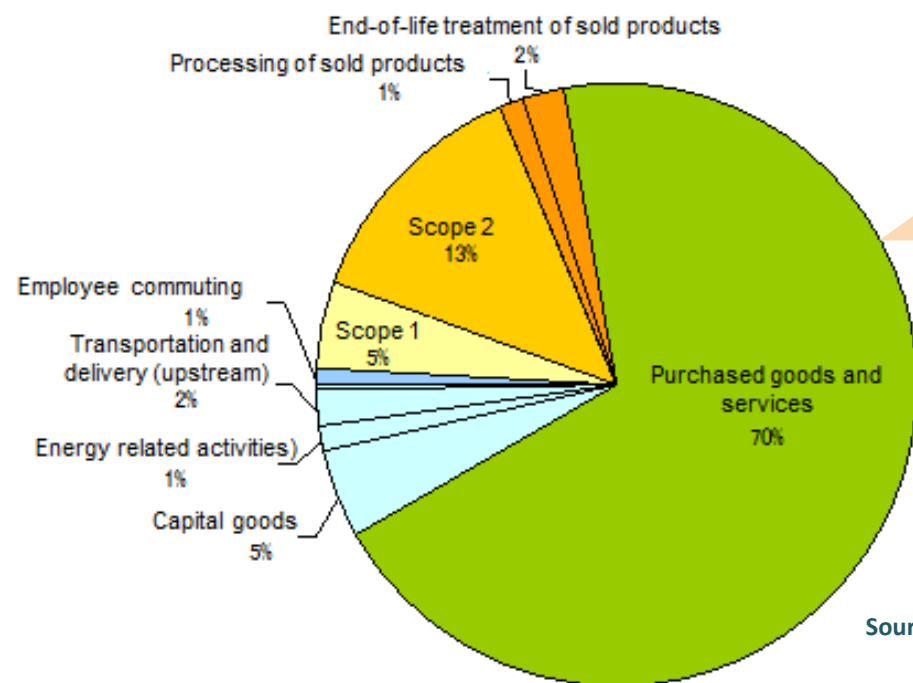# 1 YKK AP Inc.

	Company thinking
☐ **Background and purpose for accounting**	• Understanding CO_2 emissions from all corporate activities is important in reducing the load on the global environment. • The social demand for disclosing environmental load information is increasing yearly. Therefore, it is necessary to aggressively disclose environmental load information.
☐ **Utilization of accounting results**	• To reduce CO_2 emissions by prioritizing by category. • To gain the understanding and trust of customers by clarifying our involvement with environmental matters.
☐ **Advantages of accounting**	• The emissions from the entire supply chain can be clarified and effective countermeasures can be taken. • The transparency of our emissions will be improved, so that we will be able to respond to demands for information disclosure by our customers.
☐ **Internal accounting organization**	• Data is collected from the Procurement, Logistics and Accounting departments, and then calculated by the Environmental department. • The internal database is utilized to improve work efficiency.

☐ Results of calculating CO_2 emissions in the supply chain

End-of-life treatment of sold products 2%
Processing of sold products 1%
Scope 2 13%
Employee commuting 1%
Transportation and delivery (upstream) 2%
Scope 1 5%
Energy related activities) 1%
Capital goods 5%
Purchased goods and services 70%

☐ Mainly procured products (raw materials)

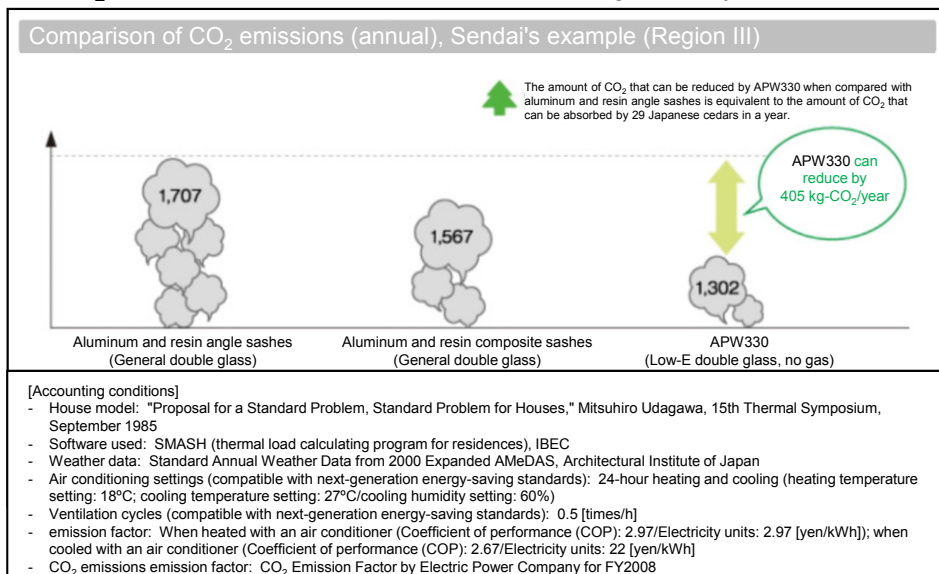Bare aluminum   Scrap aluminum   Wood raw materials   Plastics

