



# NTT **Green** Innovation toward 2040

~Reaching Carbon Neutrality in 2040~

IR DAY 2021

2021/9/30

Addressing  
Environmental Issues

Improving  
Economic Growth

Paraconsistent

## NTT **Green** Innovation toward 2040

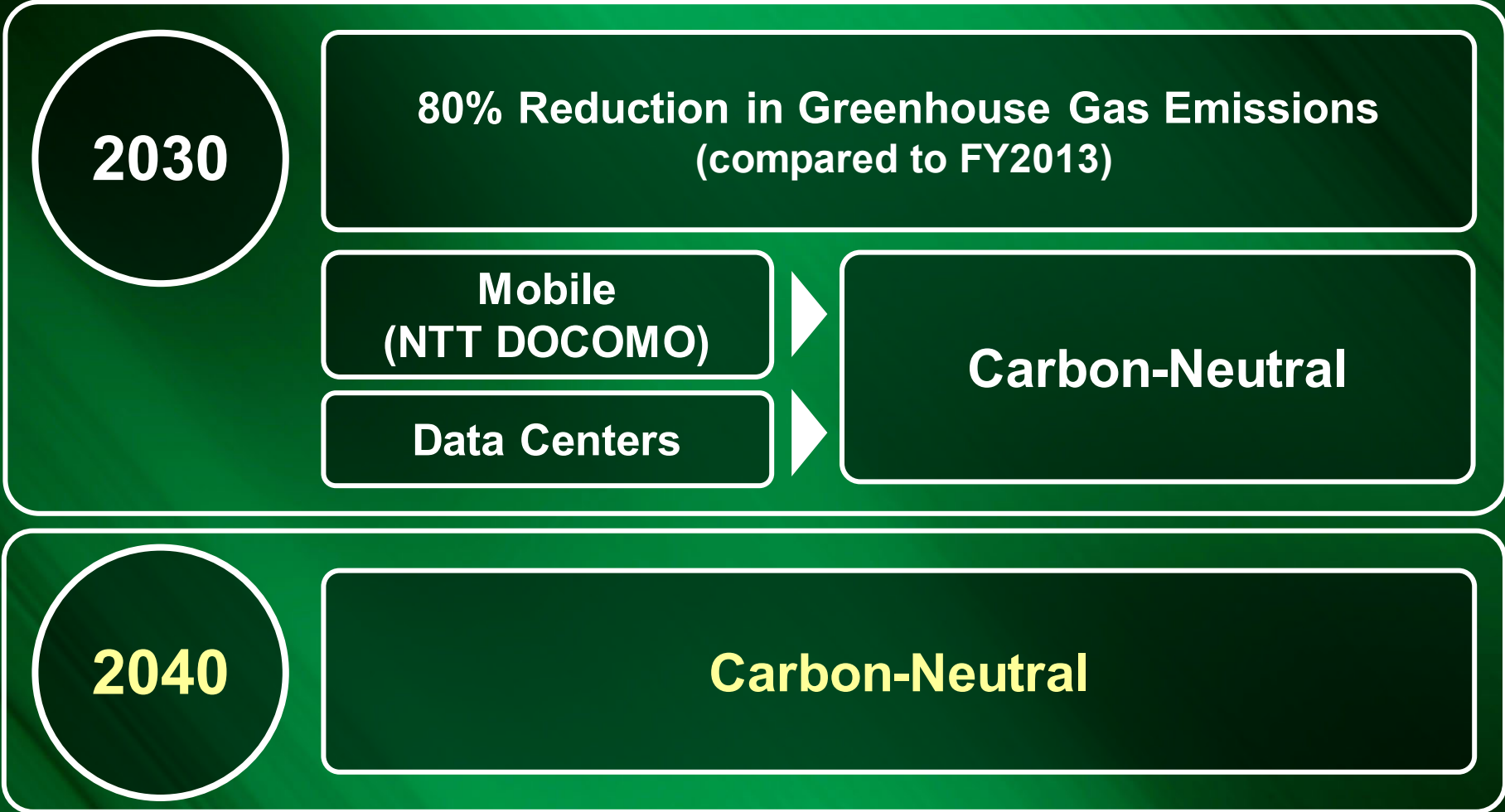
Achieving Zero Environmental Impact and  
Improving Economic Growth at the Same Time

