

### 1.Social backgrounds & business incentives

Marine waste, particularly various plastics are acting as the main culprits of disturbing marine wildlife and or the ecosystems in a negative, intolerable manner. The Great Pacific Garbage Patch is a symbolic figure of this issue, reflecting how much the it has gone out of hand. <sup>1</sup>In fact, it is estimated that by 2050, the net mass of marine waste will exceed that of the total mass of marine life on Earth. We humans are not an exception from the negative implications of this growing issue, as it has profound effects on our health through the process of biomagnification. The responsibility of us humans in the issue of marine waste is our business incentive, to reduce marine waste in oceans by introducing our SeaRake to the fishers of littered oceans.

### 2.Description of the business

Our business follows mainly 2 phases: collecting marine waste, and producing transportation oil from polyethylene, as our product. The transportation oil we produce guarantees profit, as polyethylene which is well known as PET bottles, <sup>2</sup>accounts for the highest portion of marine waste.

#### (a) Solving the issue of marine waste



The structure shown in the diagram is one unit of SeaRake, which is a device that collects marine waste floating on ocean surfaces. Here, it should be noted that

<sup>3</sup>94% of marine waste is located on ocean floors, <sup>4</sup>but they will have negligible effect on the surrounding marine life as they are unlikely to be eaten. However, marine waste floating on the surface being mistaken for food is not a rare occasion, as they are likely to be encountered by creatures of the surrounding habitat. Naturally, we will focus our marine waste collection on floating waste.

We intend to introduce this product to fishers of littered oceans to encourage “marine waste fishing” in addition to their aquatic yields. Our product is compatible with fishing vessels, by jointing it on the stern using chains. By installing additional units of the SeaRake, the device is compatible with vessels of different sizes.



It is composed of mainly two filters structured in a curved frame, considering the resistance of the water. The marine

waste comes in contact with the first filter, (bottom left) which separates the waste by size. It sends small waste, including microplastics to the bottom portion of the structure to make contact with graphene filters. <sup>5</sup>Graphene is capable of filtering only the waste while allowing water to pass through. Meanwhile, the large waste is sent to the upper portion of the structure to come in contact with a filter (top right), which filters waste of large size. This marine waste collection process of “marine waste fishing” contributes to reducing marine waste in the ocean.

#### (b) How this works as a business

Despite that the effects of plastics and various human waste on marine life is grievous, <sup>6</sup>latest technology by SIOC (China) show that the combustion of polyethylene can yield transportation oil with 70% efficiency. Though the combustion of plastic is well known for the hazardous chemicals it produces; carbon dioxide, dioxin, their emission can be prevented by Direct Air Capture (DAC) technology to keep the process environmentally legitimate. This innovative chemical processing and DAC technology will be adopted, to process polyethylene into transportation oil, in our power plants. Therefore, we consider the collection of marine waste as a business, by processing plastics into oils and selling them as our product.

<sup>1</sup> <https://nikkan-spa.jp/1451325>

<sup>2</sup> [https://www.cleanaid.jp/files/graph2016\\_1rank.jpg](https://www.cleanaid.jp/files/graph2016_1rank.jpg)

<sup>3</sup> <https://www.eunomia.co.uk/reports-tools/plastics-in-the-marine-environment/>

<sup>4</sup> [https://natgeo.nikkeibp.co.jp/atcl/news/16/b/121100251/?ST=m\\_news](https://natgeo.nikkeibp.co.jp/atcl/news/16/b/121100251/?ST=m_news)

<sup>5</sup> <https://m.srad.jp/~phason/journal/545848>

<sup>6</sup> <https://advances.sciencemaq.org/content/2/6/e1501591>

In the long run, we plan to process not only polyethylene, but <sup>7</sup>producing food products from plastic using fungi to break down the material while remaining edible biomass.

