The Electric Power Assisted Bicycle: a clean vehicle to reduce oil dependence and enhance the mobility of the elderly

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Definitions

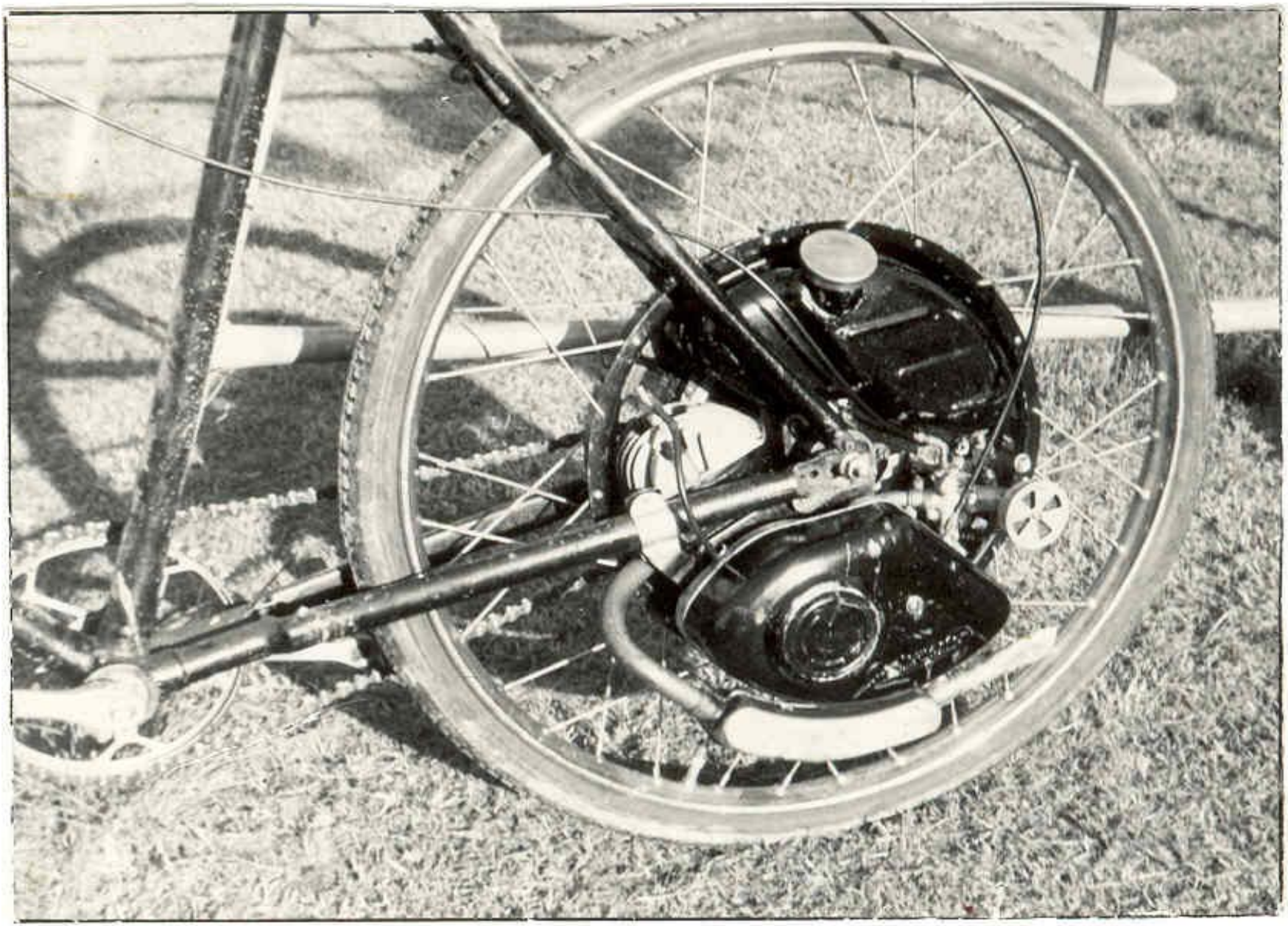
PAB = Power Assisted Bicycle

IC-PAB = **PAB with a polluting two stroke internal combustion engine. 1900 to 2000 RIP**

