

Effetto serra: siamo prudenti, intervendiamo subito

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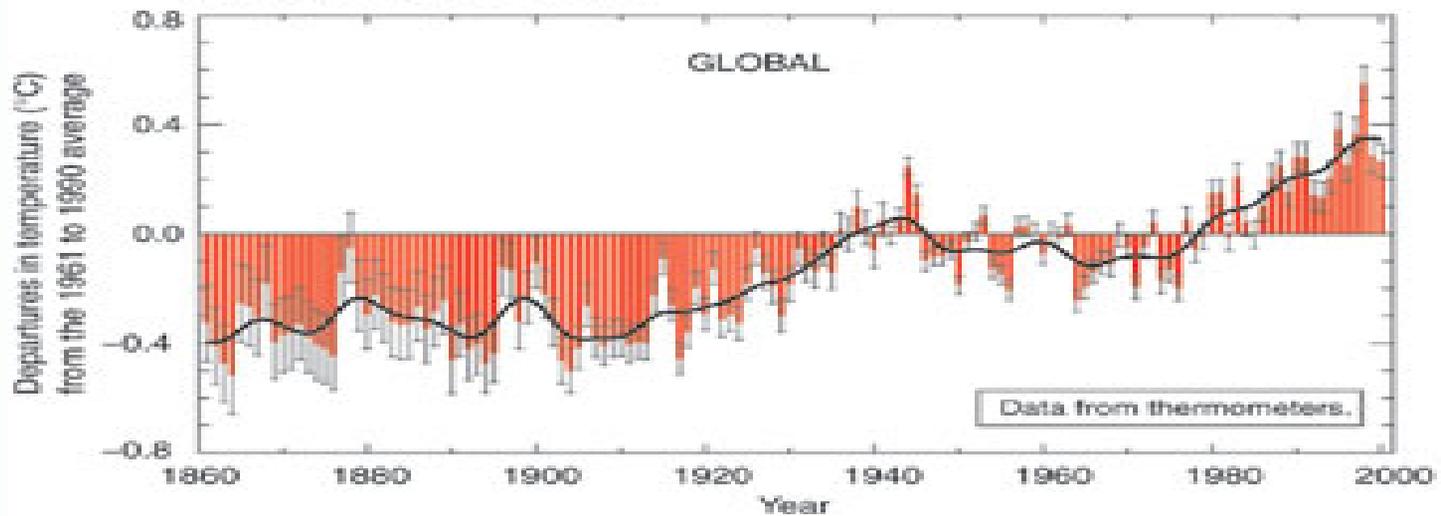


Aumentano le concentrazioni di gas climalteranti

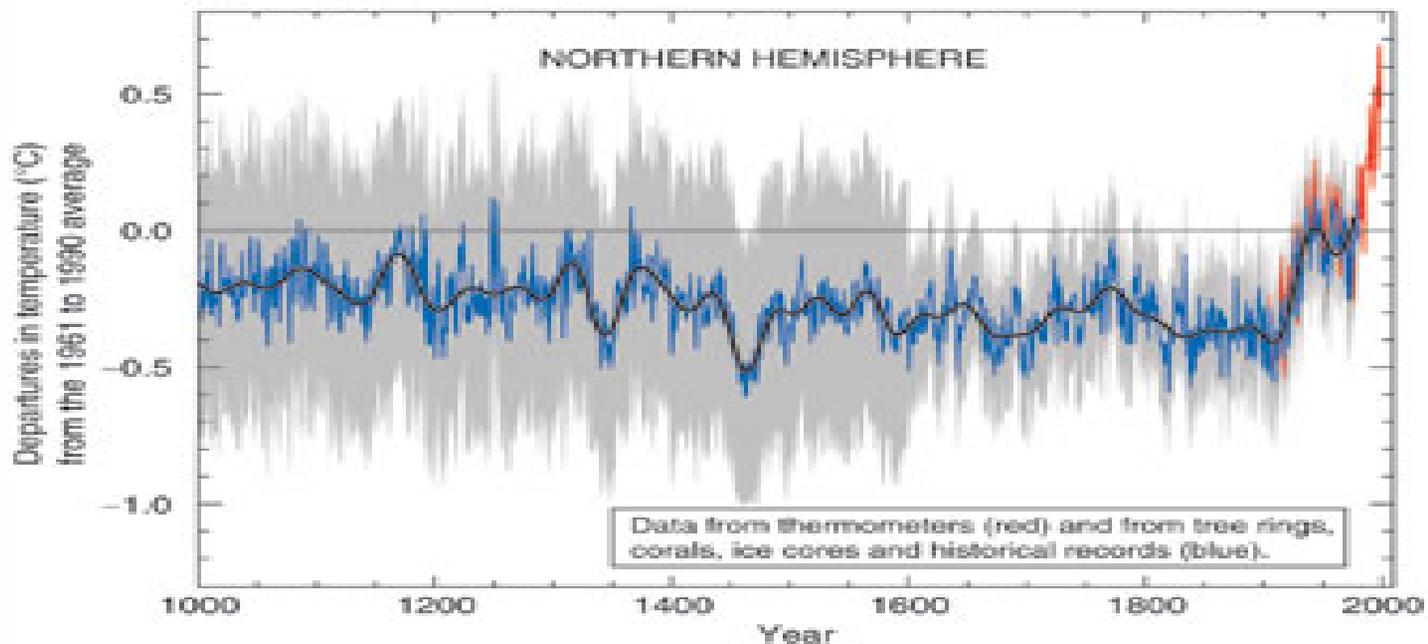
- La concentrazione atmosferica di **anidride carbonica** (CO_2) è aumentata di circa il 30% dal 1750 fino ad oggi
- La presente concentrazione di CO_2 non e' mai stata superata negli ultimi 420.000 anni
- La concentrazione di **metano** (CH_4) è aumentata di circa il 150% dal 1750 fino ad oggi

Variations of the Earth's surface temperature for:

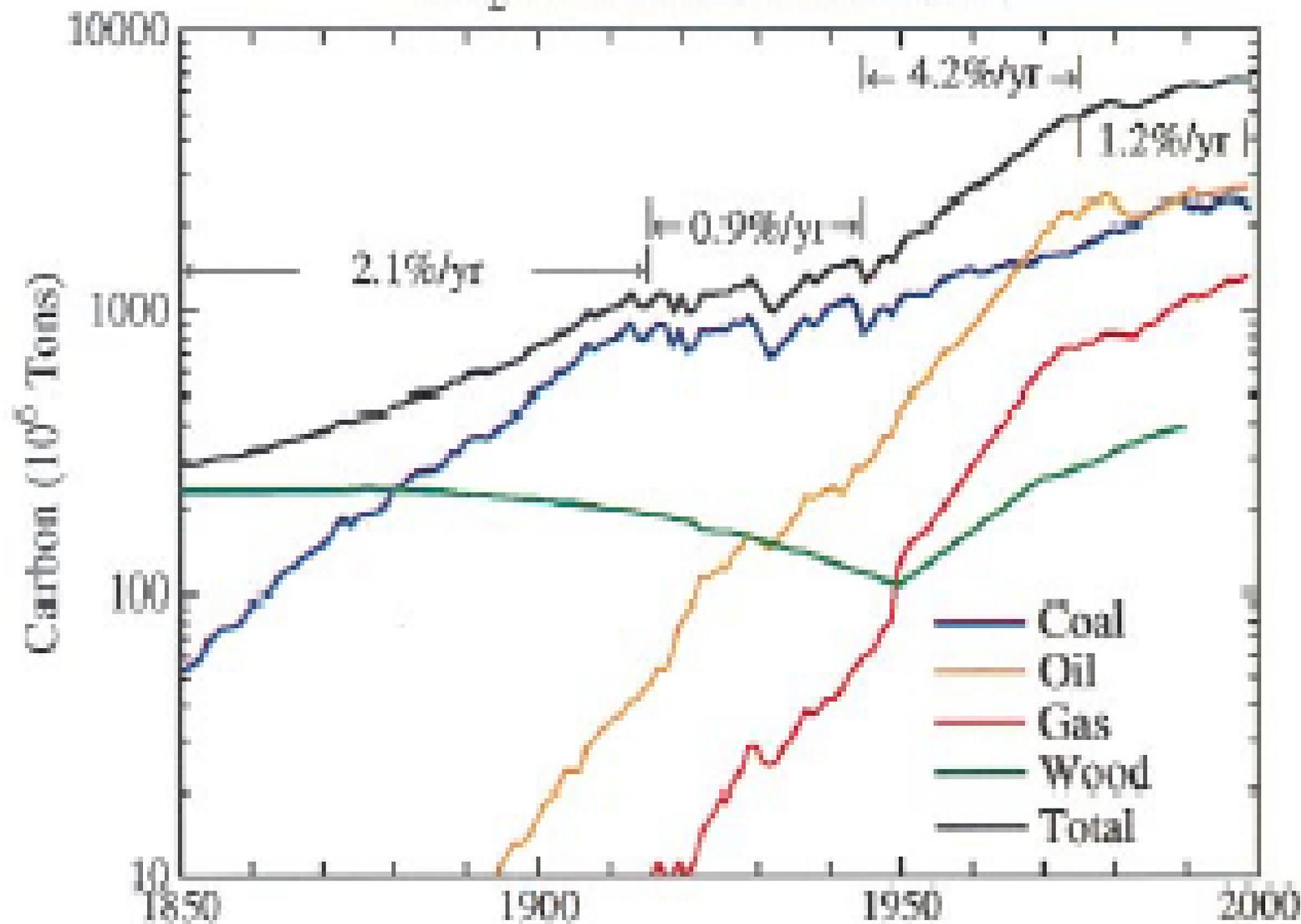
(a) the past 140 years



(b) the past 1,000 years



CO₂ Emissions from Fuels



Growth Rates of Greenhouse Gas Forcing (5-Year Mean)

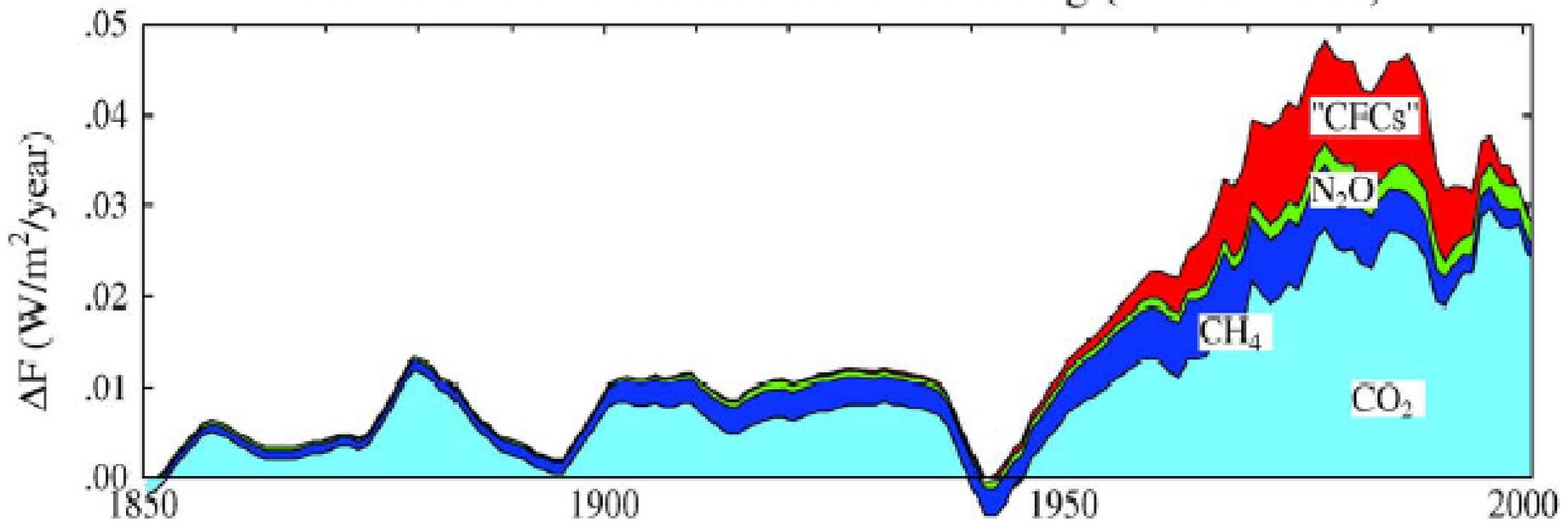


Figure 9. Growth rate of climate forcing by well-mixed greenhouse gases (5-year mean), O_3 and stratospheric H_2O , which were not well measured, are not included [Reference 1a].

Climate Forcings (W/m^2): 1850-2000

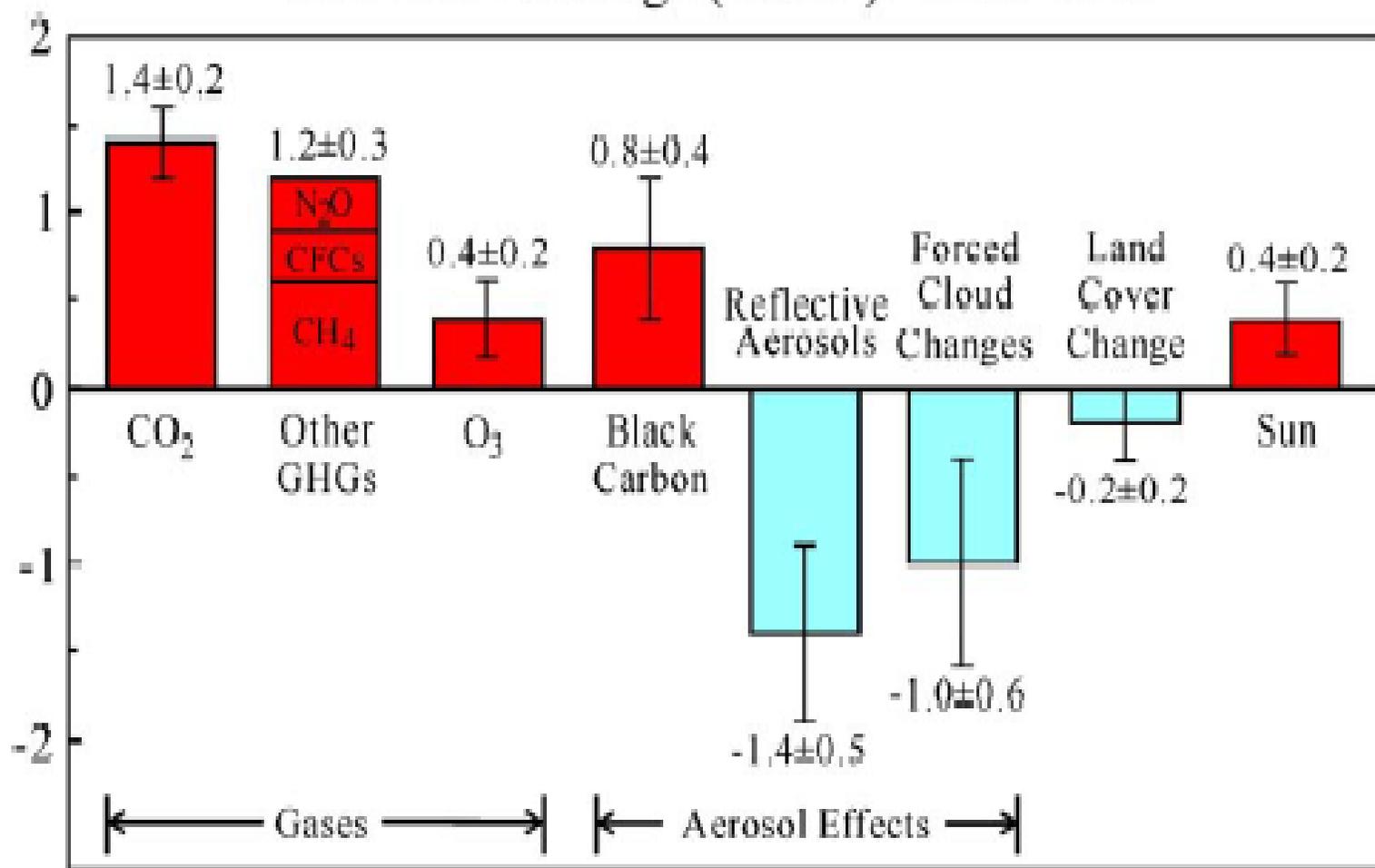


Figure 4. Climate forcing agents in the industrial era. Error bars are partly subjective 1σ (standard deviation) uncertainties.

