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The role of motorized 2-wheelers in an energy efficient transport system

Bettina Emmerling (AEA), Paul Pfaffenbichler (AEA), Giovanni Gircella (UC Davis)

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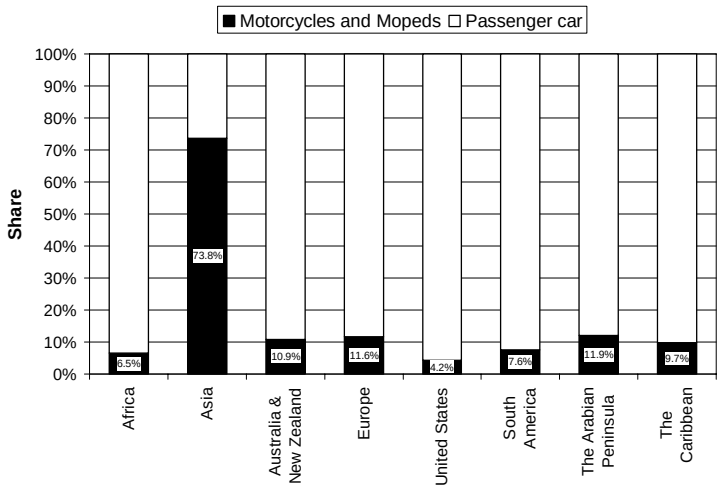
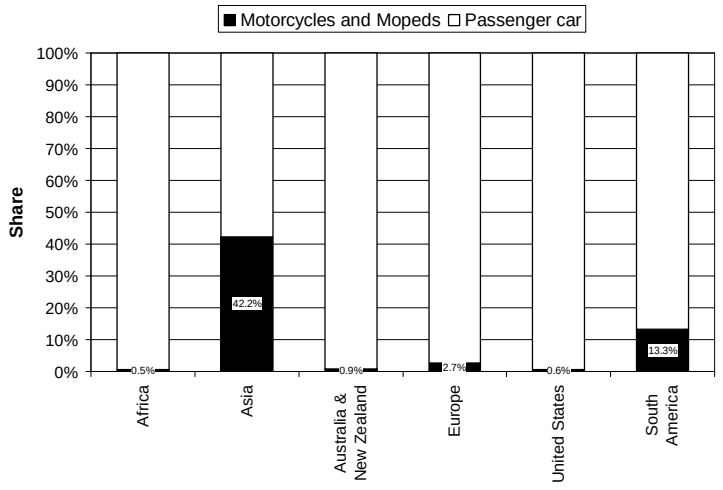
The current role of motorcycles -
Fleet share in different regions of the world



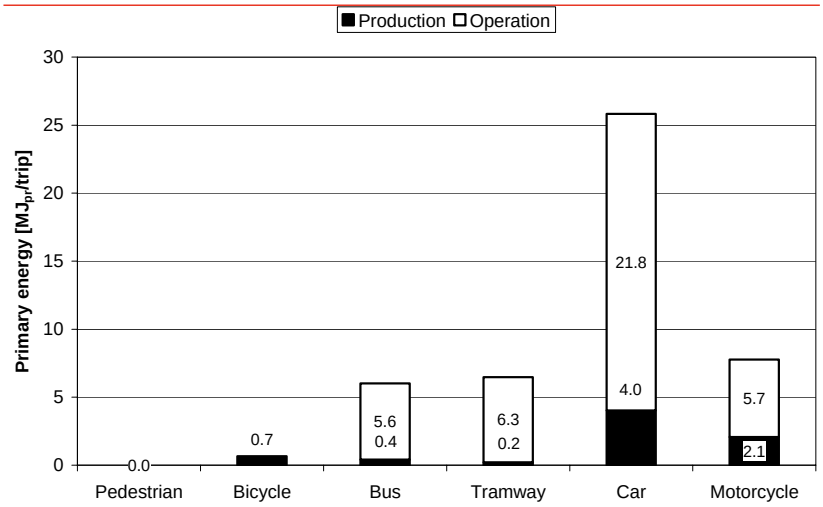
Source: (IRF 2006)

The current role of motorcycles –
Share vehicle-km in different regions of the world



