

PANORAMA ENERGETICO GLOBAL SEGUN LA AIE (WEO 2011)

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COEIC, 20-2-2011

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ANNEXES	

Los tres escenarios del WEO 2011

New Policies Scenario (NPS): escenario central o base

Asume la aplicación de los compromisos y planes anunciados, incluso aunque todavía no hayan sido formalmente adoptados

Proporciona un punto de referencia para evaluar logros y limitaciones en el desarrollo de las políticas sobre el cambio climático y la energía

Current Policies Scenario (CPS): ~ anteriores Escenario de Referencia

Solo toma en consideración las políticas que han sido formalmente adoptadas a mediados de 2011

450 Scenario (450S):

Proyecto energético compatible con el objetivo de limitar el aumento de la temperatura global media a 2 ° C

Población mundial 2009-2035

Datos de UNPD 2009

6.765 a 8.556 millones (media del 0,9% anual)

El crecimiento se ralentiza progresivamente

No-OCDE: 5.536 (81,8%) a 7.183 millones (83,9%)

Media del 1% anual: África 2,1%; Asia 0,7%

India con 1.511 millones en 2035 sobrepasa a China (1.387)

Excepción Rusia (↓ 142 a 133 millones)

Todo el crecimiento en áreas urbanas

Población en áreas urbanas: 3.400 a 5.300 millones

Mayor parte de este crecimiento (1.900 millones) en no-OCDE

En 2009, por primera vez en la historia, población urbana > rural

Crecimiento económico global 2009-2035

Table 1.2 • Real GDP assumptions by region (\$2010 trillion)

	2009	2015	2020	2035	2009-2020*	2009-2035*
OECD	39.9	46.5	51.8	69.4	2.4%	2.2%
Americas	17.3	20.5	23.2	32.4	2.7%	2.4%
<i>United States</i>	14.3	16.8	18.9	26.2	2.6%	2.4%
Europe	16.1	18.3	20.3	26.7	2.1%	2.0%
Asia Oceania	6.5	7.6	8.4	10.3	2.3%	1.8%
<i>Japan</i>	4.1	4.7	5.0	5.9	1.7%	1.4%
Non-OECD	30.9	45.5	59.4	106.8	6.1%	4.9%
E. Europe/Eurasia	3.7	4.8	5.8	9.3	4.1%	3.6%
<i>Russia</i>	2.1	2.8	3.3	5.4	4.1%	3.6%
Asia	17.6	28.2	38.5	73.6	7.4%	5.7%
<i>China</i>	9.4	15.9	22.3	41.6	8.1%	5.9%
<i>India</i>	3.7	6.0	8.3	19.4	7.7%	6.6%
Middle East	2.4	3.1	3.8	6.6	4.3%	4.0%
Africa	2.9	3.9	4.7	7.3	4.6%	3.7%
Latin America	4.3	5.6	6.6	10.0	4.0%	3.3%
<i>Brazil</i>	2.0	2.7	3.2	5.1	4.3%	3.6%
World	70.8	92.0	111.2	176.2	4.2%	3.6%
<i>European Union</i>	14.9	16.8	18.5	24.3	2.0%	1.9%

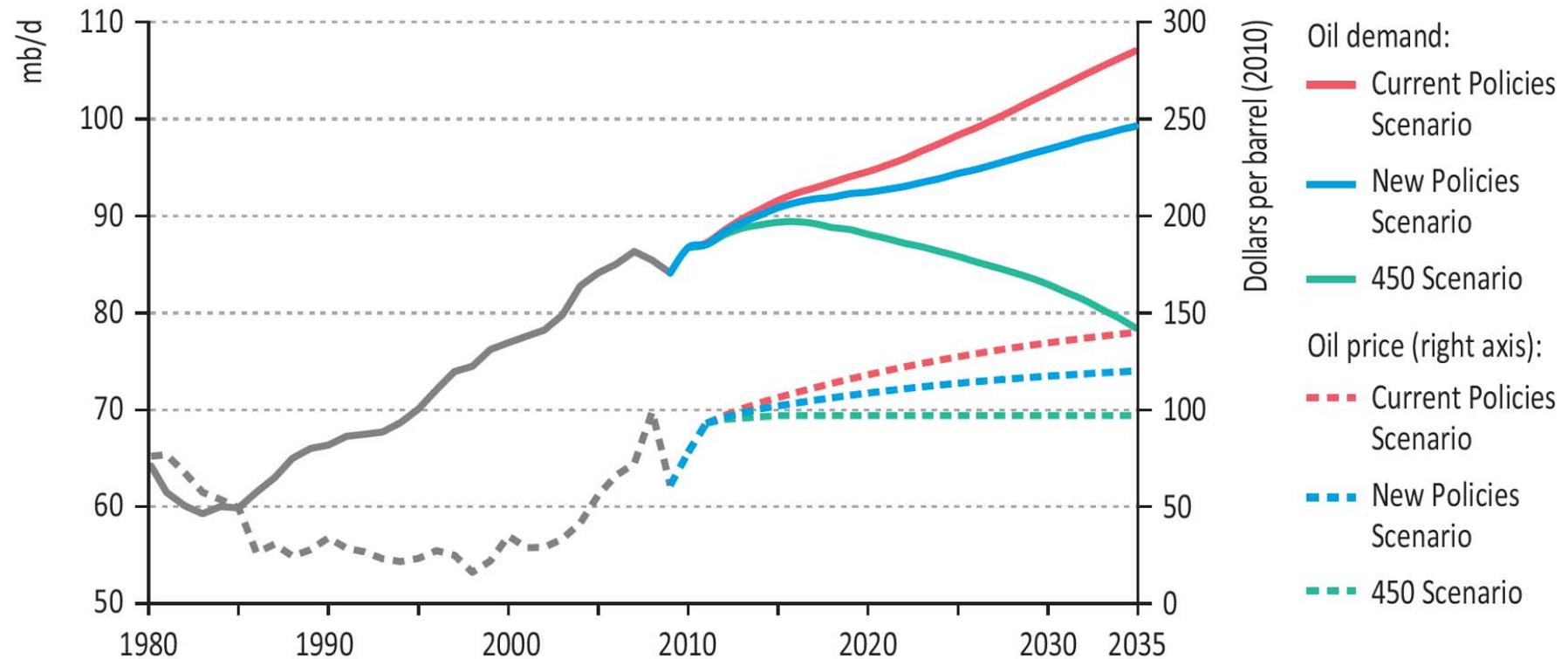
*Compound average annual growth rate.

Notes: Calculated based on GDP expressed in year-2010 dollars at constant purchasing power parity. The assumed rates of economic growth for 2009 to 2035 are the same for all three scenarios presented in this *Outlook*.

Sources: IMF, OECD and World Bank databases; IEA databases and analysis.

IEA, WEO 2011: Precios promedios del crudo de importación de la OCDE (términos reales, dólares de 2010)

Figure 3.1 ● World primary oil demand and oil price* by scenario



* Average IEA crude oil import price.

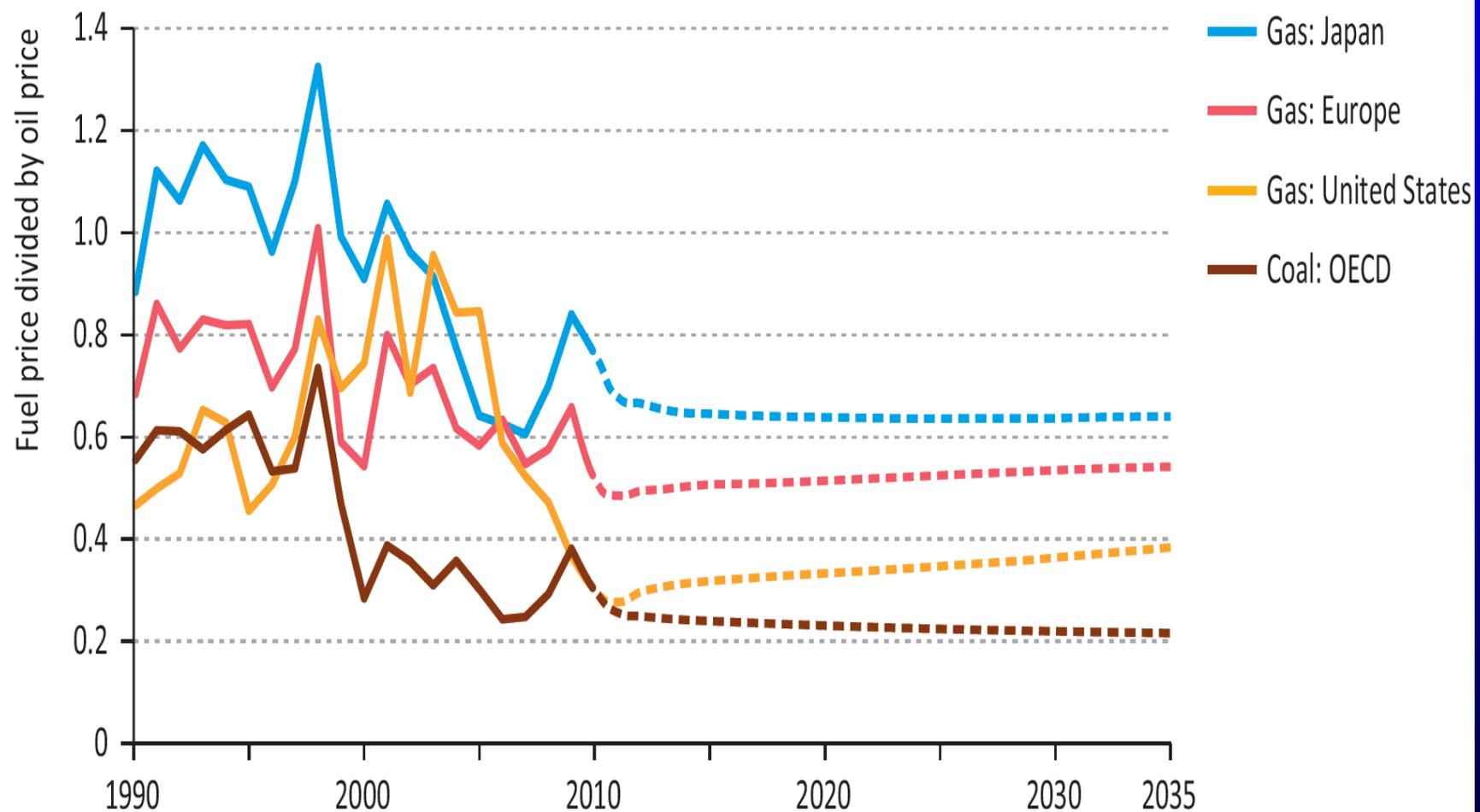
Precios en dólares nominales por escenario

CPS: 148,2 US \$ (2020) - 247,2 US \$ (2035)

NPS: 136,4 US \$ (2020) - 211,9 US \$ (2035)