Convergente preoccupazione sui rischi climatici

- *2001, IPCC : “new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities”*
- *2001, NAS, Rapporto della National Academy of Sciences commissionato da Bush: "global warming could well have serious adverse societal and ecological impacts by the end of this century"*

Ghiacciai in ritirata (nelle Alpi sciolto il 15% negli ultimi 20 anni)



1979

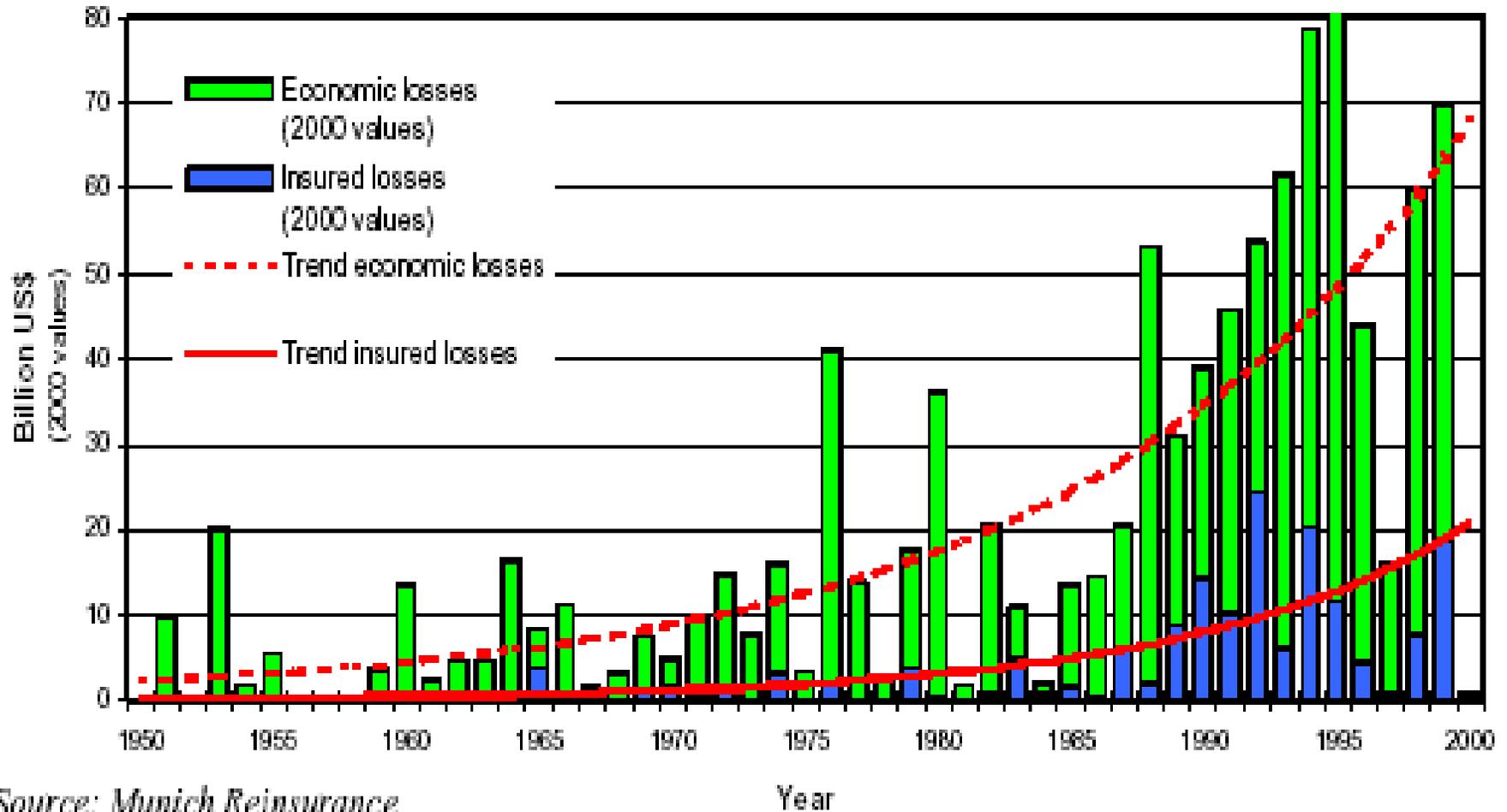


2002

Aletsch (CH)

