

Summary

Sustainability for the future 2050:

RIKEN's action plan to create a future together with
the environment

RIKEN

From the Basic policy regarding environmental measures as part of the 5th Mid- to Long-Term Plan

Sustainability for the Future 2050: To a sustainable future

1. A sustainable planet for the next generation through RIKEN and innovation
 - Aim for both knowledge creation necessary for humanity's future as well as solving societal challenges
 - Aim for high-level research to achieve a Net Zero(*) society
 - (*) Net-zero refers to the balance between GHG emissions and the amount of its absorption and fixed amounts
2. Sustainable operation of RIKEN
 - Aim to be carbon neutral by 2050
 - Use office facilities and research equipment to the fullest, minimize the carbon footprint of research activities
3. Bring the strengths of science to the world
 - Disseminate RIKEN's outstanding research outcomes and others for solving societal challenges to protect the global commons

Message from the president of RIKEN

The greatest focus

The change from *things* to *people*

- “People” are the subject of greenhouse gas measures
- Consequently, the sharing of “things” mitigates both greenhouse gas emissions for both production and use, making it an important strategy for generating synergy.

Subjects of change	What is requested
 People’s awareness	Modify behavior for mitigation and adaptation
 Use of things	Optimize by integrating functionality and use (shared use)
 Supply chains	Analyze procurement, use, and disposal trends and reduce GHGs

Roadmap to reducing GHGs

- Use FY 2013 as a base year and create a plan to gradually reduce emissions based on the national government’s action plan.

■ **GHG reduction targets
(compared to FY 2013)**

- **Supplementary:**
Must bring FY30 emissions to **135,663 tons**, down from 271,327 tons in FY13.

Fiscal year	Reduction targets (total emissions)	Percentage of renewable energy in purchased electricity
2030	50% reduction	60% or more
2035	65% reduction	—
2040	79% reduction	80% or more (decarbonized power sources)
2050	Carbon neutral	100% (transition to electricity and carbon neutral fuels)

Specific, tailored measures

- Advance steady reduction of our ecological footprint from the perspectives of facilities, vehicles, and equipment.

- **Targets for adoption/
operation of equipment**

- **Energy saving activities:**
Continue to reduce energy consumption by an average of at least 1% per year over a five-year period.
- **3R (Reduce, Reuse, Recycle)
+ Renewable**

Item	From FY 2026 (commencement)	FY 2030 targets	FY 2040 targets
Solar power	Increase installation	50% or more of buildings that can be constructed	Installation on buildings where permitted
Newly constructed buildings	Equivalent to ZEB Oriented or above	Avg. equivalent to ZEB Ready	—
RIKEN vehicles	Phased transition to electrified vehicles	100% electrified vehicles	(Maintain)
LED lighting	Phased roll out	100% LED	(Maintain)

New challenges for Scope 3

Ascertain other indirect emissions (supply chains, Scope 3) and commence reduction in addition to direct and indirect emissions (GHG Protocol Scope 1 and 2).

- ❖ GHG Protocol: Internationally recognized standards for calculating and reporting a company or organization's level of greenhouse gas (GHG) emissions

■ Calculating amount of Scope 3 emissions

Calculate with the basic formula below which utilizes the Ministry of Environment's database and others

$$\{\text{GHG emissions}\} = \{\text{activity data (amount purchased/distance, etc.)}\} \times \{\text{emission factor}\}$$

■ Example of categories to be prioritized

- **Category 1:** Purchase of research equipment, reagents, office equipment and others
- **Categories 6 and 7:** Employee business travel and commuting
- **Category 5:** Waste management for project activities

RIKEN's GHG emissions and emissions for reduction

Scope categories in the GHG Protocol delineating environmental initiatives

Scope 1 (direct emissions)

- Burning of fossil fuels
- Freon gas leak

Scope 2 (indirect emissions)

- Indirect emissions from energy sources

Scope 3 (other indirect emissions)

