Thorough Energy Conservation Reform for Realization of Carbon Neutrality in Cosmetics Manufacturing Factory

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Tomoya Ohnuki
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Shiseido Company, Limited
Self introduction

**Name**
Tomoya Onuki

**Department**
Facility Management Group, Manufacturing Department, Kakegawa Factory, Shiseido Company, Limited

**Career**
Chubu Electric Power Co., Inc. from Apr. 2012 to Jul. 2018
(Engaged in construction, maintenance/conservation and operation of extra-high-voltage transmission lines and transmission towers)
Shiseido Company, Limited, Aug. 2018 up to present
(Engaged in introduction and maintenance of the facilities, motive power and manufacturing equipment, and energy management of Kakegawa Factory)

**Future dream**
To optimize energies consumed in commerce and municipalities as well as in the manufacturing industry to reduce the global environmental load without overdoing and putting up with it, thereby realizing a world where many people feel happy.
## Shiseido Corporate Overview

<table>
<thead>
<tr>
<th>ESTABLISHED</th>
<th>COUNTRIES AND REGIONS SERVED</th>
<th>EMPLOYEES*1</th>
<th>NATIONALITIES EMPLOYED*2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1872</td>
<td>Approx. 120</td>
<td>39,000</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NET SALES</th>
<th>CORE OPM</th>
<th>POSITION AMONG JAPAN AND ASIA COSMETICS MANUFACTURERS*3</th>
<th>PRODUCTION SITES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,067.4 BILLION YEN</td>
<td>4.8%</td>
<td>NO.1</td>
<td>12</td>
</tr>
</tbody>
</table>

*1  The number of employees includes full-time employees and temporary employees. Temporary employees include part-time workers. Dispatched employees are excluded. As of the end of December 2022.

*2  As of the end of December 2021.

*3  WWD Beauty Inc Top 100 Global Beauty Manufacturers 2021

BEAUTY INNOVATIONS FOR A BETTER WORLD
## Material Issues and Strategic Action

Shiseido has established six strategic actions based on different material issues, three each in the areas of **environment** and **society**.

<table>
<thead>
<tr>
<th>Material Issues</th>
<th>Strategic Action</th>
<th>Corresponding SDGs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Climate change</td>
<td>1. Reducing our environmental footprint</td>
<td>6, 11, 12, 13, 14</td>
</tr>
<tr>
<td>• Development of eco-friendly formulas</td>
<td>2. Developing sustainable products</td>
<td>3, 9, 12, 13, 14</td>
</tr>
<tr>
<td>• Sustainable packaging</td>
<td>3. Promoting sustainable and responsible procurement</td>
<td>8, 9, 12, 13, 14</td>
</tr>
<tr>
<td>• Deforestation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Responsible procurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Waste reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Water usage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Diversity and inclusion</td>
<td>4. Advancing Gender Equality</td>
<td>5, 10, 12, 15</td>
</tr>
<tr>
<td>• Quality of life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Professional development</td>
<td>5. Empowering people through the power of beauty</td>
<td>3, 5, 10, 12, 15</td>
</tr>
<tr>
<td>• Occupational health and safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Respect for human rights</td>
<td>6. Promoting respect for human rights</td>
<td>8, 10, 12, 15</td>
</tr>
</tbody>
</table>

What are the environmental goals of Shiseido?

- **Waste:** Zero waste to landfill (For owned factories) by 2022
- **CO₂:** Carbon neutral (At all sites. Scope 1 and 2) by 2026
- **Water:** Reduce our water consumption by 40% (For all sites, intensity per sales, compared with 2014) by 2026
- **CO₂:** Reduce by 46.2% (SBTi, at all our sites, scope 1 and 2, compared with 2019) by 2030
- **Reduce by 55%** (SBTi, Scope 3, Economic Intensity Target, compared with 2019) by 2030
## Background of the Project

### [Background]
- **Shiseido ESG management.** Published realization of carbon neutrality by 2026
- **Increased energy consumption** along with a higher production volume **after 2018**

### [Issues]
- Unable to evaluate/determine quantitatively when advancing energy conservation activities
- Awareness that **only one good energy conservation measure** is renewal of facilities
- Inclined to the activities of fixed members because of **lack of interest in them**

### [Measures]
- Installed **electricity meters at 430 positions** (*Capable of measuring water, steam and air as of Nov. 1, 2022*)
- Mechanism to **allow anyone to freely acquire/analyze data anytime**
- **A facilitator himself/herself reports** energy conservation improvement items **directly to management**
- Fulfilled an improvement activity system (incentive system) for energy conservation improvement