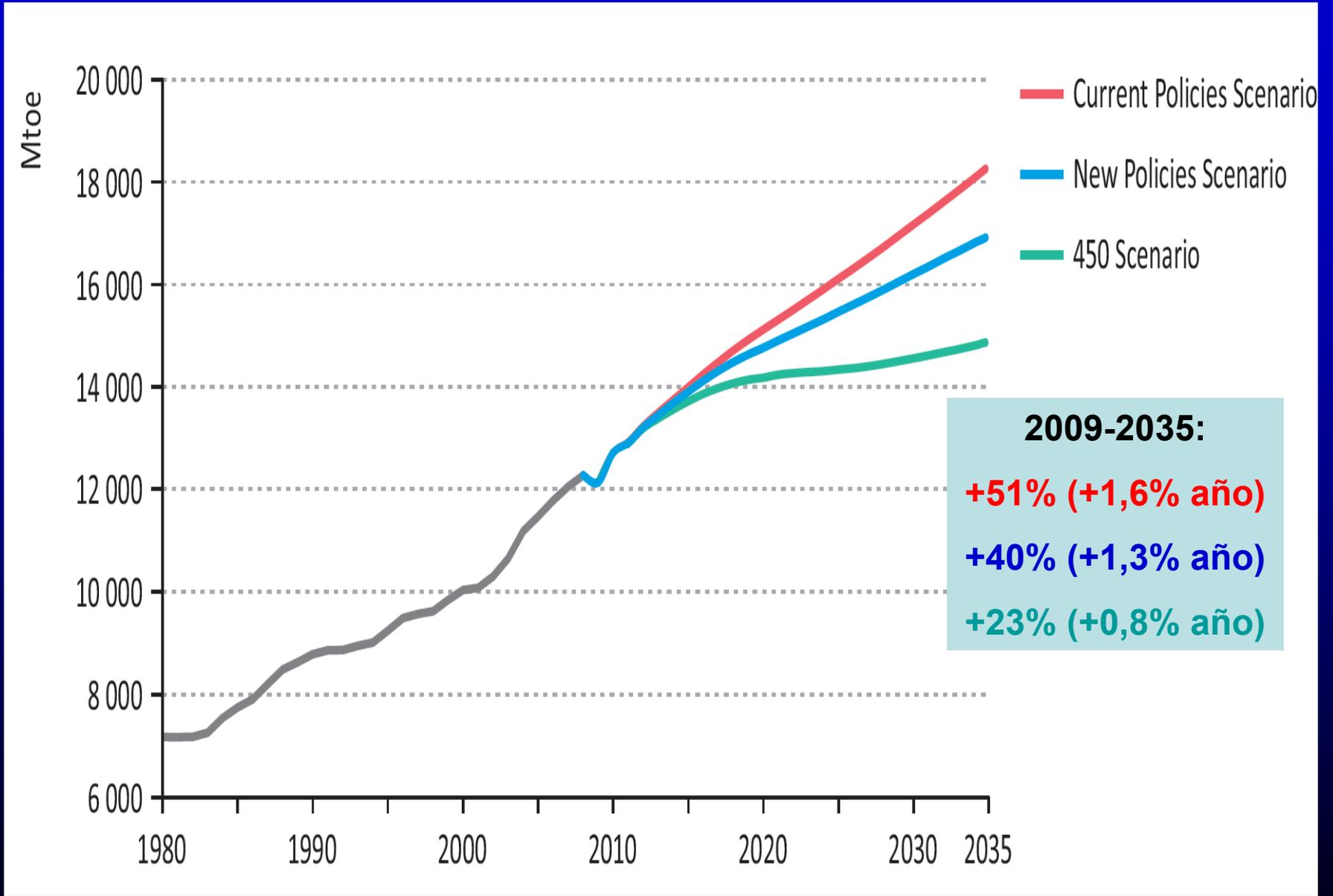
450 S: 121,8 US \$ (2020) - 171,3 US \$ (2035)

Relación entre precios del gas natural y del carbón de importación en relación al del crudo . Escenario **NPS**

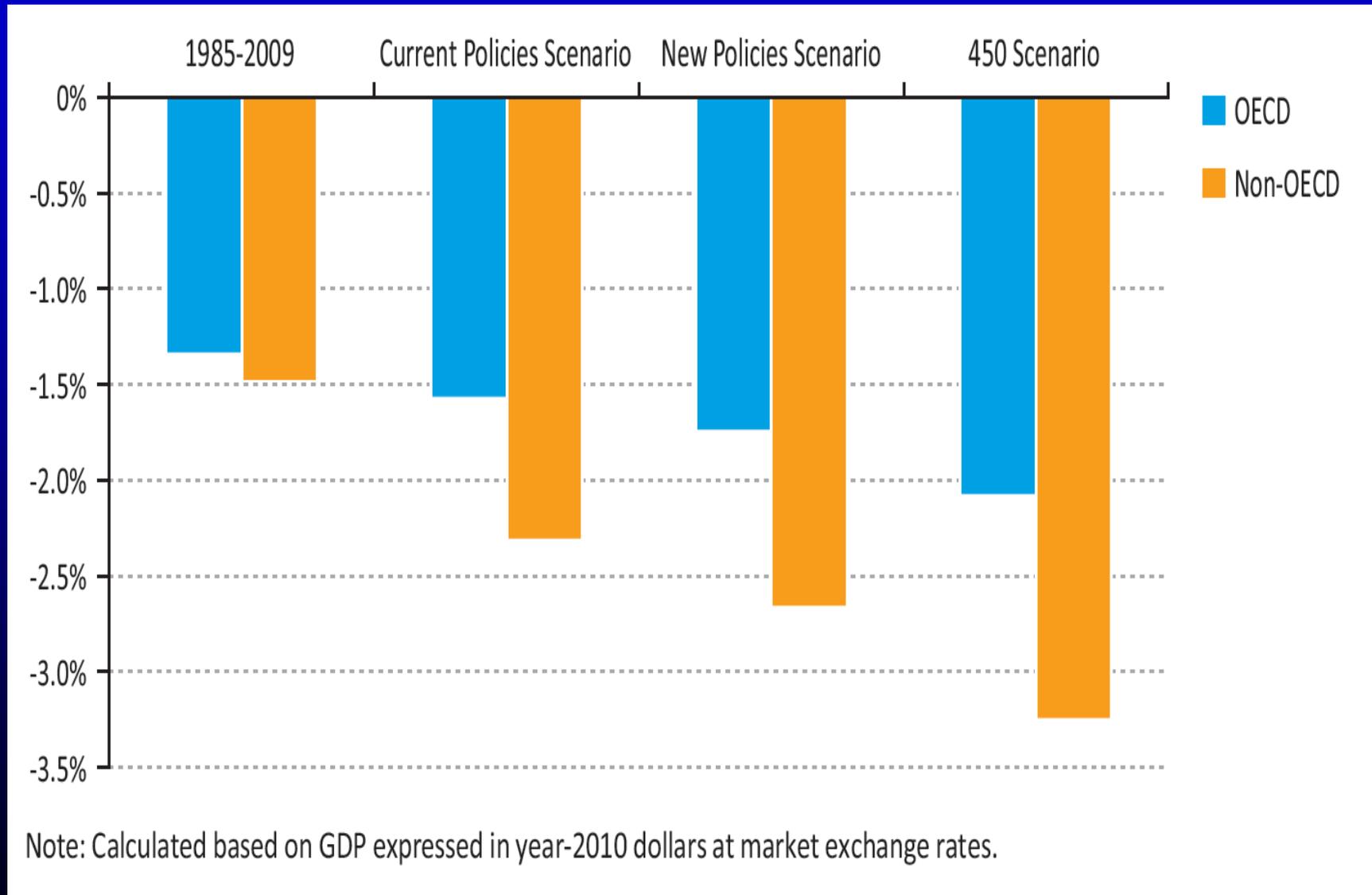


Note: Calculated on an energy-equivalent basis.

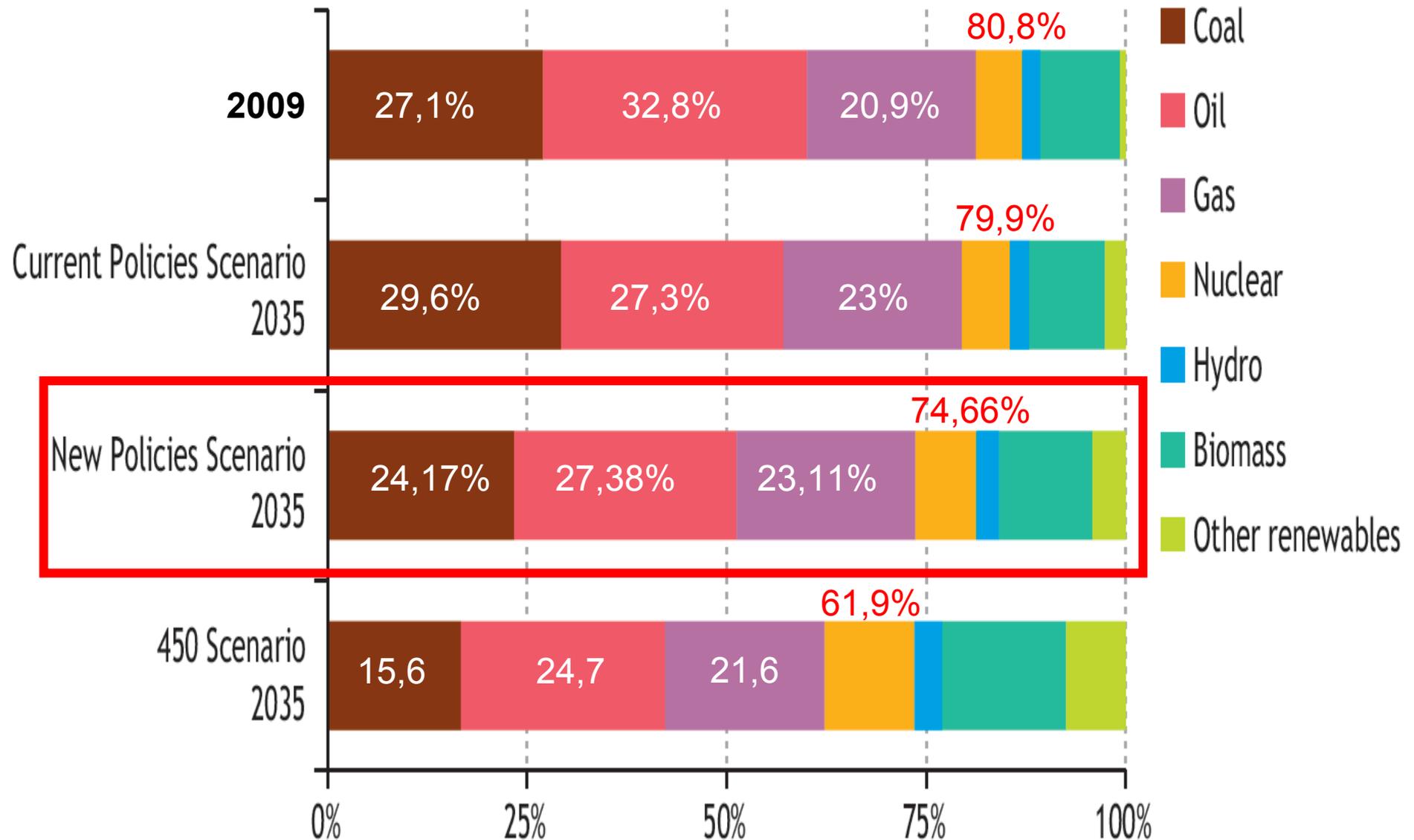
Demanda mundial de energía primaria (2009-2035)



