

## CIRCULAR ECONOMY BUSINESS CASE STUDIES IN SOUTHEAST ASIA

Sun Wu Poly Company  
Limited

- Samut Sakhon Province, Thailand
- Furniture, Home decoration
- [www.sunwu-poly.com](http://www.sunwu-poly.com)
- Analysis period: 2020-2024

## Recycling Foam and Plastic Waste into Home Decoration Products

## Business Spotlight

Sun Wu Poly is a leading producer of home decoration materials, particularly for cornices, door frames, wall panels, and frames for pictures and mirrors. Since 2005, the company has been producing with polystyrene (PS) materials made to imitate the characteristics and appearance of wood. Manufactured from an extruded, impact-resistant high-density polystyrene mix, the decorative materials used for skirting boards and other products are waterproof, durable, lightweight, pest-resistant and easy to install.

In 2006, the company's predecessor began using recycled polystyrene in a 50%–50% mix with virgin materials in some products. Over the years, the company has adopted advanced technology to increase the ratio of recycled polystyrene material from 50% to 90% in various products such as photo frames depending on product specifications. Due to increasing demand, the company is facing shortages of good quality recyclable polystyrene waste at material recovery facilities. Despite an expanding home decoration trade, however, the company must also deal with increasing price competition.

## Keywords

Recycling polystyrene foam (PS) foam, Plastics recycling, Home decoration

## Innovation

Product/Service design, Manufacturing, End-of-life management, Resource circularity, Resource efficiency, Resource substitution



# Analysis of Sun Wu Poly Company Limited

## Context and baseline

What would become Sun Wu Poly began in 1974, when the first generation of the family established their company under the name Triple Four Para Wood to manufacture wooden frame products. Beginning in 2004, because of high competition and a shortage of raw wood material, the company started using substitute raw material on a trial basis. In 2006, the company developed its products from a mixture of raw materials composed of imported plastic pellets and used plastic foam sourced in Thailand.

In 2010, based on its extensive skills and knowledge of wood furniture, the company diversified its products from wooden photo frames to a wide range of items, including skirting board moulding for interior decoration and furniture, also locally known as 'lotus wood' in Thai. Since 2017, the company has expanded production to serve large-scale real estate projects, and has also provided manufacturing services as an original equipment manufacturer (OEM) to mass produce to buyer or brand specifications. In 2020 the company formed a sister company, Sun Wu Poly company, to increase production capacity, which is the focus of this business case.

The recycling of single-use foam by Sun Wu Poly is a response to the waste situation in Thailand. In 2018, before the COVID-19 pandemic, the Thai Office of Natural Resources and Environment Policy and Planning reported that the country generated 5,500 metric tonnes of plastic waste daily, an average of 2 million metric tonnes per year, with food packaging foam containers contributing significantly to this total. About 75% of the country's plastic waste including foam (or about 1.5 million metric tonnes of total plastic waste) was neither reused nor recycled. In 2019 during the COVID-19 pandemic, the total amount of plastic and foam waste increased to 6,300 tonnes daily, a 15% increase, exacerbating the already significant and omnipresent problem of plastic pollution. Plastic does not biodegrade, as it takes more than 450 years to decompose, making plastic waste disposal a challenging task. Guiding principles known as 'Reduce, Reuse and Recycling' (3R) have since been promoted to help mitigate the plastic waste problem.