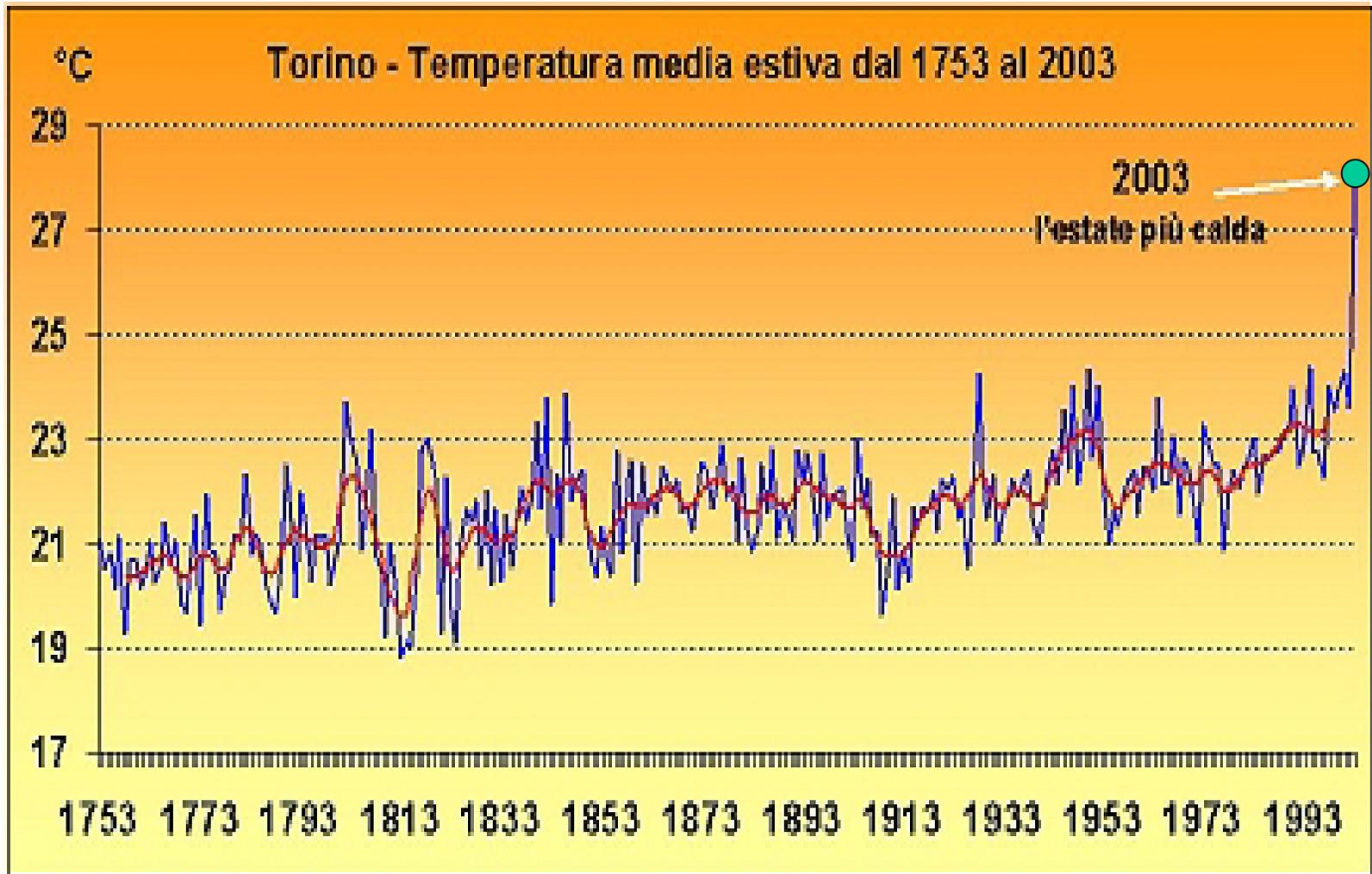
Great Natural Disasters 1950 – 2000

Economic and insured losses with trends



Source: Munich Reinsurance

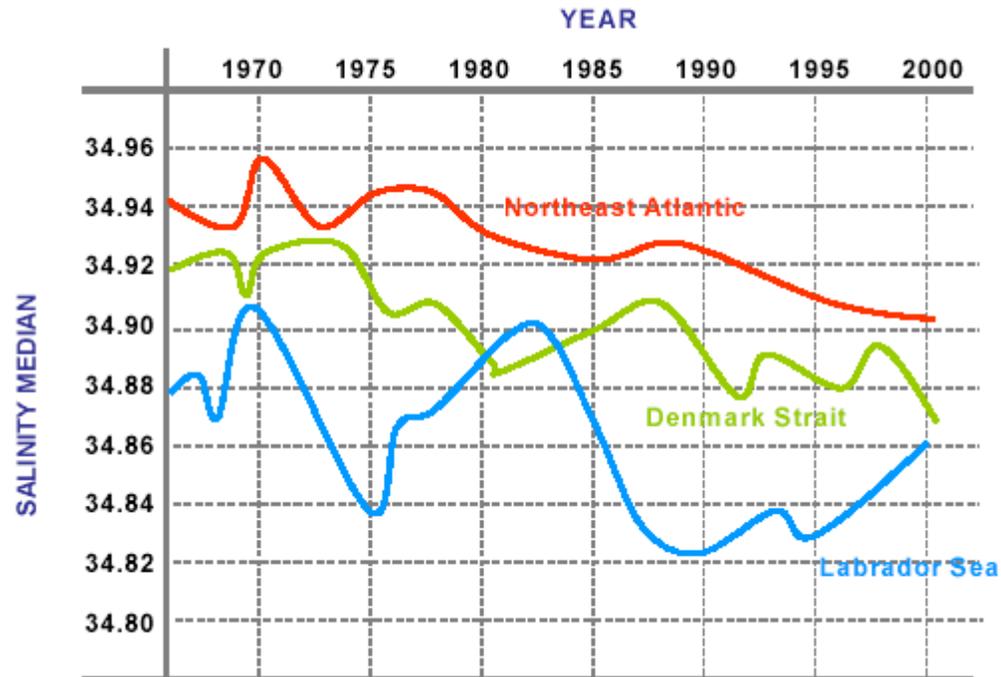
Estate 2003: almeno 20.000 morti in Europa



Allarme per possibili accelerazioni dei cambiamenti climatici

- **National Academy of Sciences, 2002**, *“Abrupt climate change is a real, recurrent phenomenon. There is no reason to believe that abrupt climate changes will not occur again”*
- **Pentagono, 2003**, *An Abrupt Climate Change Scenario and Its Implications for United States National Security*
“A scenario that although not the most likely, is plausible, and would challenge United States national security in ways that should be considered immediately”

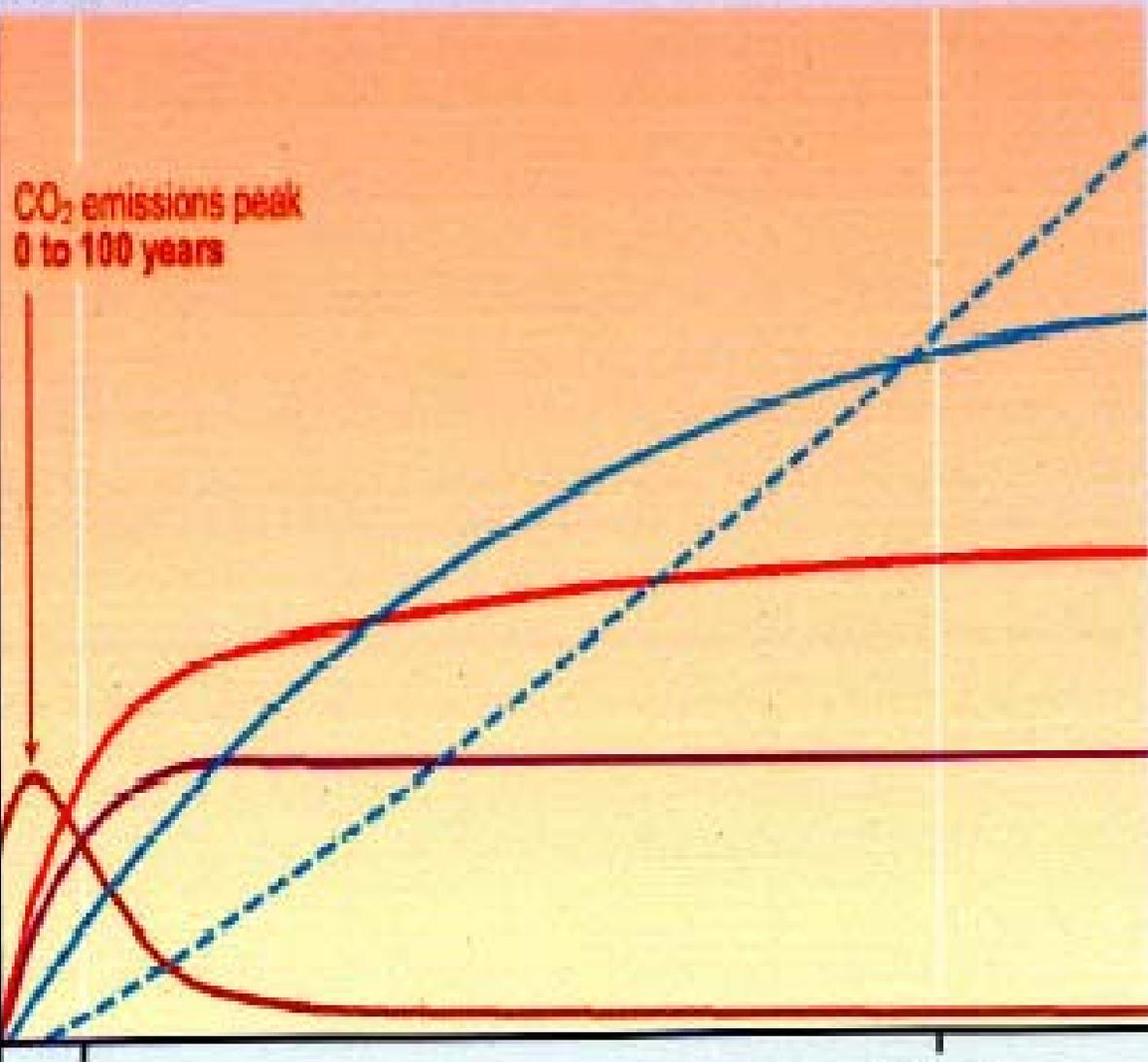
Possibilità che avvengano cambiamenti improvvisi
come l'interruzione della Corrente del Golfo
(riduzione della salinità nel Nord Atlantico)



Delicati equilibri climatici che, se alterati, possono portare mutamenti irreversibili per centinaia di anni