### [Results]
- **Built a field-based all-hands energy conservation system**
- Implementation of additional energy conservation measures utilizing data
- Realized **9.5% reduction (735 kL/year) than before** in crude oil equivalent
## Shiseido Kakegawa Factory Overview

### Shiseido Company, Limited (Established on Sep. 17, 1872)

<table>
<thead>
<tr>
<th>[Scope of business]</th>
<th>Manufacture and marketing of cosmetics, makeup tools, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Domestic factories]</td>
<td>Kakegawa, Nasu, Osaka, Osaka Ibaraki, Fukuoka Kurume</td>
</tr>
</tbody>
</table>

### Kakegawa Factory (Kakegawa, Shizuoka) (As of end of Jan. 2023)

<table>
<thead>
<tr>
<th>[Operation started in]</th>
<th>1975</th>
</tr>
</thead>
<tbody>
<tr>
<td>[No. of employees]</td>
<td>901 (Contract employees and temporary workers included)</td>
</tr>
<tr>
<td>[Designated category]</td>
<td>Type 1 designated energy management factory (Crude oil equivalent of 7,691.24 kL, 2020)</td>
</tr>
</tbody>
</table>

General factory to manufacture makeup and skin care products
What kind of organizational structure was designed in order to promote field-based energy conservation?

- **Project general manager**
  - Factory manager

- **Project manager**
  - Manufacture manager

- **Project leader**
  - Tomoya Ohnuki, Facility Management Group

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>Data analysis, information provision</td>
</tr>
<tr>
<td>As required</td>
<td>Consideration of operational improvement</td>
</tr>
<tr>
<td>As required</td>
<td>Improvement examples, support for report preparation</td>
</tr>
<tr>
<td>As required</td>
<td>Budgeting and introduction of capital investment</td>
</tr>
<tr>
<td>As required</td>
<td>Support for energy conservation secretariats at other bases</td>
</tr>
<tr>
<td>Monthly</td>
<td>Report to management, in-house development</td>
</tr>
</tbody>
</table>

Manufacture A
- ✔ Usage survey
- ✔ Usage survey
- ✔ Verification of draft measures
- ✔ Consideration of operation change

Manufacture G
- ✔ Usage survey
- ✔ Verification of draft measures
- ✔ Consideration of operation change
- ✔ Formulation of guidelines
- ✔ Adjustment of GMP standards
- ✔ Quality confirmation

Understand the quality risks and build the all-hands energy conservation structure.
Past Activity Results
How do you use data to reduce energy?

**Example of dust collector**

**Before improvement**

Weekly electricity consumption

1,777 kWh

**After improvement**

Weekly electricity consumption

834 kWh

**CO₂ emissions**

23.9 t less a year

**Crude oil equivalent**

12.5 kL less a year

**Tangible activities visualized by data**
How do you make effective capital investments for energy conservation?

Example of renewing an aeration blower for wastewater treatment plant

<table>
<thead>
<tr>
<th>[Before introduction]</th>
<th>[After introduction]</th>
</tr>
</thead>
<tbody>
<tr>
<td>7,753 [kWh/day]</td>
<td>6,698 [kWh/day]</td>
</tr>
</tbody>
</table>

**CO₂ emissions** 187.9 t less a year

**Crude oil equivalent** 98.6 kL less a year

Available as reference information when introducing similar equipment by organizing an energy increase/decrease before and after introduction of equipment.
Why did we place the solar power panels in a prominent location?

The corporate level of commitment to reduction of environmental load is conveyed, fostering awareness of energy conservation.
How to sustain energy-saving activities in factory?

To report the improvement results, it is necessary to list much information.

Troublesome because of much time and effort required  □  Not continued

Support preparation of reports

[Results of improvement activities]

<table>
<thead>
<tr>
<th>No. of improvement cases</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
<td>30</td>
<td>24</td>
</tr>
</tbody>
</table>

CO₂ emissions (t/year)

- 2020: 350 less
- 2021: 400 less
- 2022: 190 less

Crude oil equivalent (kL/year)

- 2020: 184 less
- 2021: 210 less
- 2022: 100 less

Various energy conservation activities are developed by a hands-on approach through accompanying support from consideration to implementation and reporting.
How did 2021 change in comparison with 2019?

Various conventions are reviewed by involving many persons, leading to large energy reduction.

