



World Energy Council
CONSEIL MONDIAL DE L'ENERGIE

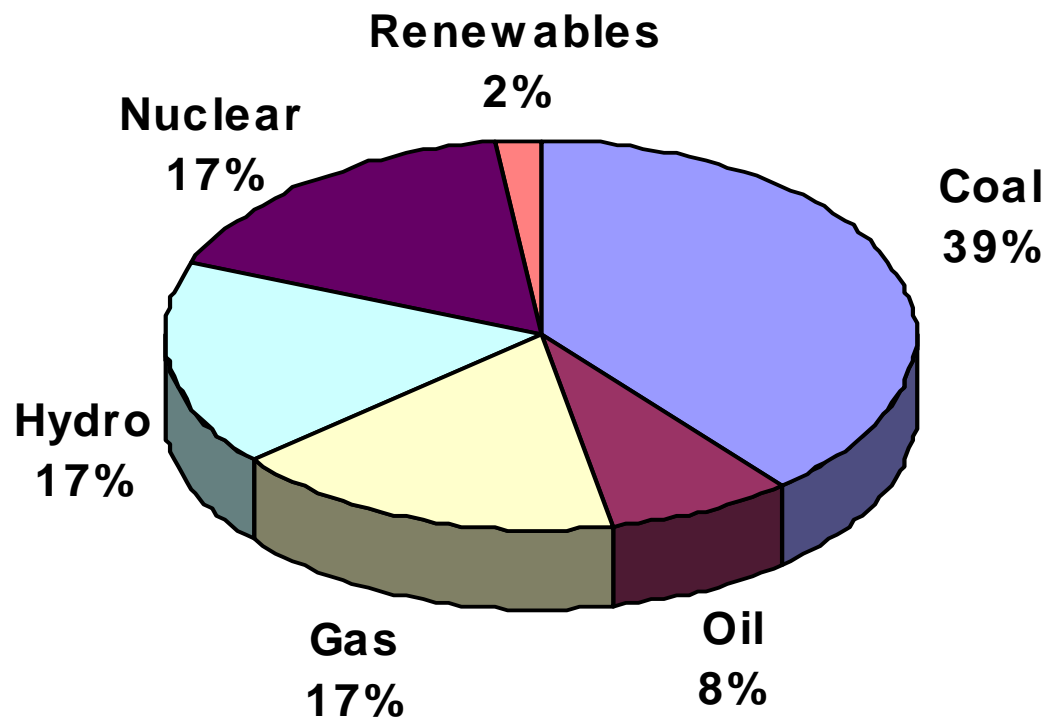
GLOBAL ENERGY



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World Energy Council**



