



C U T E

CUTE – STEP - ECTOS

Operational results of the FC buses

Conclusion of the operators



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LUXEMBOURG



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Operational results of the FC buses

Conclusion of the operators

Total
mileage:
1.074.539 km



Total
operational
experience:
63 bus-years

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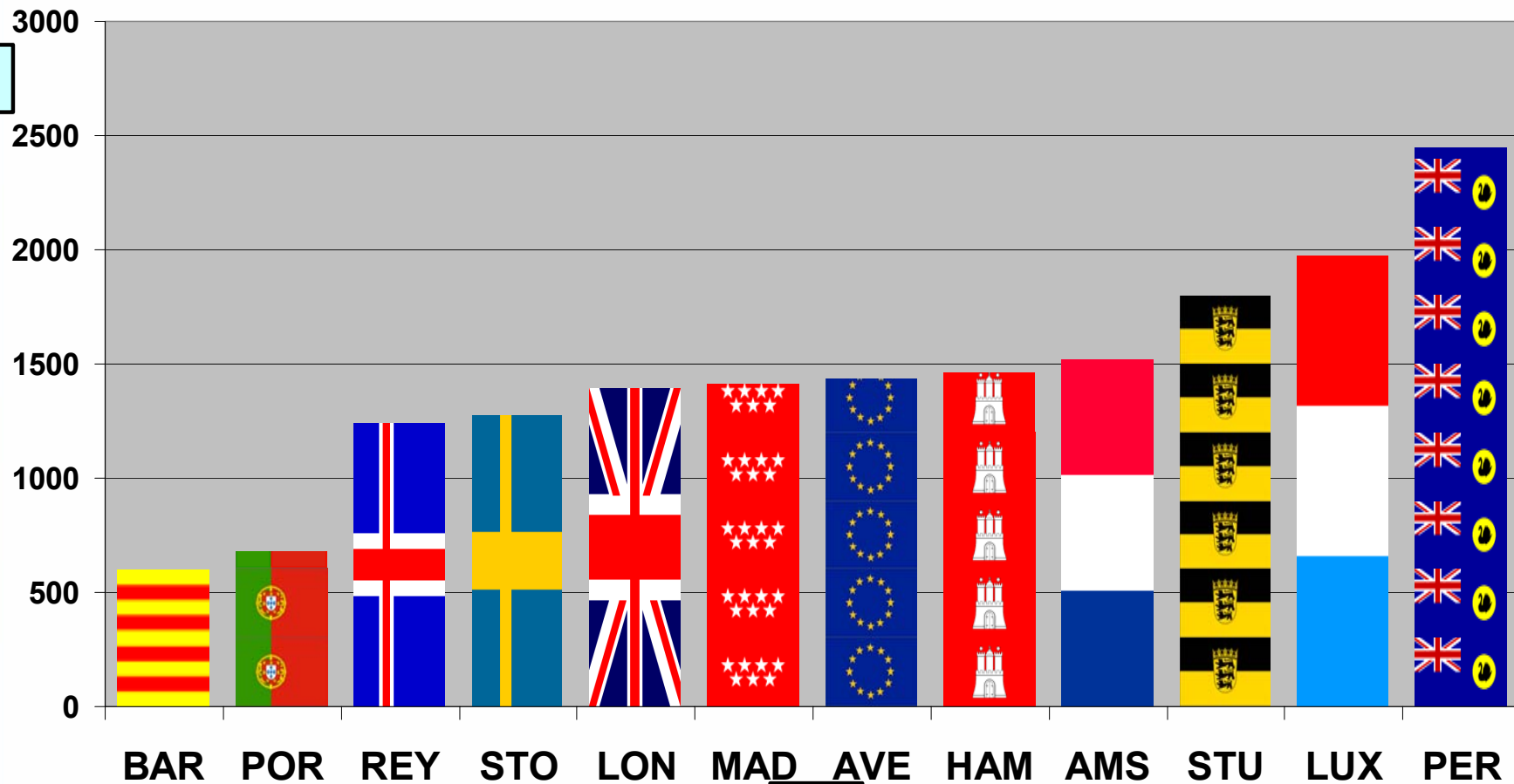
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CUTE