Magnitude of response

Time taken to reach equilibrium



Sea-level rise due to ice melting:
several millennia

Sea-level rise due to thermal expansion:
centuries to millennia

Temperature stabilization:
a few centuries

CO₂ stabilization:
100 to 300 years

CO₂ emissions

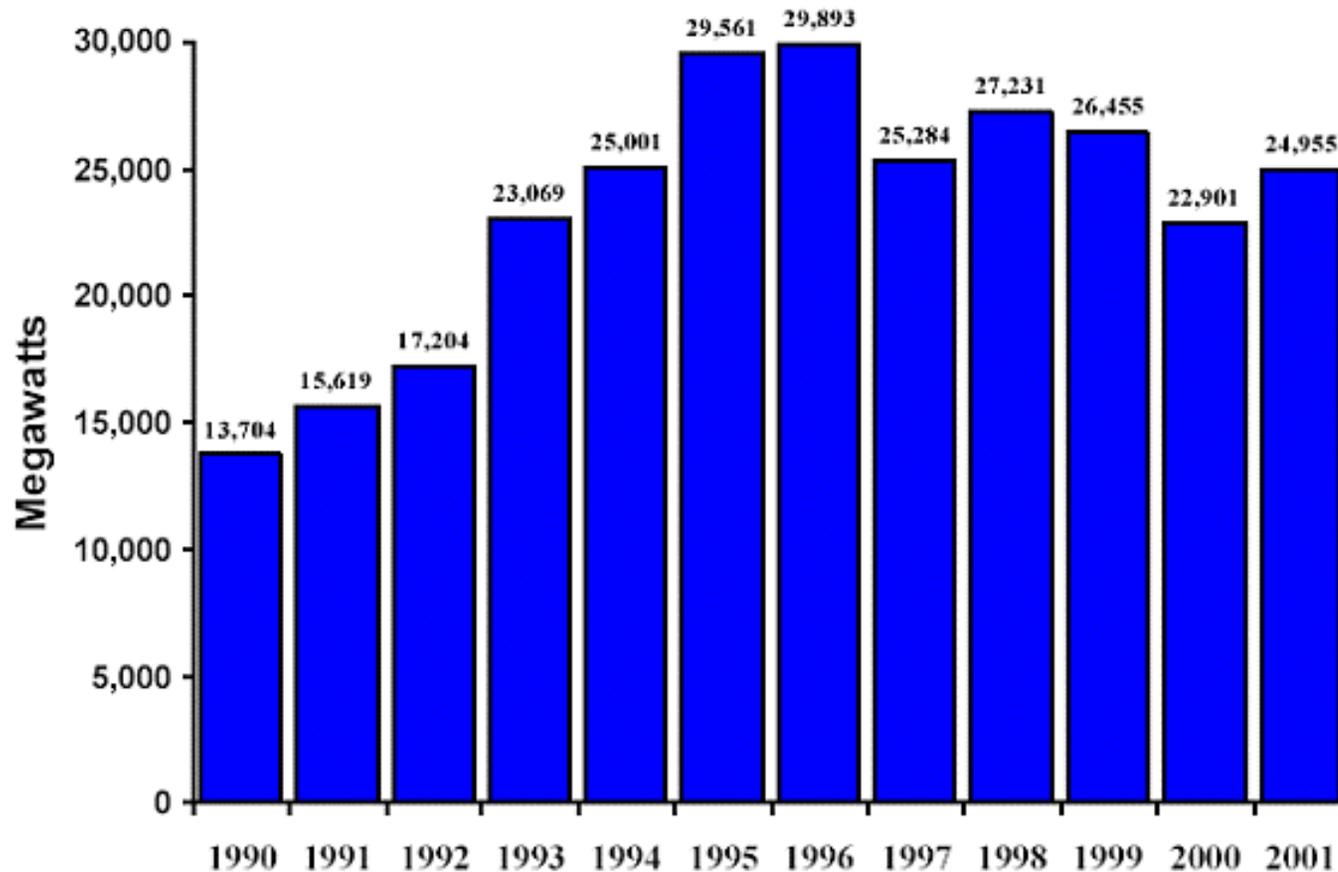
Today 100 years

1000 years

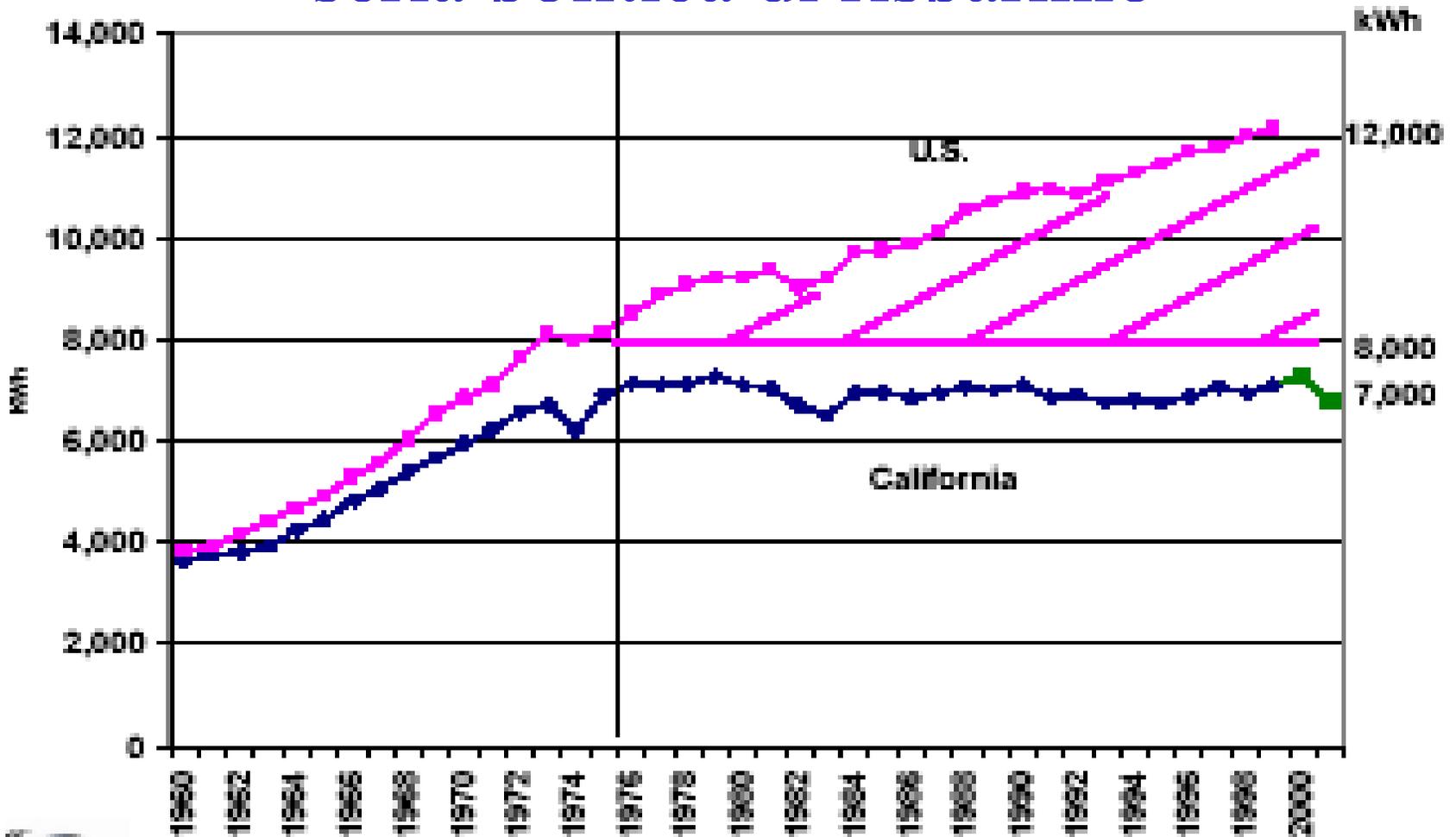
Intervenire è possibile, con costi
sopportabili
(anzi, talvolta guadagnandoci)

