

NCCRD

SA National Energy Development Institute

GREEN TRANSPORT

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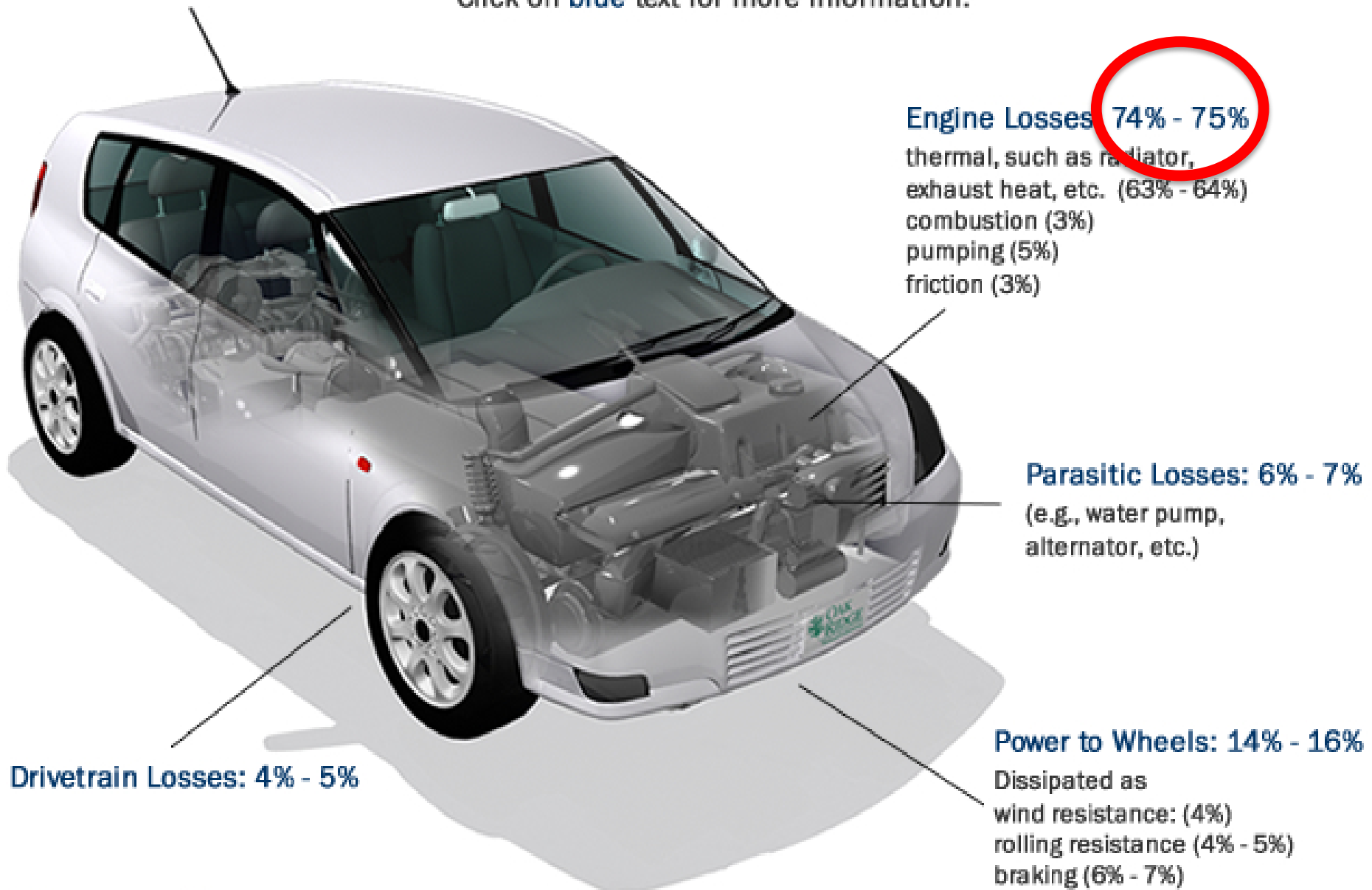






Energy Requirements for City (Stop and Go) Driving

Click on [blue text](#) for more information.