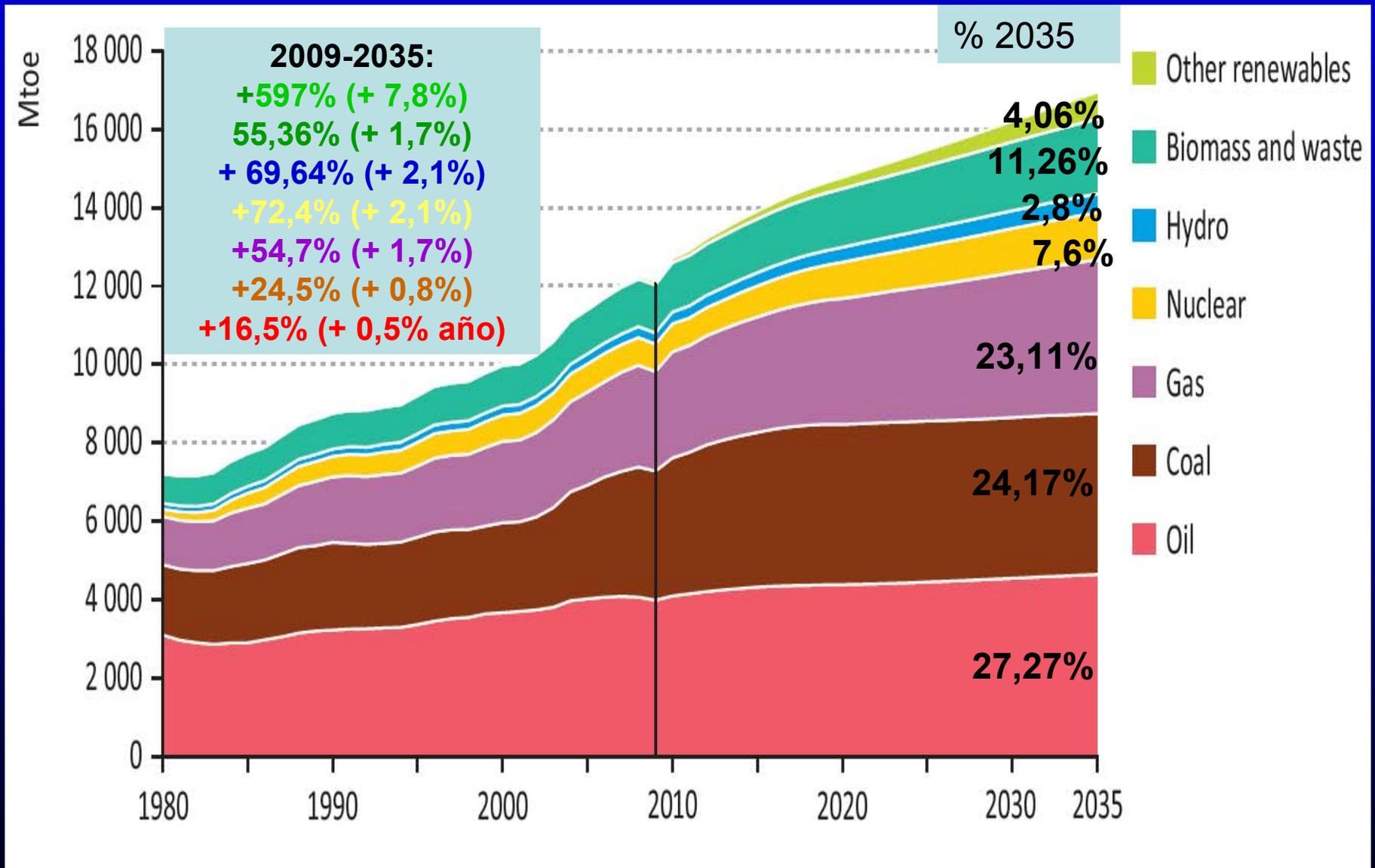
Mejora media anual en porcentaje de la intensidad energética por escenario y región (2009-2035)



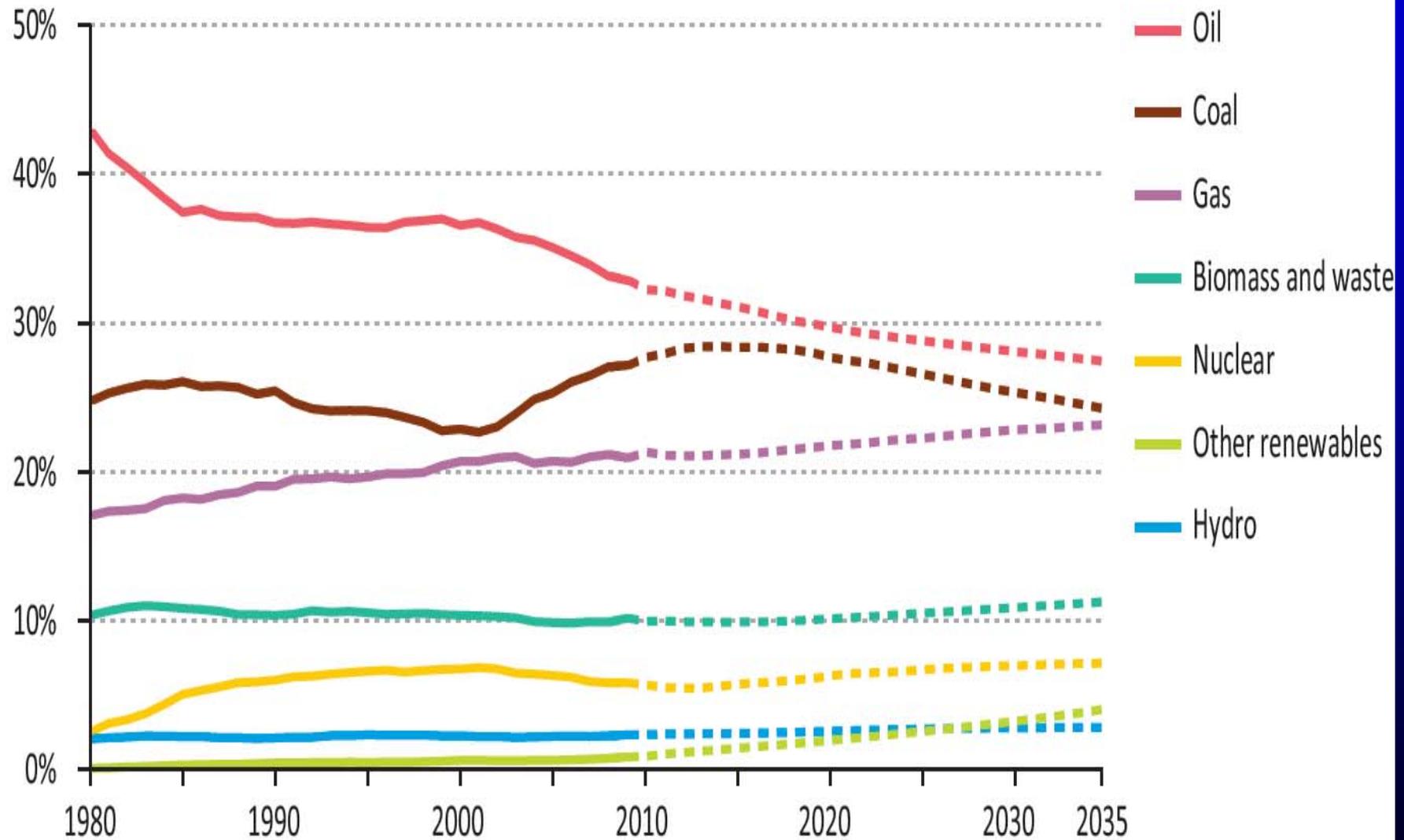
Demanda mundial de energía primaria por fuentes en diferentes escenarios. CF (2035): 79,9% - 61,9%



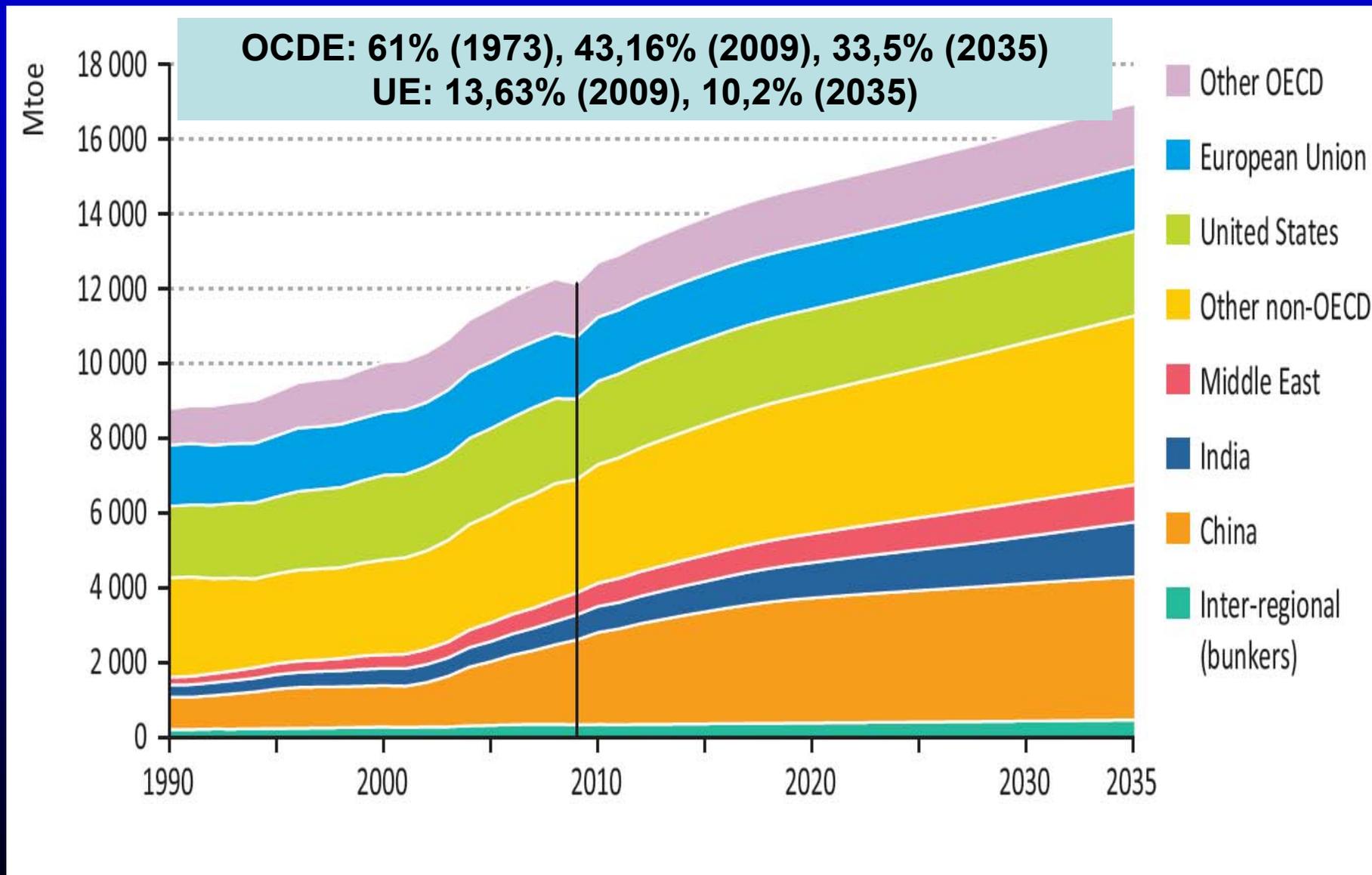
NPS: Demanda mundial de energía primaria



NPS: evolución de la participación (%) diferentes fuentes en la demanda mundial de energía primaria



NPS: Demanda mundial de energía primaria por regiones



NPS: demanda de energía primaria OCDE (Mtoe)

	1980	2000	2009	2015	2020	2030	2035	2009-2035*
OECD	4 067	5 292	5 236	5 549	5 575	5 640	5 681	0.3%
Americas	2 102	2 695	2 620	2 780	2 787	2 835	2 864	0.3%
<i>United States</i>	<i>1 802</i>	<i>2 270</i>	<i>2 160</i>	<i>2 285</i>	<i>2 264</i>	<i>2 262</i>	<i>2 265</i>	<i>0.2%</i>
Europe	1 501	1 765	1 766	1 863	1 876	1 890	1 904	0.3%
Asia Oceania	464	832	850	906	912	914	912	0.3%
<i>Japan</i>	<i>345</i>	<i>519</i>	<i>472</i>	<i>498</i>	<i>490</i>	<i>481</i>	<i>478</i>	<i>0.0%</i>
Non-OECD	2 981	4 475	6 567	8 013	8 818	10 141	10 826	1.9%
E. Europe/Eurasia	1 242	1 001	1 051	1 163	1 211	1 314	1 371	1.0%
<i>Russia</i>	<i>n.a.</i>	<i>620</i>	<i>648</i>	<i>719</i>	<i>744</i>	<i>799</i>	<i>833</i>	<i>1.0%</i>
Asia	1 066	2 172	3 724	4 761	5 341	6 226	6 711	2.3%
<i>China</i>	<i>603</i>	<i>1 108</i>	<i>2 271</i>	<i>3 002</i>	<i>3 345</i>	<i>3 687</i>	<i>3 835</i>	<i>2.0%</i>
<i>India</i>	<i>208</i>	<i>460</i>	<i>669</i>	<i>810</i>	<i>945</i>	<i>1 256</i>	<i>1 464</i>	<i>3.1%</i>
Middle East	114	364	589	705	775	936	1 000	2.1%
Africa	274	505	665	739	790	878	915	1.2%
Latin America	284	432	538	644	700	787	829	1.7%
<i>Brazil</i>	<i>114</i>	<i>185</i>	<i>237</i>	<i>300</i>	<i>336</i>	<i>393</i>	<i>421</i>	<i>2.2%</i>
World**	7 219	10 034	12 132	13 913	14 769	16 206	16 961	1.3%
<i>European Union</i>	<i>n.a.</i>	<i>1 683</i>	<i>1 654</i>	<i>1 731</i>	<i>1 734</i>	<i>1 724</i>	<i>1 731</i>	<i>0.2%</i>

*Compound average annual growth rate.