Reduction of Environmental  
Impact through Business  
Activities



Creation of Breakthrough  
Innovation

### NTT is Innovating for a Sustainable Environment



- Targets of the Above Reduction Objectives  
GHG Protocol: Scope 1 (our own direct greenhouse gas emissions) and Scope 2 (indirect emissions associated with the purchase of electricity, heat and steam that are provided by other companies)  
Mobile: 15 companies in the NTT DOCOMO Group (as of September 28, 2021)
- NTT Group's Reduction Target (Scope 1+2): Upgraded to SBT's 1.5°C level

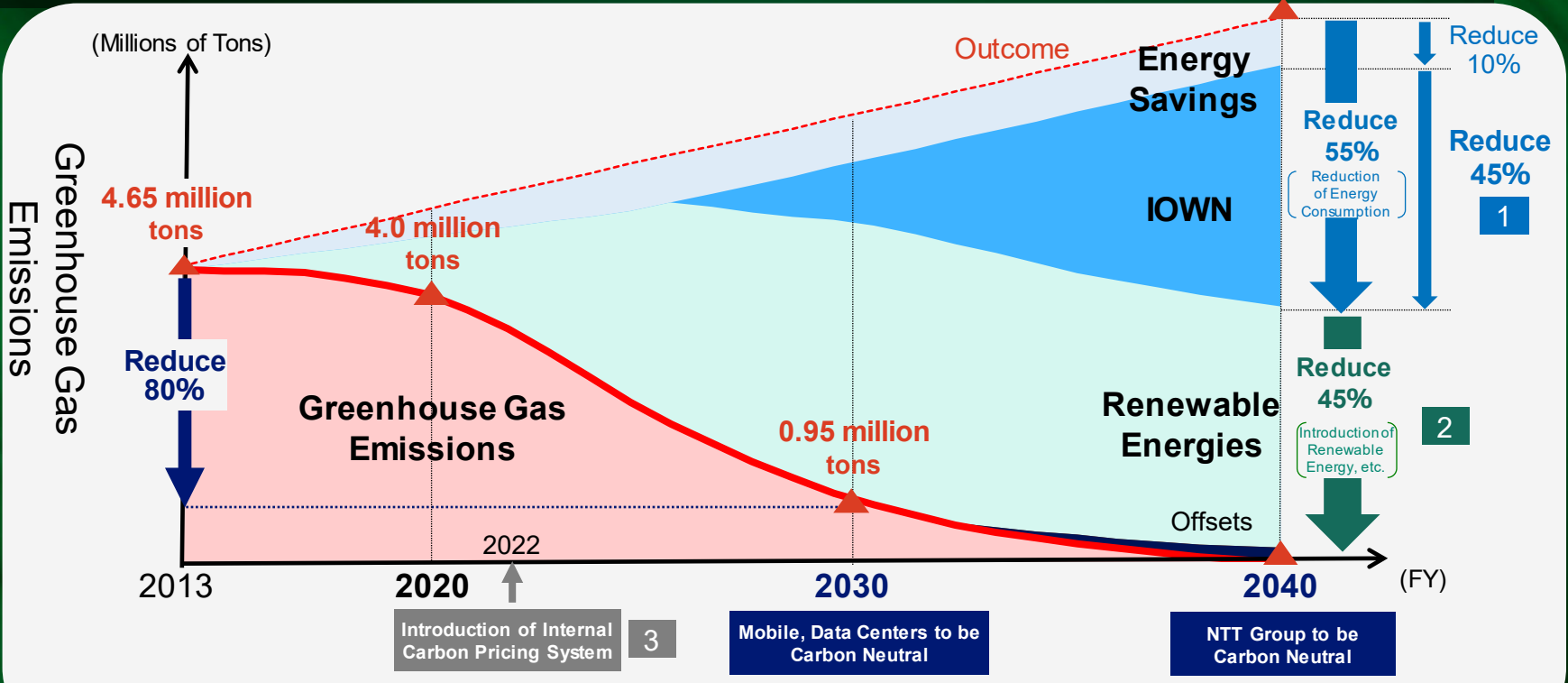
# Towards the Achievement of Carbon Neutrality



- Lower energy consumption with **IOWN technologies**: Reduce greenhouse gas emissions **by 45%**<sup>(1)</sup>
- **Increased use of renewable energy**: Reduce greenhouse gas emissions **by 45%**<sup>(2)</sup>
- **Introduce an internal carbon pricing system** (FY2022)

- 1
- 2
- 3

(Change to a procurement system based on carbon prices, etc.)