Idle Losses: 6%

In this figure, they are accounted for as part of the engine and parasitic losses.

Oil Well



96%



Refinery



90%



Distribution



97%



Petrol Car



18%

$(W \rightarrow W)\eta$

15%

Coal Mine



97%



Synfuel Plant



40%



Distribution



97%



Petrol Car



18%

7%

Oil Well



96%



Refinery



90%



Distribution



97%



Petrol Car



18%

$(W \rightarrow W)\eta$

15%

Coal Mine



97%



Synfuel Plant



40%



Distribution



97%



Petrol Car



18%

7%

Coal Mine



97%



Power Station



35%



Distribution



95%



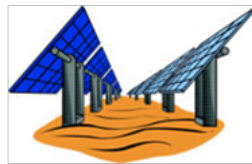
Electric Car



75%

24%

Solar Farm



Distribution



95%



Electric Car



75%

71%

W_{to}T 100%

Efficient

Petrol Car

$(W \rightarrow W)\eta$



18%

18%

Petrol Car



18%

18%

Coal Mine

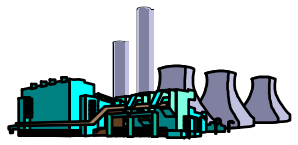
Power Station

Distribution

Electric Car



97%



35%



95%



75%

24%



Solar Farm



Distribution



Electric Car



75%

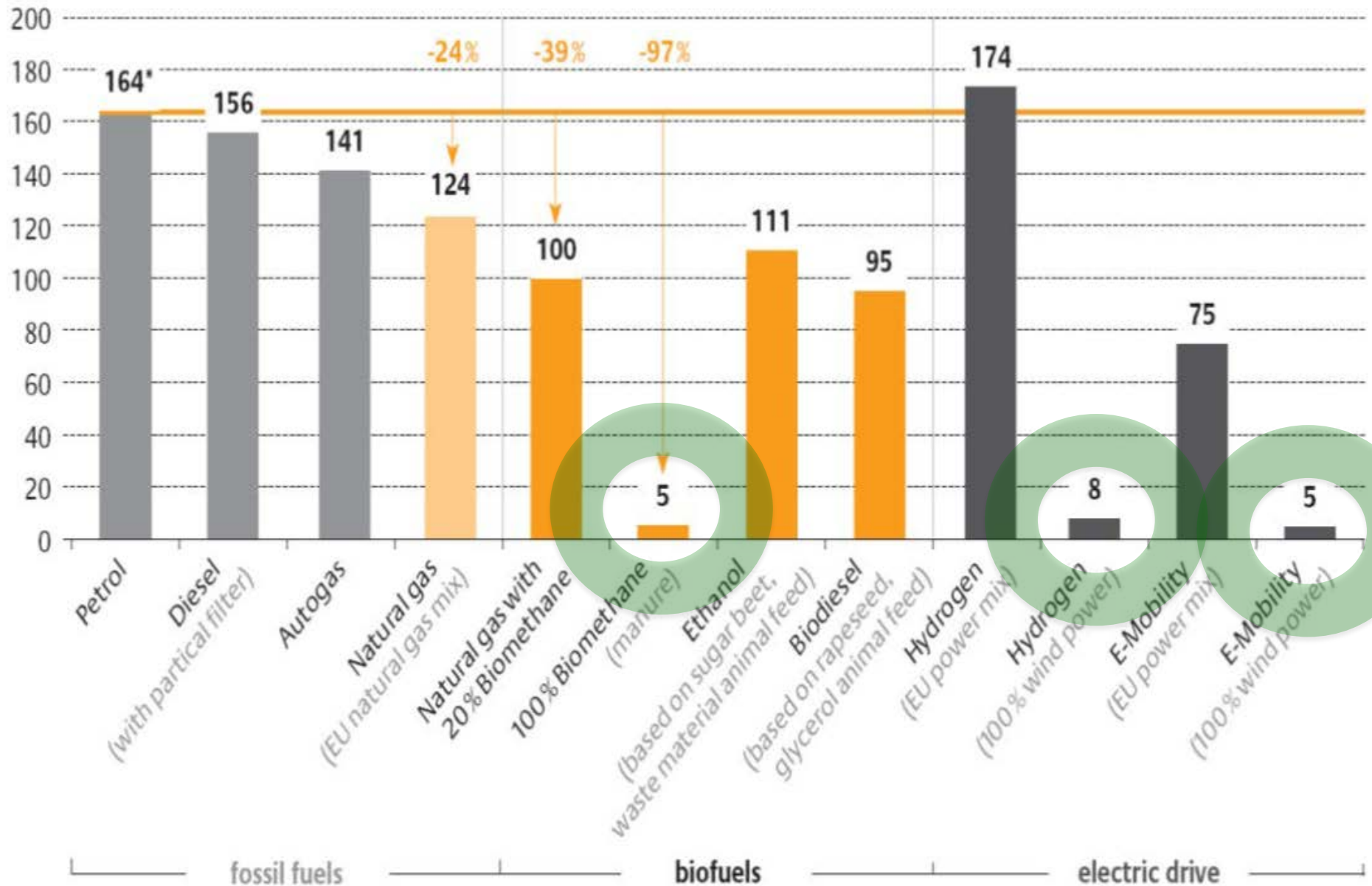
71%

Cost, Energy and Pollution



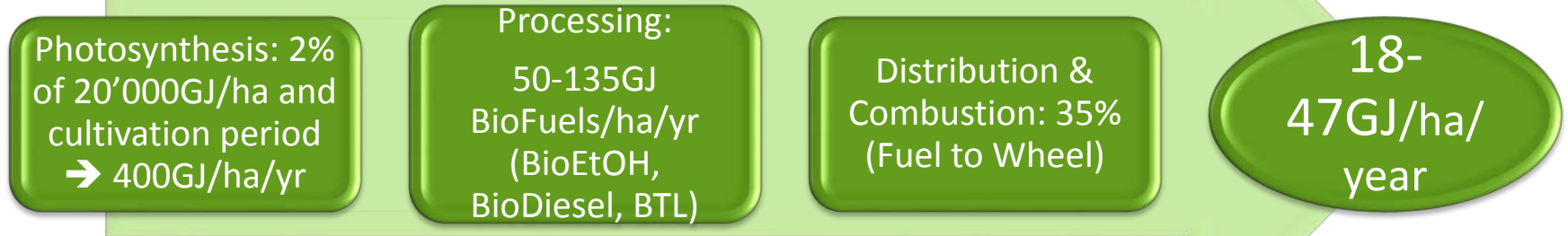
For 100km:	Petrol Car	Electric Car	
		Normal	Off-peak & Small Car
Price/Unit	R 14,00	R 1,33	60c
Units	10 litres	15 kWh	5 kWh
Energy	320 MJ	54 MJ	27 MJ
Cost	R 140,00	R 20,00	R3,00
GWP	45kg	39kg	13kg

