

**New Japan – Brazil EE&C Cooperation Project
(B-1) (October 14th, 2021) -**

Answers to Questions of Mr. Lamberts to Mr. Akamine

This is the answers to the questions from Mr. Roberto Lamberts by his email of Nov. 10 addressed to Mr. Akamine of BRI.

However, AOTS asked Yoshida to prepare the answers. AOTS explained me that Mr. Akamine is physically very difficult to answer to the questions due to his certain reasons including an extremely busy job situation. Therefore, it is noted that these answers are prepared based on my knowledge and data / information investigated by myself.

I hope that the answers are satisfactory for you.

November 24th, 2021

Kazuhiko Yoshida / ECCJ

Questions / Comments and Answers

Questioner	Name	Mr. Roberto Lamberts
Commentator	Organization	Federal University of Santa Catarina
Date	November 10, 2021	
Title of Lecture	(B-1) Calculation Method of Energy Consumption Performance for Residential Buildings Based on the Building Energy Efficiency Act Japan	
Lecturer	Yoshihiko Akamine	
Respondent	Kazuhiko YOSHIDA, ECCJ	

(1) Questions / Comments

What is the floor height ?

Answer (by Yoshida)

According to the “Model Building Method”, the following are the specifications.

Height between Floors	Height of Ceiling for Room Usage
A. 4m	Machine Room : 4m
	Robby etc. : 3.5m
	Office Room and Corridor etc. : 2.4m – 2.6m
B. 5m	Mainly Machine Room : 5m

In addition, the “Model Building Method” also requires to input the total floor height of the building for calculation.

(2) Questions / Comments

Could you provide the breakdown for the air conditioning cooling and heating ?

Answer (by Yoshida)

I have no data since I cannot get the details of the results of the calculation from Building Research Institute.

However, based on the inputs etc. provided by the lecture of Mr. Akamine, you will be able to approximately calculate the ratio of heating energy consumption to cooling energy consumption as follows. This method would be possible for you to analyze the required point.

(1) Data of Air Conditioner

	Rated Capacity (kW/m ²)		COP	
	Cooling	Heating	Cooling	Heating
Zone 2 (Hokkaido)	0.114	0.232	3.24	2.74
Zone 6 (Tokyo)	0.146	0.158	3.24	3.42
Zone 8 (Okinawa)	0.162	0.068	3.24	3.42

The Energy Conservation Center, Japan (ECCJ)

(2) Setup Temperature and Humidity

For Cooling : 26 °C , RH 50%

For Heating : 22 °C , RH40%

For Transition between cooling and heating : 24 °C , RH50%

(When the conditions exceed the criteria for cooling, the criteria for cooling are applied for calculation.)

(3) Daily Operating Hours : As per the date shown in the lecture material of Mr. Akamine (Page 20)

(4) Monthly Schedule for Cooling and Heating etc.

As per the table shown below.

	Zone 2	Zone 6	Zone 8
Cooling	For 3 months (July to September)	For 4 months (July to September)	For 6 months (May to October)
Transition	For 3 months (May to June and October)	For 4 months (April to May and October to November)	For 3 months (November to January)
Heating	For 6 months (January to April and November to December)	For 4 months (January to March and December)	For 3 months (January to March)

(3) Questions / Comments

Did you consider all electric ?

Answer (by Yoshida)

Not only equipment worked by electricity but also the equipment and facilities using fuel etc. are included, for example,

- Gas Heat Pump
- Boilers to generate steam and hot water using for air conditioning
- District Thermal Energy Supply for Heating and Cooling, etc.

(4) Questions / Comments

What is the electricity transformation factor for primary energy ?

Answer (by Yoshida)

9.76 MJ/kWh