**World includes international marine and aviation bunkers (not included in regional totals).

NPS: demanda de energía primaria no-OCDE (Mtoe)

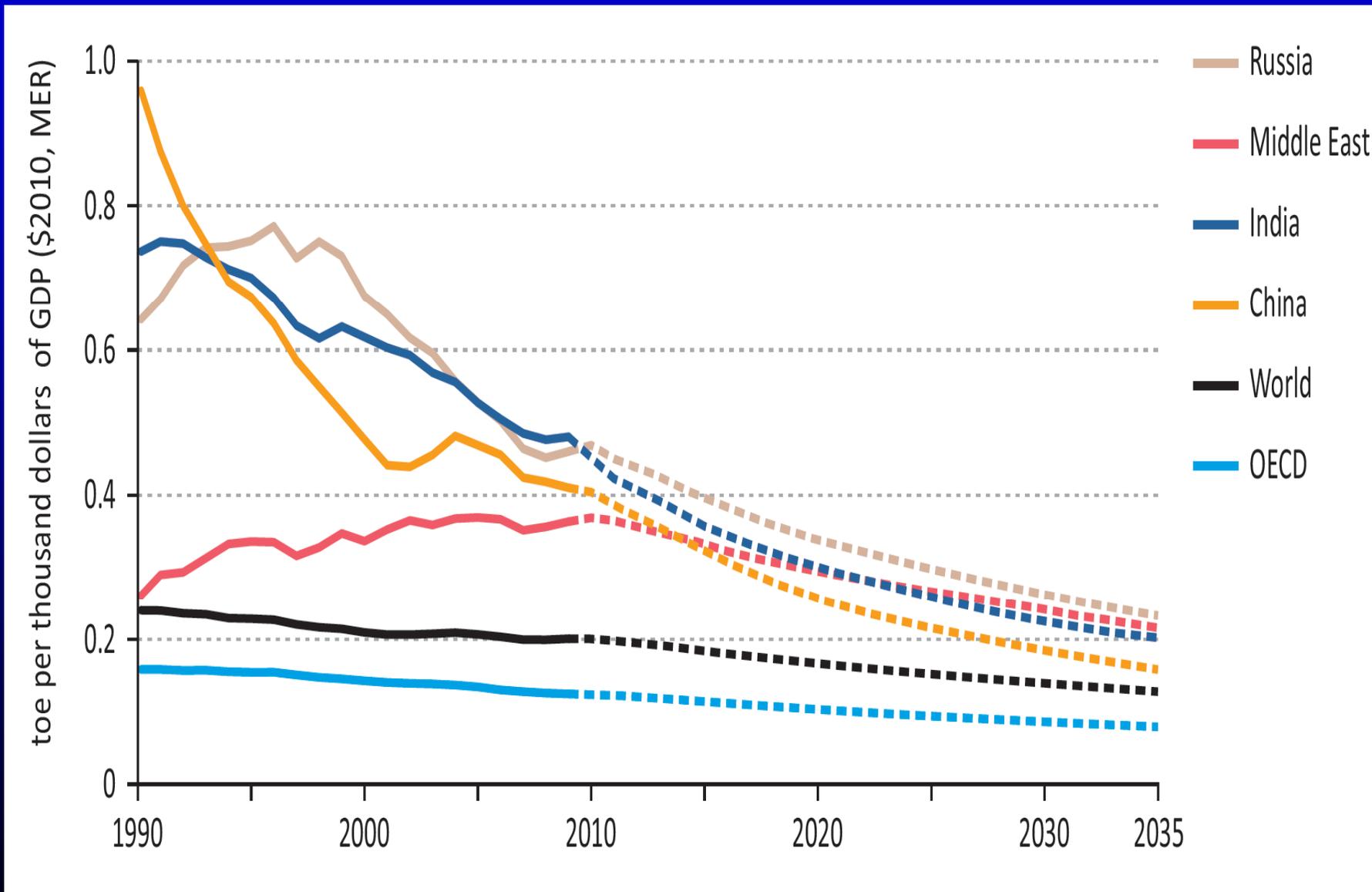
	1980	2000	2009	2015	2020	2030	2035	2009-2035*
OECD	4 067	5 292	5 236	5 549	5 575	5 640	5 681	0.3%
Americas	2 102	2 695	2 620	2 780	2 787	2 835	2 864	0.3%
<i>United States</i>	1 802	2 270	2 160	2 285	2 264	2 262	2 265	0.2%
Europe	1 501	1 765	1 766	1 863	1 876	1 890	1 904	0.3%
Asia Oceania	464	832	850	906	912	914	912	0.3%
<i>Japan</i>	345	519	472	498	490	481	478	0.0%
Non-OECD	2 981	4 475	6 567	8 013	8 818	10 141	10 826	1.9%
E. Europe/Eurasia	1 242					314	1 371	1.0%
<i>Russia</i>	<i>n.a.</i>					799	833	1.0%
Asia	1 066					226	6 711	2.3%
<i>China</i>	603					687	3 835	2.0%
<i>India</i>	208					256	1 464	3.1%
Middle East	114					936	1 000	2.1%
Africa	274	505	665	739	790	878	915	1.2%
Latin America	284	432	538	644	700	787	829	1.7%
<i>Brazil</i>	114	185	237	300	336	393	421	2.2%
World**	7 219	10 034	12 132	13 913	14 769	16 206	16 961	1.3%
<i>European Union</i>	<i>n.a.</i>	1 683	1 654	1 731	1 734	1 724	1 731	0.2%

2009-2035
China: +68,8 % (32,4% Δ global)
India: +118,8% (16,46% Δ global)
OM: +69,7% (8,5% Δ global)
Brasil: +77,6% (3,8% Δ global)

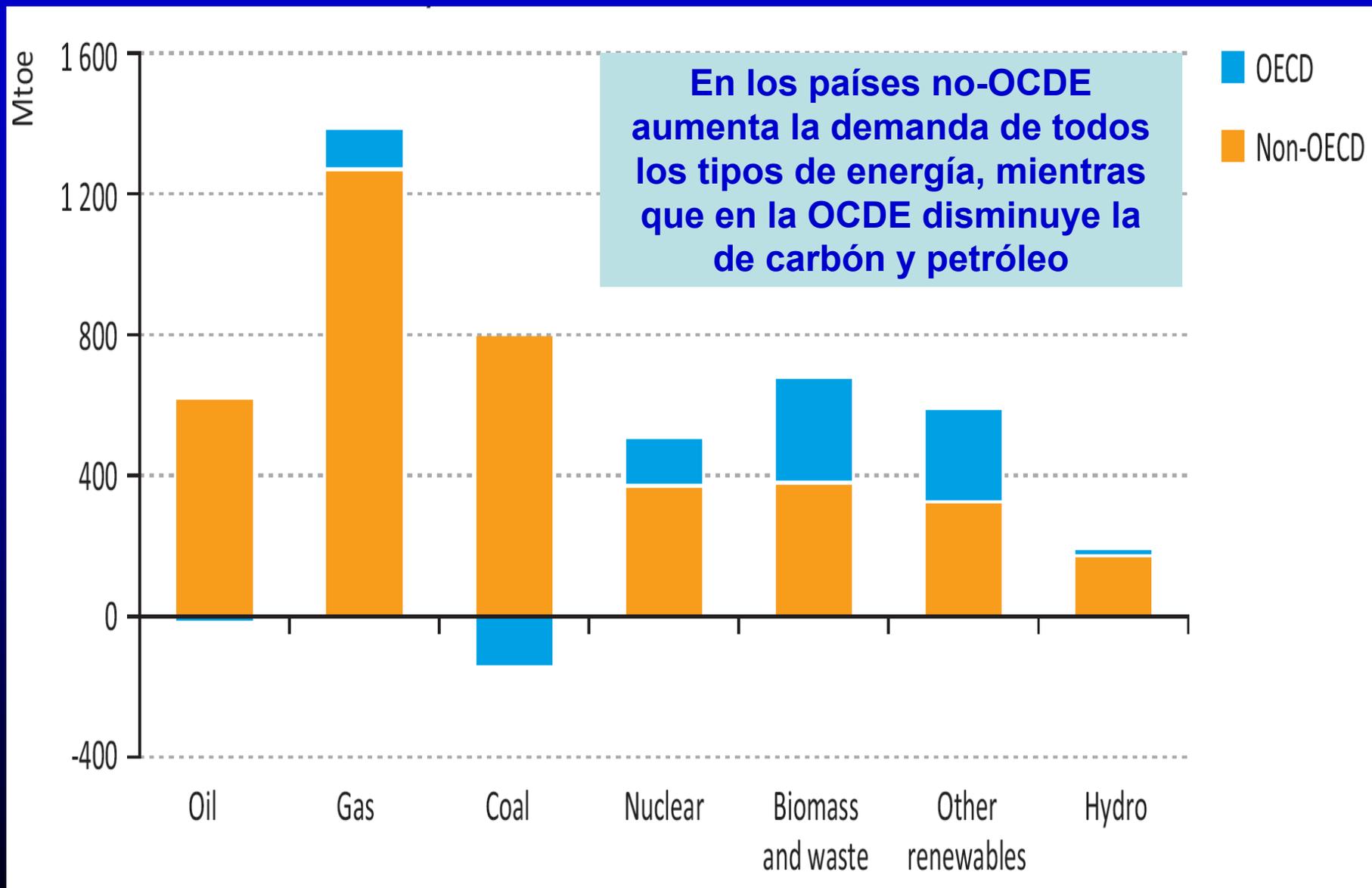
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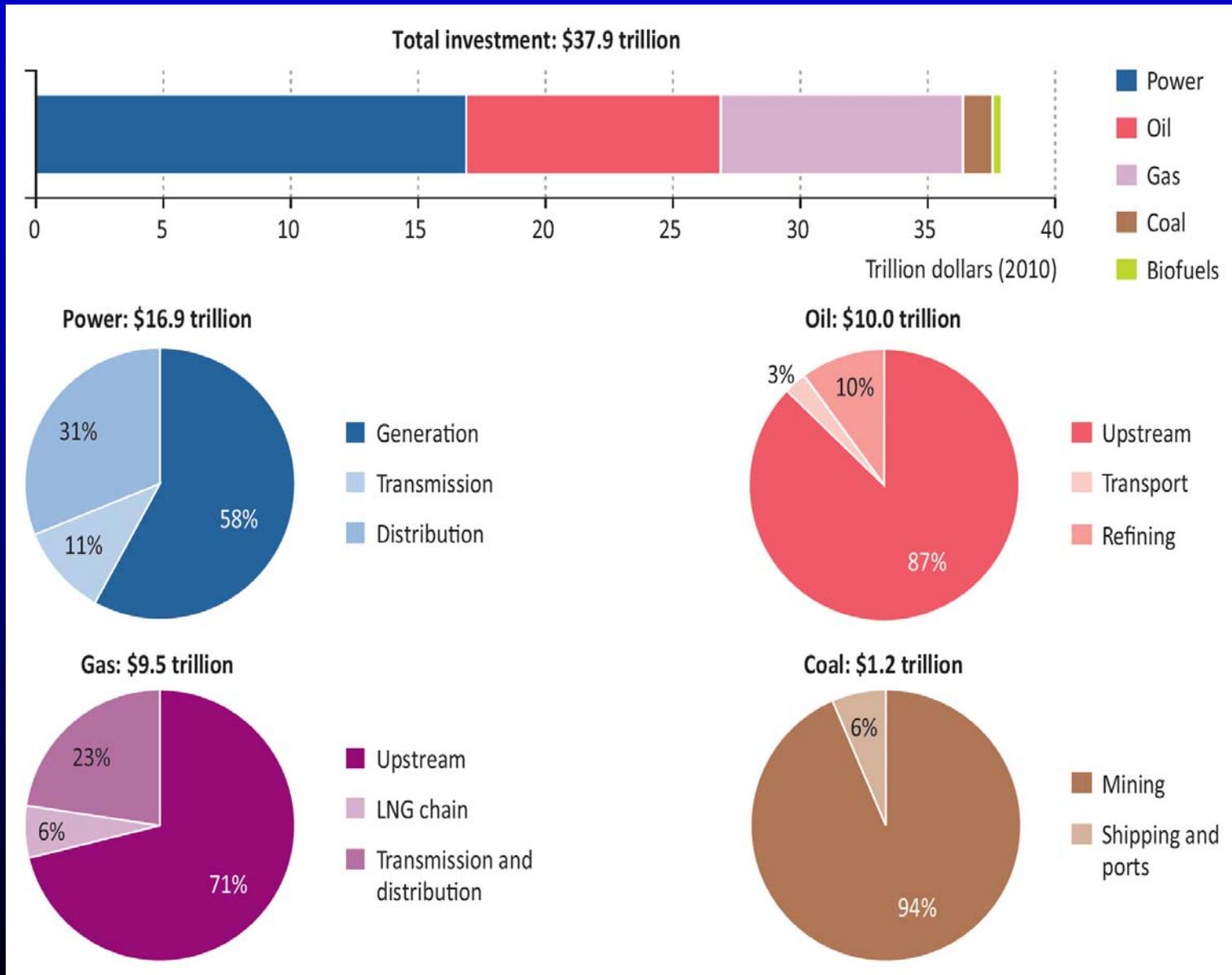
NPS: Cambio en la intensidad energética primaria por países y regiones