Well to Wheel GHG emissions in gCO₂eq./km

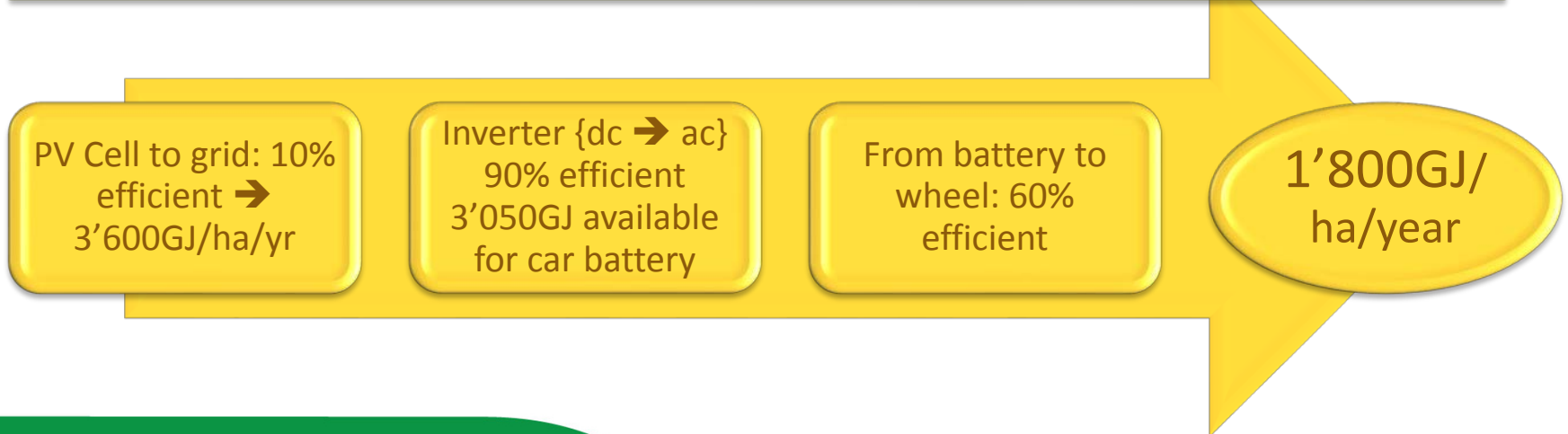


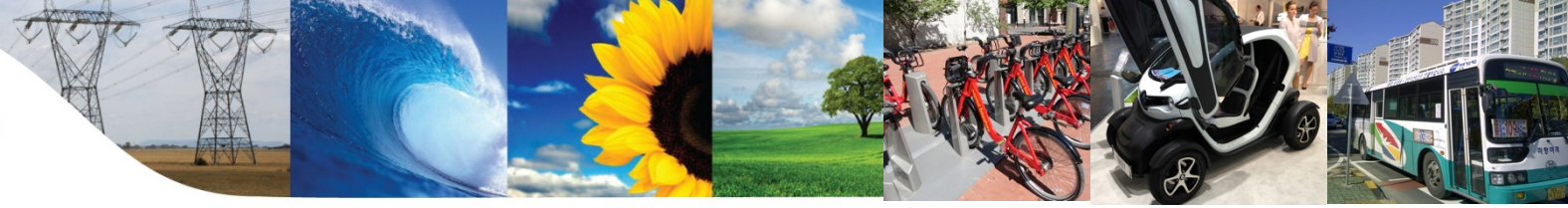
* reference vehicle: gasoline engine (induction engine), consumption 7 l per 100 km

How much energy/hectare/year?