1. Purchased goods and services

2. Capital goods

3. Fuel- and energy-related activities (not included in scope 1 or scope 2)

4. Upstream transportation and distribution

5. Waste generated in operations

6. Business travel

7. Employee commuting

8. Upstream leased assets

9. Downstream transportation and distribution

10. Processing of sold products
 11. Use of sold products
 12. End-of-life treatment of sold products
 13. Downstream leased assets
 14. Franchises
 15. Investments
- Others

RIKEN will **consider new initiatives for reducing GHG emissions** in these categories

(However, this consideration is not required for items subject to the Green Purchasing Law.)
Specifically, we will **analyze GHG emissions throughout the entire supply chain** and consider selecting goods and services with low emissions.

- Fuel use for combustion facilities (boiler rooms, generators, etc.)
- Fuel use for vehicles (RIKEN vehicles, etc.)
- Use of utility gas
- Freon and other gas leaks (AC equipment, temperature control for research equipment, etc.)



Purchase and use by RIKEN

- Electricity
- Heat
- Steam ...others



Category 1

- Research equipment
- Reagents
- Supplies
- Outsourced services, etc.



Category 2

- New or increase in facilities, equipment



Category 4,9

- Research samples
- Transportation and delivery of materials, etc.



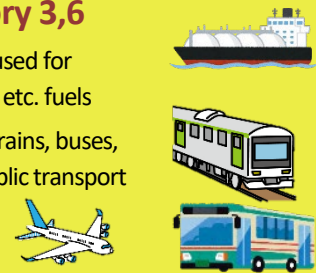
Category 5

- Research activities
- Waste management for admin activities (excluding valuable materials)



Category 3,6

- Energy used for shipping, etc. fuels
- Planes, trains, buses, other public transport uses



Category 7

- Employee methods of transportation
- Private car
 - Public transportation
 - Vehicle
 - Walking, etc.



* Examples of categories applicable to RIKEN

Contribute to society through research activities

Contribute to solving global challenges through RIKEN's own "power of science."

For example...

- **Next-gen energy:** Research biofuel production that uses solar energy
- **Carbon cycle:** Collect and reuse CO₂ as well as sustainable material synthesis
- **Advanced facilities:** Supercomputers; large-scale synchrotron radiation facilities and use of X-ray-free electron lasers; along with decrease of energy use due to improved performance

RIKEN Environmental Action Plan

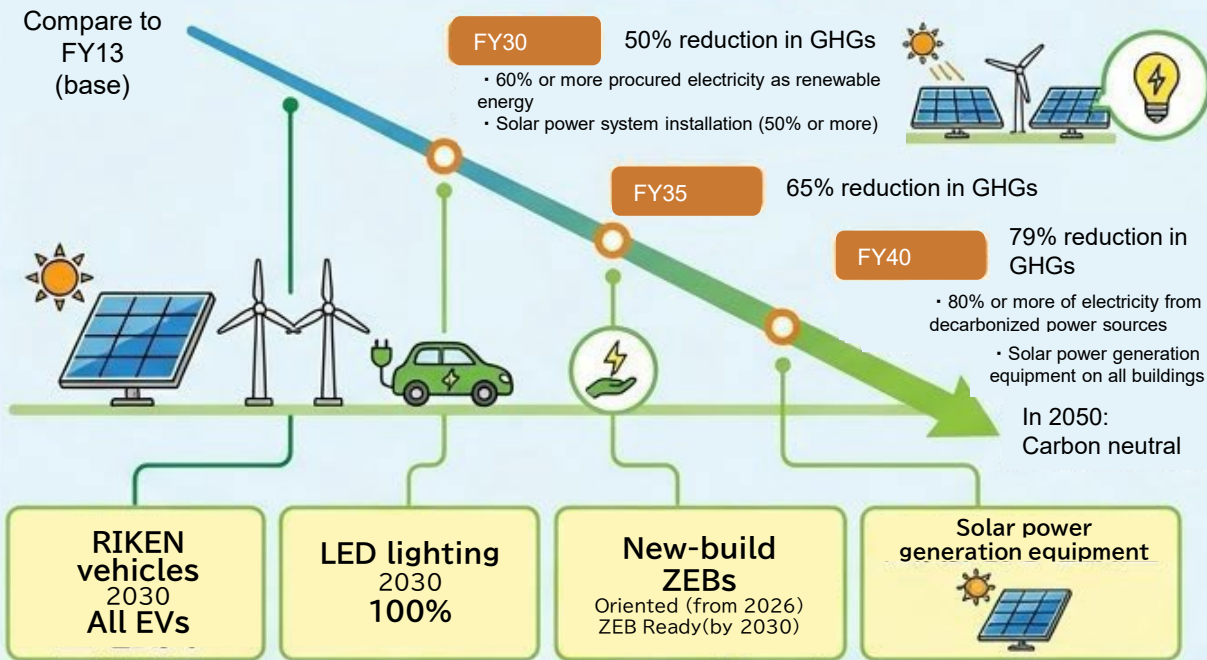
RIKEN's challenge for carbon neutrality by 2050