[Glossary]
Aluminum ingots: The raw material for aluminum is a mineral called bauxite. Alumina (oxidized aluminum) is made from this bauxite, and this undergoes electrolysis to extract (refine) the aluminum. Ingots are made by casting aluminum in molds.
Scrap aluminum: Waste sashes, aluminum alloy wheels and the like are the raw material for scrap aluminum. Electricity consumption is lower than refining aluminum from bauxite, so that the load on the environment can be reduced.
Plastics: Vinyl chloride resins are the main type of plastic (resin) used in sashes.
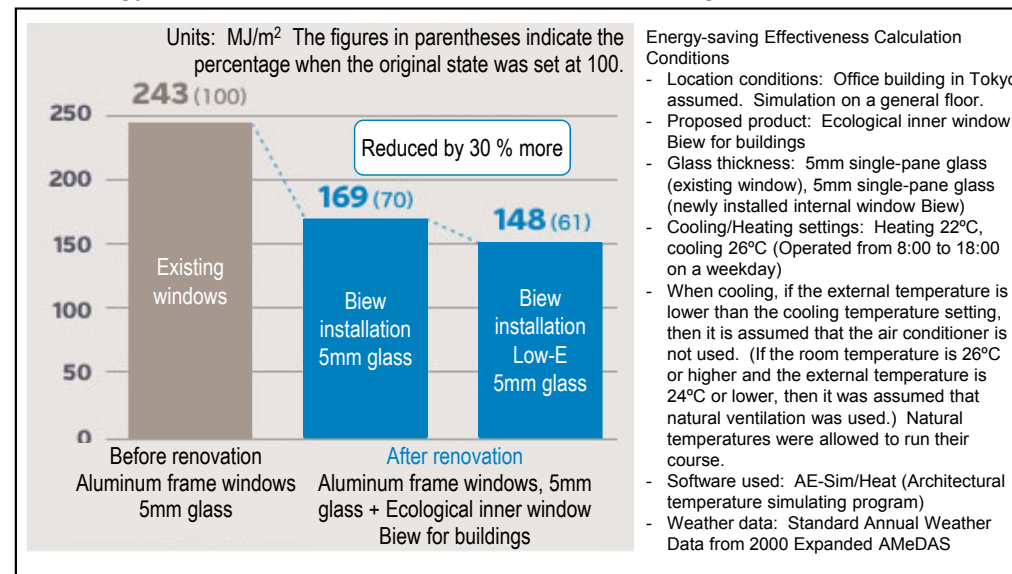
Source : http://www.ykkap.co.jp/company/japanese/environment/report2013/ecology/ecology04.asp

Company thinking	
☐ **To reduce supply chain emissions**	• Because raw materials account for about 50 percent of all CO_2 emissions in the overall supply chain, we are aggressively promoting a transition from raw materials with high CO_2 emissions to raw materials with lower CO_2 emissions. • With respect to logistics, we dispatching vehicles in a more efficient way, improving loading rates and attempting a modal shift. • We are starting "green" procurement and recycling of waste. • Although our products themselves do not produce CO_2, by having customers use our products we can contribute to reducing CO_2 emissions from and energy usage in single-family houses and buildings.
☐ **Tasks to account for supply chain emissions**	• When a monetary basis is used for emission factor, fluctuations in procurement value and not amount of material affect CO_2 emissions. • Domestically, improved accuracy for emission factor and activity data are necessary. • Activity data and emission factor must be implemented when developing this system abroad.
☐ **For those starting to account for supply chain emissions**	• First, secondary data should be used to comprehend the approximate CO_2 emissions, so that an overview can be gained. It is then more efficient to improve accuracy for categories with high volumes of CO_2 emissions. • CO_2 emissions become clearer by category, so that effective reduction countermeasures can be taken.