- L'obiettivo UE della riduzione dell'8% dei gas climalteranti dovrebbe comportare un costo pari allo 0,06% del Pil nel 2010

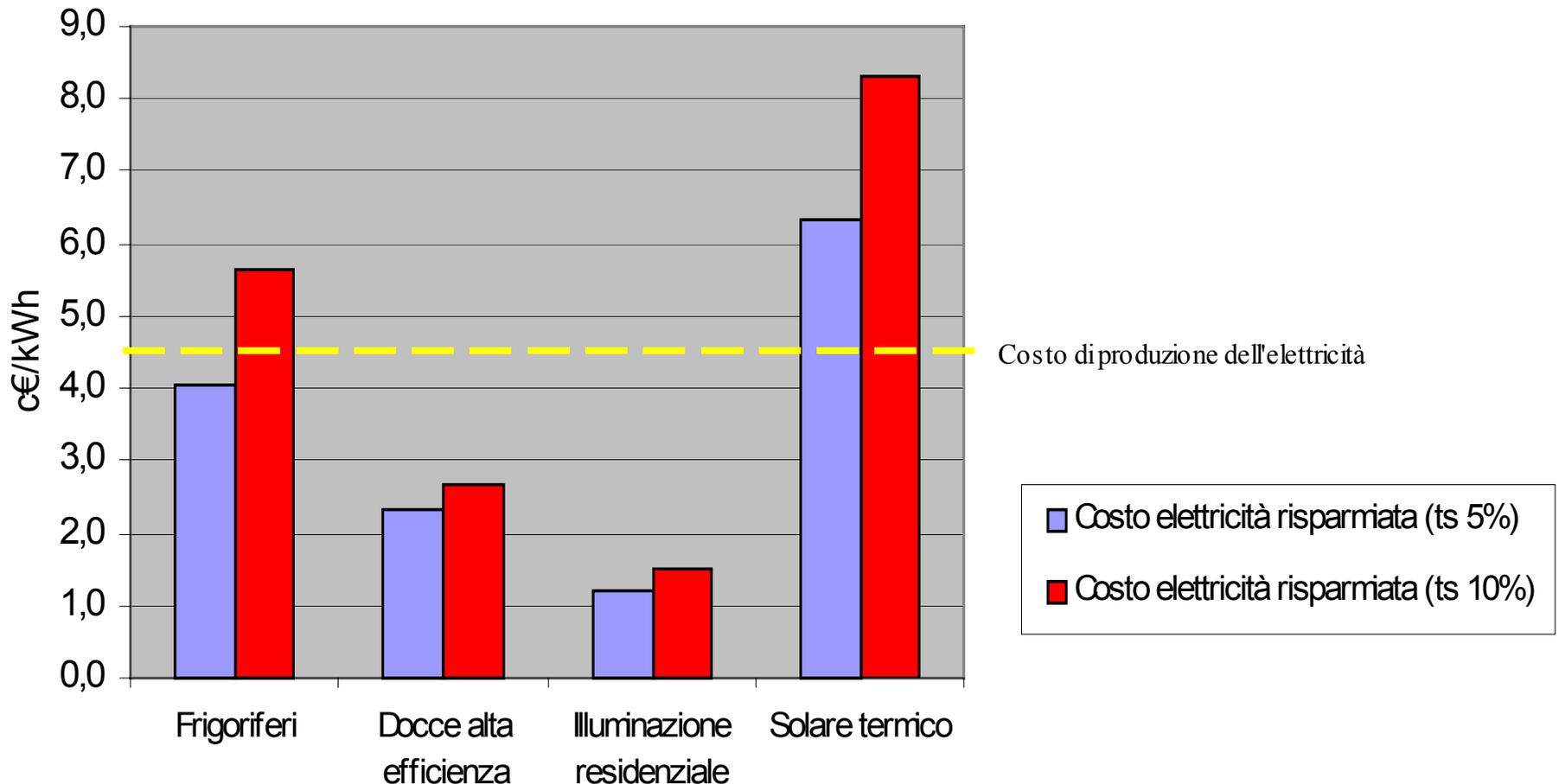
Riduzioni della potenza elettrica grazie agli interventi di risparmio delle compagnie elettriche statunitensi



Consumo elettrico pro capite in California e negli Usa: gli effetti di una seria politica di risparmio



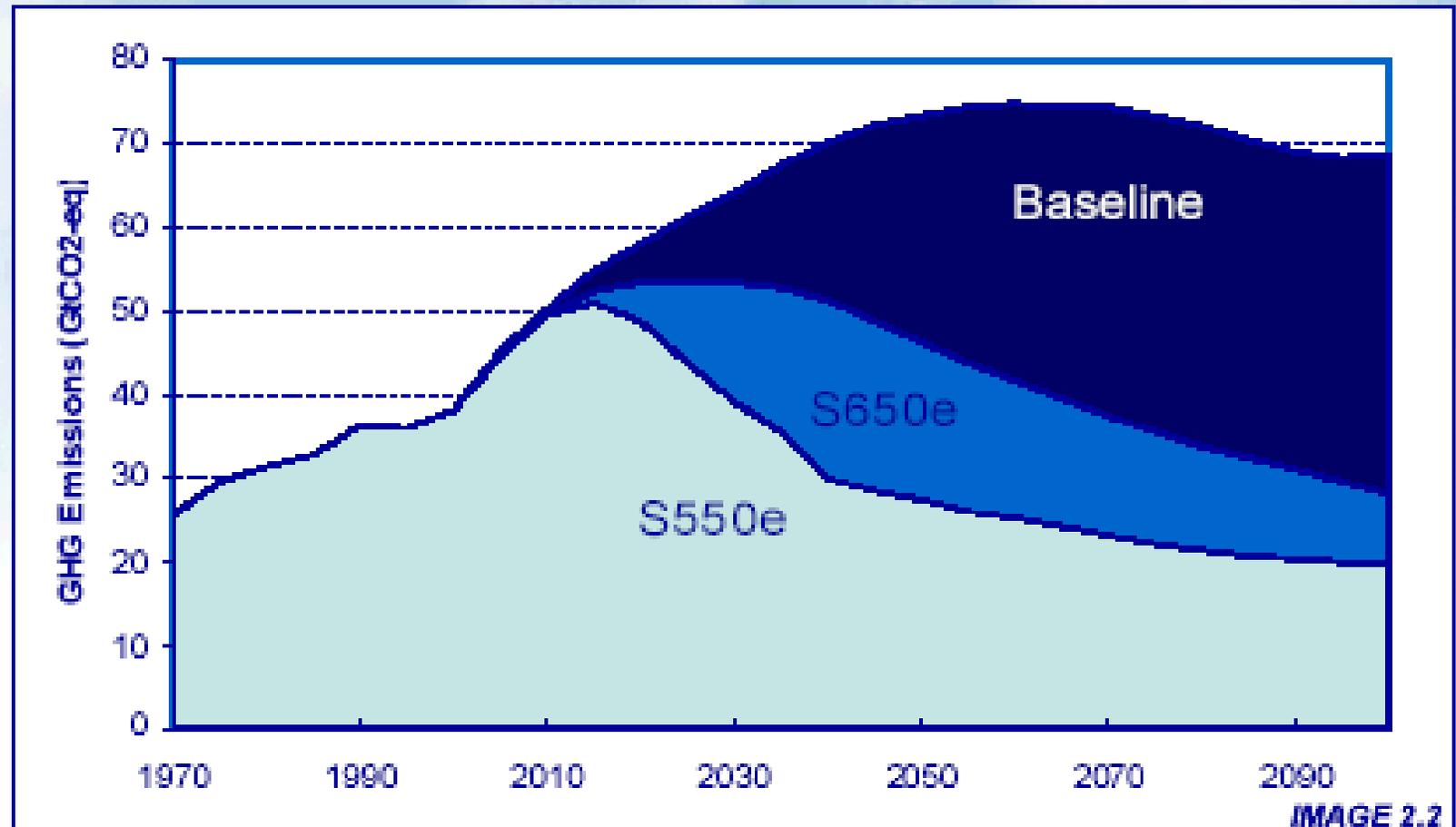
Il costo dell'energia conservata spesso è inferiore a quello della produzione di energia



