



AGROFÒRUM

El paper de l'agricultura al segle XXI

El panorama energètic global:
tendències i reptes de futur
Mariano Marzo,
Facultat de Geologia UB

DIJOUS 10 d'abril de 2014

INSTITUT D'ESTUDIS CATALANS Sala Prat de la Riba
CARRER DEL CARME, 47 BARCELONA

$$CO_2 \uparrow = \left(P \times \frac{PIB}{P} \times \frac{E}{PIB} \times \frac{CO_2}{E} \right) - CO_2 \downarrow$$

$CO_2 \uparrow$ = CO_2 net antropogènic a l'atmosfera

P = població mundial

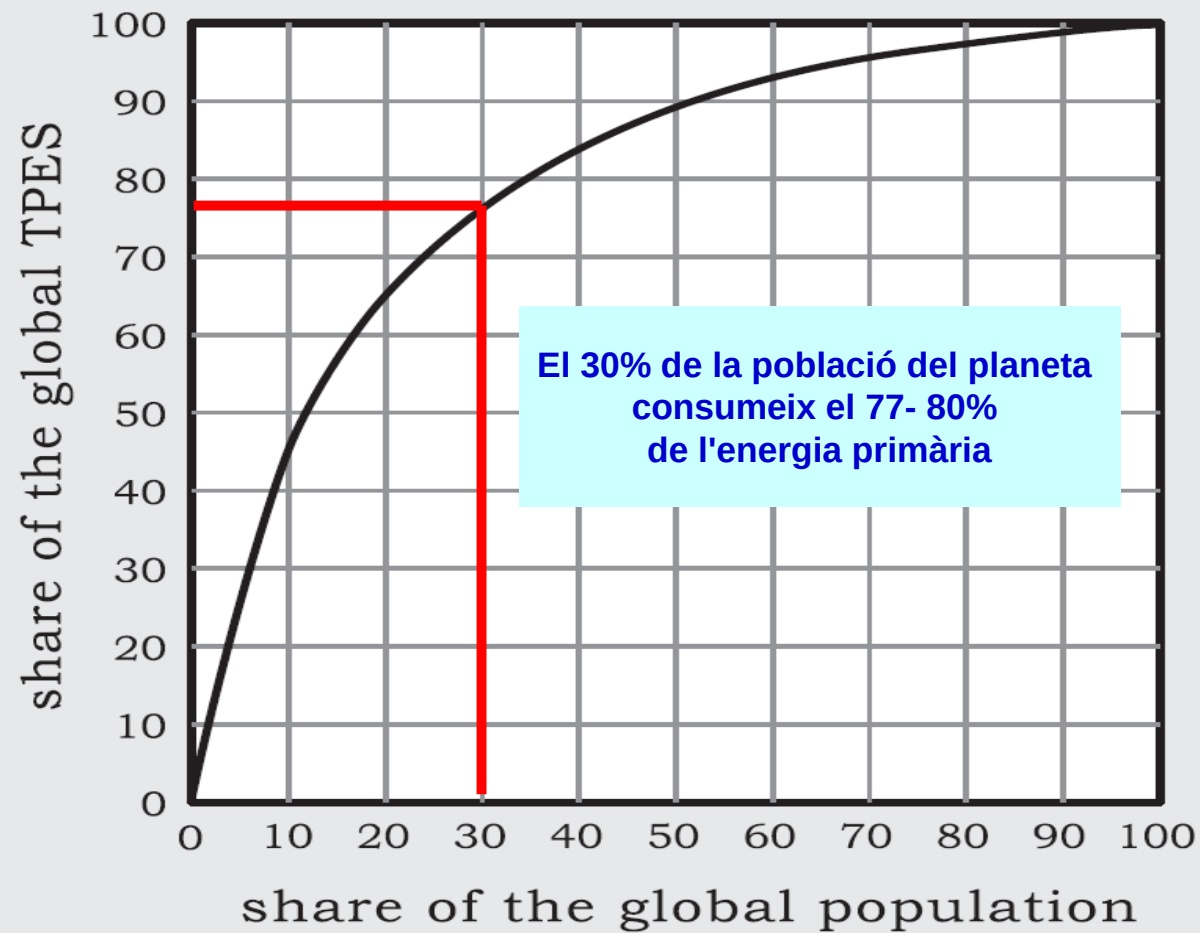
PIB / P = renda per càpita global

E / PIB = intensitat energètica del món

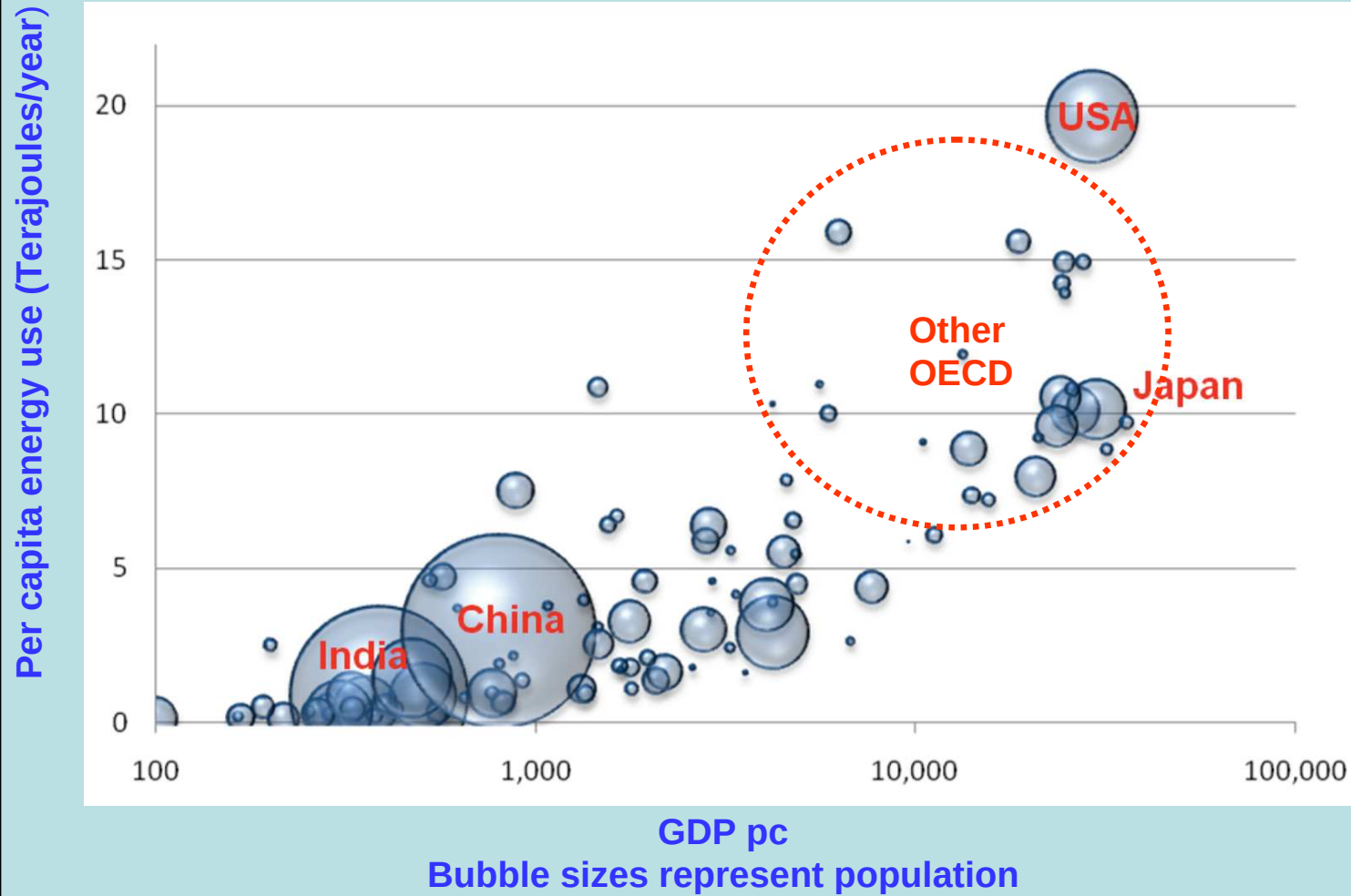
CO_2 / E = intensitat de carboni del mix energètic global