NPS: Variaciones de la demanda de energía primaria desglosada por combustible y región, 2009-2035



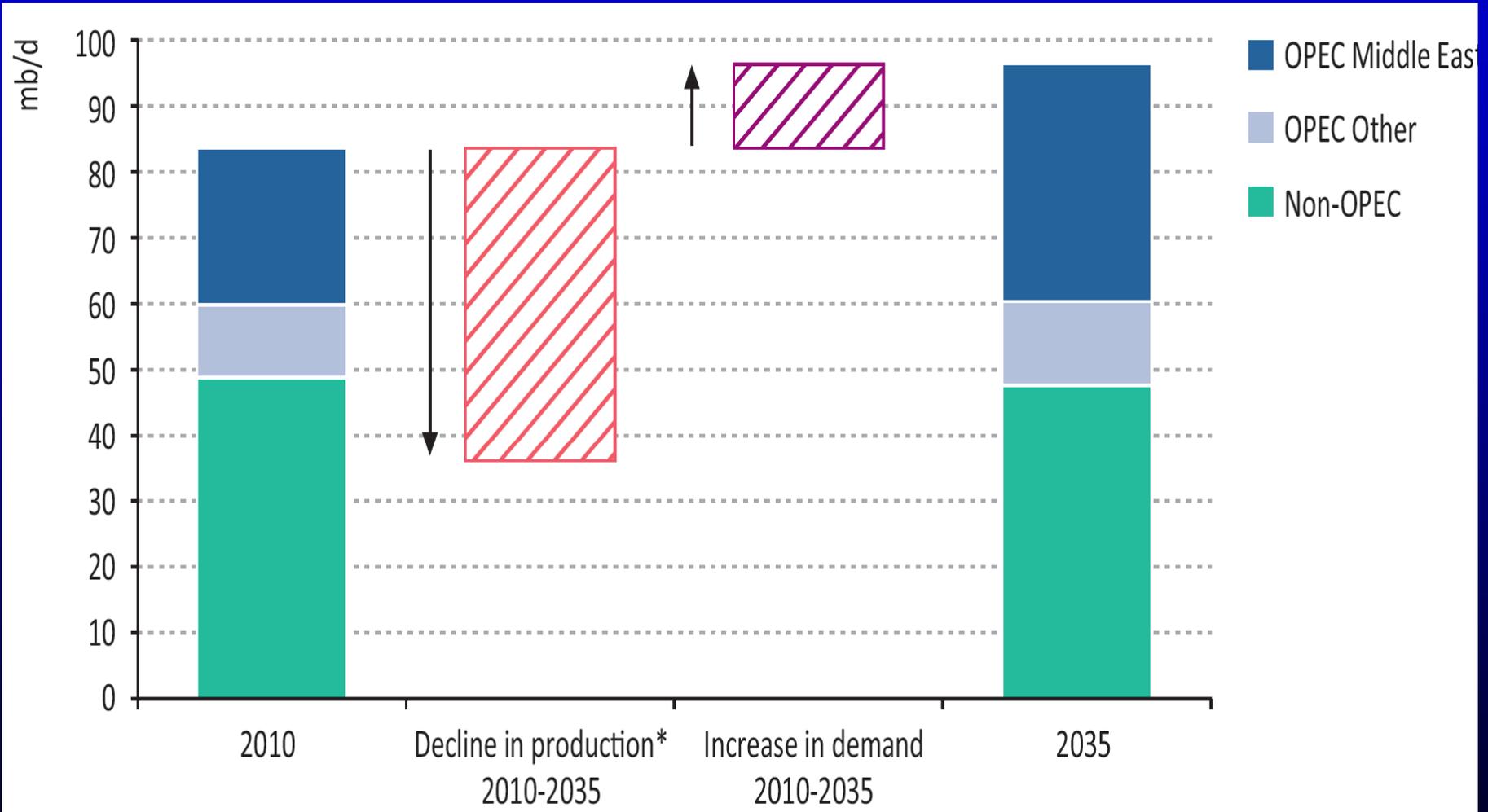
NPS: Inversiones acumuladas (2011-2035) en infraestructuras de suministro energético (\$ 2010)



NPS: inversiones acumuladas 2011-2035 en infraestructuras de suministro energético (10⁹ \$ 2010)

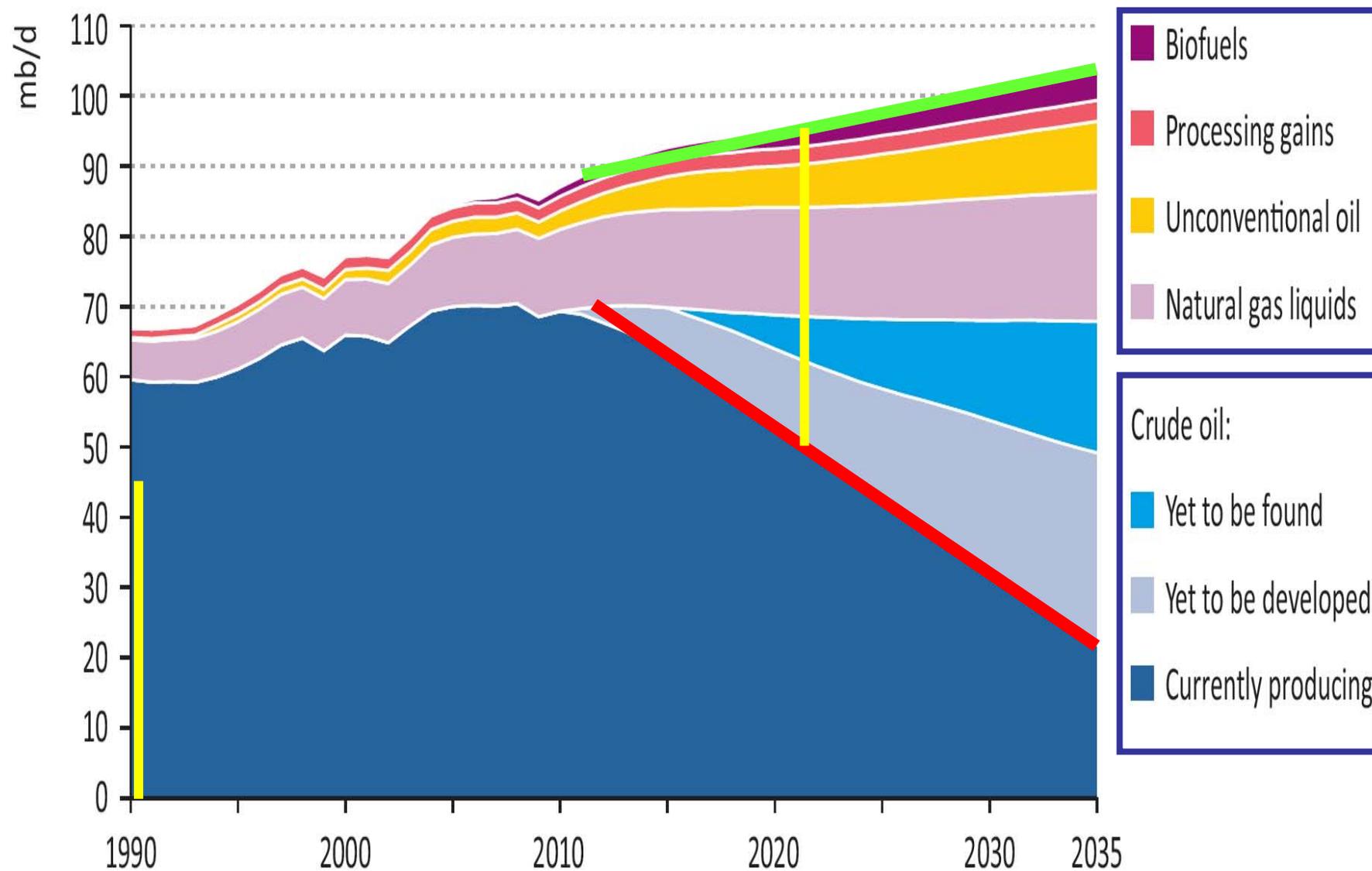
	Coal	Oil	Gas	Power	Biofuels	Total
OECD	175	2 703	3 756	6 897	216	13 746
Americas	78	2 100	2 172	3 009	142	7 501
Europe	7	511	1 019	2 892	72	4 501
Asia Oceania	90	91	565	996	2	1 745
Non-OECD	934	7 027	5 661	9 986	136	23 744
E. Europe/Eurasia	38	1 398	1 562	1 029	6	4 033
<i>Russia</i>	24	787	1 077	614	0	2 502
Asia	812	963	1 664	7 018	60	10 518
<i>China</i>	647	510	638	3 968	31	5 794
<i>India</i>	87	203	266	1 631	16	2 203
Middle East	0	1 137	510	583	0	2 230
Africa	52	1 557	1 316	638	3	3 564
Latin America	32	1 971	609	718	68	3 399
Inter-regional transport	55	268	80	-	4	407
World	1 164	9 997	9 497	16 883	356	37 897

NPS: Producción mundial de petróleo 2010 y 2035, declive y nueva demanda (2010-2035), OPEP vs no-OPEP