Monthly mileage per bus

Km



City

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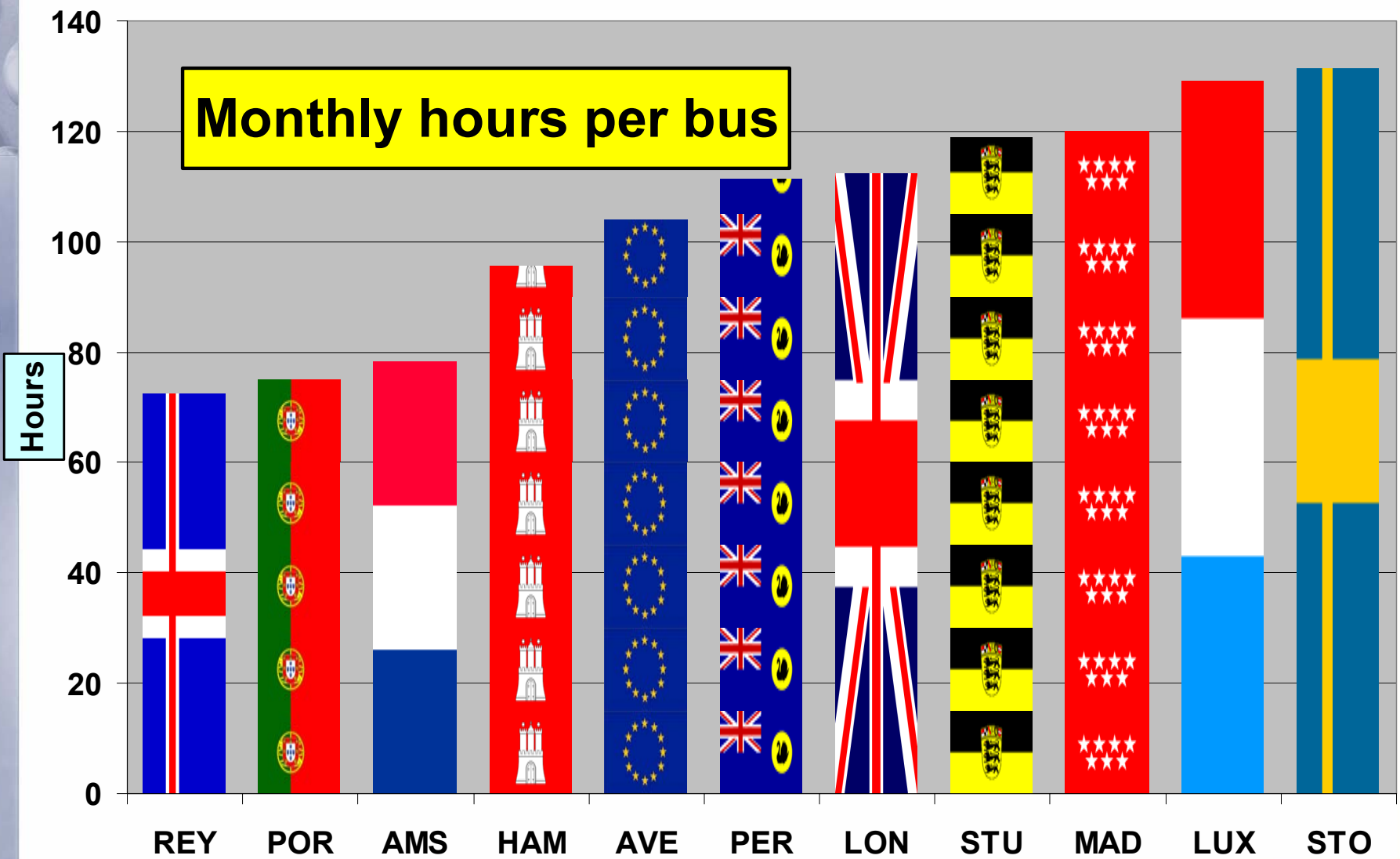
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Monthly hours per bus



