



The Long-term Vision for Global Warming Countermeasures of Japanese Aluminium Industry to 2050



1. Nature of the Long-term Vision for Global Warming Countermeasures

- The Japan Aluminium Association, as the aluminum fabrication industry, has participated in the Keidanren (Japan Business Federation)'s Commitment to a Low Carbon Society, setting energy consumption rate targets for fiscal 2020 and fiscal 2030, and working to prevent global warming.
- Keidanren has also called for the formulation of a long-term vision for global warming countermeasures by its member companies and organizations, based on the Paris Agreement (October 2018). In response to this, our association has decided to formulate a Long-term Vision for Global Warming Countermeasures to indicate our direction after the current Commitment to a Low Carbon Society program up to fiscal 2030.
- This long-term vision indicates the direction of global warming countermeasures for the aluminum fabrication industry up to 2050. The figures for expected reductions are estimates based on assumptions rather than targets.

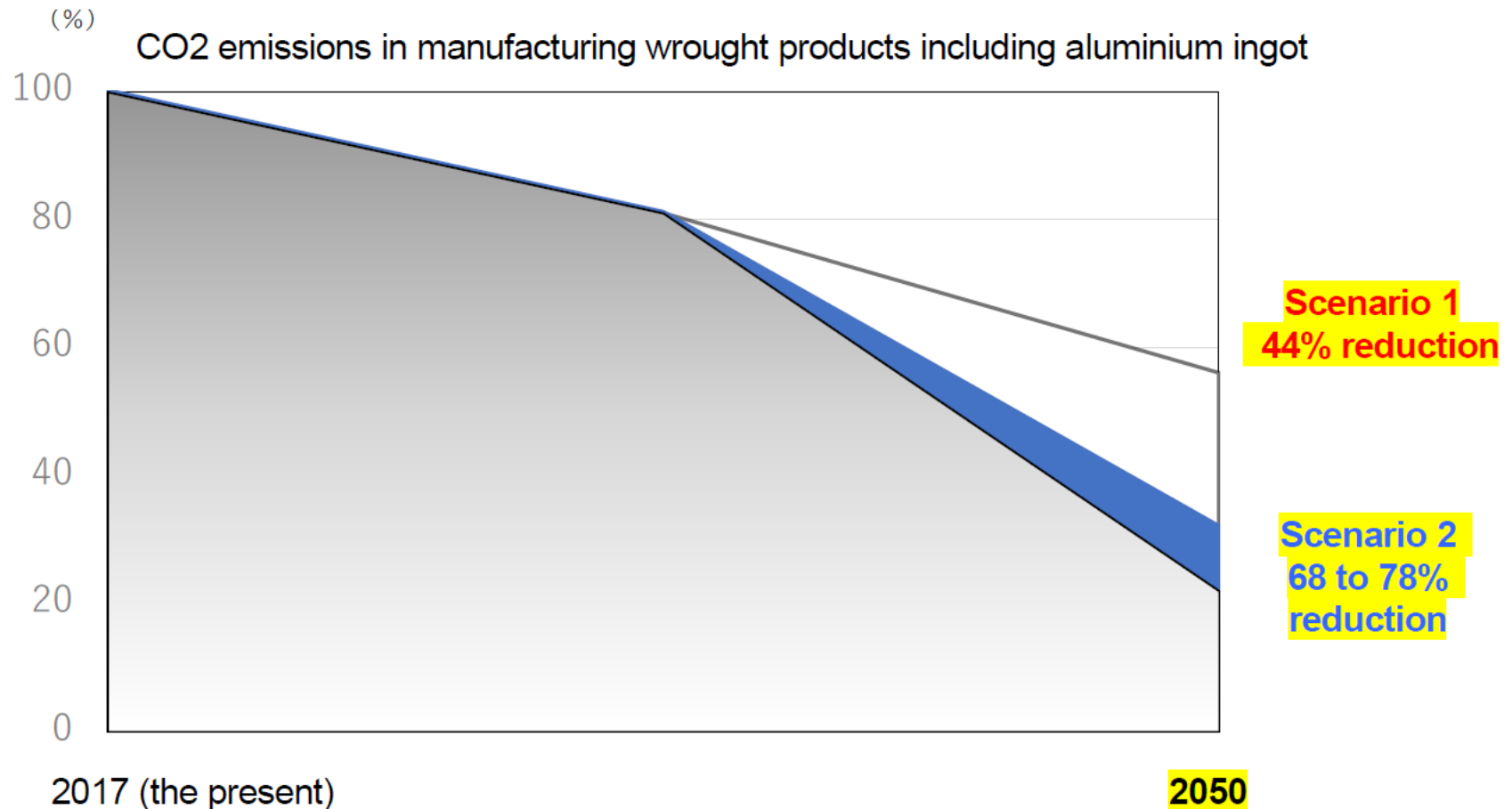
2. Expected CO2 emissions reduction effects to 2050

- CO2 emissions in manufacturing aluminium wrought products including aluminium ingot in 2050 will be reduced as follows in comparison to 2017.
 - (1) Scenario 1 (reduction efforts during manufacturing of aluminium wrought products): 44% reduction
 - (2) Scenario 2 (expected innovations in primary aluminium smelting in addition to the above Scenario 1): 68 to 78% reduction

Note: This is formulated with awareness of the government's long-term target of an 80% reduction by 2050.

(For reference) Graph of progress in CO2 emissions reduction

This graph shows progression of CO2 emissions in manufacturing aluminium wrought products including aluminium ingot by 2050 compared to 2017 (the present) as results of (1) and (2) above.



* CO2 emissions (%) taking 2017 as 100

3. Assumptions in the expected CO2 emissions reduction to 2050

(1) Scenario 1: Reduction efforts during manufacturing of aluminium wrought products

- The volume of CO2 emissions in the manufacturing of aluminium wrought products using primary aluminium as materials includes approximately 90% manufacturing of primary aluminium. Thoroughgoing reduction of CO2 emissions requires reduction of the volume of primary aluminium used (an increase in the volume of recycled ingot) in addition to efforts in the aluminium wrought product manufacturing process.

1. Efforts in aluminium wrought product manufacturing processes

Fuel: Introduction of waste heat recovery (regenerative burners, etc.)
100% Switching fuels (fuel oil to LNG) 100%, plus shifting 50% of such to non-fossil fuels (hydrogen, bio, electricity).

Electricity: Use 50% renewable energy

Note: The use of unstable renewable energy and non-fossil fuels in certain processes (e.g. melting and casting) is considered to be unsuitable in terms of safe operations, hence use of non-fossil fuel is set at 50%, and renewable energy at 50%.

2. Realizing a high level of aluminum recycling (increasing the amount of recycled ingot)

The proportion of recycled ingot used as raw material for aluminium wrought products is set at 50% (currently the figure is around 10%).

3. Assumptions in the expected CO2 emissions reduction to 2050

(2) Scenario 2: Consideration to global warming countermeasures in aluminum smelting(primary aluminium smelting) worldwide

- The International Aluminium Institute's estimates indicate the need to reduce CO2 emissions in global aluminum smelting by 80 to 90% by 2050, in order to achieve the Paris Agreement. The current formulation assumes a 50 to 70% reduction by 2050 in CO2 emission intensity of primary aluminium imported from abroad.

(3) Contributions in products

- Utilizing such properties as lighter products and higher thermal efficiency will contribute to CO2 reductions in a wide variety of areas, including automobiles and industry. This vision does not include calculations on the CO2 emissions reduction effects at the product stage.