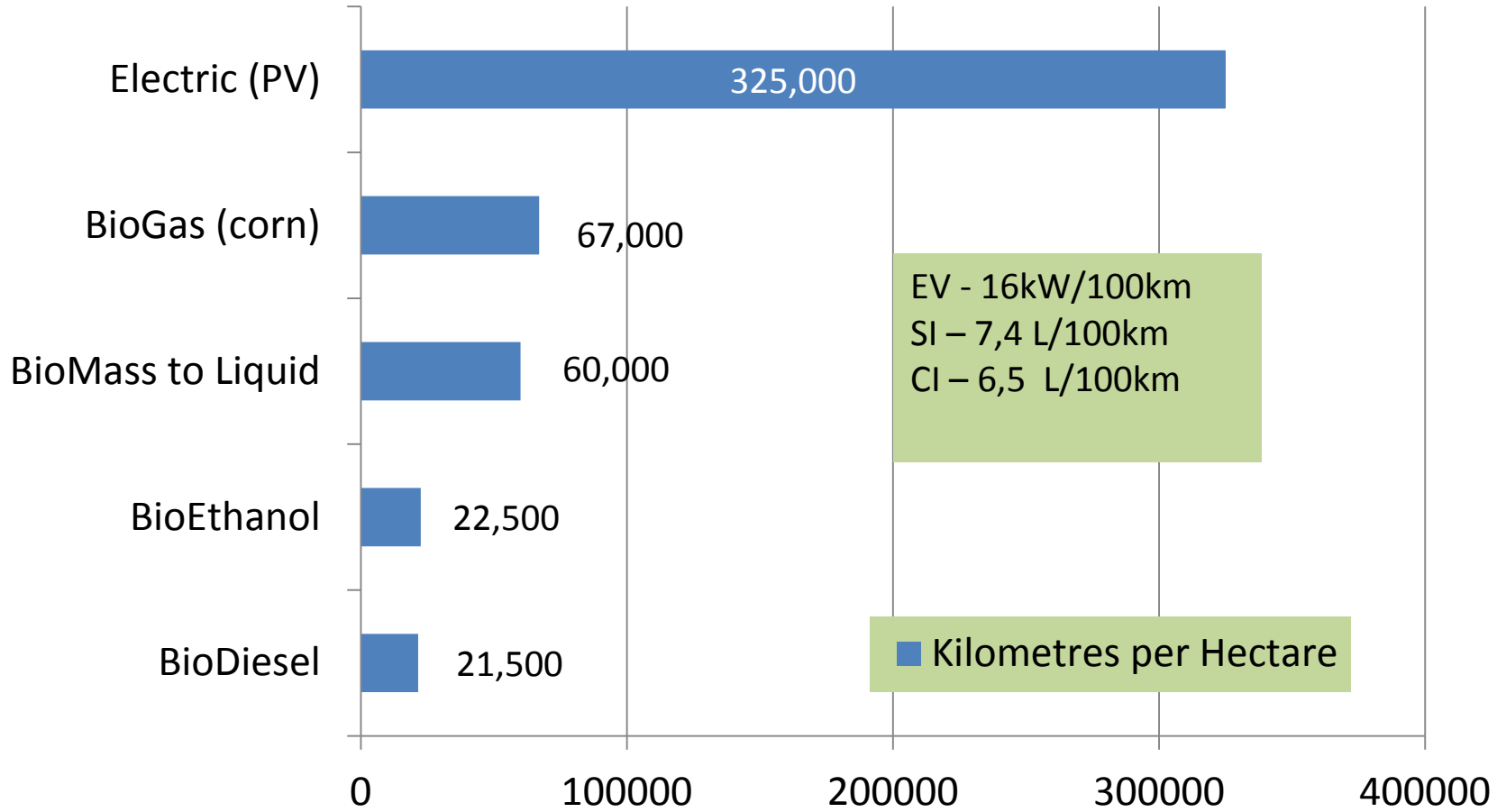


Solar beats **Biomass** 40-100 times!