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Main reasons for long out-of-operation periods:

05/04: 10/04: 04/05: 09/05: 01/06:

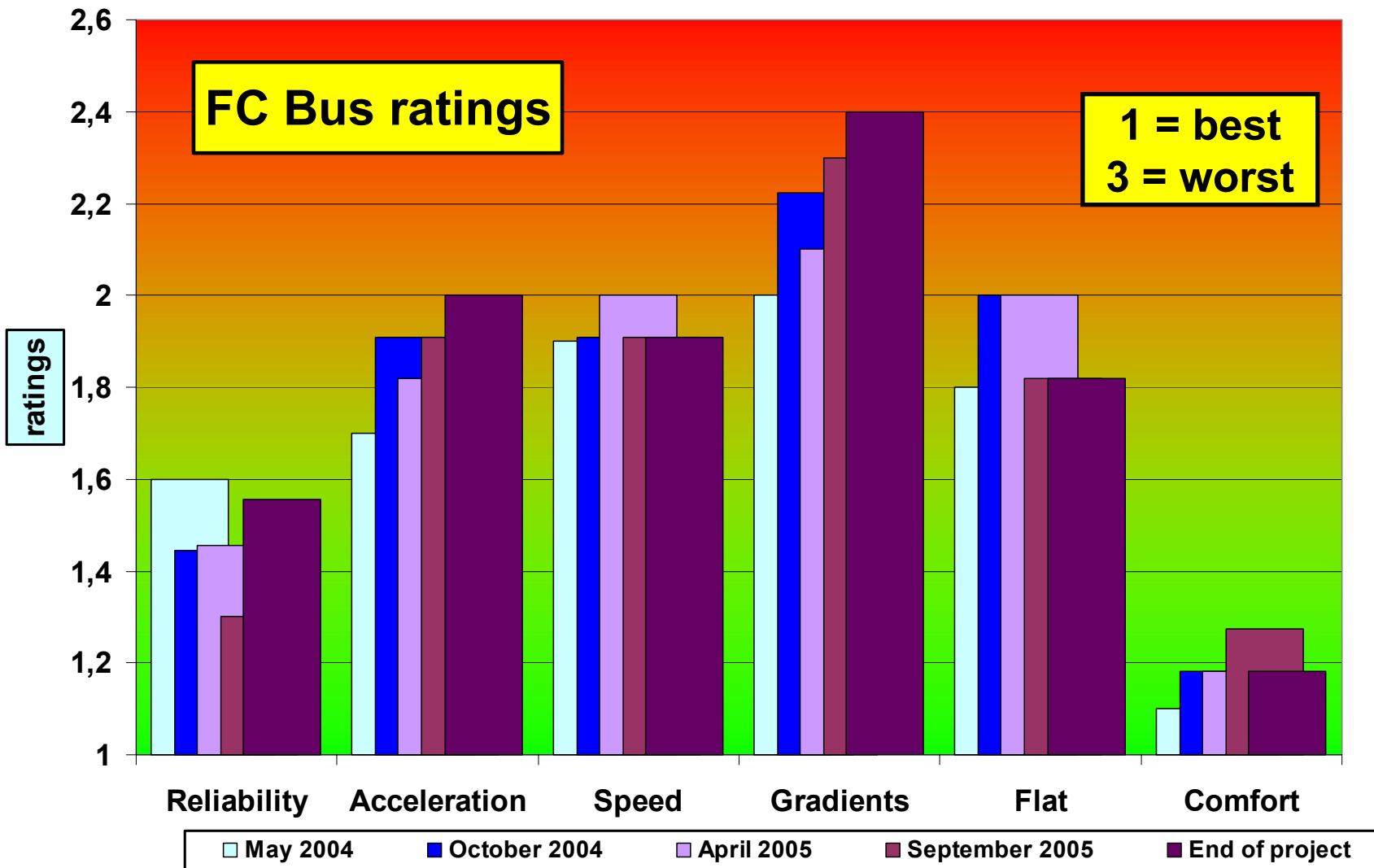
Filling station:	8	1	2	4	2
Inverter:	5	2	4	1	1
Hydrogen supply/contamin.	1	2	1	-	1
Body damage:	1	1	-	4	2
Technical problems:	1	1	-	-	-
Safety valve, Tescom regulator, Electric motor, starter problems, Compressor, anti-freeze protection					
Each:	-	-	1	-	-
Spare parts:	5	1	-	2	1
Fuel cell:	2	1	-	-	-
Cell Volt Monitoring:	1	-	-	-	-
Gear Case replacement:	-	-	-	1	-
Airco compressor:	-	-	-	1	-





