Third Party Opinion Report

The Sustainability Collaborative
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Personal

She is residence in Sweden since 1974.
In 1999, she was involved in the establishment of the Japan office of The Natural Step, a Swedish international NGO that provides environmental education for business and municipalities. She was chief executive of The Natural Step Japan from 2000 until 2011. Since 2012, she has been an associate of Natural Step Sweden. She was a member of the Recycling Association Committee of the Clean Japan Centre Foundation, member of the Roundtable on the Development of Technology for Sea Area Utilization, Ports and Harbours Bureau, Ministry of Land, Infrastructure, Transport and Tourism, and member of the Nagano Prefecture Forest Ordinance Review Committee. She was a member of the Industrial Structure Council for 3R Upgrading, Ministry of Economy, Trade and Industry, and a member of the Development Bank of Japan's Round-Table Committee.
She is currently a Senior Advisor to The Sustainability Collaborative, an office of The Natural Step Sweden.

Introduction

Although the world has finally overcome the coronavirus pandemic, it is currently facing multiple crises: the climate crisis, the biodiversity crisis and the energy and economic crisis caused by the war in Ukraine. Hitachi Zosen Group, hereinafter referred to as HZ-Group, has decided to promote sustainability in the medium to long term, as it sees the rapid changes in its surrounding business environment as a management issue. However, the Group's diversified business made it difficult to get a comprehensive overview of its business policies, measures, and activities. Therefore, the Group set a new Sustainable Vision in 2022 and developed measures and a roadmap to address sustainability promotion. This time, a third party opinion was requested to evaluate both the process and the content, and to guide the implementation of concrete strategies and measures in the future.
This third party opinion was based on the Group's business overview, organizational chart, sustainability promotion project overview document, sustainable vision, roadmap of success pillars and key measures, Natural Step sustainability analysis questionnaire responses, interviews with the President and Senior Managing Executive Officer, Sustainability Promotion Office manager, the website, and a tour of the water electrolysis equipment and methanation facilities in the Chikko plant.

1. Evaluation of the process

The process of setting a sustainable vision and developing a roadmap is excellent in the following aspects.

- **Top management's strategic thinking and commitment**

Successful promotion of sustainability requires conviction and commitment to change at the top level. The President and Senior Managing Executive Officer of the HZ-Group expressed in interviews their willingness to commit the vision set by the Board of Directors for the company to exist sustainably and become a sustainable company. The vision and goals are ambitious, but the management team is committed to achieving them. This is a highly ambitious vision and goal, and the top management is strongly committed to ensuring that it is achieved since the accumulated technological know-how. The president also spoke of the need to learn from best practice around the world and promote initiatives in collaboration with each other. I highly praised the company's awareness as a global company and its solid strategic thinking and commitment.

- **Sustainable vision, backcasting and roadmap**

The mission within the HZ-Group's Sustainable Vision is 'Using the power of technology to achieve harmony between mankind and nature'. The visions are 'Reduce environmental impact to zero' and 'Maximize people's happiness' - appropriate visions for a company that has been supporting economic growth and social development with technology for 140 years, and at the same time is facing global environmental degradation and a range of social problems in the world.

In the process of identifying seven 'pillars of success' (materiality) to achieve these visions, the following three points are highly commended.

- The first is the identification of challenges through backcasting, based on The Natural Step's "Four Principles of Sustainability "*, as well as an awareness of the external environment from a long-term perspective.

- Second, the pillars of success were identified from the perspective of impact on business continuity, society, and stakeholders, as well as the degree of difficulty in achieving them. In particular, the fact that The Natural Step's 'four sustainability principles' are based on science means that Hitz Group has a compass to guide them in the right direction in solving the highly complex and transformative challenges of sustainability. You cannot negotiate with the laws of physics and nature. It is highly commendable that the four principles of sustainability are recognized as the ultimate goal, backcasting from there, and that the company's vision and mission is to achieve the goal.

- Third, in order to promote the Group's strategy on sustainability in general, a Sustainability Promotion Committee has been established directly under the Board of Directors and a promotion system has been established to achieve overall sustainability management. The biggest challenge in corporate sustainability measures is often the lack of a system to promote strategies and action plans. For example, there is often a lack of understanding of why, who and when to do what within the company. I think the HZ-Group's sustainability project is an excellent process for establishing the prerequisites for involving the entire company and moving forward as one.