Uno scenario per questo secolo

- Forte aumento dell'efficienza energetica (riduzione annua intensità en. 1-1,5%)
- Ritorno delle fonti rinnovabili su larga scala (50% dell'energia primaria tra il 2050-70)
- Creazione di un sistema solare-idrogeno che consenta uno sviluppo compatibile con gli equilibri climatici

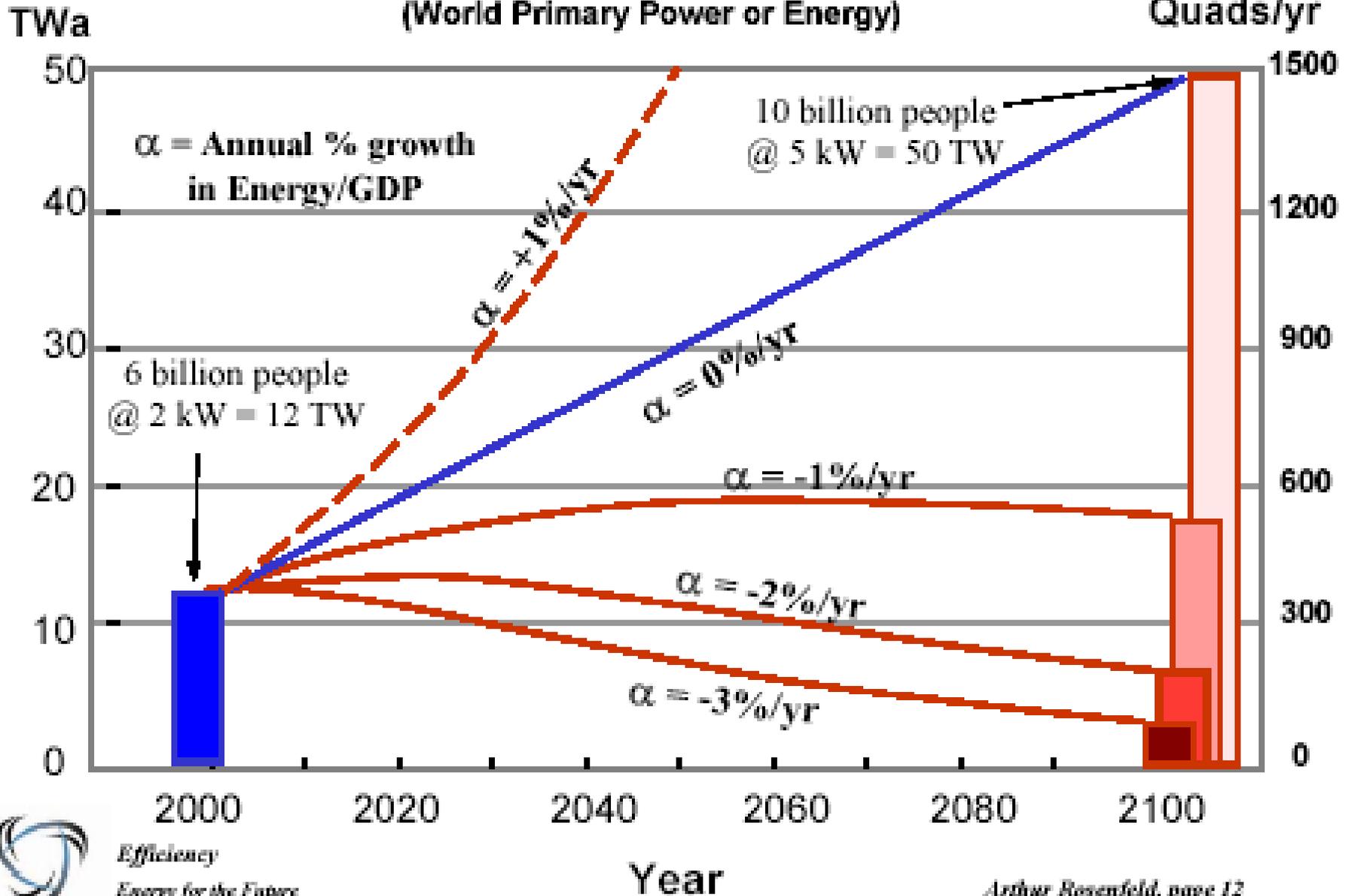
GRP: the S550e and S650e profiles



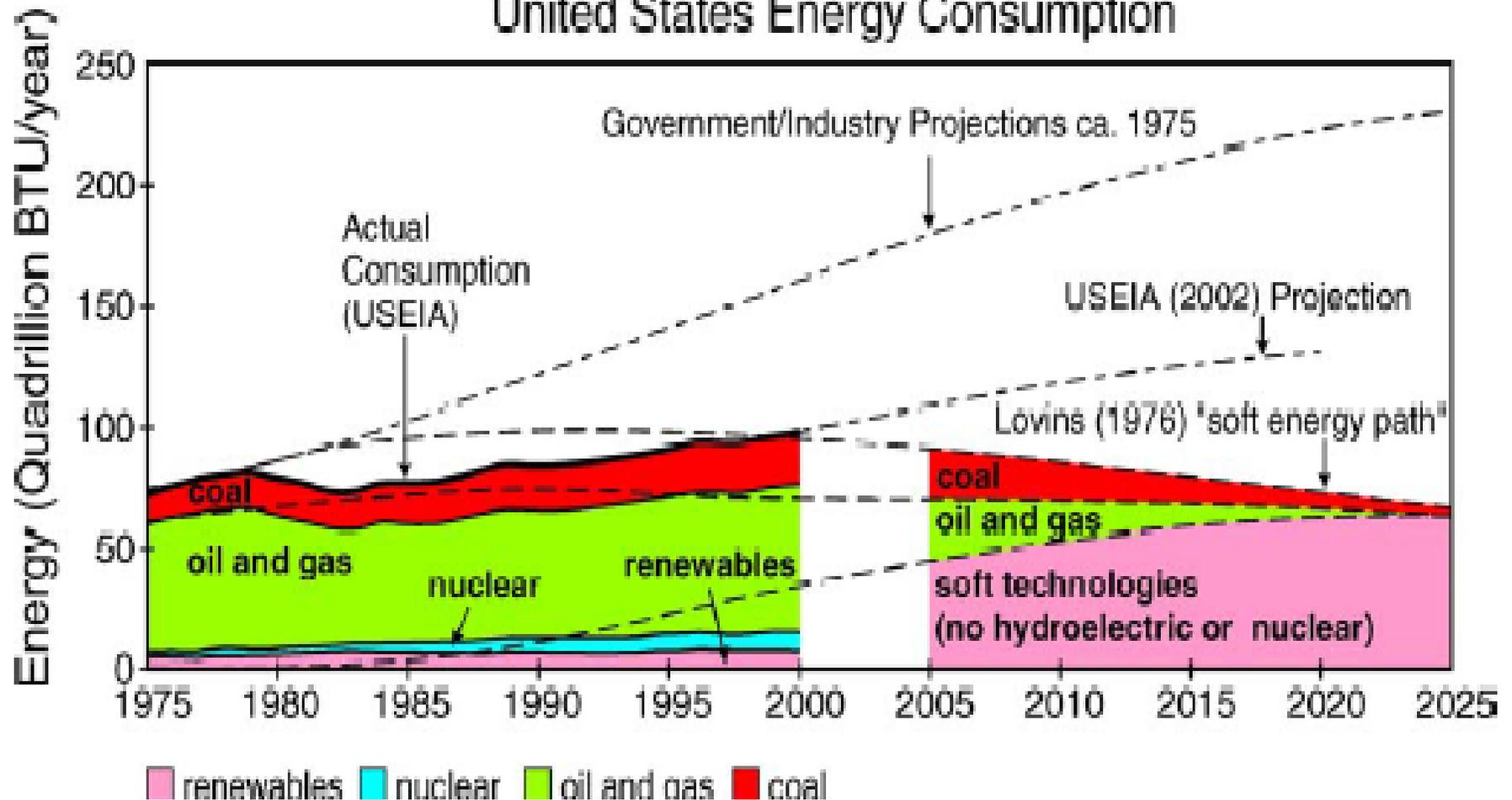
- ◆ By 2025, global reductions of 15 to 30 % from baseline are required, respectively in S650e and S550e
- ◆ By 2050, these reductions reach 35 to 65 %

The "Conservation Bomb"

(World Primary Power or Energy)



United States Energy Consumption



Energia eolica: un boom europeo...