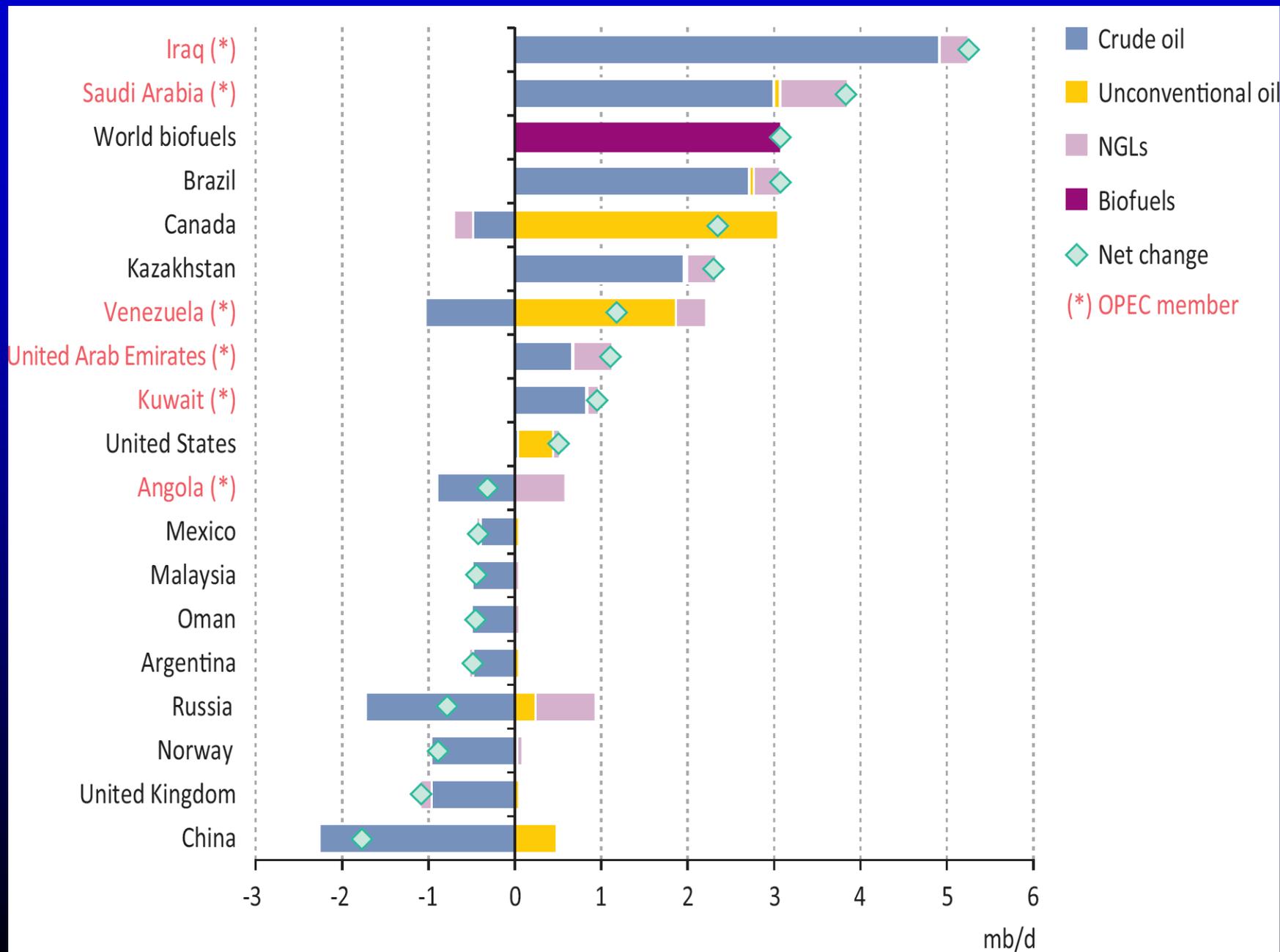


*Of oil fields producing in 2010.

NPS: suministro mundial de líquidos por tipos



NPS: suministro de líquidos, 2010-2035



A golden age for gas?

World
Energy
Outlook
2010

- Gas is set to play a key role in meeting the world's energy needs
 - > *demand rises by 44%, led by China & Middle East*
- Unconventional gas accounts for 35% of the increase in global supply to 2035, with new non-US producers emerging
- Gas glut will peak soon, but may dissipate only very slowly
- The glut will keep pressure on gas exporters to move away from oil-price indexation, notably in Europe
- Lower prices could lead to stronger demand for gas, backing out renewables & coal in power generation

Map of 48 major shale gas basins in 32 countries

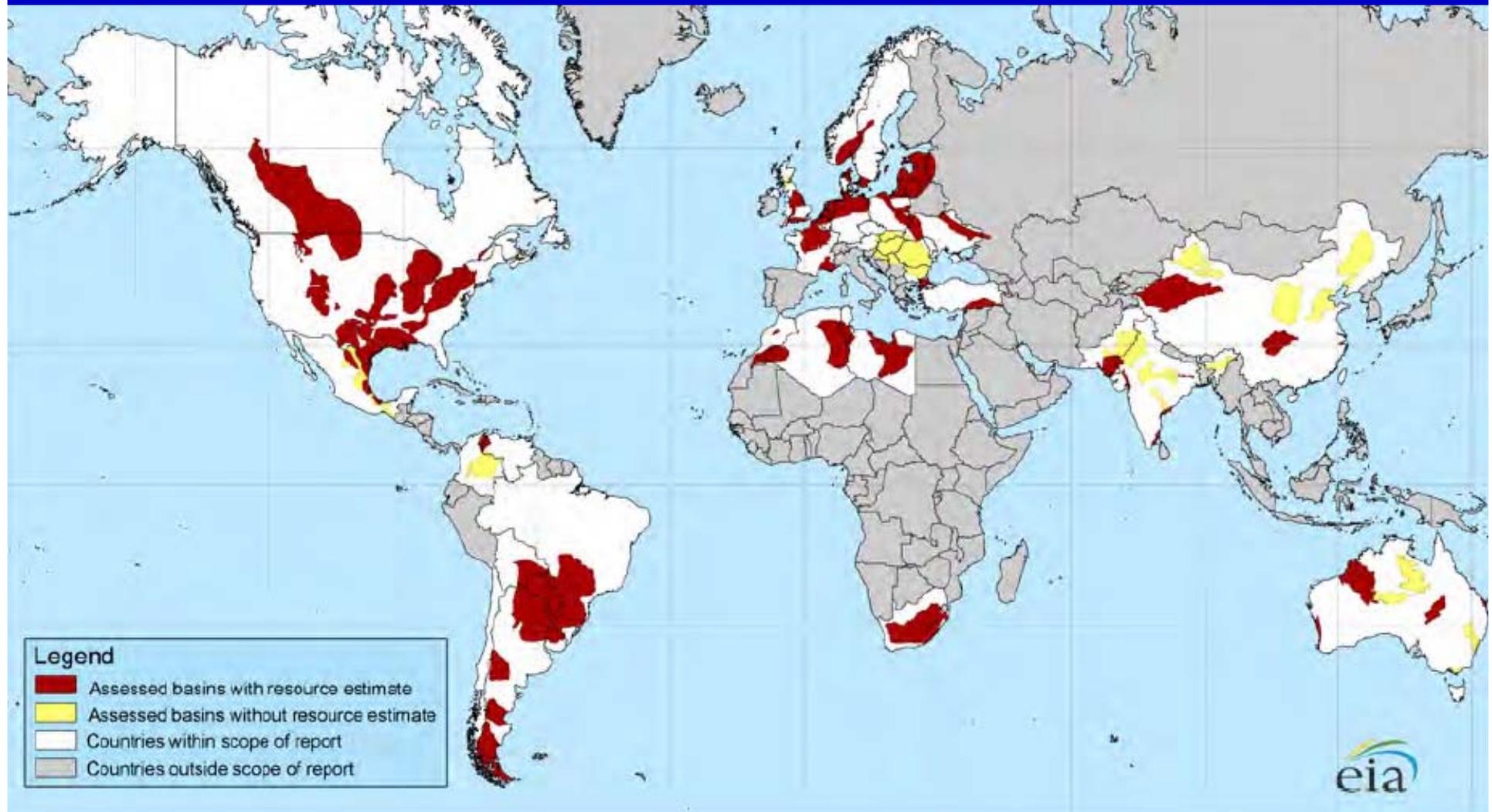


Figure VIII-1. Shale Gas Basins and Pipeline System of Central North Africa

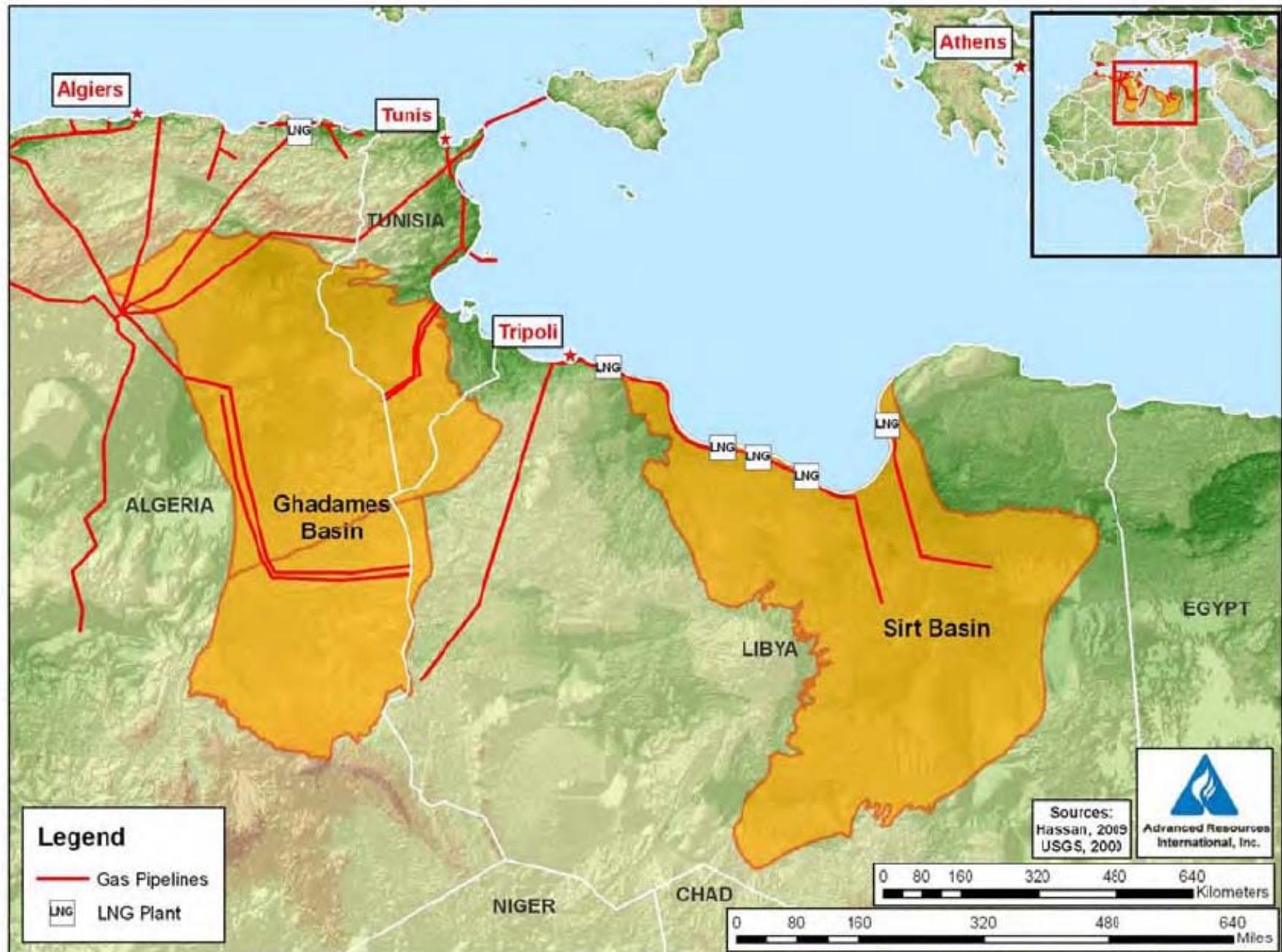
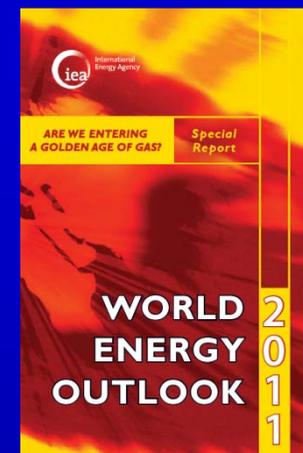
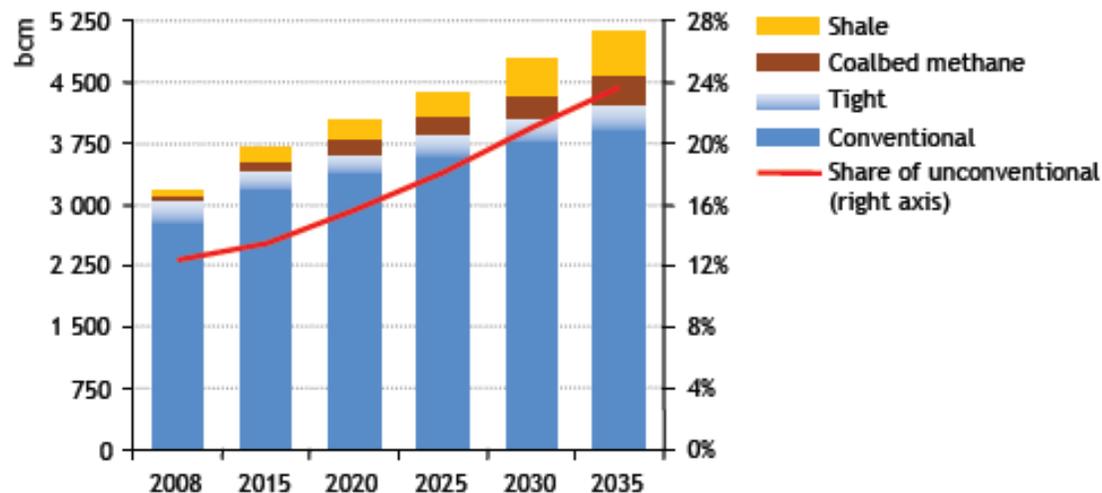
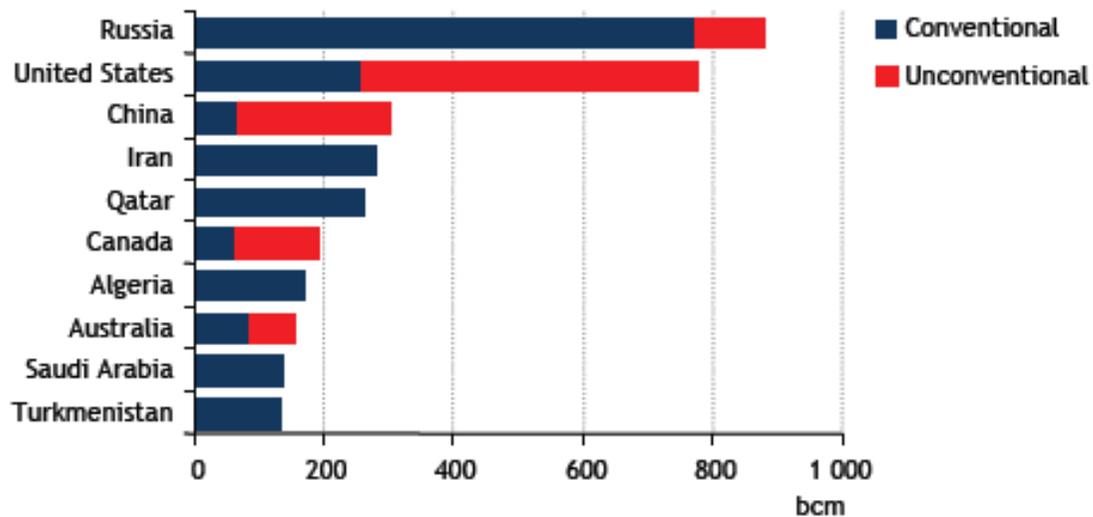