World Electricity Production





Access to Energy

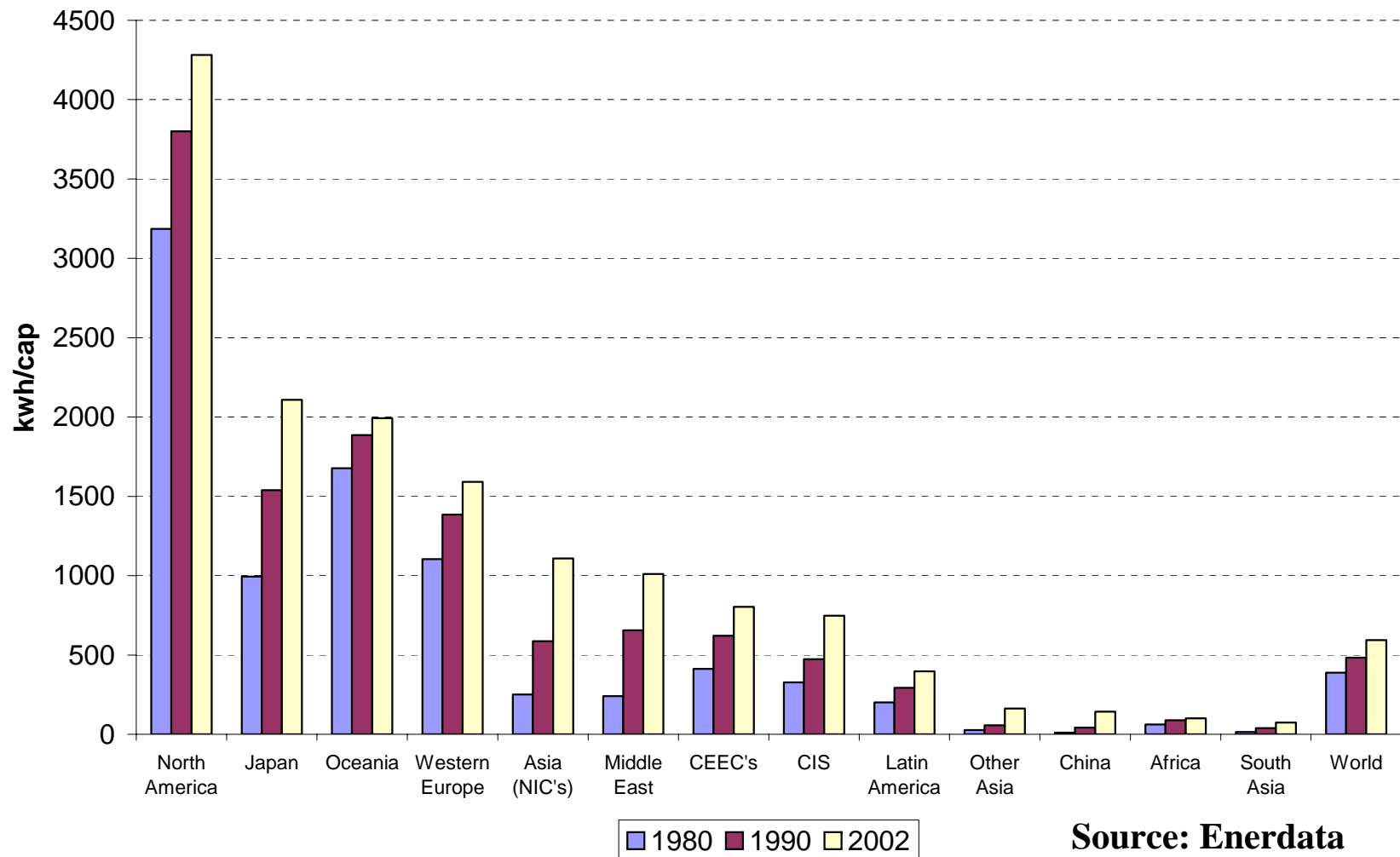
- **World**
 - 1970: 51%
 - 1990: 40%
 - 2000: 27%
- **Africa** 34%
- **South Asia** 41%