$CO_2 \downarrow$ = CO_2 segrestat per mitjans naturals o induïts

% Consum energètic vs. % població global



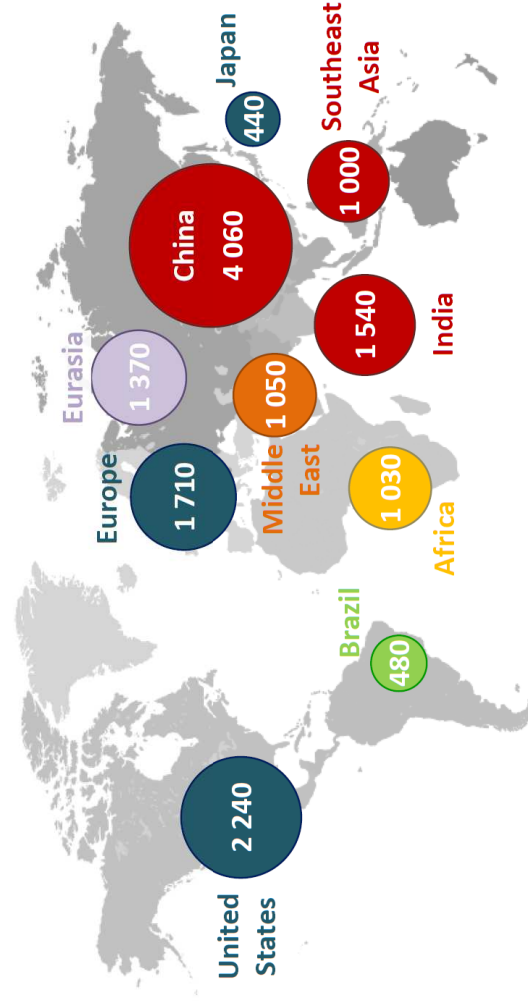
Per Capita Income and Energy Use, 2006 “the demonic bubble bath”



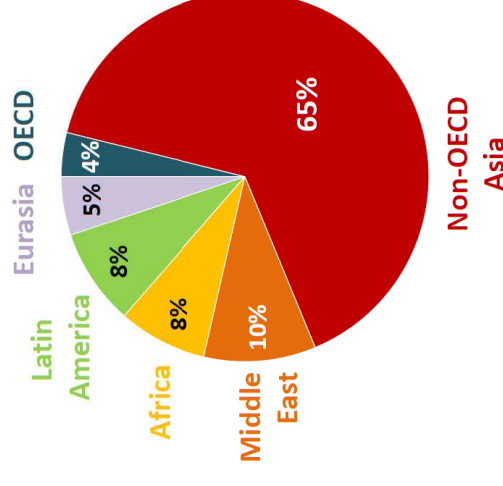
The engine of energy demand growth moves to South Asia

WORLD
ENERGY
OUTLOOK
2013

Primary energy demand, 2035 (Mtoe)