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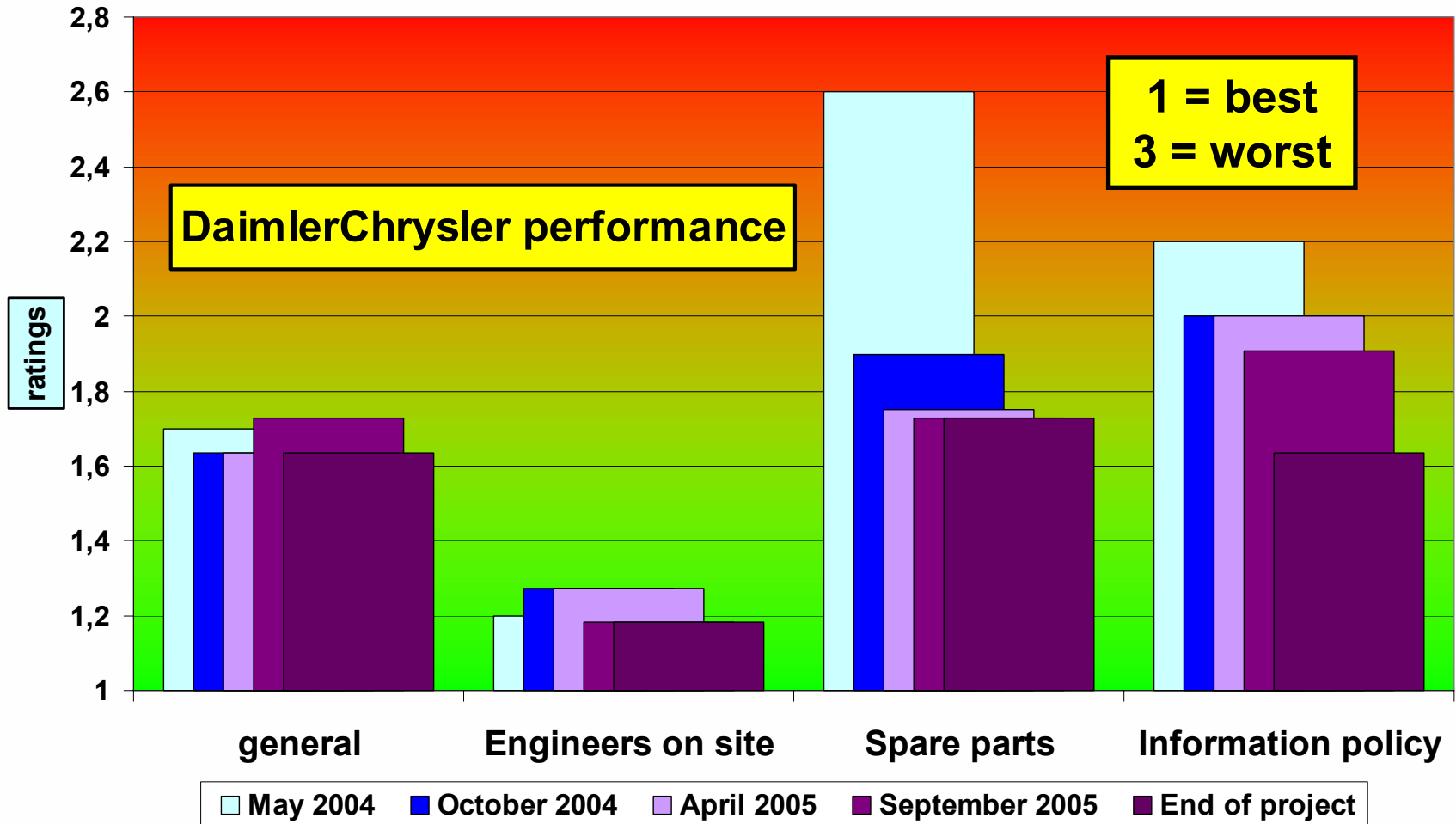