E-PAB = **PAB with a rechargeable battery and electric motor with a maximum power out put of 250 watts. Reduces effort by 50%**

E-Bike = **Electric bicycle with a motor rated at around 400 to 500 watts that does not need to be pedaled except on steep hills and when opposed by strong winds**

Lafree-The Giant EV are stepping into a new innovation to blend the characters of traditional bicycle and the benefit of electrical technology.
GIANT
BICYCLES
Lafree
GIANT
vpc



E-PABs JAPAN 1993 to 2002

1.4 Million Women bought 70% of E-PABs

- People over 50 bought 66%, mostly women over 50 and men over 60.

- Women under 40 bought 9.4%; many use E-PABs fitted with specially designed child passenger seats or shopping baskets that are very stable.

- Fortyish Business men bought 7.6%: they value the time saved in congested business districts; most of them do not want to "work up a sweat" on a bicycle .and the E-PAB is easier to use and park than a car.

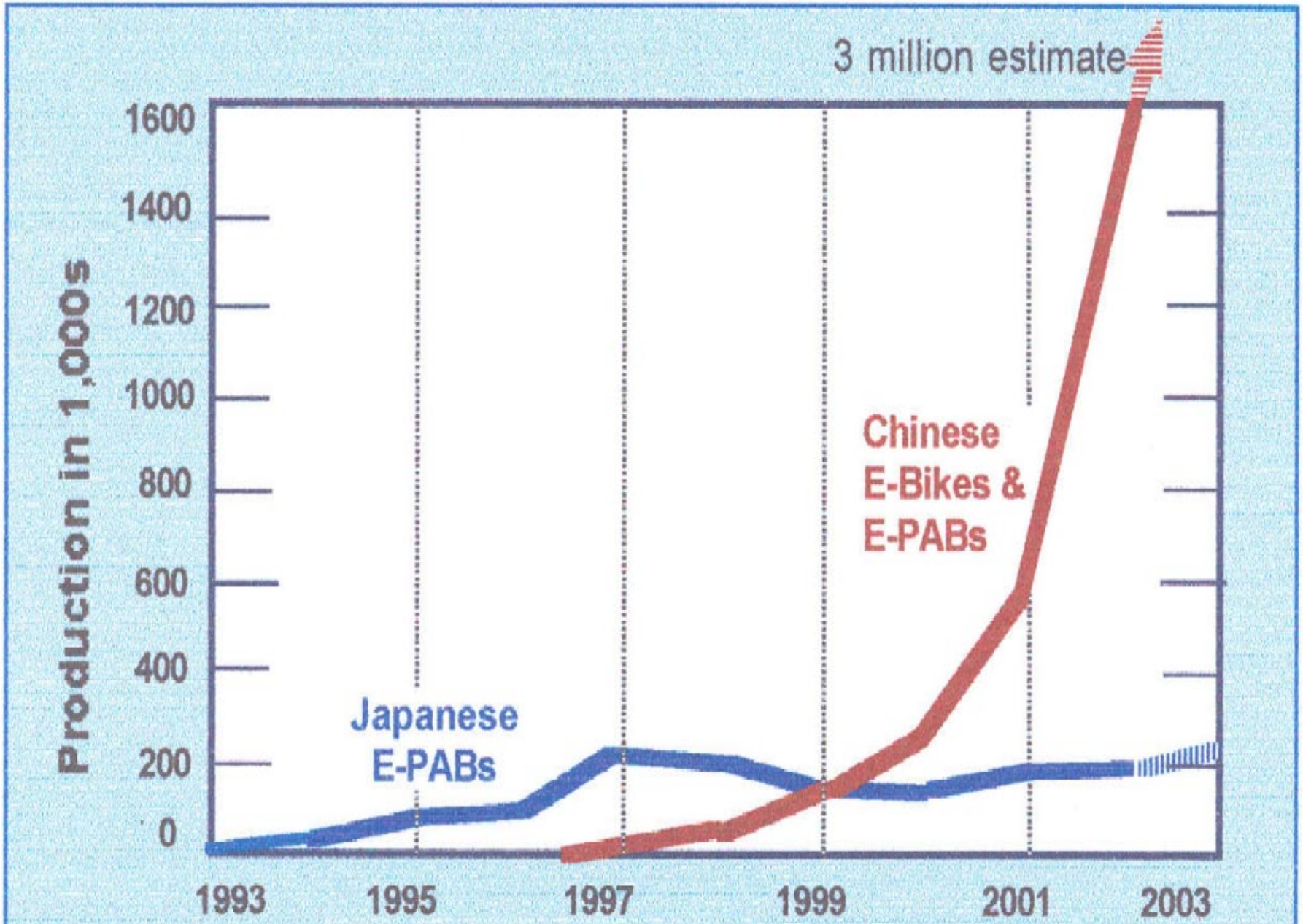


Figure 3 Production of Japanese E-PABs & Chinese E-Bikes 1993-2003

YAMAHA MOTOR

E-PABs JAPAN 2001/2020

Towards a sustainable transport system

- Solar cell arrays on the roof of apartments,offices and homes recharge E-PAB batteries
