Fibo

Company Name:Sific
<63.Sific>

1. Executive summary

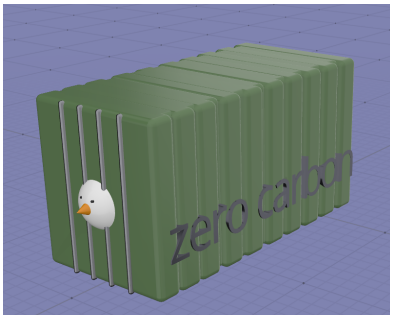
As the global population increases, physical distribution is expected to increase as well. The carbon dioxide emissions from transportation represented to airplanes and automobiles, currently account for 20% of the total[1], and the total amount of CO2 emissions is expected to rise in the future. We have designed a product that reduces the wasteful portion of these emissions and moves the transportation industry toward decarbonization. Our product is a container, which is essential transportation, made of carbon-neutral materials lighter and stronger than conventional, which could reduce CO2 emission physical distribution.

2. Our mission

Our company will reduce energy use in order to achieve a decarbonized society.
We focused on containers for physical distribution used in airplanes, ships, and trucks, which are currently and will continue to be indispensable globally. Our goal is to reduce the amount of fuel consumed and CO2 emissions.

3. Product/service Description

The concept of our product Fibo is to reduce carbon dioxide emissions during transportation by using lighter materials than conventional containers. Generally, most of the containers are made of steel, and the own weight of a 20ft (6 x 2.4 x 2.6m) container in ISO planning is 2250kg. [2] Fibo uses cellulose nanofiber (CNF) as a substitute material for steel.
CNF is a biomass material made by decomposing plant-derived fibers to the nano-order (several hundredths of a micron).
Surprisingly, CNF is 1/5 lighter and 5 times stronger than steel [3] and it has been studied as a lightweight part for automobiles. Therefore, the performance is sufficient for use as a material for containers. By using CNF as an alternative to steel, the weight of Fibo will be approximately 0.5 tons, which is 80% lighter than conventional material.



Since the wood-derived pulp is the most common source of plant material, our company will use thinned wood to prevent excessive logging.Thinning maintains and improves the carbon sequestration capacity of the forest as a whole. Additionally, the injection of other cellulosic organic materials such as food waste could be considered in the future.To degrade fiber, several methods exist; chemical treatment, acetic acid bacteria, enzymes, and pressure exist. Our project adopted TEMPO oxidation[4], which is considered to be inexpensive to produce. Manufactured cellulose nanofibers will be processed into panels for containers by adding glass fiber and other materials as reinforcing resin and then assembled into a box shape.

4. CO2 Emissions

As mentioned earlier, the concept of this product is to reduce CO2 emissions during transportation. The truck industry leads Japan's CO2 emission in terms of ton-kilometers in the physical distribution, accounting for 51.3% of the total [5]. And trucking consumes 306,750 kℓ of gasoline per year and emits about 600 tons of carbon dioxide per year. By using our containers, the above gasoline consumption and carbon dioxide emissions can be reduced by about 80%.

Currently, 280 million TEU (number of 20-foot containers) of containers are distributed worldwide, while the number of containers handled is increasing. Our products are effective in reducing consumed gasoline and emitted carbon dioxide as the population and distribution volume increases.

5. Marketing

The demand for physical distribution has skyrocketed globally due to the development of e-commerce sites and the new coronavirus. The current market price for 20-foot containers is about 500,000 - 800,000 yen[6]. However, our product is priced at 650,000 yen, which is in the low to medium price range. Furthermore, as the container is stronger and has a longer durability than conventional containers as mentioned above, it could be introduced by several transportation companies.
Containers focused on sustainability are untapped in the market, which could attract attention to the logistics industry as a new product with a new concept that considers the burden on the environment. Although containers are in demand all over the world, our business could expand on a global scale.

6. Finance

Japan's Ministry of Economy, Trade, and Industry (METI) has stated that the price of cellulose nanofiber will drop in the future[7], which is estimated to be reduced from around 10,000 yen to as low as 200 yen. Since our goal is to achieve carbon neutrality by 2050, we considered the Financial Plan for the year 2050.

(YEN)	Year1	Year2	Year3	Year10	Year30
1,Revenues	130,000,000	280,000,000	525,000,000	1,500,000,000	27,000,000,000
(unit average price)	650,000	700,000	750,000	750,000	900,000
(Units sold)	200	400	700	2,000	30,000
2,Production Cost	110,000,000	208,000,000	322,000,000	790,000,000	11,028,000,000
(Units cost)	550,000	520,000	460,000	395,000	367,600
3,Expenses	56,500,000	94,700,000	144,500,000	193,500,000	1,931,000,000
Staff Salaries	24,000,000	48,000,000	72,000,000	100,000,000	1,200,000,000
Sales & Marketing	500,000	700,000	1,000,000	1,500,000	16,000,000
Rent	25,000,000	45,000,000	70,000,000	90,000,000	700,000,000
Other expenses	7,000,000	1,000,000	1,500,000	2,000,000	15,000,000
4,Profit/Loss before tax	-36,500,000	-22,700,000	58,500,000	516,500,000	14,041,000,000
5,Income Tax	0	0	17,550,000	154,950,000	4,212,300,000
6,Net Profit/Loss	-36,500,000	-22,700,000	40,950,000	361,550,000	9,828,700,000
7,Start up cost	50,000,000	0	0	0	0
9,Free Cash Flow	-86,500,000	-22,700,000	40,950,000	361,550,000	9,828,700,000
10,Funding Required	20,000,000	0	0	0	0
11,Loan Required	20,000,000	0	0	0	0
12,Repayment of Loan	0	0	20,000,000	0	0
13,Divident for shareholders	0	0	200,000	250,000	300,000
14,Cash Balance	-46,500,000	-22,700,000	20,750,000	361,300,000	9,828,400,000

7. Conclusion

Since the industrial revolution, greenhouse gas emissions have continued to increase and climate change is getting worse by the day. In order to reduce the burden on future generations, not only to reduce greenhouse gas emissions, but also to contribute to the prevention of transportation delays caused by container shortages due to increased demand, is important for the logistics industry.

8. References

[1]https://www.mlit.go.jp/sogoseisaku/environment/sosei_environment_tk_000007.html
[2]https://freightfinders.com/container-transport/20-feet-iso-container/
[3]https://www.meti.go.jp/policy/tech_evaluation/e00/03/r01/J059.pdf
[4]https://pubs.rsc.org/en/content/articlelanding/2011/nr/c0nr00583e
[5]https://jta.or.jp/wp-content/themes/jta_theme/pdf/student_2020.pdf
[6]https://www.shippingcontainersuk.com/brands/20ft-new-shipping-containers.php
[7]http://www.rish.kyoto-u.ac.jp/labm/wp-content/uploads/2014/04/10e72119b391676b286869c9df845f22.pdf