Share of global growth
2012-2035

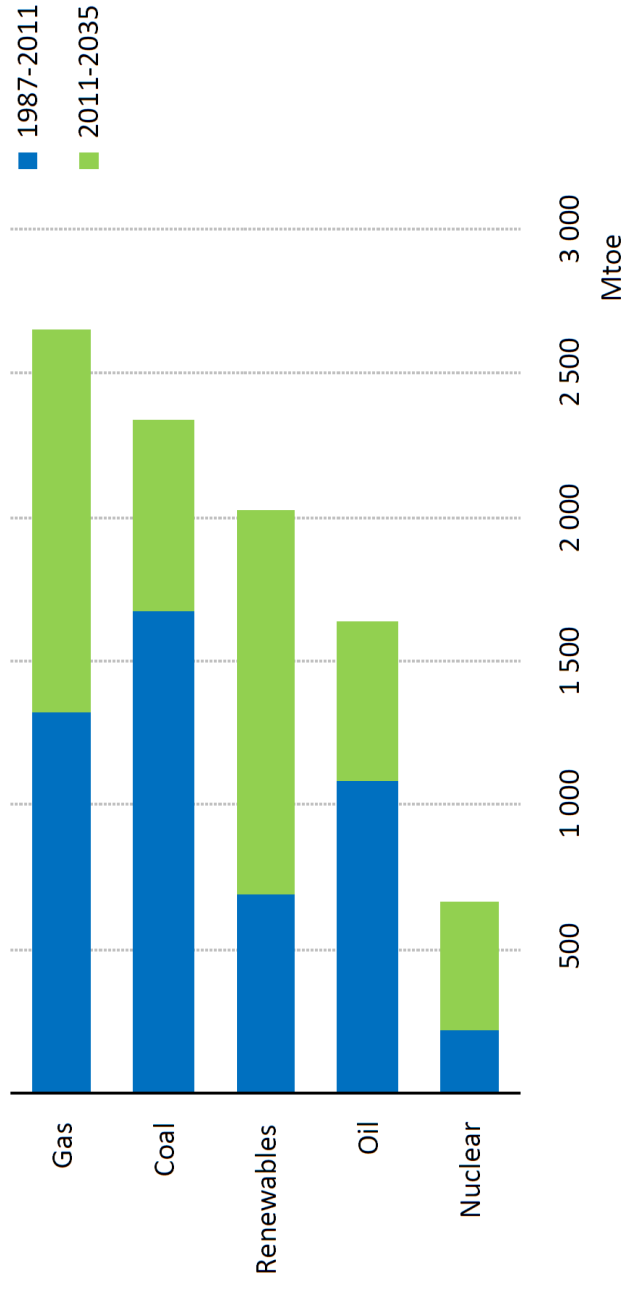


*China is the main driver of increasing energy demand in the current decade,
but India takes over in the 2020s as the principal source of growth*

A mix that is slow to change

WORLD
ENERGY
OUTLOOK
2013

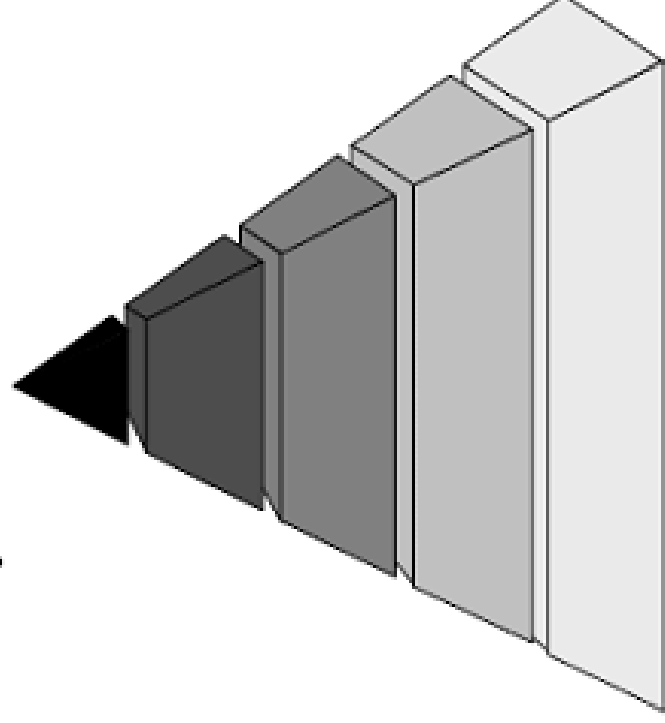
Growth in total primary energy demand



Today's share of fossil fuels in the global mix, at 82%, is the same as it was 25 years ago; the strong rise of renewables only reduces this to around 75% in 2035

Resource Pyramid (for minerals)