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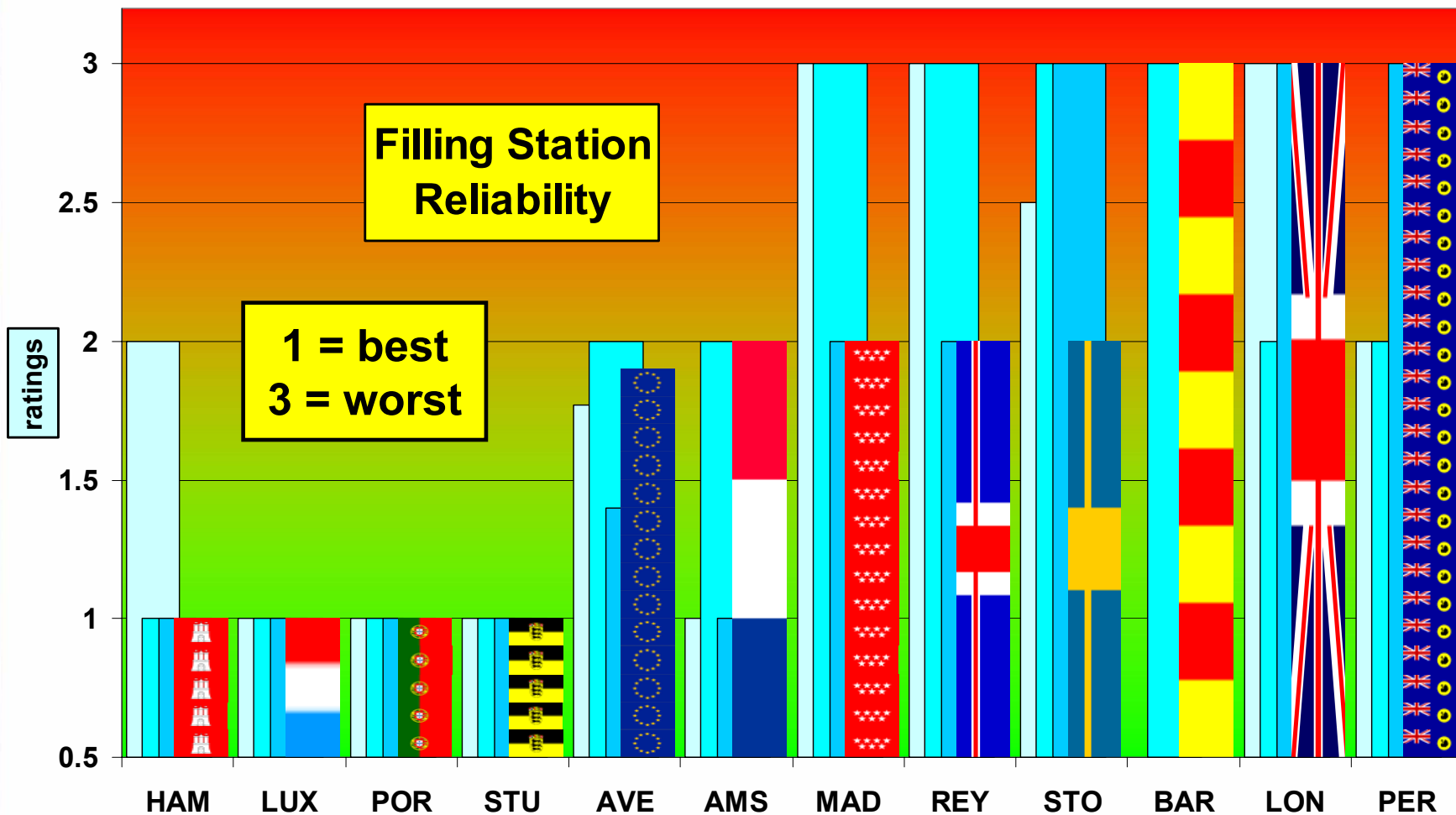
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