**Illustration of NTT Group Greenhouse Gas Emission<sup>(3)</sup> Reductions (Domestic + Overseas)**

(1) Estimated Reduction of Energy Consumption through the Introduction of IOWN (Comparison to Outcome)  
 Percentage of Introduction of IOWN (Photonics-electronics Convergence Technologies, etc.) out of Total Energy Volume  
 → FY2030: (2.0) billion kWh ((15%); FY2040: (7.0) billion kWh ((45%))  
 → FY2030: 15%; FY2040: 45%

(2) Estimated Introduction of Renewable Energy (including actual renewable energy through Non-Fossil Fuel Certificates)  
 → FY2020: 1.0 billion kWh; FY2030 to FY2040: around 7.0 billion kWh  
 The introduction of renewable energy will have the optimal types of energy determined on the basis of each country's energy composition, etc. Approximately half of the domestic renewable energy usage is anticipated to be from energy sources owned by NTT (FY2030).

(3) GHG Protocol: for Scope 1 and 2

# Transition of Energy Consumption

Energy Consumption Outcome: will be approximately doubled by FY2040

- **Approximately half of energy consumption will be reduced by introducing IOWN** 1
- **Renewable energies will be introduced for the other approximate half<sup>(1)</sup>** 2

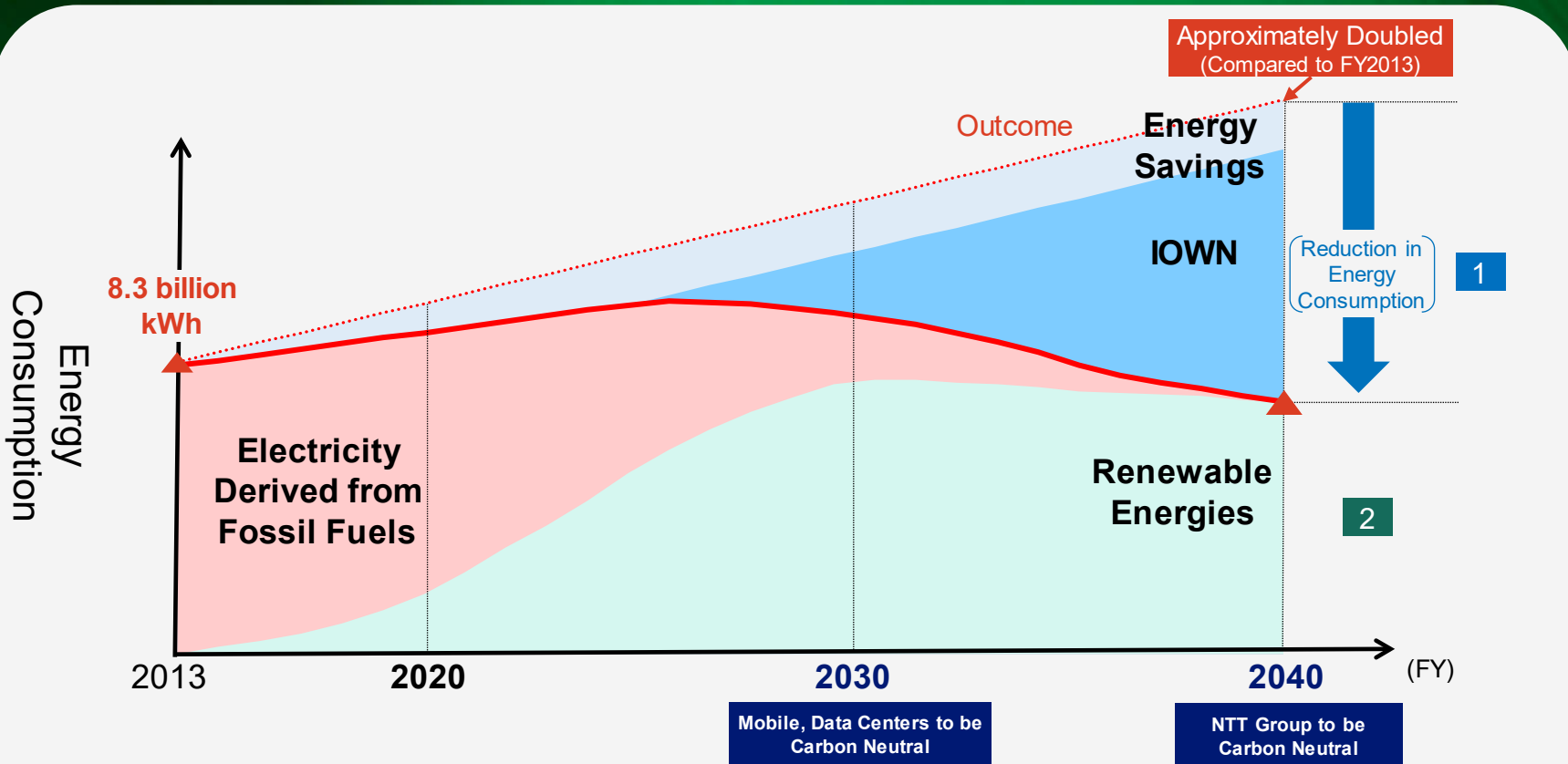


Illustration of Transition Trends in NTT Group's Energy Consumption<sup>(2)</sup> (Domestic + Overseas)

(1) Estimated Introduction of Renewable Energy (including actual renewable energy through Non-Fossil Fuel Certificates) → FY2020: 1.0 billion kWh; FY2030 to FY2040: around 7.0 billion kWh  
 The introduction of renewable energy will have the optimal types of energy determined on the basis of each country's energy composition, etc. Approximately half of the domestic renewable energy usage is anticipated to be from energy sources owned by NTT (FY2030).

(2) Energy consumption used in calculating greenhouse gas emissions on the previous page.

# NTT's Contributions to Reducing Society's Environmental Impact



## ■ Expanding adoption of IOWN technologies from the telecommunications field into other industries

- Contribute to the **reduction of greenhouse gases<sup>(1)</sup>** in Japan and the world
