV truck, EV trailer, EV bus, EV mini-van, and EV passenger car, all with emphasis on battery quality and safety.

**2. Sourcing services** for charging equipment, Energy Storage System (ESS), and new technology that will support usage with alternative energy such as solar roofs. Also, the service extends to seeking technologies that can upcycle used batteries to be energy storage systems as well as introducing reliable drivers for the vehicles.

**3.** Establishing distribution centers for **EV** **spare parts**.

**4. Assembly services** such as importing spare parts for local assembly and converting internal combustion engines to EV.

**5. Maintenance services** with partners in the form of service centers and mobile services.

**6. Internet of Vehicle** wherein the development of the IoT system for EV can support maintenance services and real-time tracking systems, all of which, aiming to enhance efficiency and safety.

**7**. **Charging stations** that stem from the charging station network to expand service areas.

**8. Finance services** introduce diverse financial packages, both for leasing and other options.

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