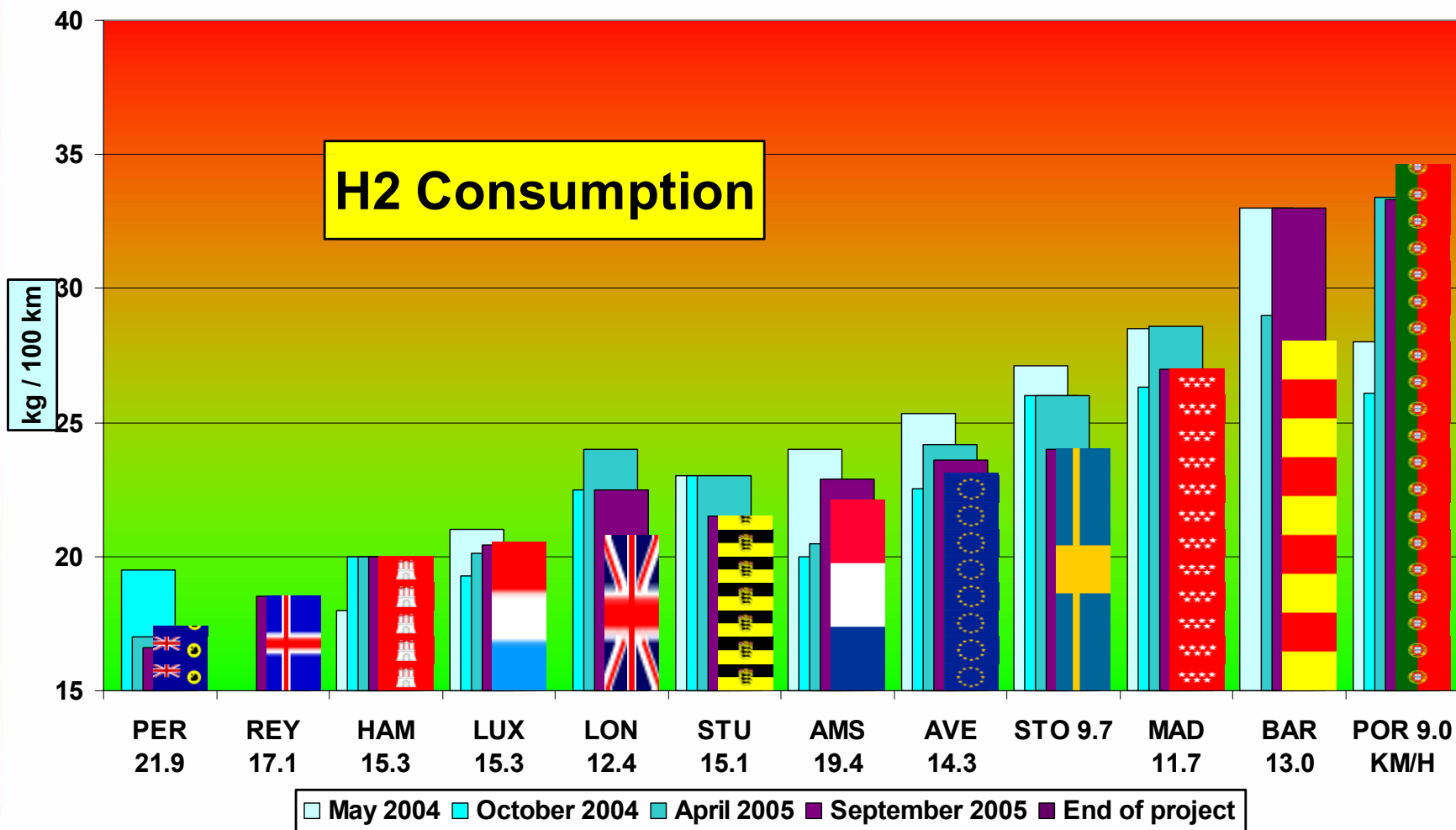
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H2 Consumption