1. A message from the president of RIKEN

Achieve carbon neutrality by responding to climate change/resource constraints, strengthening resilience, bringing together fundamental science and by modifying behaviors from "things" to "people."

2. Targets and roadmap for GHG emissions reduction



3. Efforts in live with the national government's action plan

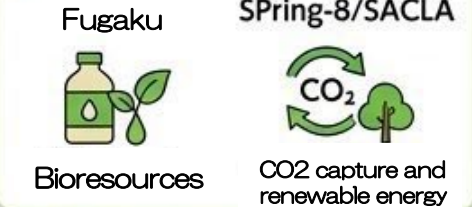
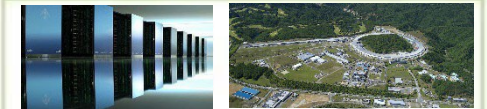
Develop and implement solid plans based on the national government's action plan.

4. New challenges for RIKEN

4.1 Transform employee awareness and actions



4.2 Contribute to addressing global warming through research activities



4.3 Cooperation with local communities

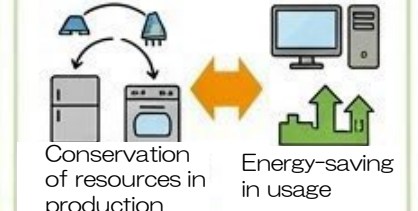


4.4 GHG reduction and Scope3

Scope 3 is wide-ranging



4.5 Common use of equipment (shared use)



5. Progress management and information disclosure



Regular inspections



Update targets



Clearly demonstrate progress with environmental reports and on RIKEN's website



Improve transparency

Sustainability for the future 2050: RIKEN's challenge to create a future together with the environment

Current
(base FY13)

FY30

FY40

Achieve carbon neutrality
(2050)

FY30: 50% reduction in GHGs
60% or more use of renewable energy

FY40: 79% reduction in GHGs
80% or more use of decarbonized power sources

2050: Virtually zero
(Transition to electricity and carbon neutral fuels)

Reduce our own emissions (Scope 1 and 2)



Energy saving (1% reduction per year, 100% LED adoption)

Energy generation/renewable energy (purchase solar and renewable energy)

Renovate facilities (ZEB-friendly, 100% electrified vehicles)

Shared-use equipment (share like-equipment)

Environmentally friendly activities

For the whole supply chain (Scope 3)



Low-carbon transition of purchasing/shipping

Revise commuting for business trips

Promote 3R+Renewable for waste reduction

Expand calculations and targets for reduction



Value chain collaboration

Social contributions through the power of science



Fugaku

SPring-8/
SACLA

Research (Non-fossil fuels, CO2 capture/reuse)

Platform creation (advanced facilities for demonstrations and analysis)

Social implementation and community cooperation

Contribute to future society

A thriving and sustainable future society

Challenges based on the RIKEN Spirit: Change in mindset; Disclose information; Engage with society