***Four principles of Sustainability**

We will have achieved full sustainability when we no longer contribute to…

...systematically increasing concentrations in nature of substances from the Earth's crust

... systematically increasing concentrations in nature of substances produced by society

...systematically increasing degradation of nature by physical means

...conditions that systematically undermine people's ability to meet their needs

(barriers to health, influence, competence, impartiality and meaning)

Source: The Natural Step

Suggestions for future processes

Carbon neutrality is at the top of the priority list of the seven pillars of success. This third party opinon report makes recommendations for future processes with a focus on the carbon neutrality roadmap.

1. Follow-up and review needed

The HZ-Group plans to review KPIs from April 2023 onwards, based on the roadmap of key measures developed by the Sustainability Strategy Committee. The roadmap will also be followed up by the Sustainability Promotion Committee and the Sustainability Strategy Committee, which will review progress at least twice a year. It is also a good structure that the pillars of success will be reviewed regularly, e.g. every three years.

With regard to 'carbon neutrality', which is the most important of the seven pillars of success, the climate change situation has been deteriorating rapidly in recent years. IPCC report warns that the current pace of global greenhouse gas reductions is inefficient and that we are losing the opportunity to limit the temperature rise to below 1.5°C. We need to drastically reduce carbon dioxide emissions by 2030. Therefore, I believe that a system is needed to ensure that the roadmap of measures can be followed, reviewed and, if necessary, revised based on science.
In addition, as sustainability demands are expected to have a significant impact on all businesses in the future, and the role of the head of the Sustainability Office will become increasingly important, I propose that the head of the Sustainability Office be placed in a position closer to the overall decision-making authority for the business.

2. Proposal for a carbon neutral strategy for the HZ-Group as a whole

It is excellent that a roadmap has now been drawn up for each business, with backcasting and analysis of the current situation. As a next step, I would like to propose the direction and strategic planning of measures for the whole group. The reason for this is that if the strategy as a whole is clarified, you can expect more active collaboration among the businesses and companies in the group, which will increase the achievement of the carbon-neutral roadmap. Three reasons for this are as follows:

(i) There are prerequisites for putting carbon-free products on the market.

There are two preconditions for the spread of carbon-free products in society with economic rationality in each project. One is access to electricity from renewable energy sources.
The second is that the electricity must be priced to be competitive with fossil power.
For example, for methane from methanation, which is expected to contribute to the market as a carbon-free product, the raw material, carbon dioxide, must be recovered from renewable energy power plants, and the electricity to produce the other raw material, hydrogen, by water electrolysis, must come from renewable energy. In addition, to make economic sense, the electricity must be at a lower price than the price of fossil power generation. At this point, it would be advantageous if the electricity from fossil power is more expensive by carbon pricing. Here is a major obstacle that Japanese companies currently face. Since Japan has very little access to renewable energy, as it accounts for a very small proportion of the electricity it generates, while in the European Union (EU) countries the share of renewable energy is increasing rapidly. Thanks to the EU has a system for trading emission rights - ETS (European Union Emissions Trading Scheme), wind and solar power are becoming competitive with fossil power. Japan does not yet have a carbon tax or emissions trading system.
The success of the HZ-Group in achieving carbon neutrality is based on the background that renewable energy production will increase significantly in the near future and that carbon pricing and policy support for carbon neutrality is needed.

(ii) Full use of renewable energy technologies within the HZ-Group

I think the Hitz Group is to be in a very strong position compared to its competitors in Japan. This is because the HZ-Group has a wide range of renewable energy production technologies within the Group, from onshore and offshore wind power to biomass power, biogas and solar power. First, as a stepping stone, I propose to invest in renewable energy technologies within the Group and use them fully as measures for carbon-free electricity use within the Group. In other words, to use it as a Scope 1 and 2 measure and offer it to the market as a product while utilising own technology and experience. And I believe that the commercialisation of methanation will proceed smoothly if more renewable energy is available and accessible, the government introduces carbon pricing and the price of electricity is lower. In this way, if the group collaborates and accelerates energy transformation, this will increase HZ-Group's chances of achieving carbon neutrality.
I believe that by becoming carbon-free first and setting an example in society, the HZ-Group will also gain the trust of society. If the HZ-Group can't do it, which company can?

Source:Ministry of the Environment.
https://www.env.go.jp/earth/ondanka/supply_chain/gvc/estimate.html, (reference 2023-03-29)

(iii) Collaboration with suppliers, same and different industries

Increased collaboration with Scope 3 suppliers is also needed: in order for Hitachi Zosen's products to be completely carbon-free, the raw steel products iron must also be carbon-free. Collaboration with suppliers is needed to ensure that they supply carbon-free steel.
In this sense, I believe that in the future it will be necessary to select suppliers who understand the HZ-Group's new vision, mission and roadmap and who are willing to collaborate. It is hopeful that both the President and Managing Director of the HZ-Group expressed the willingness to work towards sustainable procurement as most recent target.

