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Third Party Review Report

Sachiko Takami
Senior Advisor
The Sustainability Collaborative

I have conducted this analysis independently of the Kanadevia Group as a senior advisor with extensive experience in sustainability. The following analysis and assessment has been conducted on the basis of relevant information obtained within the procedures described below.

- Analysis procedures
- ◇ "Kanadevia Corporation TNFD Report 2024" was read and questions were asked to the Company to obtain further information as needed.
 - ◇ The Natural Step's concept of sustainability was used as a method for analysis. A backcasting approach, which looks at the current initiatives from the perspective of what has been successful in a sustainable society was used. The four sustainability principles served as a benchmark to assess how progress was made and to suggest measures.
 - ◇ Information on the state of waste management and its challenges provided by the Japanese Ministry of the Environment, the National Institute for Environmental Studies and the Swedish Environmental Protection Agency were used as reference.
 - ◇ In addition, information from the website of "Stockholm Exergi", a cutting edge company in sustainability running a biomass heat and power supply plant, and from the websites of environmental NGOs in both countries were used as reference.

Analysis Results

The Kanadevia Group changed its name from 'Hitachi Zosen' to 'Kanadevia' last year. With a renewed sense of purpose as a global actor they are determined to make a significant contribution to the realisation of a sustainable society. As befits this new step, they have registered as Early Adopters of the international Task Force on Nature-related Financial Disclosures (TNFD) and are disclosing environmental and social risks and information on financial impact for their core business Waste to Energy (WtE), and biomass power generation businesses, from now until 2050. Sorting through the vast amount of information and making these judgements is not an easy task. The report is ambitious and serious in its disclosure. The report is highly commendable in that it communicates a well-defined strategy for backcasting from a sustainable future.

The volume of waste incinerated using Kanadevia Group's technology accounts for 26% of the total volume of waste incinerated worldwide. The Kanadevia group is already the world's largest plant engineering company for waste incineration and power generation facilities. In addition to refuse incineration power generation, they have technologies for biomass power generation and biogas production facilities. Therefore, they have the potential to contribute to combatting climate change and achieve the objective 'nature positive'¹ by using these technologies to promote the circulation of resources.

The contribution of Kanadevia Group's technology to combatting climate change lies not only in the use of refuse as an alternative to fossil fuel for power generation, but also in preventing the serious global warming effects of methane emissions from landfill food waste. In Sweden, greenhouse gas emissions from landfills have been reduced by 88% between 1990 and 2023. This is because landfills are rarely used as combustible waste containing no hazardous substances is incinerated. The introduction of waste incineration power generation facilities in developing countries with open dumping site is expected to have a significant result on climate challenge in the future.

Biomass power generation business has the potential not only to support decarbonization but also to contribute to the revitalization of Japan declining forestry industry. By Utilizing waste wood sourced from sustainable forestry that respects biodiversity, these projects can help restore natural capital and promote "nature positive" future.

The Kanadevia Group should moreover be commended for having created the 'Sustainable Vision' which they aim to achieve in 2050, based on the four principles of sustainability. For example, the Company has taken on the challenge of developing new technologies to produce recyclable products, green electricity and biomethane as well as green ammonia and green hydrogen, chemicals, recycled metals and other valuable products from waste. In addition, the company is a forerunner in a medium-term strategy of proposing capturing CO₂ and biogas facilities for waste incineration and power generation facilities.

In recent years, average temperatures have risen globally every year and climate change related disasters have become more frequent. Ground breaking climate action is needed in every country to meet the Paris Agreement's 1.5 degree target.

A positive example of climate action is taken by Stockholm Exergi, which supplies district heating for the city of Stockholm, will start a full-scale BECCS (Bioenergy Carbon Capture and Storage) in 2028. They will be the first in the world to capture carbon dioxide from the atmosphere and store it in the

¹ "By 2030, using 2020 as a baseline, we will have halted and reversed the natural losses. Achieve full recovery by 2050." The social global goal.

earth's crust. BECCS is a technology that permanently removes biogenic CO₂ from the atmosphere. Stockholm Exergi is Europe's largest biomass-based combined heat and power plant which combines heat recovery to capture and permanently store large amounts of biogenic CO₂. This removes carbon from the atmosphere and achieves what is known as negative emissions. It is 'climate positive'². The scale of this business is so large that it could absorb and store in the earth's crust the annual emissions of carbon dioxide from all vehicles in Stockholm. What makes this business groundbreaking is that it has not been achieved by one company, but through a collaboration between the EU, the Swedish Government and environmentally conscious customers.