- Millions of E-PABs used to access rail stations and modal interchanges and replace car trips.
- Young riders using E-PABs in hilly cities to be as mobile as cyclists riding in flat urban areas.
- The growing elderly population will use more E-PABs electric and fully powered 3 and four-wheel scooters

Chinese E-PABs & E-Bikes 2000/2020

- The demand in China is for fully battery powered E-Bikes capable of self propulsion. As PABs production will mostly be for export. China has an economy with a 7.8% growth rate.

- Manufacturing policy provides a secure market for E-PAB and E-Bikes manufacturers. China plans to become the worlds Factory. In 2002 it made 60 million bicycles and exported 46 million.

- 3 million E-PABs and E-Bikes will be made in 2003 which will increase to 10 million in few years. Given the appalling urban air pollution it is likely that more environmental legislation will be introduced in more cities to replace IC-PABs with E-Bikes

- The domestic E-Bike market will be for the urban workers in the new industrial parks and office complexes, most of whom will be male and unable to afford cars for many years.

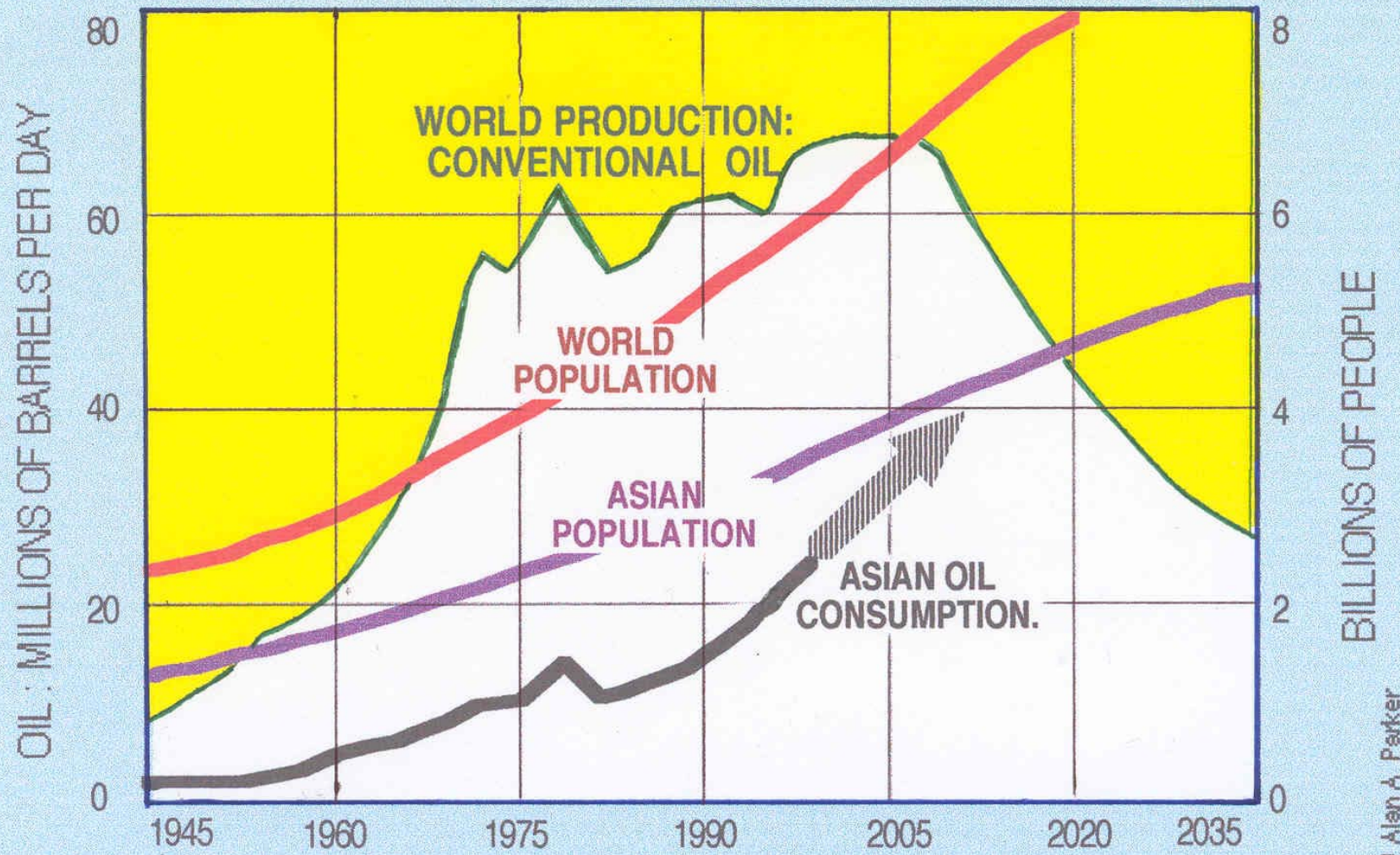
In 2002 the EU, US & Canada enact new laws to encourage E-PAB & E-Bike use