☐ CO_2 reduction contribution (windows for single-family houses)

Comparison of CO_2 emissions (annual), Sendai's example (Region III)

The amount of CO_2 that can be reduced by APW330 when compared with aluminum and resin angle sashes is equivalent to the amount of CO_2 that can be absorbed by 29 Japanese cedars in a year.

APW330 can reduce by 405 kg-CO_2/year

1,707 — Aluminum and resin angle sashes (General double glass)

1,567 — Aluminum and resin composite sashes (General double glass)

1,302 — APW330 (Low-E double glass, no gas)

[Accounting conditions]
- House model: "Proposal for a Standard Problem, Standard Problem for Houses," Mitsuhiro Udagawa, 15th Thermal Symposium, September 1985
- Software used: SMASH (thermal load calculating program for residences), IBEC
- Weather data: Standard Annual Weather Data from 2000 Expanded AMeDAS, Architectural Institute of Japan
- Air conditioning settings (compatible with next-generation energy-saving standards): 24-hour heating and cooling (heating temperature setting: 18ºC; cooling temperature setting: 27ºC/cooling humidity setting: 60%)
- Ventilation cycles (compatible with next-generation energy-saving standards): 0.5 [times/h]
- emission factor: When heated with an air conditioner (Coefficient of performance (COP): 2.97/Electricity units: 2.97 [yen/kWh]); when cooled with an air conditioner (Coefficient of performance (COP): 2.67/Electricity units: 22 [yen/kWh]
- CO_2 emissions emission factor: CO_2 Emission Factor by Electric Power Company for FY2008

☐ Energy reduction contribution (windows for buildings)

Units: MJ/m^2 The figures in parentheses indicate the percentage when the original state was set at 100.

243 (100) — Existing windows

Reduced by 30 % more

169 (70) — Biew installation 5mm glass

148 (61) — Biew installation Low-E 5mm glass

Before renovation Aluminum frame windows 5mm glass

After renovation Aluminum frame windows, 5mm glass + Ecological inner window Biew for buildings

Energy-saving Effectiveness Calculation Conditions
- Location conditions: Office building in Tokyo assumed. Simulation on a general floor.
- Proposed product: Ecological inner window Biew for buildings
- Glass thickness: 5mm single-pane glass (existing window), 5mm single-pane glass (newly installed internal window Biew)
- Cooling/Heating settings: Heating 22ºC, cooling 26ºC (Operated from 8:00 to 18:00 on a weekday)
- When cooling, if the external temperature is lower than the cooling temperature setting, then it is assumed that the air conditioner is not used. (If the room temperature is 26ºC or higher and the external temperature is 24ºC or lower, then it was assumed that natural ventilation was used.) Natural temperatures were allowed to run their course.
- Software used: AE-Sim/Heat (Architectural temperature simulating program)
- Weather data: Standard Annual Weather Data from 2000 Expanded AMeDAS

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Category	Accounting methods	
	Activity data	**Emission factor**
Category 1: Purchased goods and services	• Weight of procured raw materials and other materials	• Emission factor database (*1, *2)
Category 2: Capital goods	• Value of procured capital goods	• Emission factor database (*2)
Category 3: Fuel and energy related activities not included in Scope 1 or 2	• Electricity and fuel energy usage	• Emission factor database (*1)
Category 4: Transportation and delivery (upstream)	• Calculated based on calculation methods for specific cargo owners in accounting, reporting and public disclosure systems	
Category 5: Waste generated in operations	• Treatment volume of waste by type	• Emission factor database (*2)
Category 6: Business travel	• Amount paid by means of transportation	• Emission factor database (*2)
Category 7: Employee commuting	• Amount paid by means of transportation	• Emission factor database (*2)
Category 8: Leased assets (upstream)	• Depends on the scenario settings	• Emission factor by means or transportation using the ton/km method
Category 10: Processing of sold products	• Depends on the scenario settings	• Emission factor per internal manufacturing and processing weight
Category 12: End-of-life treatment of sold products	• Sold logistics volume for the cargo owner	• Emission factor database (*2)

*1 "Carbon Footprint Communications Program Basic Database, Ver. 1.01 (Domestic Data)"
*2 "Emission Factor Database on Accounting for Greenhouse Gas Emissions Throughout the Supply Chain, Ver. 2.0"