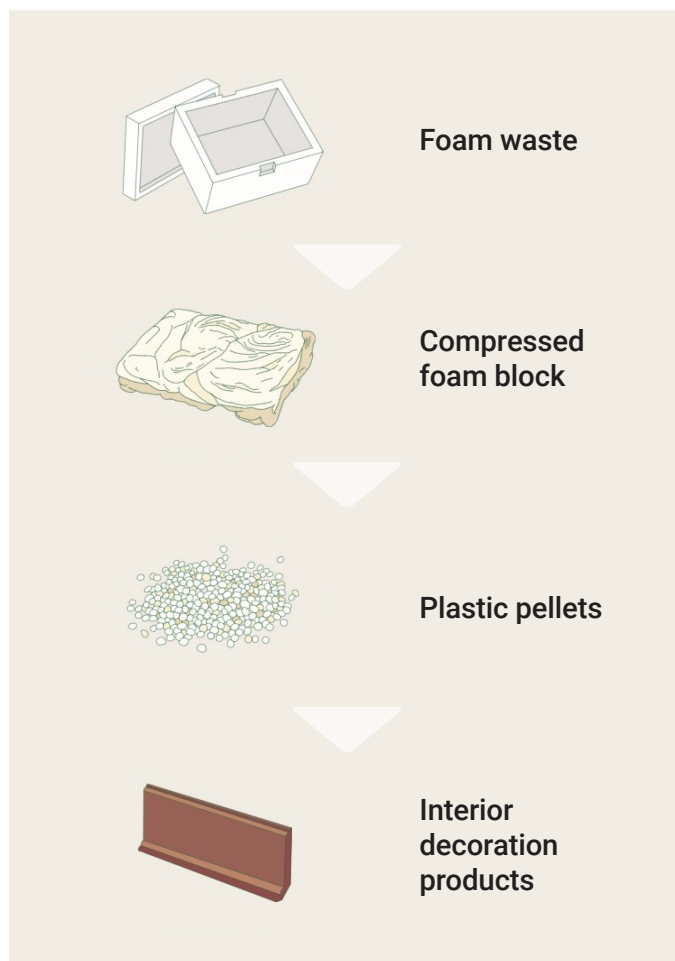
## Innovation

Instead of using virgin polystyrene material, Sun Wu Poly has begun to recycle expanded polystyrene (EPS) foam waste by melting it and subsequently grinding the resulting sub-product into its own alternative recycled polystyrene, which is then transformed into various products such as frames,

indoor decorations and furniture. The company itself sources and buys EPS foam waste for in-house melting and reprocessing to produce the recycled PS material that it uses in its manufacturing process. Sun Wu Poly is registered as a non-metal processing factory with the Department of Industrial Work (DIW), and is therefore required to mitigate its social and environmental impact on nearby communities, as required by DIW guidelines.

Recycled foam is sourced from wholesalers, which are typically specialist waste collectors, industrial sources, or materials recovery facilities (60% of total foam material), direct purchase from waste pickers at the factory gate (20%), and CSR activity carried out by the company by offering to event organisers the free shipment of used foam to the company (10%). Imported plastic pellets are also used as raw material.

In 2006, the company R&D developed a mixture of about 50% recycled foam, 20% plastic pellets, and 30% other chemical substances to produce its products, restructuring machines and tools to accommodate this new substitute raw material mixture. In 2024, the Thai Industrial Standards Institute issued the product standard. In 2022 the company had already received certification for importing recycled plastic pellet raw material from the Department of Industrial Works.



## Circular Economy impact

The design, recycling and manufacturing practices at Sun Wu Poly contribute to circular economy through recovery and reuse of previously discarded EPS foam waste, denoting resource circularity; more efficient use of materials and energy, an illustration of resource efficiency; and partial use of renewable energy, showing resource substitution.

In regard to resource circularity, in 2006 the predecessor company of Sun Wu Poly started to replace up to 50% of virgin material with recycled polystyrene. Over the years, the use of recycled polystyrene has increased, resulting in varying levels of recycled contents in diverse products. In 2023 Sun Wu Poly used about 1,000 metric tonnes of virgin polystyrene and 900 metric tonnes of foam waste, resulting in a 47% recycled PS content across all products. By 2028, the company is planning to increase recycling to approximately 80% of their total production to achieve an average recycled contents ratio of 90+% for specific products, depending on functionality and technical specifications for each product (e.g. translucence, transparency, and/or fragility properties). Resource circularity is also evident in the refurbishment of returned products damaged in transport or onward sales.

In terms of resource efficiency, the company is using advanced manufacturing techniques and improved designs to reduce production losses. Additionally, under its zero material waste practices, all production waste is internally recovered and reutilised. Moreover, improvement and smart planning and procurement have reduced left-over material by some 20%. A further efficiency initiative covers reduction and rationalisation of product packaging, which means that less material is required for product packaging, and also less space is needed in trucks and warehousing, enabling fuel and other savings in logistics and in the distribution of the final products.

The company's solar panels supply around 20% of the electricity requirement, a demonstration of change from non-renewable grid power to renewable solar power.

## Business and market impact

Sun Wu Poly is on track to reach the break-even point of its investment in new polystyrene extrusion and product manufacturing technology some 4–5 years after its 2020 investment. The company's market share is about one-fourth of total sales in the home decorations market segment in Thailand.

The marketing strategy of the company focuses on offering an environmentally friendly version for standard products according to the Thailand Industrial Standard Institute at a competitive price along with after-sales service. Furthermore, the company customises products according to customers' needs and specifications, particularly when supplying to large scale real-estate projects, office buildings and other property developments.

Real estate projects and corporate clients are reputable customers for product showcasing, including Korra Brand Design Company, hospitals, hotels, and commercial shops. Apart from direct sales to large-scale real estate projects, the company has direct sales with the leading mass volume trading companies such as Siam Cement Group Company (SCG) and Boonthavorn, a well-known home improvement and construction materials retailer in Thailand. In cooperation with three other companies in Thailand, the company has a policy to create a domestic market that competes with imports from China by not competing on low prices but by offering a diverse range of products in a complementary and environmentally friendly way.