Highly concentrated
Easy extraction/access



Low concentration
Difficult extraction/access

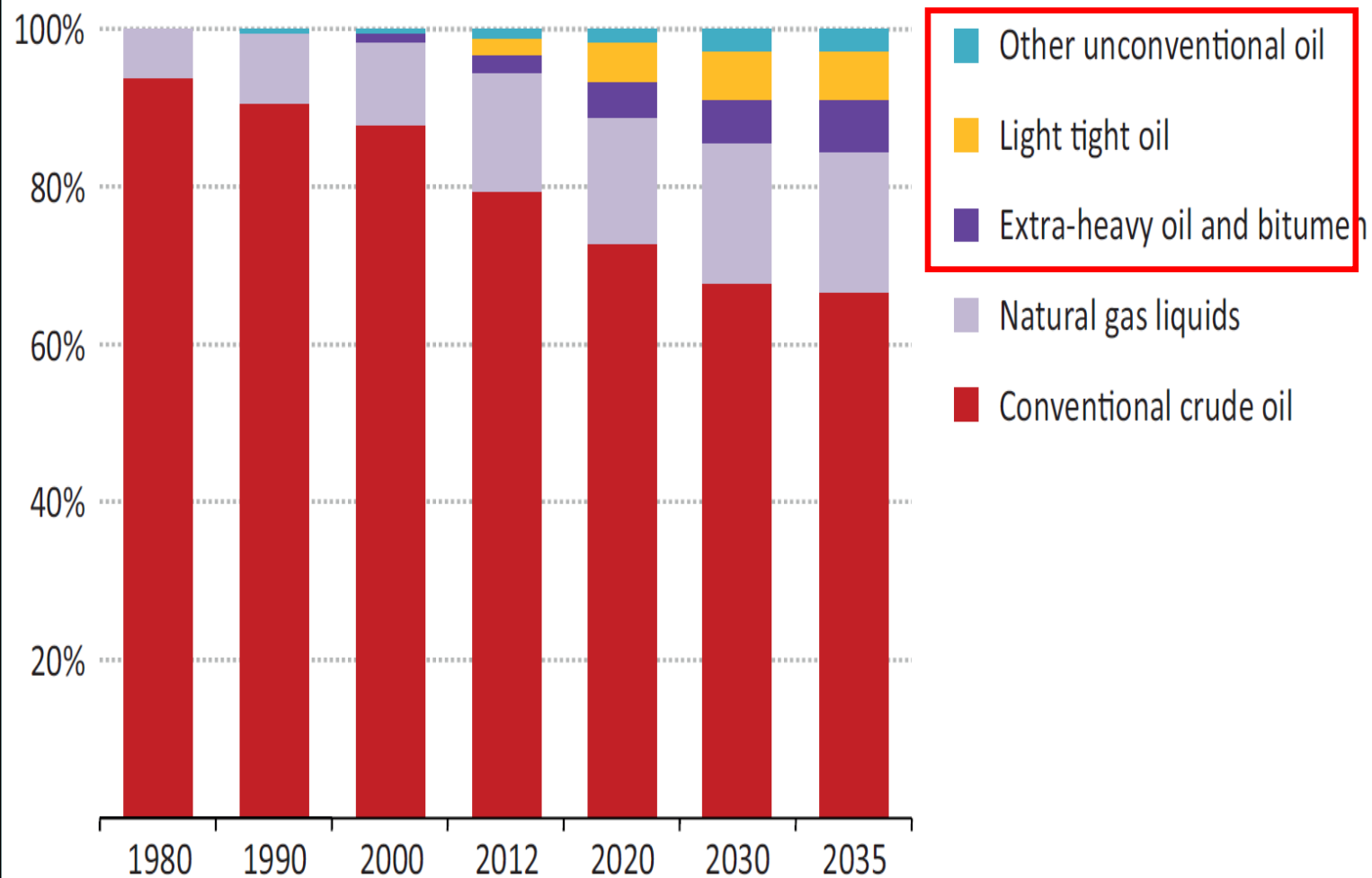
Better quality
resource



Increasing cost
of extraction
(including
MORE
ENERGY)