- The European Union reclassified electric bicycles with a maximum power output of up to 250 watts as bicycles. For safety reasons the EU requires that all E-PABs have electronic controls that progressively cut off the power assist at 25 km/hour.

- The US legislation allows for a 750 watt maximum power output, a 32 km/hour assisted speed limit, functioning pedals. E-bikes and E-PABs must conform to CPSC safety standards for bicycles.

- The Canadian Legislation allows for a 500 watt maximum power output, assisted speed limit of 32 km/hour, and for the motor not be engaged until a speed of 3 km/h is attained. This is a Performance Based Standard recommended for adoption by N.Z. to replace the existing E-PAB & E-Bike classification as a moped.

THE NEED FOR OIL TO DEVELOP ASIA AND THE DEPLETION OF CONVENTIONAL OIL RESEVERVES



DATA SOURCE: Campbell, C. J. 1997. *Better Understanding Urged for Rapidly Depleting Reserves* , Oil and Gas Journal.

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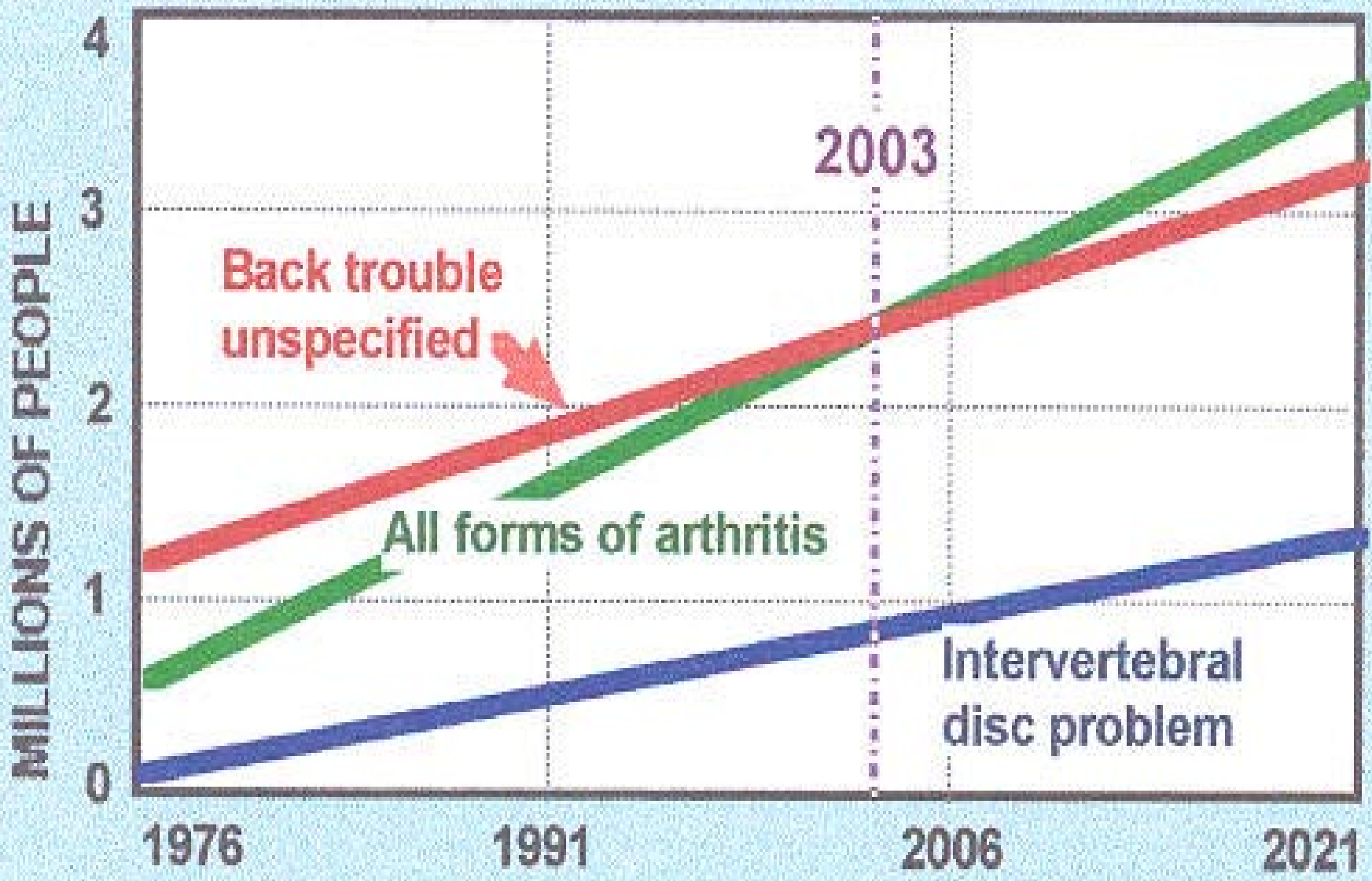

Figure 6 Australia: people with musculoskeletal problems

Comfort Orthopedic

Expanded Plant In Mainland China; Production of Manual & Electric Wheelchairs Boosted

NZ should encourage E-PABs & E-Bikes

PABS are mopeds in law needing registration, number plates illuminated at night, a motorcycle helmet and a driver license. This discourages their use and denies people the right to buy the safest machines. Reclassification as a bicycle with a power output up to 500 Watt has two main advantages..

1. In the outer suburbs most destination are to far to walk to but easy cycling distance except when there are lots of hills. E-Pabs and E-Bikes would enable people of all ages to cycle over the hills and use their cars less.

2. N.Z. has 520,000 arthritis sufferers and Walking is painful for many of them. Riding an E-PAB or E-bike for people with osteo-arthritis in the leg and hip joints is often painless as the body weight is carried by the saddle.

Conclusion and Recommendations

To enable N.Z. to survive the predicted depletion of world oil reserves that. that E-PAB and E-bike use be encouraged instead of driving cars to conserve national oil reserves.

- **N.Z. should adopt a Performance Based Standard which allows a maximum power output of 500 watt, maximum assisted speed of 32 km/hour and allows the import of state of the art Japanese E-PABs and E-Bikes as bicycles.**

- **The N.Z. EECA creates incentives for imported E-PABs and E-Bikes to be sold as part of a package, complete with a DC battery charging system coupled to solar panels.**

- **The N.Z. EECA promotes the development of a solar PV battery recharging system for E-PABs and E-Bikes and produce a feasibility study for manufacture in N.Z.**

QUESTIONS

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