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H2 Supply System

- With hindsight, choice of H2 supply system:
 - No regrets for 8 cities
 - 1 city regrets choice (trailer) because of high price
 - 1 city regrets choice (reformer) because of reliability problems and high price
- Future plans for H2 supply facility and filling station:

	Oct '04	Apr '05	Sep '05	Jan '06
– Use it in another project:	6 x	7x	4x	4x
– Don't know:	3 x	2x	2x	6x
– Sell it to someone else:	2 x	3x	-	-
– Sell it back to manufacturer:	1 x	2x	3x	2x
– Scrap it:	1 x	2x	-	-
– Station belongs to H2 supplier:			2x	2x
– Keep it (more vehicles!)		1x	-	





Are you able to run FC buses on your own?

- Do you think your own technicians can keep the buses running on their own without assistance?

Oct 2004: No: 8 x Yes: 2 x

April 2005: No: 8 x Yes: 3 x

Sept 2005: No: 7 x Yes: 4 x

Jan 2006: No: 5 x Yes: 5 x

- Do you think your staff needs further assistance?

Oct 2004: No: 3 x Yes: 7 x

April 2005: No: 1 x Yes: 10 x

Sept 2005: No: 1 x Yes: 10 x

Jan 2006: No: 2 x Yes: 8 x





What is the work that an untrained technician is allowed to do in order to help the driver?

• Help when the bus does not start:

Oct 2004:	7 x no	3 x yes (AMS, LON, LUX)
Apr 2005:	7 x no	3 x yes (AMS, LUX, STU)
Sep 2005:	5 x no	5 x yes (AMS, LUX, MAD, REY, STU)
Jan 2006:	6 x no	5 x yes (AMS, BAR, LUX, MAD, STU)

• Help to tow the bus back to the workshop:

Oct 2004:	3 x no	7 x yes (AMS, HAM, LON, LUX, PER, REY, STO)
Apr 2005:	3 x no	8 x yes (AMS, BAR, HAM, LON, LUX, REY, STO, STU)
Sep 2005:	3 x no	8 x yes (AMS, HAM, LON, LUX, MAD, REY, STO, STU)
Jan 2006:	2 x no	9 x yes (AMS, BAR, HAM, LON, LUX, MAD, REY, STO, STU)





Main future development to go into:



Bus itself: mentioned 6 x

(Apr 05: 4x; Oct 04: 5x; May 04: 5x; Sep 05: 6x)

Filling station: 9 x

(Apr 05: 7x; Oct 04: 6x; May 04: 7x; Sep 05: 8x)



Fuel cell: 9x (Apr 05: 6x; Oct 04: 9x; May 04: 7x; Sep 05: 7x)



H2 prod.: 9 x (Apr 05: 7x; Oct 04: 6x;

May 04: 7x; Sep 05: 6x)





What is the ideal type of propulsion for a next-generation Fuel-Cell bus?

- Hybrid drive fuel cell: 8 x
- Direct drive fuel cell: 1 x





What is the ideal hydrogen supply for a future generation filling station?