Kilometres per Hectare



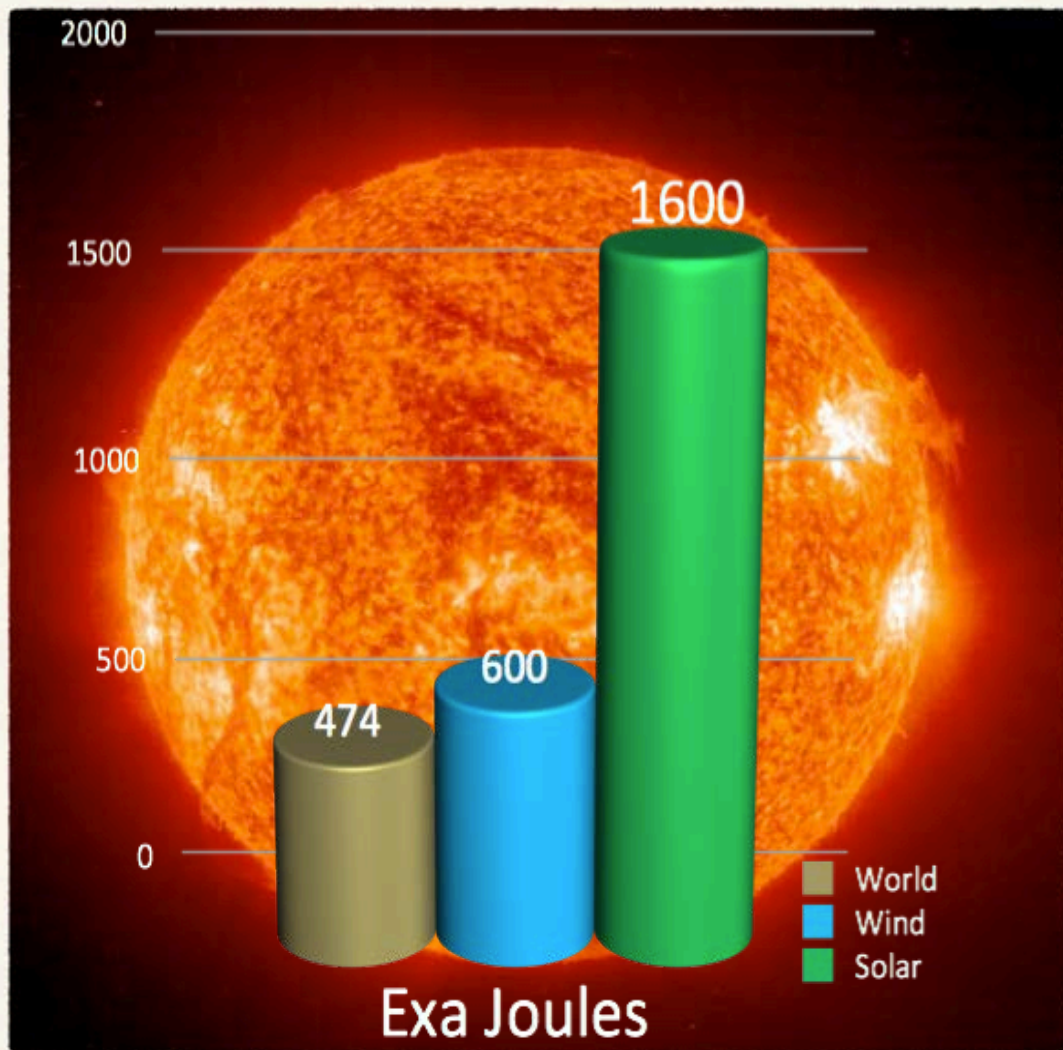
Home & eCommuter



For Every Day			
Appliance	Wh/d	MJ/d	Cost
Kitchen	8'577	31	R 8,58
Rest	7'720	28	R 7,72
Outside	2'780	10	R 2,78
Total	19kWh	69	R 25
	Use of petrol or electricity	MJ/d	Cost
pCar 9L/100km	7,2 L 80km/day	205	R 100 R14/L
eCar 15kWh/100km	12 kWh 80km/day	43	R 16 R1,33/kWh
eCom 5kWh/100km	4 kWh 80km/day	14	R 5 R1,33/kWh