Figure 1.7 ▶ Natural gas production by type in the GAS Scenario



**More gas,
conventional &
unconventional**

Figure 1.8 ▶ Largest gas producers by type in the GAS scenario, 2035



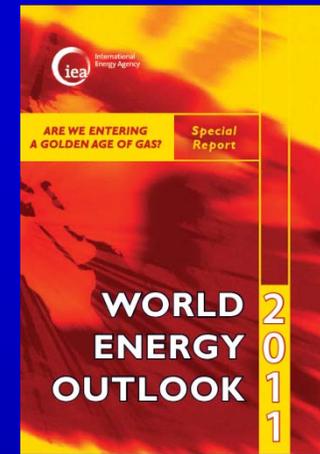


Figure 1.10 ▶ Net gas trade by major region and scenario

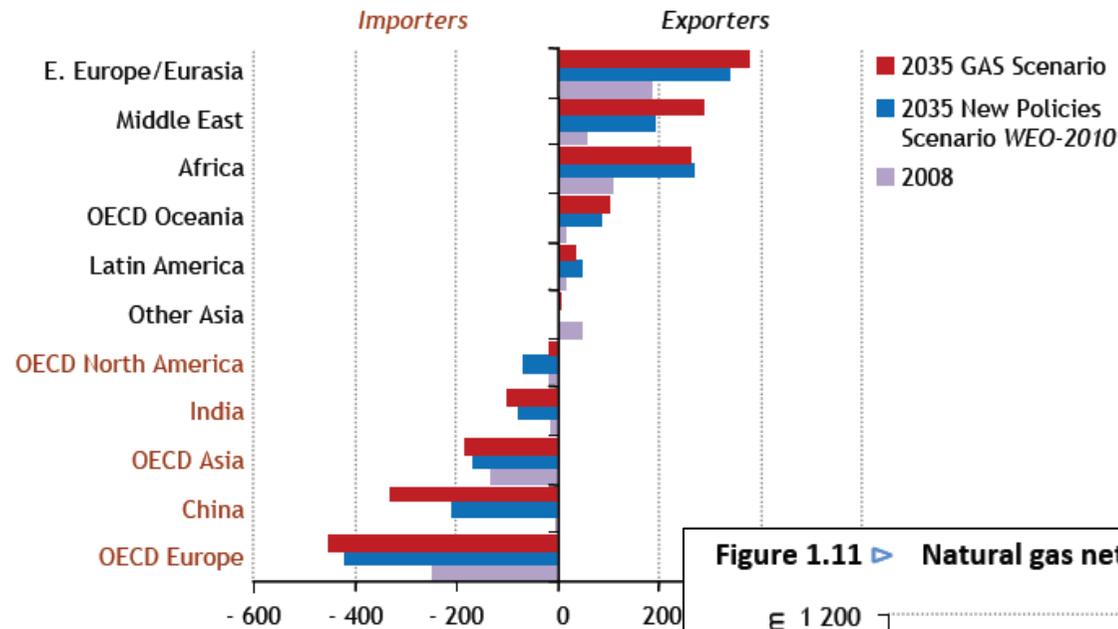
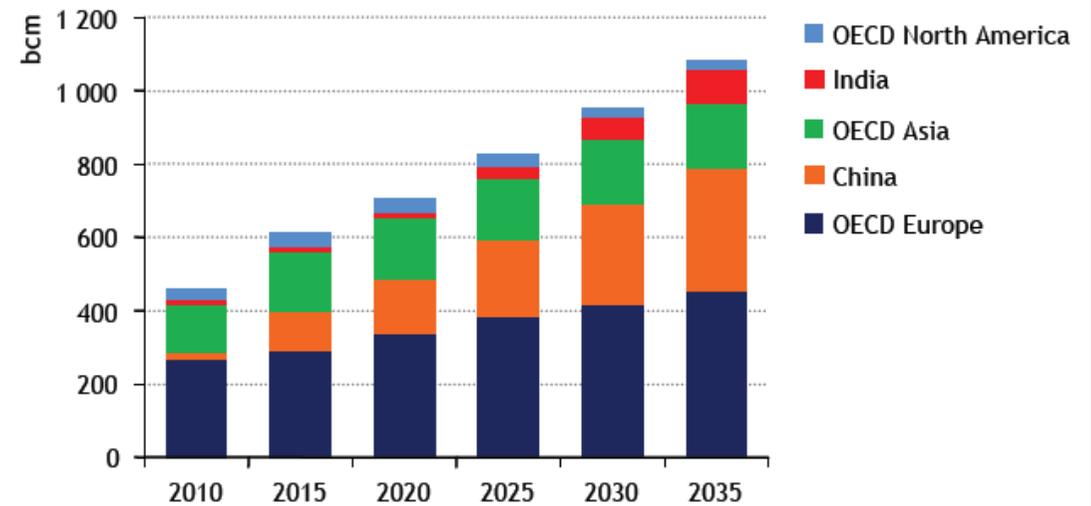
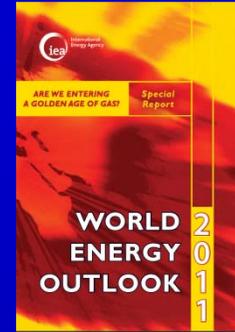
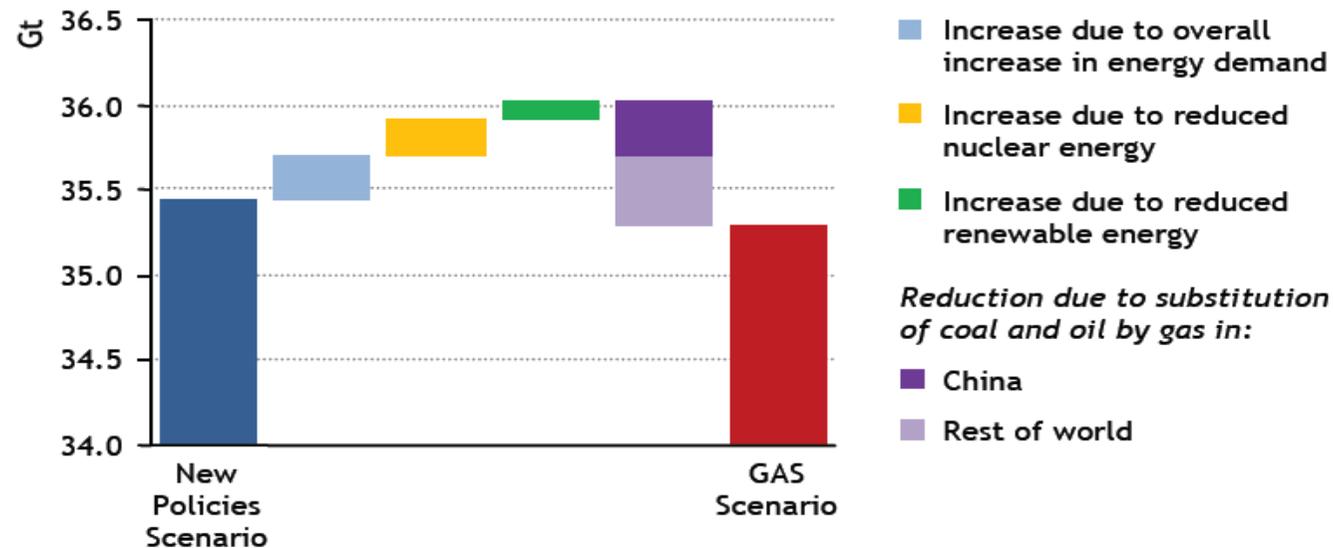


Figure 1.11 ▶ Natural gas net imports by major region in the GAS Scenario



**More gas:
more trade,
more (EU) imports**

Figure 1.16 ▶ CO₂ emissions in the GAS Scenario relative to the New Policies Scenario, 2035



But, how about climate change?

Overall, the GAS Scenario puts CO₂ emissions on a long-term trajectory consistent with stabilising the atmospheric concentration of greenhouse gases at around 650 ppm, resulting in a probable temperature rise of more than 3.5°C in the long term, well above the widely accepted 2°C target. Widespread deployment in gas applications for power generation and industry of technologies, such as carbon capture and storage (CCS), has the potential to reduce emissions from gas consumption significantly in the long term, which could result in stabilisation at lower levels, but the GAS Scenario does not allow for this in the period to 2035.

Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean

The U.S. Geological Survey estimated a mean of 1.7 billion barrels of recoverable oil and a mean of 122 trillion cubic feet of recoverable gas in the Levant Basin Province using a geology based assessment methodology.

Introduction

As part of a program aimed at estimating the recoverable oil and gas resources of priority basins around the world, the U.S. Geological Survey (USGS) estimated the undiscovered oil and gas resources of the Levant Basin Province. The Levant Basin Province encompasses approximately 83,000 square kilometers (km²) of the eastern Mediterranean area (fig. 1). The area is bounded to the east by the Levant Transform Zone, to the north by the Tartus Fault (Roberts and Peace, 2007), to the northwest by the Eratosthenes Seamount, to the west and southwest by the Nile Delta Cone Province boundary, and to the south by the limit of compressional structures in the Sinai. This assessment was based on published geologic information and on commercial data from oil and gas wells, fields, and field production. The USGS approach is to define petroleum systems and geologic assessment units and to assess the potential for undiscovered oil and gas resources in each of the three assessment units defined for this study—Plio-Pleistocene Reservoirs, Levant Sub-Salt Reservoirs, and Levant Margin Reservoirs.