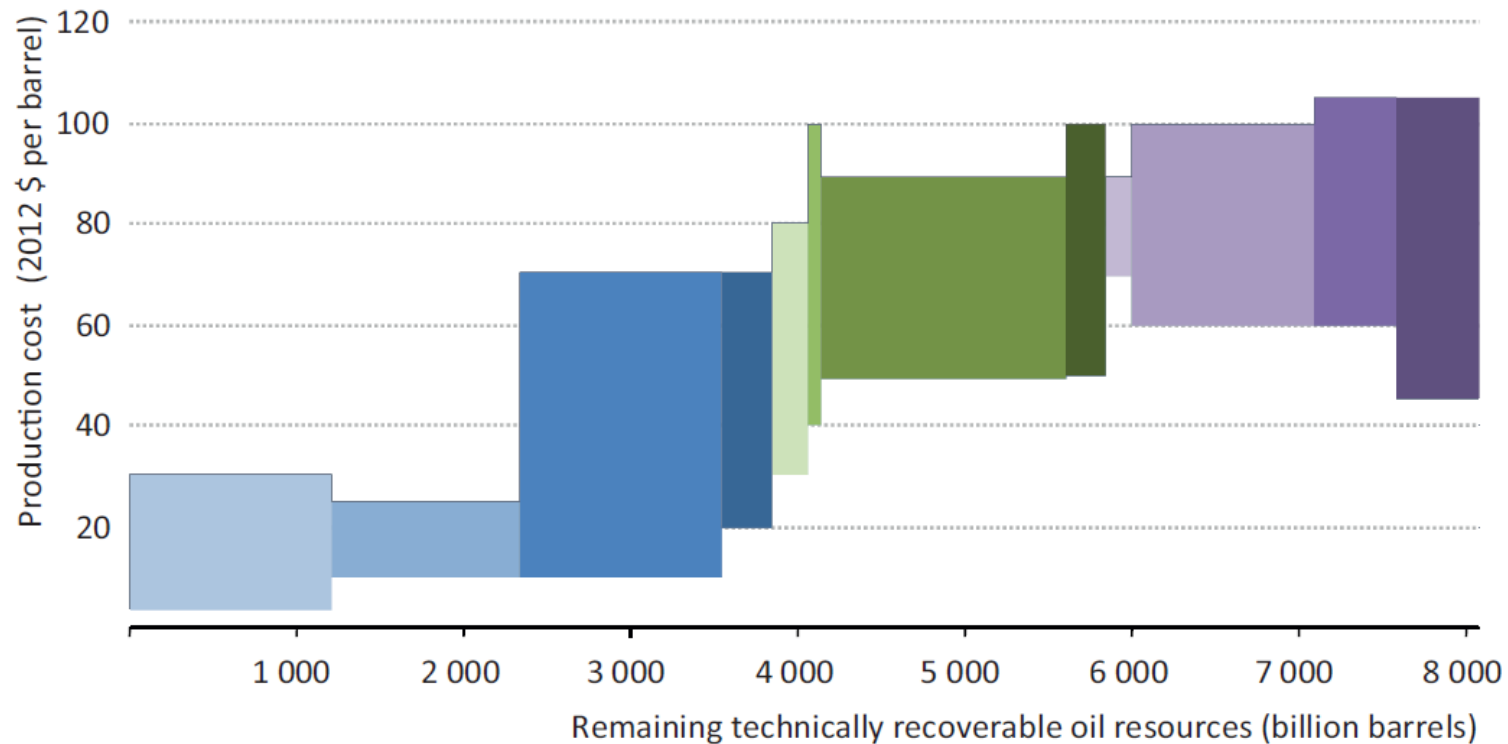
Producció mundial de petroli per tipus 1980-2035