Breakdown of reduction effects:
- Operational change: ▲138kL
- Solar power generation: ▲189kL
- Non-operation: ▲105kL
- Capital investment: ▲303kL

Improved 78% by utilizing data

Crude oil equivalent (kL) from 2017 to 2021:
- 2017: 6,524 kL
- 2018: 7,604 kL
- 2019: 7,733 kL
- 2020: 7,630 kL
- 2021: 6,998 kL

Crude oil equivalent (kL) course of events from 2017 to 2021:
- 2017: 6,524 kL
- 2018: 7,604 kL
- 2019: 7,733 kL
- 2020: 8,012 kL
- 2021: 8,412 kL
New approaches for reduction of our environmental footprint and people’s abundance
Establishing the energy-saving production method

I want to reduce energy per product, but where should I start?

Visualize energy for each process

Review operating conditions

Consider alternative manufacturing method

Review efficiency of the production line and the product manufacturing method for each process to establish the energy-saving production method.
Reviewing the production plan with the power consumption prediction system

Standardize a production plan based on the weather conditions to **reduce energy consumption**.
Reducing the air conditioning load

Breakdown of total power consumption of factory

- **Air conditioning** 46%
  - General power 12%
  - Electric lights 14%
  - Production power 29%

Air conditioning load accounts for approx. 50%.

Ready-made work uniform is **stifling** because of poor **breathability**.

Lower the air conditioning setting **temperature** to cope with the situation.

Higher steam (city gas boiler) **consumption** for humidity control

Develop a more **breathable work uniform** to increase the air conditioning setting **temperature** by 3°C.
## How did visualization and attraction change the activities?

<table>
<thead>
<tr>
<th>Major principle 1</th>
<th>Major principle 2</th>
<th>Major principle 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not criticize or</td>
<td>Satisfy other's self-esteem</td>
<td>Put yourself in other’s shoes to consider</td>
</tr>
<tr>
<td>blame</td>
<td></td>
<td>his/her profit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Conventional</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issue</td>
<td>Reduction of annually increasing energy consumption by any means</td>
<td>Factory operation with necessary and sufficient energy</td>
</tr>
<tr>
<td>Interest</td>
<td>Interested, but no idea where to start</td>
<td>Want to know and understand current energy consumption accurately</td>
</tr>
<tr>
<td>Pursuit of cause</td>
<td>Energy consumption and energy conservation effects had been left to individual’s feelings</td>
<td>Analyze measurement data by EMS to visualize energy consumption</td>
</tr>
<tr>
<td>Investigation</td>
<td></td>
<td>Confirm variations and changes by hour, day of week, week and month</td>
</tr>
<tr>
<td>Consideration</td>
<td>Unable to prepare specific requests or draft measures because of no visible values, failing to collaborate with relevant departments</td>
<td>Extract questionable points to consider necessity of current operation</td>
</tr>
<tr>
<td>Information sharing</td>
<td></td>
<td>Hear opinions from relevant departments based on data in order to consider multidirectionally</td>
</tr>
<tr>
<td>Mutual aid cooperation</td>
<td></td>
<td>Consider propriety of operation plan, while taking quality risks into account</td>
</tr>
<tr>
<td>Effect verification</td>
<td>Unable to know changes before and after improvement because of no visible values</td>
<td>Compare energy consumption before and after improvement to verify effects</td>
</tr>
<tr>
<td>Continuation</td>
<td>Left up in air over time because effects cannot be numerically expressed</td>
<td>Understand status quo and establish awareness of improvement for further energy conservation</td>
</tr>
</tbody>
</table>

**Current**

- Factory operation with necessary and sufficient energy
- Want to know and understand current energy consumption accurately
- Analyze measurement data by EMS to visualize energy consumption
- Confirm variations and changes by hour, day of week, week and month
- Extract questionable points to consider necessity of current operation
- Hear opinions from relevant departments based on data in order to consider multidirectionally
- Consider propriety of operation plan, while taking quality risks into account
- Compare energy consumption before and after improvement to verify effects
- Understand status quo and establish awareness of improvement for further energy conservation

**Major principle 1**: Do not criticize or blame

**Major principle 2**: Satisfy other’s self-esteem

**Major principle 3**: Put yourself in other’s shoes to consider his/her profit
How to advance energy conservation activities, their viewpoints, and actions of the secretariat. Capable of widely applying and developing in various fields, regardless of private sector, administrative sector and business category.
Under the Mission of BEAUTY INNOVATIONS FOR A BETTER WORLD, we will make efforts to solve various social issues such as responding to climate change and emphasize realization of a sustainable society.