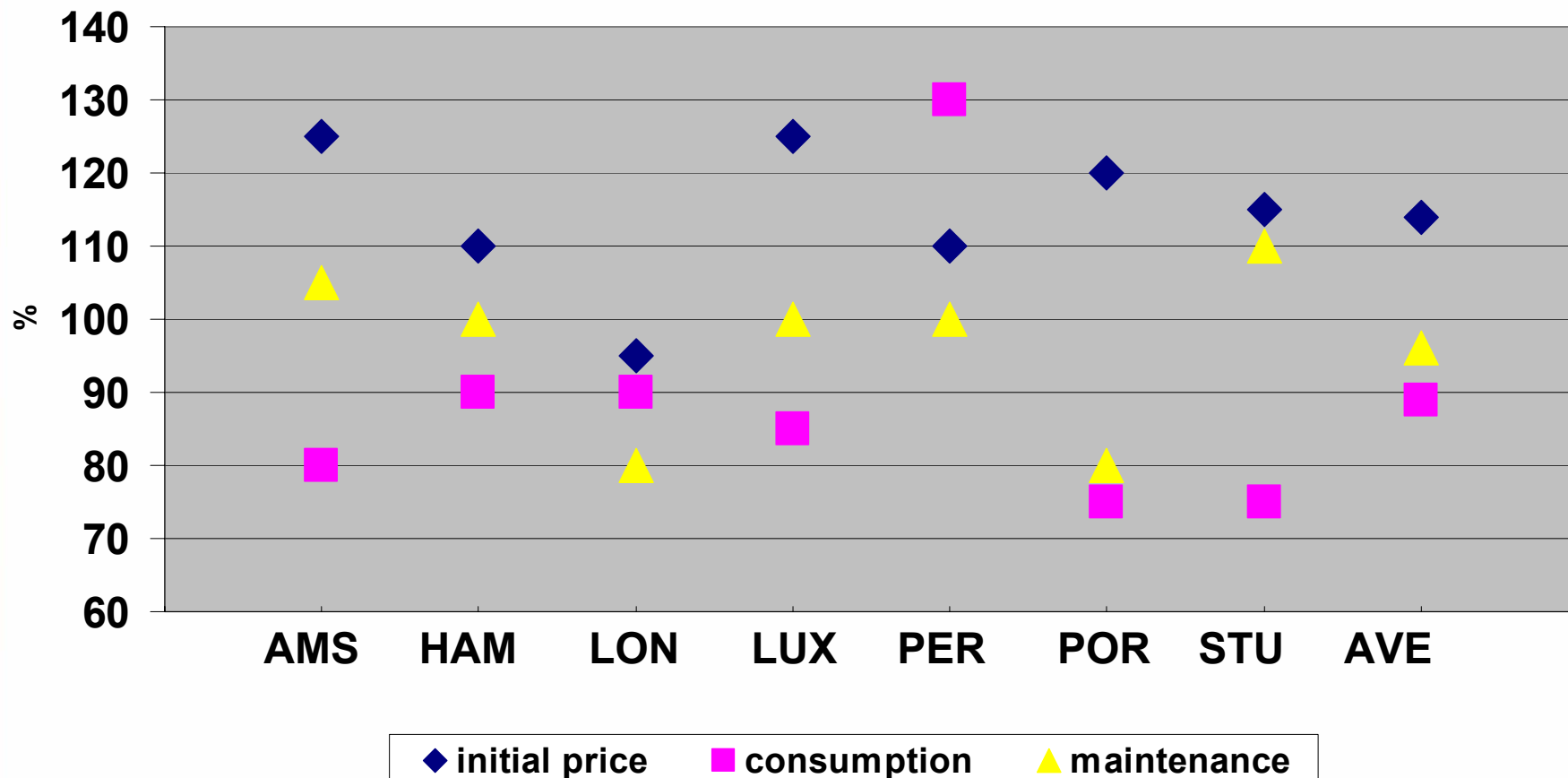
- On site: 2 x
- Pipeline: 6 x
- Trailers: 1 x





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Acceptable costs





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Thank you for your attention!

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