  - > Japan ⇒ Reductions: over 0.02 billion tons; Reduction Rate: over 4%
  - > World ⇒ Reductions: over 0.3 billion tons; Reduction Rate: over 2%
- Further **accelerate DX<sup>(2)</sup>** (e.g. digital twin computing)
- Promote greenhouse gas reduction across the entire supply chain

## ■ Providing new services that contribute to carbon neutrality

## ■ Strengthening development and expanding introduction of NTT Group's Renewable Energy Plan

- Promotion of local energy production for local consumption

(1) Conditions for Reduction Estimates

- Target: beginning in FY2040
- Adoption Rate of IOWN for Electric Semiconductors etc. (Photonics-electronics Convergence Technologies, etc.): approximately 50%
- CO<sub>2</sub> Emission Factor: Japan · · · 0.185kg-CO<sub>2</sub>/kWh; World · · · 0.130kg-CO<sub>2</sub>/kWh

(2) CO<sub>2</sub> Reduction Potential: approximately 50% (2030; Target: World, calculated based on GeSI and IEA estimates)

# (Reference) NTT's Main Initiatives



## Reduction of Environmental Impact through Business Activities

### ➤ Reducing Society's Environmental Impact



- ✓ Further acceleration of DX and promotion of Remote World
- ✓ Promotion of regional urban development and the introduction of new social infrastructure development
- ✓ Promotion of greenhouse gas reduction across the entire supply chain
- ✓ Provision of new services that contribute to carbon neutrality
- ✓ Contribute to local production and consumption of energy, through smart grids based on battery farms
- ✓ Expansion of green electricity retail

## Green by ICT

Contributions to Reducing Society's Environmental Impact

## Creation of Breakthrough Innovation

### ➤ Creation of Innovative Environmental Energy Technology



- ✓ Use of 4D digital platform for future predictions / optimal use of urban assets\*
- ✓ Optimal operation of fusion reactors (ITER/QST)
- ✓ Lightning charging
- ✓ Applied genome-editing technology for "Green" (Collaboration)

\* Energy, transportation, logistics, etc.