Furthermore, it is necessary to encourage governments to remove regulations/obstacles on carbon pricing in order to be able to move to carbon neutrality. To do this, lobbying in partnership with other companies in the same or different industries, or with environmental NGOs, is more effective than a single company doing it on its own. I also believe that new innovations in the future will require collaboration with completely different industries.

3. Improving efficiency in the use of energy resources

The Waste to Energy concept in particular is an excellent concept that will create jobs in Japan and make a significant contribution to the country's economy and security. In Japan, there are still many cases where waste is not utilised as a useful resource. For example, sludge from sewage treatment plants, food waste from food processing plants and households, and livestock manure can be fermented into biogas. Biogas can be used as fuel for city buses, taxis, passenger cars and ships, replacing petrol, diesel and natural gas.
The HZ-Group already has the technology and has examples. It should be spread to society on a larger scale.

Even in the field of waste-to-energy power generation, which is the most advanced in Waste to Energy concept, there is a need to backcast from a sustainable picture. In a future sustainable society, resources are fully recycled. This means that recycling is advanced and waste is drastically reduced. In a sustainable society, there is only the waste that cannot be recycled is incinerated and thermally recycled. As the amount of waste is drastically reduced, the number of facilities is reduced, but they are larger in scale to increase efficiency, and the heat is used for district heating and other purposes and is 100% utilised. Backcasting from this picture, I propose that measures should be taken to introduce both recycling of resources and efficient systems of heat use from waste incineration in Japan, as well as in developing countries in the coming market. First of all, I propose that measures should include increasing the efficiency of energy resource use, as currently more than 70% of the heat from incinerating waste is not utilised.

4. No product or service is sustainable from the beginning. They need to be managed sustainably!

The four principles of sustainability of the Natural Step can be used when creating a vision, but also when prioritising measures and how to manage sustainably. No product or service is sustainable from the start. For example, if paper is made from trees from rainforests that have been overexploited, it violates the third principle of sustainability. Similarly, wind and solar power cannot be said to be sustainable energy just because they are wind and solar power. For example, overexploiting farmland or forests with nature conservation value when installing them violates Principle 3. It also violates Principle 4 if there is no agreement with residents. Renewable energy can only be sustainable if it is managed in such a way that all principles are not violated. It is necessary to compare measures with the four principles and to manage them in such a way that even renewable energy does not violate them.

5. Communication to raise social and consumer awareness.

There is another necessary condition for carbon neutrality to be successful. It is that consumers are willing to buy new carbon-free products in order to avoid increasing the climate crisis even if the price is a little higher. This is especially necessary in the early stages of market introduction. The reason why EU companies are now seriously investing in for example carbon-free steel, EV vehicles, etc. is because consumers are demanding it. In other words, consumer awareness is necessary. Japanese companies need to actively communicate with consumers to change their mindset. This can be done by communicating on the web site why the HZ-Group is committed to sustainability, their sustainable vision, mission and roadmap, and how this is partly achieved by collaborating with local authorities and environmental NGOs to provide energy education for citizens. There are many possibilities, such as providing education on the environment and energy in primary and secondary schools. For example, I think the HZ-Group's work in Laos producing picture books to educate children about waste recycling and resource recycling is an excellent activity. In this way, together with consumers, we can build a sustainable future.

Conclusion

The world is changing rapidly, and carbon neutrality is now a matter of survival for the people of Japan, just as top managements are aware that it is a matter of survival for their companies. In this reality, the Hitz Group can provide technologies that use wind, solar, waste, sewage sludge, biomass and other energy sources that can be procured in Japan. The HZ-Group can thereby make a significant contribution to Japan's transition to carbon neutrality by eliminating its dependence on fossil fuels. In particular, the Waste to Energy concept could play an important role in creating jobs in Japan, in helping the country's economy and in promoting security. In Waste to Energy, energy could be used more efficiently if methods or systems could be developed to use heat, of which currently more than 70% is not utilized, as in district heating. Furthermore, I propose that energy efficiency should also be included in the measures.

The road to carbon neutrality is not easy. However, the HZ-Group is a company whose spirit of facing challenges has been handed down in its DNA over its 140-year history. Thus, the HZ-Group has great potential to succeed in the social transformation of the world to become carbon neutral. In addition, the Group has now established a structure to promote sustainability within the Group. Here, using the four principles of sustainability as a compass, I hope that Hitz Group will show leadership in this greatest challenge of mankind.

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