Access to Electricity

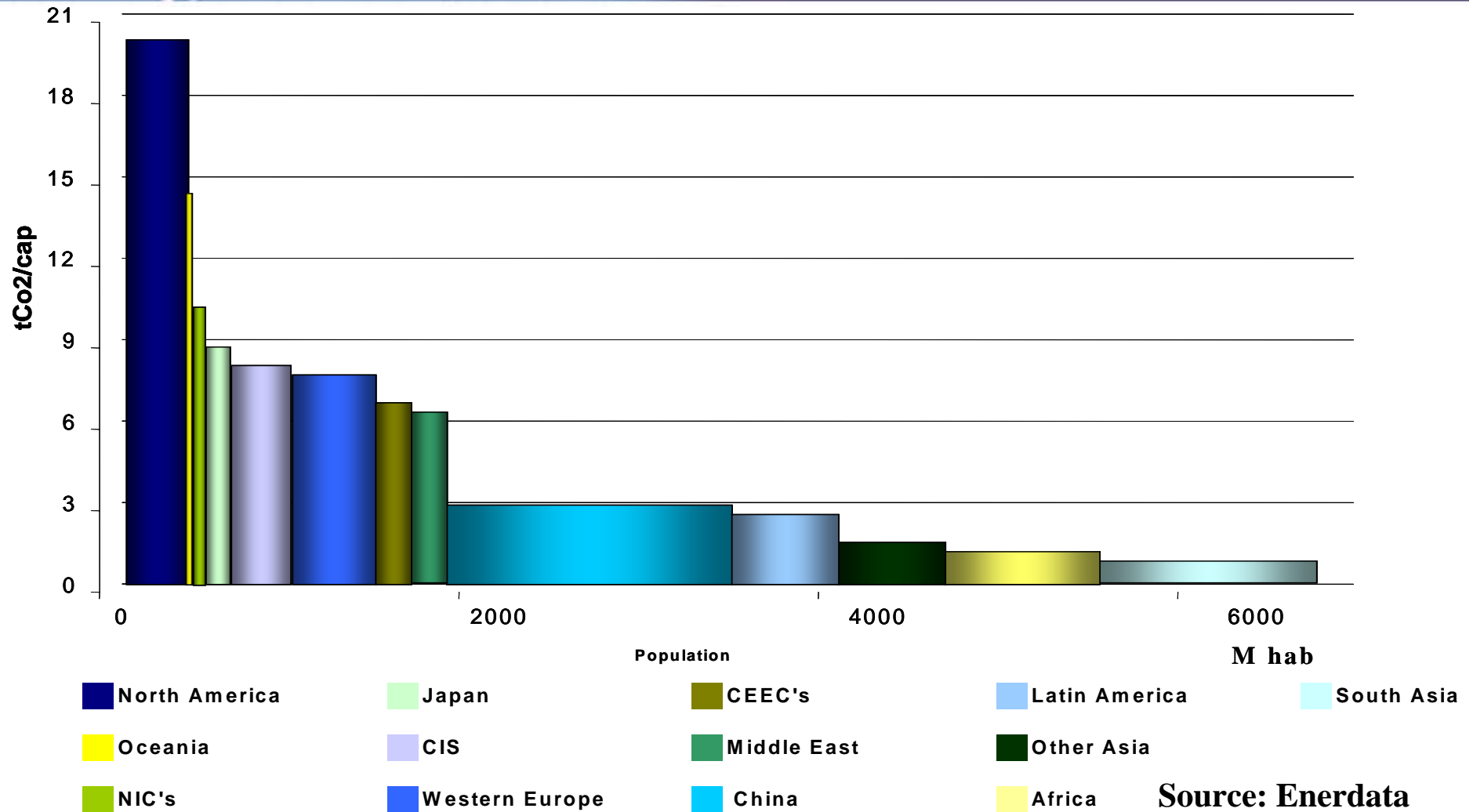
- **2bn people: 5% of the current world's electricity consumption**
- **ODA Commitment 0.7% of GDP**
 - **US\$100 billion per year**
- **Total requirement US\$665 billion over the next 30 years**
- **US\$22 billion pa / US\$20 billion for Coke**