## Green of ICT

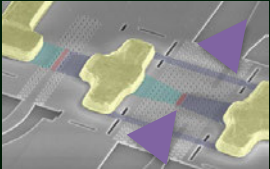
Reducing NTT's Own Environmental Impact

### ➤ Introduction of IOWN and Expansion of Renewable Energy



- ✓ Reduction of energy consumption through the introduction of IOWN
- ✓ Expansion of the development and usage of renewable energy
- ✓ Introduction of an internal carbon pricing system
- ✓ Issuance of green bonds

### ➤ Achievement of Ultra-Low Power Consumption



- ✓ Photonics-electronics Convergence Technologies (IOWN All Photonic Network)
- **Creation of Decentralized Technology**
- ✓ Photonic disaggregated computing
- ✓ Space integrated computing network

# (Reference) Shift Our Business into Decarbonized and Circular Style



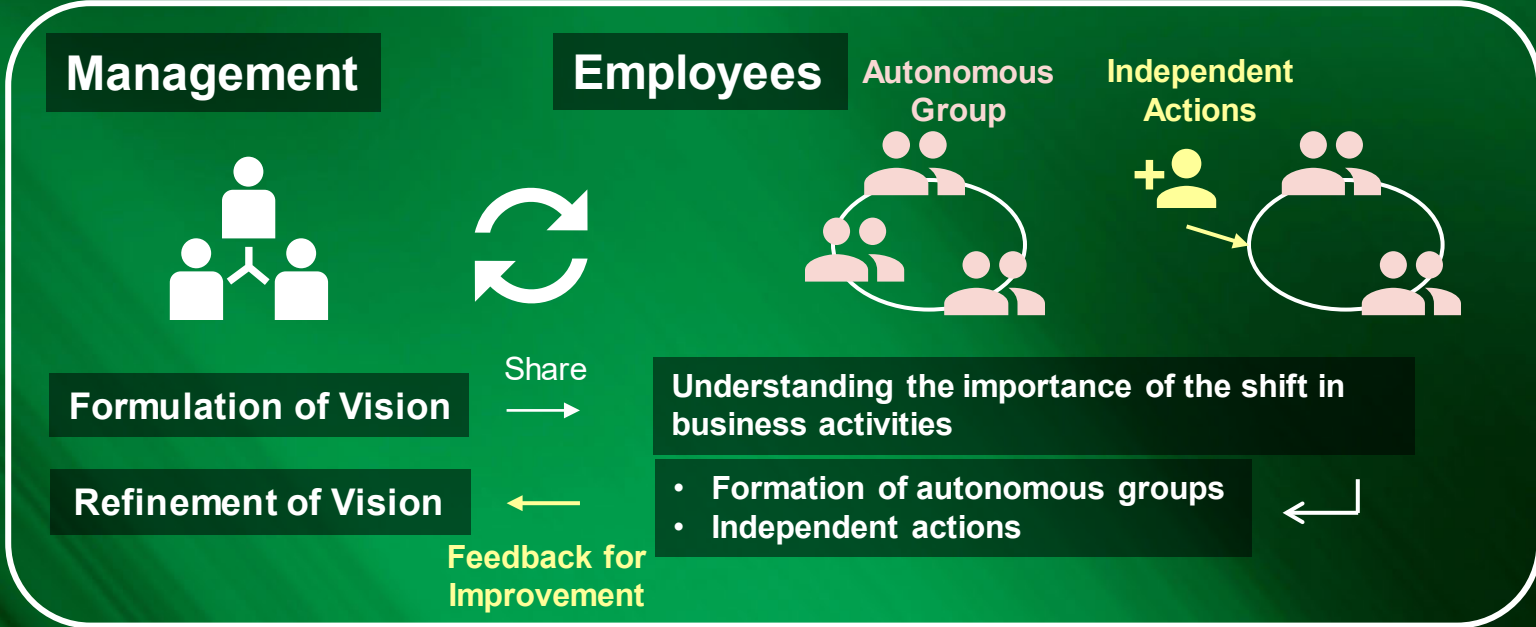
Resource/Energy Consumption-Based Business Style



Decarbonized Business Style

Circular Business Style

Comprehensive Initiatives





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- \* "E" in this material represents that the figure is a plan or projection for operation.
- \*\* "FY" in this material indicates the fiscal year ending March 31 of the succeeding year.
- \*\*\* "1Q" in this material represents the three-month period beginning on April 1 and ending on June 30, "2Q" represents the six-month period beginning on April 1 and ending on September 30, "3Q" represents the nine-month period beginning on April 1 and ending on December 31, and "4Q" represents the twelve-month period beginning on April 1 and ending on March 31.