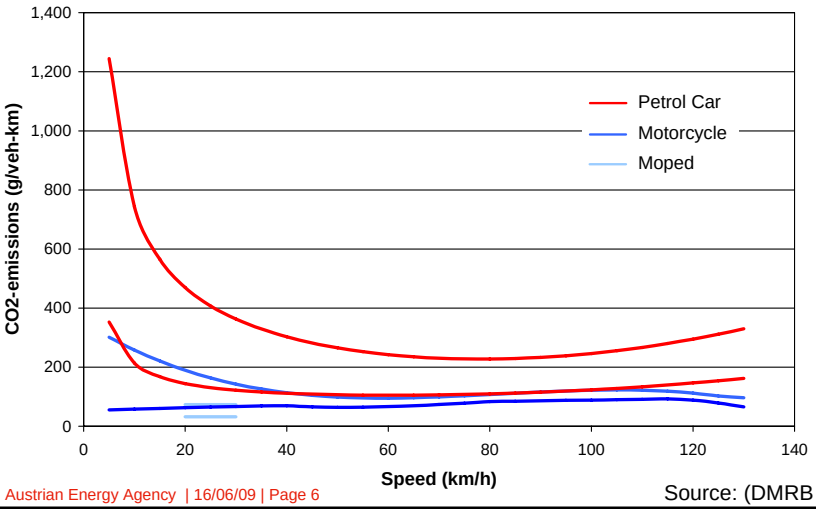
Source: (IRF 2006)

Basic characteristics
Consumption of primary energy



Source: (Pfaffenbichler 1998; 2001)

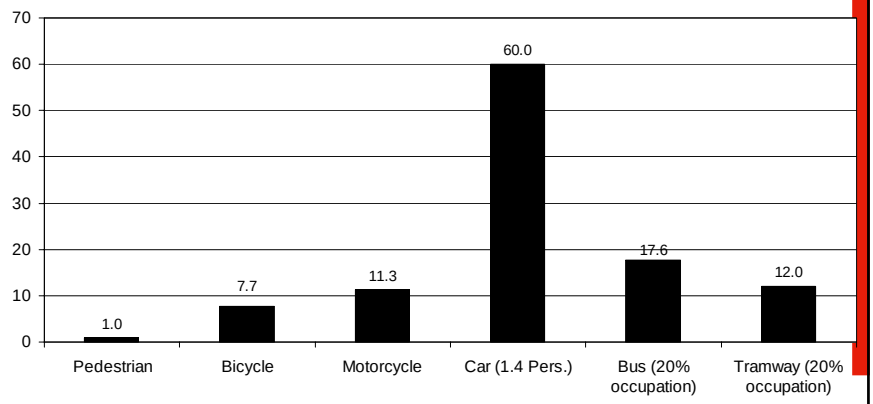
Basic characteristics
CO_2-emissions vehicle operation



Source: (DMRB 2003)

Basic characteristics
Space consumption

In Operation



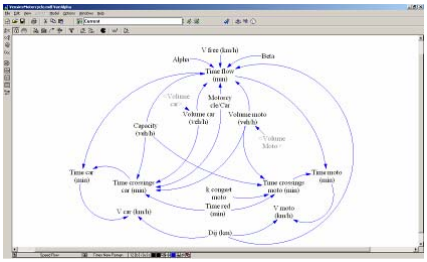
Source: (Pfaffenbichler 1998; 2001)