Major changes in waste management such as this requires national and local policies to go in the same direction. Both the EU and Sweden share a vision of leading the world in climate change, and carbon pricing and carbon dioxide emissions trading have become systemic as guiding policies. For carbon dioxide capture and storage to become considered as business opportunities, such an adaptive system of infrastructure will be necessary.

I believe that challenges for the Kanadevia Group include that waste collection is a municipal matter and Kanadevia is not yet involved in it. Also, it is important to acknowledge that direct involvement in natural capital is largely and variously biased towards decision-making on the part of customers. We hope that the Kanadevia Group will take on the challenge of collaborating with customers in the great future challenge of building a sustainable society.

Proposed strategies for 2030

- 1) There are approximately 1,000 waste incineration facilities in Japan, but only 39.8% of these have power generation facilities. Power generation efficiency is less than 30% and more than 70% of the heat is not utilised, so heat utilisation systems should be in place in the region to increase utilisation.
- 2) As subsidiary Kanadevia Inova has the technology for biogas production, and biogas use is widespread in Europe. I recommend that Kanadevia work with local authorities on methods and infrastructure building that can be deployed in Japan and other countries.
- 3) The introduction of inducements to reduce the amount of plastic in waste, for example by charging a fee for the plastic content.

² A state in which the amount of carbon dioxide absorbed is higher than the amount of carbon dioxide emitted. Also referred to as carbon negative, Climate positive is more popular with companies and municipalities at the cutting edge of climate change action in Europe.

Stockholm Exergi also declares Climate Positive on its website Swedish

<https://www.stockholmexergi.se/nyheter/stockholm-exergis-verksamhet-ska-vara-klimatpositiv-redan-2025/>

- 4) A system to recycle the waste collected for incineration by further separating the materials into food waste, plastics and metals should be studied in collaboration with municipalities and recycling companies.
- 5) In the Transition Risks section, policy risks mentioned include lower electricity generation due to a decrease in the amount of waste incinerated as a result of stricter recycling and other systems, the setting of recycling standards for incineration residues and the increased cost burden in the event of non-compliance with laws and regulations. However, as it is also desirable to reduce waste when backcasting from a sustainable society, this should not be seen as a risk, but rather as a possibility. For example, supporting environmental measures in other countries by importing waste from those countries where waste measures are still lagging behind. Alternatively, if carbon dioxide taxes and emissions trading are introduced, CCUS, which captures and utilises or stores carbon dioxide, could become a new business. Policy advocacy activities should also be considered.

Conclusion



Source: sopor.nu, Sveriges avfallsportal.

The illustration above shows a staircase diagram of the priorities of the Swedish government and administration for waste management. The Japanese Ministry of the Environment also defines the same priorities (1 minimize , 2 re-use, 3 recycling, 4 heat recovery, 5 proper disposal) for the cyclic use of resources and waste management.

According to data from Avfall Sverige (the national waste administration) for Sweden in 2023, 24% of materials were recycled, 3% of building materials, 15% of biogas/compost, 56% of energy (heat and electricity) and 2% of landfill. According to OECD data, Japan incinerates the largest waste volumes in the world. On 30 March 2021, data released by the Japanese Ministry of the Environment showed that incineration was the most common method of waste management, with 79.4%, recycling stood at 19.6% and landfill 1%. A notable difference between the two countries is that in Sweden 15% of waste management consists of biogas/composting. There is also potential for this in Japan.

In a separate report, the Japanese Ministry of the Environment states that the role of energy supply through heat recovery and fuel conversion of circulating and biomass resources will come to play an even greater role in the future. Furthermore, the report states that at present, the efficiency of power generation and the ratio of heating is low and needs to be further increased. With regard to biomass resources, the report states that it is necessary to promote technological development and a stable supply, and to establish an integrated system from raw material production to collection, transport, production and utilisation. The ministry report states that the early development of high-efficiency waste power generation facilities by local authorities and the development of facilities for high-efficiency waste power generation by the private sector should be promoted. Also, the sophistication of heat recovery from waste power generation should be improved. Furthermore, the effective use of medium and low temperature heat generated from incineration facilities and industrial processes, for example the use in district cooling and heating, should be promoted. The report summarises that the production of biofuels will be expanded and that biogasification, which involves highly efficient methane recovery from food waste is to be promoted. In summary, I believe that the time is ripe now for a major change in this field.

The society today is in upheaval due to climate change, drastic reduction in biodiversity, wars and global economic instability. It is time to take up the challenge of backcasting from what future should lie ahead of us, and aim to become 'climate positive' and 'nature positive' by 2030.