Household Electricity Consumption



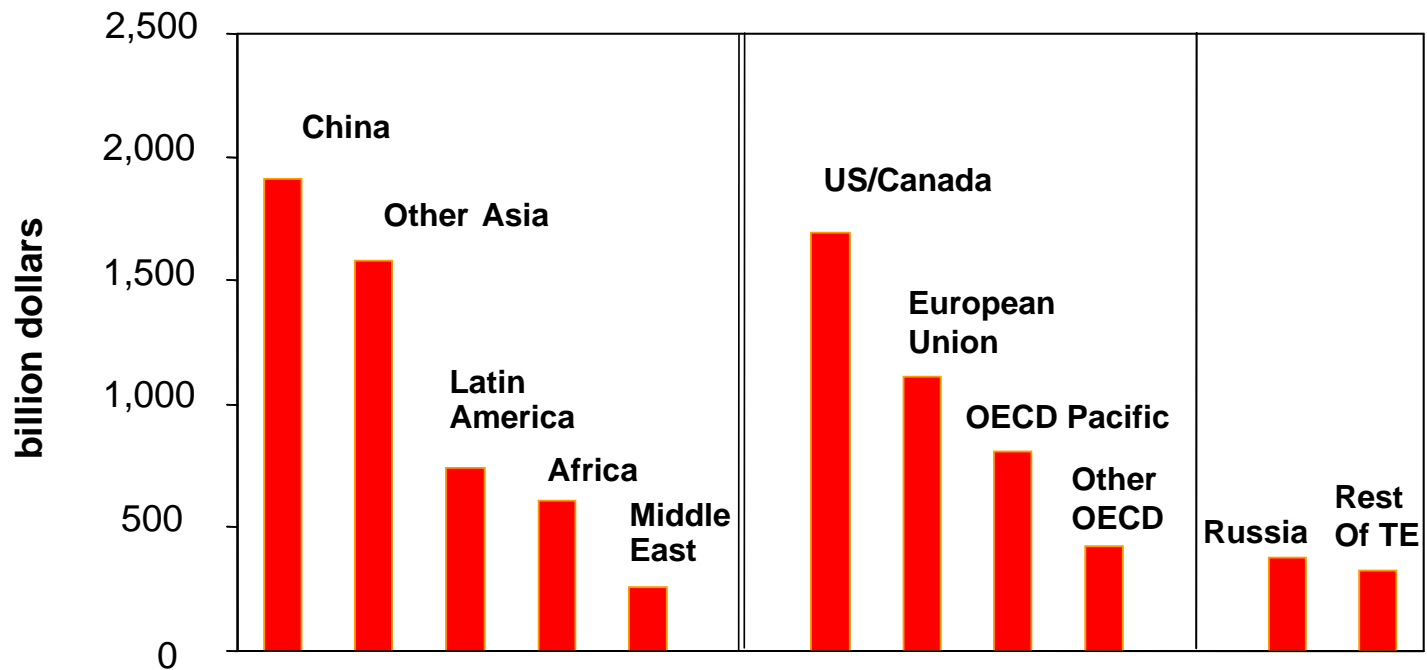
Source: Enerdata

CO₂ Emissions per Capita





Electricity Sector Investment by Region 2001 - 2030



Source: World Energy Investment Outlook, IEA - modified

DATA ON INVESTMENT, PRODUCTION AND EXTERNAL COSTS OF ELECTRIC POWER PLANTS

Type of plant	Average Investment cost * (€/ kW)	Production cost * (including exploitation, investment amortization, fuel and R&D) (€/ MWh)	External costs ** (€/ MWh)	Rate external cost / production cost (%)
Nuclear	1730	29	0.05 – 4.8	0.2 – 17 %
Coal (CFB)	1273	33	19 – 99	58 – 300 %
Gas (CCGT)	488	35	7 - 31	20- 89%
Hydro		40	0.04 – 6.03	0.1 – 15 %
Micro Hydro	1250			
Wind (terrestrial)	1000	45	0.5 – 2.6	1.1 – 5.8 %
Solar PV (grid - connected)	8000	650	1.4 – 3.3 (only one study)	0.2 – 0.5 %
Biomass	1200	128	2.0 - 50	1.6 - 39 %
Geothermal	1830	55***	0.2 – 0.5***	4 – 14%

* Source Eurostat Les Echos march 2003

** Source European Commission ExternE 1999

*** Source IGA 2004



Life Cycle Emissions

Life Cycle Emissions g/kWh	CO ₂ G/kWh	SO ₂ g/kWh	NO _x g/kWh
Coal Best Practice (UK)	955.00	11.80	4.30
Coal FGD and low NO _x (UK)	987.00	1.50	2.90
Gas CCGT (UK)	430.00	-	0.50
Hydro small scale	9.00	0.03	0.07
Hydro large scale	3.60-11.60	0.009-0.024	0.003-0.006
Wind	7.00-9.00	0.02-0.09	0.02-0.06
Solar PV	98.00-167.00	0.20-0.34	0.18-0.30
Energy crops current practice	17.00-27.00	0.07-0.16	1.10-2.50
Energy Crops future practice	15.00-18.00	0.06-0.08	0.35-0.51
Geothermal	79.00	0.02	0.28