Energy from the SUN

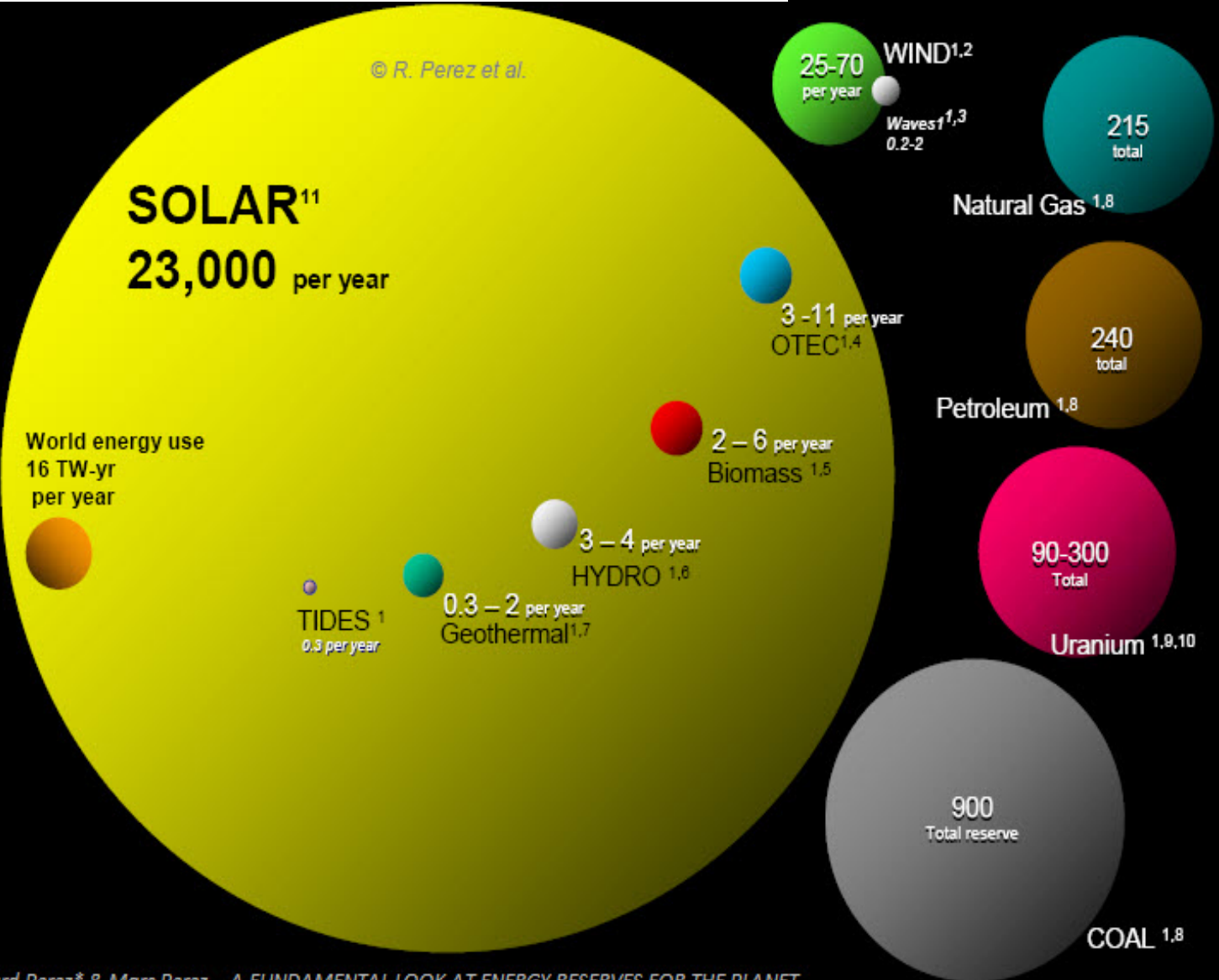


- Average = 80km per day
- Small electric commuter:
5kWh/100km = 4kWh/day
- PV electrical energy
 - 5kWh per day
 - 1kW array = 5 x 200W panels
 - 10m²
- PV cells cost – R30'000,
once-off, for 25 years
- PV life = 500'000km
- 6c/km (no increase!)

Energy in Perspective



TW.yrs



source: Richard Perez* & Marc Perez - A FUNDAMENTAL LOOK AT ENERGY RESERVES FOR THE PLANET

Comparing finite and renewable planetary energy reserves (Terawatt-years). Total recoverable reserves are shown for the finite resources.