El món necessitarà més i més petroli no convencional



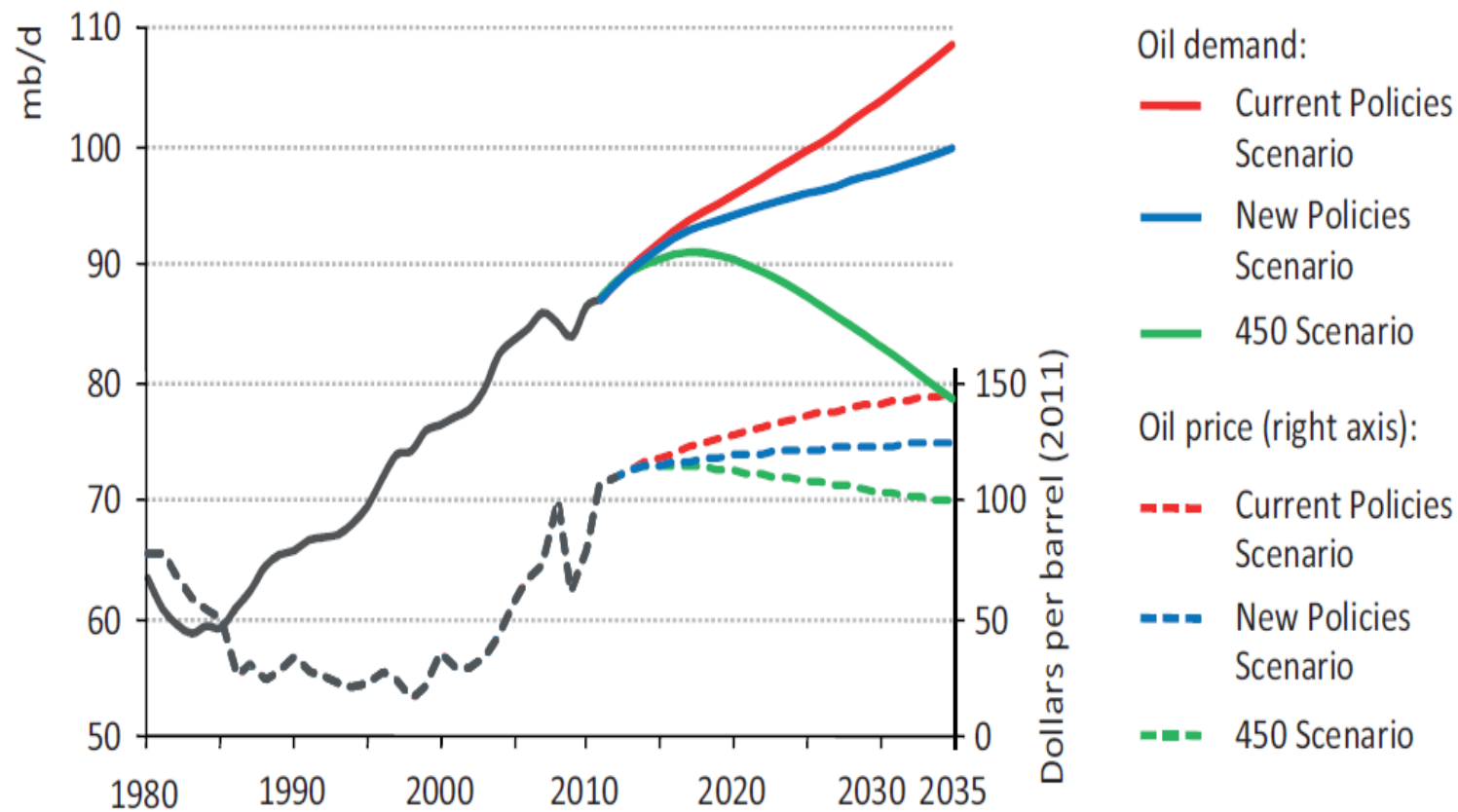
IEA, WEO 2013

Supply costs of liquids fuels



Source: *Resources to Reserves* (IEA, 2013).

Demanda mundial de petroli i preus del cru d'importació de la IEA per escenari



* Average IEA crude oil import price.

