

Additional Information on the Proposed JCM Methodology
 “Introduction of CNG-Diesel Hybrid Equipment to Public Buses”

Japanese-made buses are widely introduced and operated in Indonesia.

In the project which this proposed methodology refers for its development, 72 public buses are all made by Japanese bus manufacturers. Therefore, fuel efficiency data have been collected from catalogues published by three major Japanese bus manufacturers. The following tables show the data of fuel efficiency and total displacement for each type of public buses.

1. Collected data

[Middle size]

Company A

Type	A-1	A-2
Total displacement (L)	5.123	5.123
Fuel efficiency (km/L)	6.5	6.5

Company B

Type	B-1
Total displacement (L)	5.193
Fuel efficiency (km/L)	6.5

Average of all three data: 6.5

[Large size]

Company A

Type	A-3	A-4	A-5	A-6	A-7	A-8
Total displacement (L)	9.70	9.77	9.93	10.00	9.26	9.33
Fuel efficiency (km/L)	4.9	4.6	4.9	4.6	5.3	4.95

Type	A-9	A-10
Total displacement (L)	9.49	9.56
Fuel efficiency (km/L)	5.3	4.95

Company B

Type	B-2	B-3	B-4	B-5	B-6	B-7
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Total displacement (L)	9.74	9.81	9.97	10.04	9.30	9.37
Fuel efficiency (km/L)	4.9	4.6	4.9	4.6	5.3	4.95

Type	B-8	B-9
Total displacement (L)	9.53	9.60
Fuel efficiency (km/L)	5.3	4.95

Company C

Type	C-1	C-2	C-3	C-4	C-5	C-6
Total displacement (L)	7.545	7.545	7.545	7.545	7.545	7.545
Fuel efficiency (km/L)	4.45	4.3	4.45	4.3	4.45	4.3

Type	C-7	C-8	C-9	C-10	C-11	C-12
Total displacement (L)	7.545	7.545	7.545	7.545	7.545	7.545
Fuel efficiency (km/L)	4.45	4.3	4.45	4.3	4.45	4.3

Average of all 28 data: 4.7

2. Default fuel efficiency values

It is clearly observed that fuel efficiencies of middle size buses are higher (more efficient) than those of large size buses. Therefore, default values have been calculated (averaged) and set for each size category as follows.

Total displacement	$x < 5.2\text{L (5,200cc)}$	$5.2\text{L (5,200cc)} \leq x$
Fuel efficiency ($\eta_{RE,i}$)	6.5	4.7