The sales ratio of the company is about 50% sales through leading trading companies, 30% of direct sales to large scale property development projects, and 20% operation as OEM for other brands.

## Stakeholders

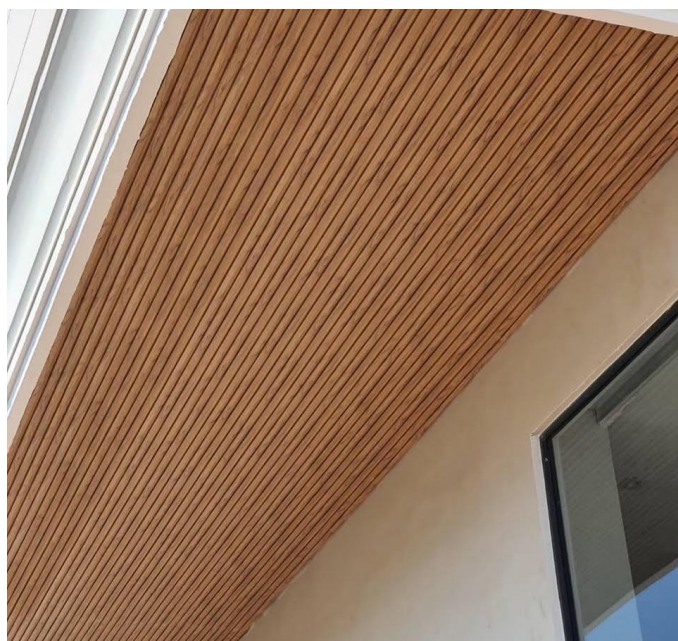
During the COVID-19 pandemic, Sun Wu Poly began buying recyclable foam and plastic waste directly from some 20–30 individual waste pickers and retail shops that were not registered as recycling facilities. With business slowing down during this period, the company was able to set up a direct buying system and offer competitive purchasing prices. The company now sources about 10%–15% of foam and plastic waste materials from individual waste pickers, retail shops, and wholesalers, and 10% from sorting companies.

The company sources 90% of its virgin polyester plastic pellets from China. A few local companies supply 80% of foam requirements and 10% of plastic pallets requirement. Every quarter, the company utilizes some of its corporate social responsibility (CSR) funds into activities to acquire foam waste from event organisers by providing them free shipment of foam waste from event venues to the factory.

## Implementation

Due to increasing demand, Sun Wu Poly is facing shortages of quality foam waste from materials recovery facilities, and these are holding the company back from achieving its target of 90% recycled polystyrene use. The company plans to identify more suppliers and establish a network of waste foam suppliers, including individual waste pickers, and retail shops such as Wongpanit Recycle Station in Samut Sakhon Province.

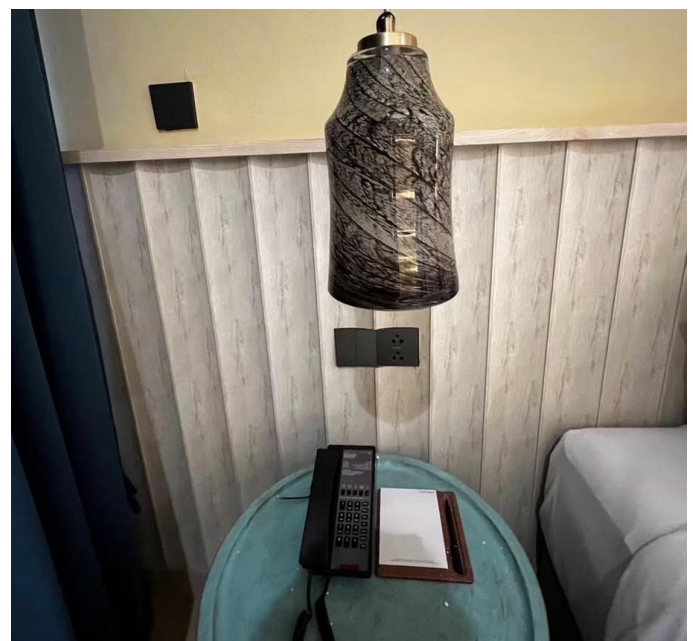
The company is encountering challenges in expanding sales through the leading large-scale retailers, given price competition with consumers unwilling to buy environmentally friendly and recycled products from Sun Wu Poly.



## Takeaways

To satisfy customers' needs, especially those of exporting and large-scale companies, Sun Wu Poly would like to develop a traceability system, including carbon footprint accounting. In terms of technology, the company is willing to explore advanced polystyrene material production to reduce the volume of raw material, which should result in lower unit price costs.

In addition, with a view to reaching its 90% recycled content target, the company is actively searching for foam waste suppliers through e-platforms and online databases, such as the Recycoex online platform.



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