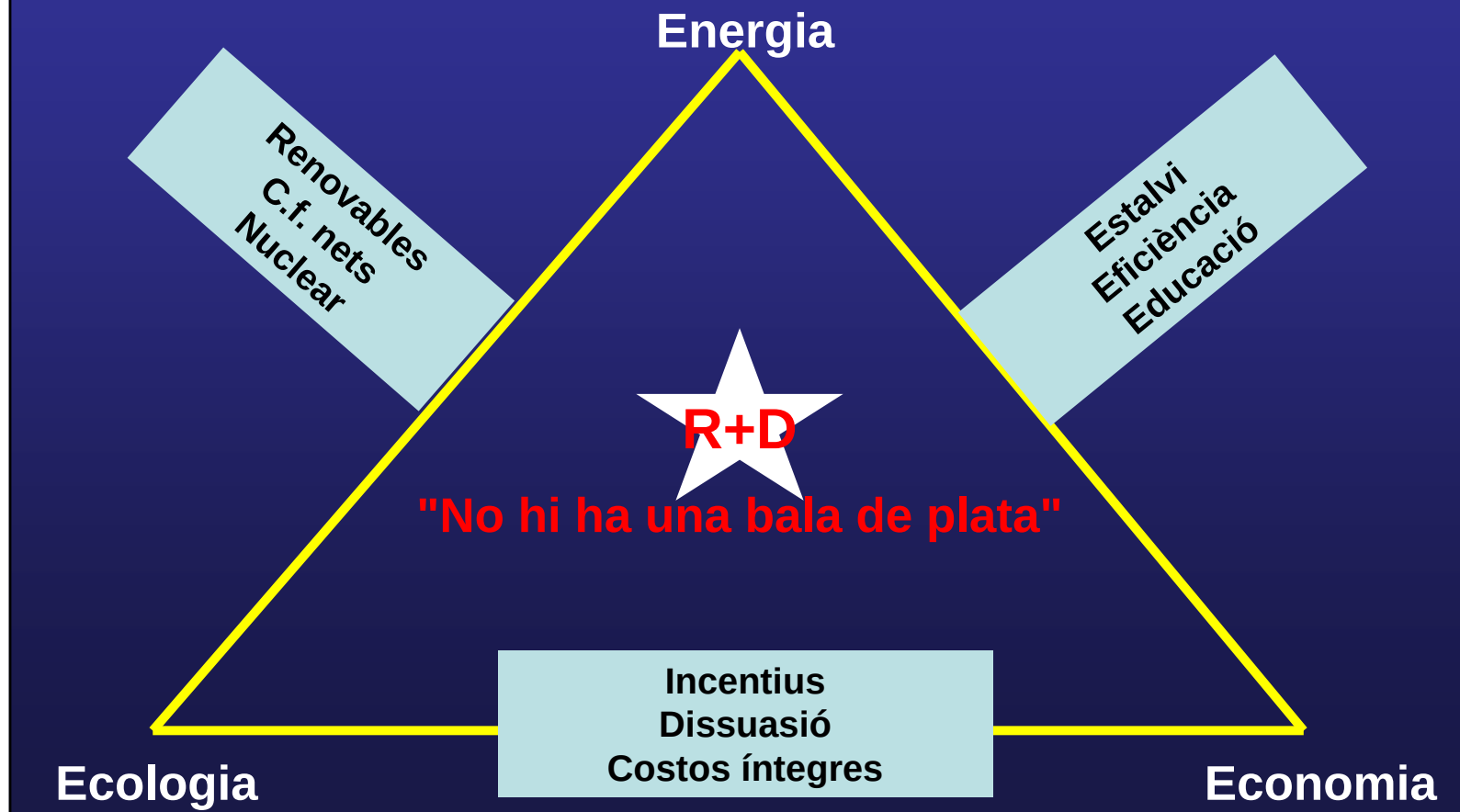
Preus nominals 2020: 157, 147, 139

Preus nominals 2035: 250, 215, 177

Debat. Equilibri entre les 3 "és"

Integrar la política energètica amb les polítiques econòmiques, ambientals, de seguretat, afers exteriors, R+D

Pacte nacional i d'estats



La piràmide de Maslow per l'energia i el desenvolupament humà



**How resilient is
your country?**