Basic characteristics
Space consumption

- Motorcycle parking in Ho Chi Minh City

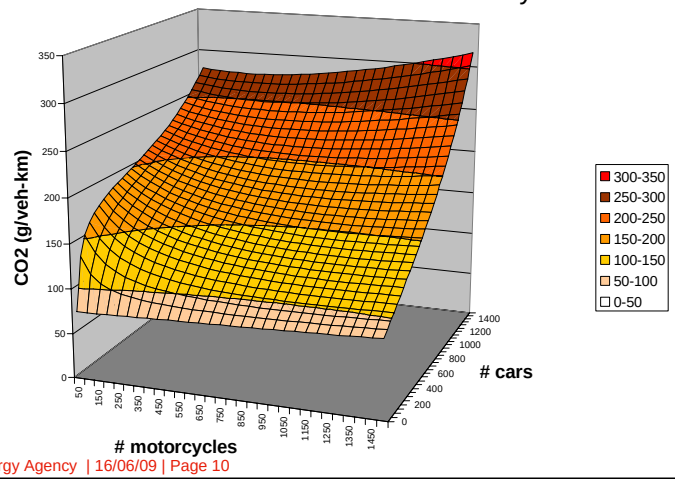
Case studies
Hanoi

- Model of the interaction between cars and motorcycles



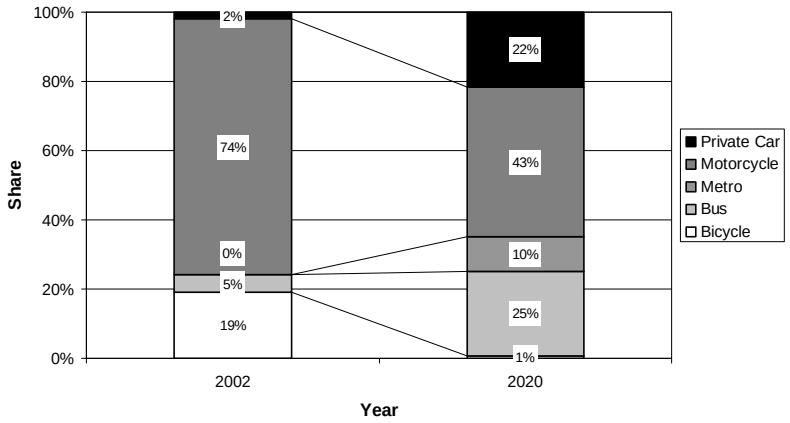
Case studies
Hanoi

- Model of the interaction between cars and motorcycles



Case studies
Ho Chi Minh City

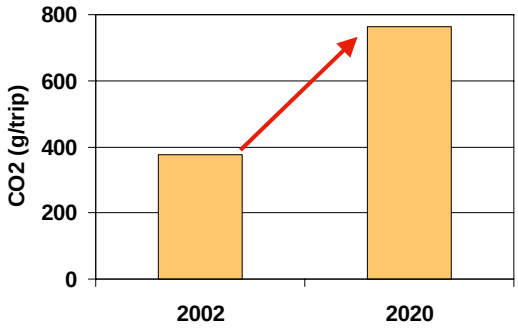
- Modal split in Ho Chi Minh City in 2002 and 2020



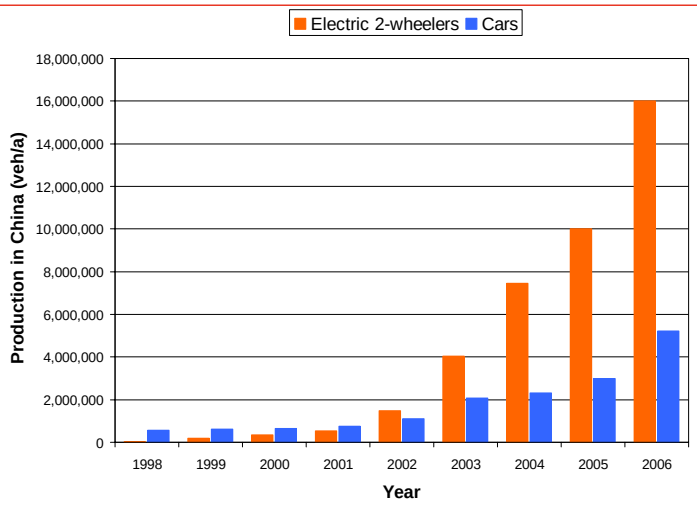
Source: (Gomez-Ibanez 2008; JICA et al. 2004)

Case studies
Ho Chi Minh City

- The average trip length in 2002 was about 6.6 km.
- The predicted changes double trip length to ~13 km.
- CO_2-emissions per trip double from 377 g to 764 g.



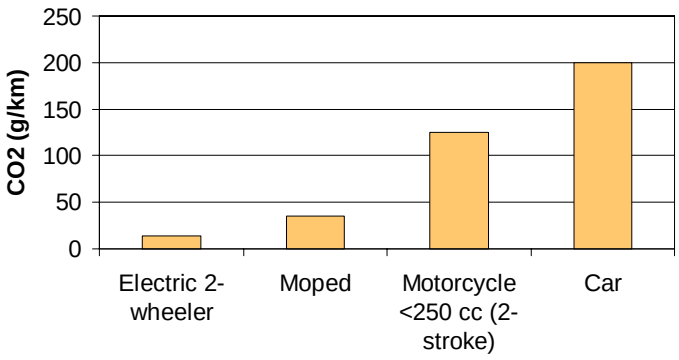
Outlook – Electric 2-wheelers
China



Source: (Weinert et al 2007a,b), (JAMA 2008)

Outlook – Electric 2-wheelers
China

- Motorcycles with internal combustion engines have been banned in some Chinese cities due to air pollution problems.



Source: DMRB, (Weinert et al 2007)

Conclusions (1)

- Due to their specific characteristics (low space consumption, low weight) motorcycles might be able to solve some of our existing and future transport problems.
- Motorised 2-wheelers play a very important role in the transport system of many countries worldwide.
- Despite that, in Europe transport planners and scientists still see them mainly as leisure activity and a safety problem.
- In the work presented here it was not yet possible to identify the exact circumstances under which motorised 2-wheelers can contribute to a sustainable transport system.

Conclusions (2)

- Nevertheless some first results indicate that a transport system based on motorcycles with internal combustion engines is more efficient than a car based one.
- The transport system of Ho Chi Minh City as it is predicted for 2020 will be twice as inefficient in terms of g CO_2 per trip as it is today.
- Recent developments in electric 2-wheelers (especially human power-electric hybrids – “Pedelecs”) might bring a breakthrough towards a sustainable transport system.

Contact

Bettina Emmerling
Paul Pfaffenbichler

Austrian Energy Agency
Mobility & Transport
Mariahilfer Straße 136
A - 1150 Vienna

bettina.emmerling@energyagency.at
paul.pfaffenbichler@energyagency.at