### **3. Marketing strategies**

#### **a) Analysis and target**

<sup>8</sup> 99% of the fuel consumed in Japan are imports from foreign countries, and its' demand is not predicted to see any decline in the near future. The vast amount of imports for natural resources and capital is negatively affecting its economic growth, demanding an immediate solution. Through SeaRake, gradual production of fuel will be probable, decreasing imports and raising domestic consumption, eventually leading to an increase in GDP. Therefore, our business and power plants are initiated in Japan. Our target customer will be firms in the <sup>9</sup>steel industry as their consumption of oils are the largest.

#### **b) Marketing strategies**

##### **i. Manufacturing method**

We intend to base the activities of the product in the north pacific ocean given the below facts.

-<sup>10</sup>The garbage density of the north pacific garbage patch is the largest

-Japan is geographically adjoined in the garbage patch, where expected yield of marine waste can be maximized.

-<sup>11</sup>Most Japanese trading vessels pass through this area.

-<sup>12</sup>80% of marine debris is composed of plastics, polyethylene being the main contributor.

##### **ii. Marketability**

The strengths of our product surpasses existing cleaning products, ones that are operating at this day. This system is not only a sustainable method of production, but one that imposes a significantly minimal effect on marine biodiversity. Moreover, in the long-run, it can potentially contribute to a positive result on Japan's economic growth. <sup>13</sup>The biggest forte of our product is its refined efficiency, making it possible to collect 200 times more marine debris than prior systems. The SeaRake can be installed in any type of boats and ships,

<sup>7</sup><https://www.dezeen.com/2014/12/10/livin-studio-katharina-unger-fungi-mutarium-recycle-plastic-food/>

<sup>8</sup><https://www.teikokushoin.co.jp/statistics/map/index16.html>

<sup>9</sup><https://www.enecho.meti.go.jp/about/whitepaper/2013html/img/21-1-5.gif>

<sup>10</sup> [https://marineplastic.net/fate/garbage\\_patch](https://marineplastic.net/fate/garbage_patch)

demonstrating high flexibility. <sup>14</sup>In the process of converting plastic into fuel, emission of carbon dioxide is prevented, showing a high consideration to the environment not only in the ocean, but on land as well. Another big strength of this system is that we provide our cleansing product for free, avoiding any reluctance of instalment.

##### **iii. Sales promotion method**

We promote our business through social media such as Facebook and YouTube to inform our target and individuals about our business and contribution to the environment. Also, we will create a website that contains detailed information and visualizes the amount of plastic waste collected and the amount of fuel produced to appeal our efforts as much as possible.

### **4. Financial plan**

(USD)	Year 1	Year 2	Year 3
1.Revenues (a)+	660,000	1,320,000	28,800,000
2.Cost (b)	140,000	280,000	500,000
3.Expenses (c)	326,000	605,000	1,260,000
Staff Salaries	150,000	300,000	600,000
Energy Conversion Cost	125,000	250,000	600,000
Other Expenses	51,000	55,000	60,000
4. Net Profit/Loss after tax	194,000	304,500	784,000
5. Capital Investment (h)	301,000	100,000	100,000
6. Free Cash Flow	-116,000	204,500	684,000
7. Loan Required (k)	120,000	0	0
8. Cash Balance (m)	4,000	88,500	772,500

We expect our business to expand exponentially due to its immense effect on reducing marine debris, however only tested in Japan for the first 3 years and then the expansion to a worldwide scale in the latter years.

We expect more fuel production as more ships & vessels are encouraged to install this system, as the recognition of this system will increase, which can be visualized easily from our website.

We expect some natural disasters during the course of the ships journey, destroying our product, however can be assumed to be negligible to the effects on our profits.

It should be noted that the cost of purchasing the marine waste collected by ships & vessels adopting the SeaRake is an expense as well.

<sup>11</sup><https://www.canadiangeographic.ca/article/map-lets-you-visualize-shipping-traffic-around-world>

<sup>12</sup> <https://www.iucn.org/resources/issues-briefs/marine-plastics>

<sup>13</sup> [https://marineplastic.net/responses/seabin\\_project](https://marineplastic.net/responses/seabin_project)

<sup>14</sup> <https://buzzap.jp/news/20150728-carbon-engineering/>