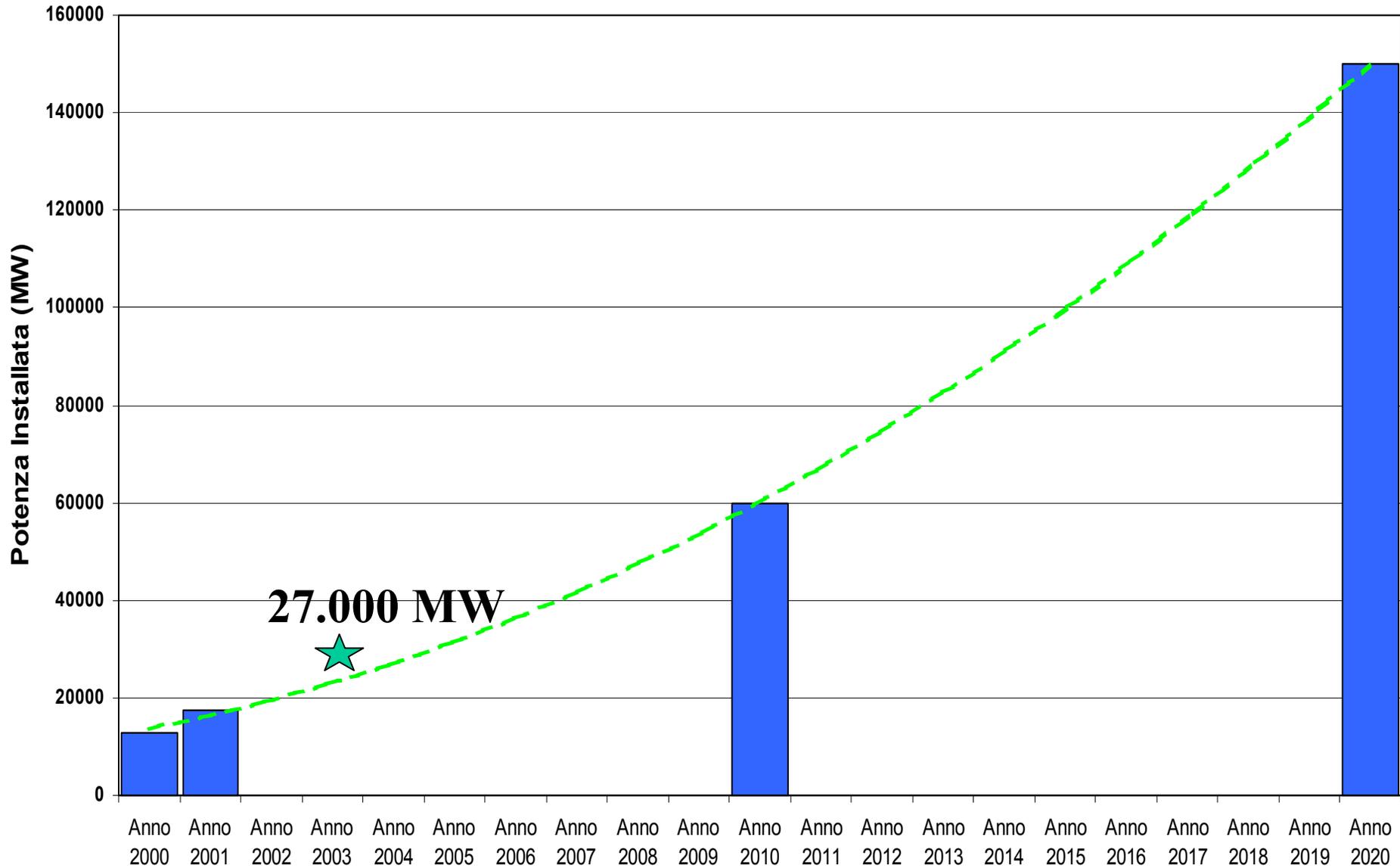
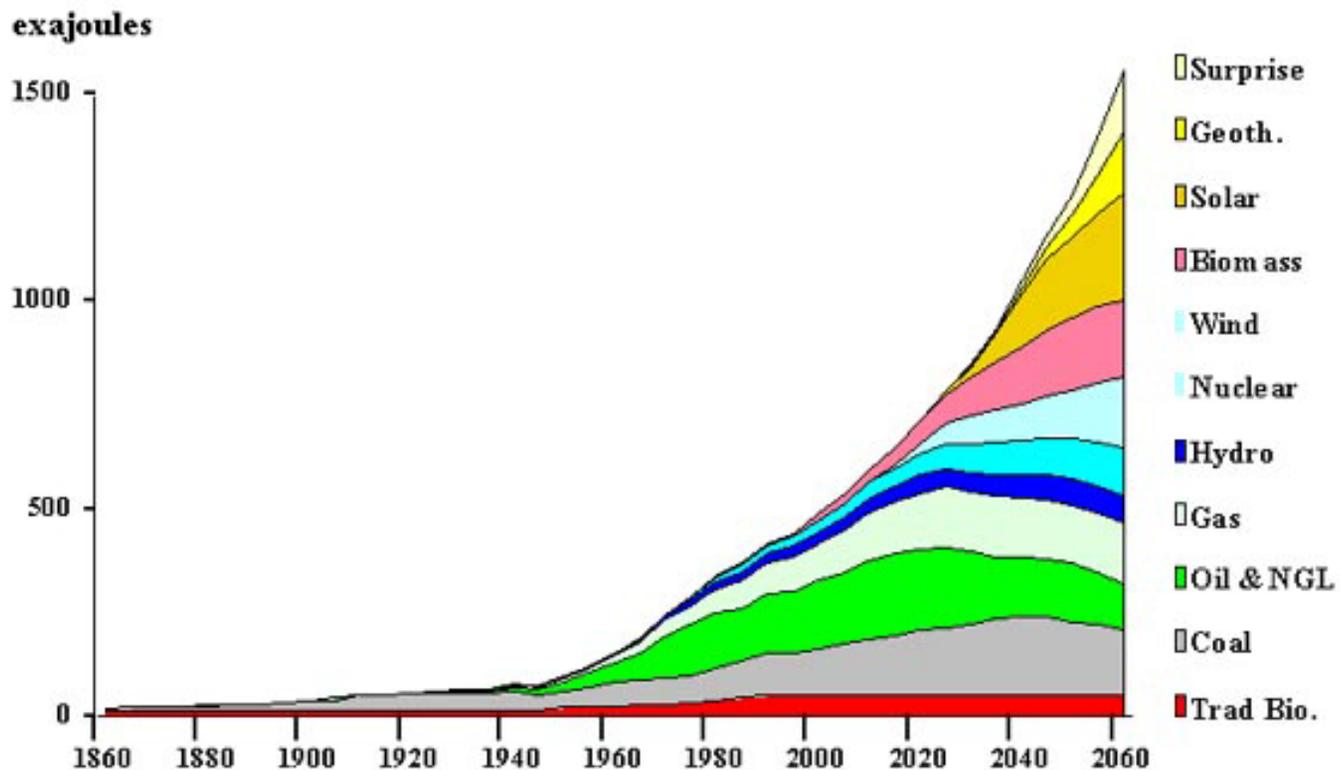


Figure 22: Energy Supply Sustained Growth Scenario



Source: Shell International Limited.