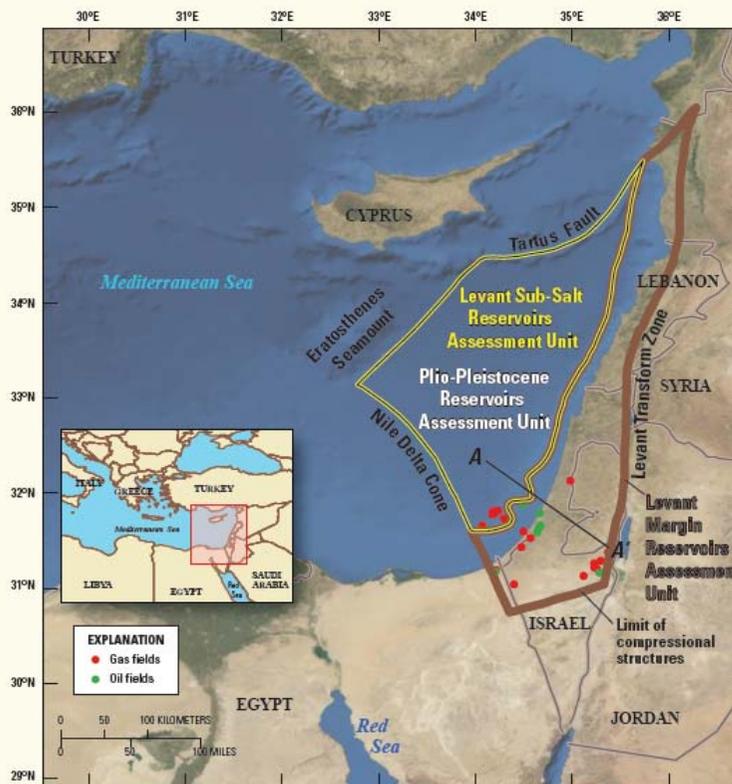


Figure 1. Location of the three assessment units (AU) in the Levant Basin Province in the Eastern Mediterranean. The boundaries of the Levant Sub-Salt AU and the Plio-Pleistocene Reservoirs AU are coincident.

“Let me tell you something that we Israelis have against Moses. He took us 40 years through the desert in order to bring us to the one spot in the Middle East that has no oil”.

Golda Meir, 1973

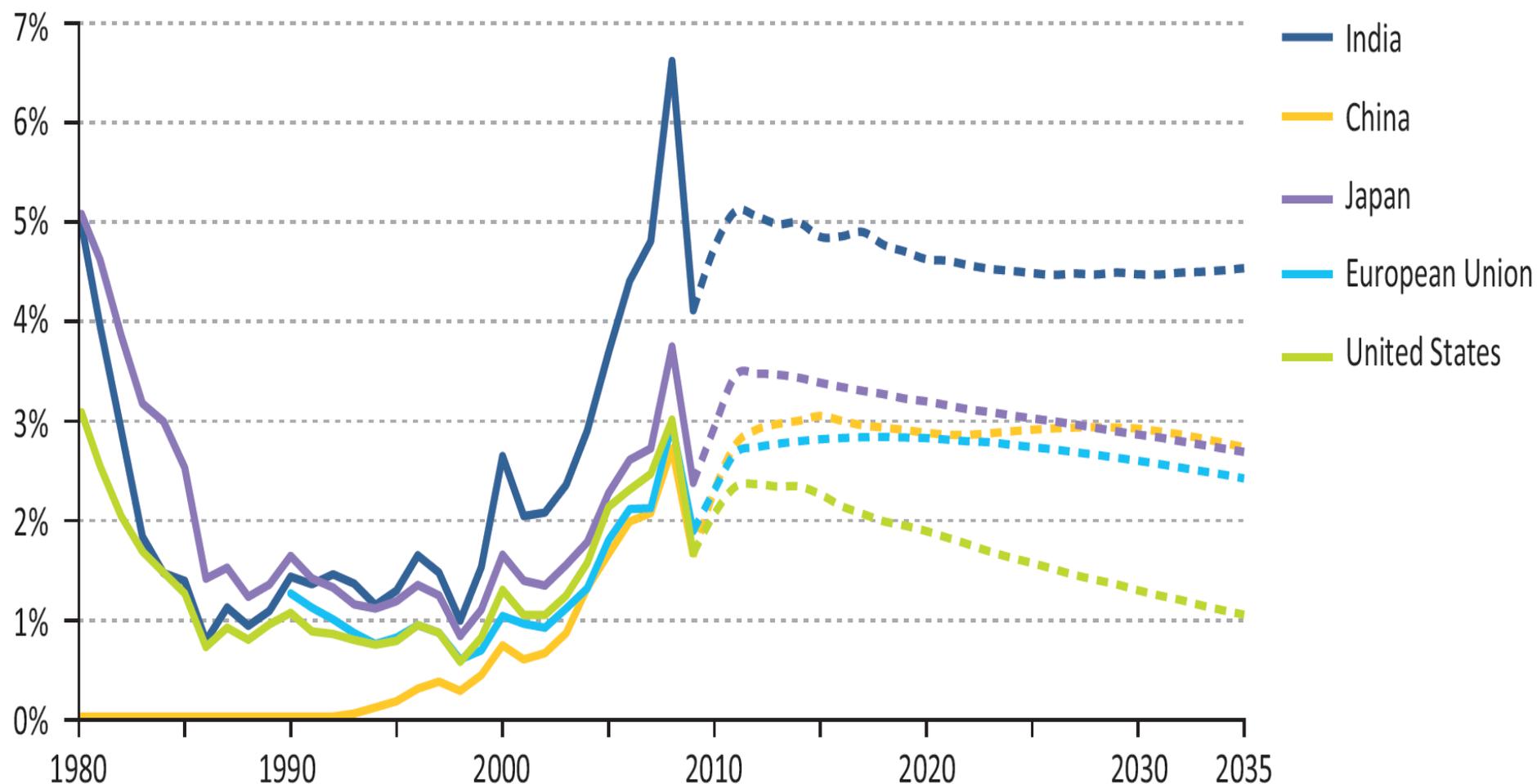
Bloomberg Businessweek

Wednesday September 22, 2010

Israel May Join Gas Exporting Nations

June 03, 2010, 9:22 PM EDT

NPS: gastos en importaciones netas de petróleo y gas expresado en % del PIB real



Note: Calculated as the value of net imports at the prevailing average international prices. The split between crude/refined products and LNG/piped gas is not taken into account. GDP is measured at market exchange rates in year-2010 dollars.

1.2. Comercio Exterior en enero-octubre de 2011. Desglose por Sectores Económicos

	EXPORTACIONES			IMPORTACIONES			SALDO	
	Millones €	% total	%11/10	Millones €	% total	%11/10	Millones €	%11/10
Alimentos	24.662,1	13,9	9,6	22.361,8	10,3	11,3	2.300,3	-4,3
Frutas y legumbres	9.225,0	5,2	3,0	2.729,2	1,3	5,0	6.495,8	2,2
Pesca	2.311,7	1,3	13,9	4.216,6	1,9	8,3	-1.904,9	2,3
Bebidas	2.425,5	1,4	18,9	1.341,1	0,6	3,7	1.084,3	45,3
Carne	3.351,0	1,9	18,4	1.407,0	0,6	-5,6	1.944,1	45,3
Otros alimentos	7.348,9	4,1	10,6	12.667,9	5,8	17,0	-5.319,0	27,3
Productos energéticos	12.545,2	7,1	66,7	45.618,8	21,0	27,5	-33.073,6	17,1
Petróleo y derivados	11.649,6	6,6	68,7	35.970,3	16,6	29,2	-24.320,7	16,1
Gas	296,6	0,2	97,1	8.141,2	3,8	18,4	-7.844,5	16,6
Carbón y electricidad	598,9	0,3	27,0	1.507,3	0,7	43,6	-908,4	57,2
TOTAL	177.616,0	100,0	16,6	216.730,9	100,0	10,9	-39.114,9	-9,1

84,55%

BALANZA DE PAGOS

Saldo por turismo (millones de euros).

Año 2011.

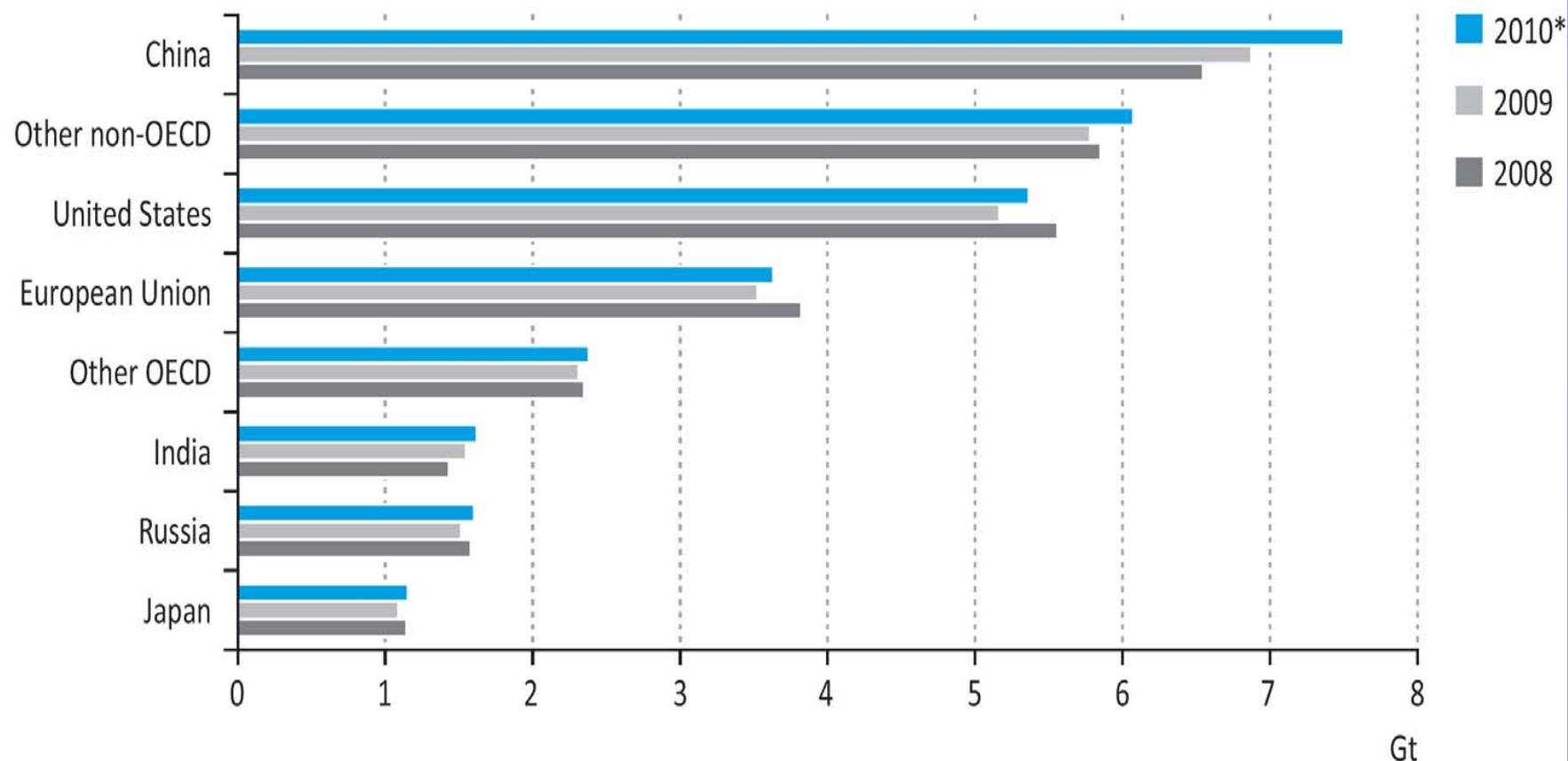
	Saldo	Tasa de Variación Interanual	Diferencia
Total	-33.073,6 27.919,8	14,2	3.479,1
Enero 2011	1.698,5	8,6	134,6
Febrero 2011	1.318,3	11,7	138,0
Marzo 2011	1.861,8	12,1	201,2
Abril 2011	2.012,6	30,6	471,7
Mayo 2011	2.875,0	11,2	288,5
Junio 2011	3.178,9	19,4	517,6
Julio 2011	4.212,1	11,9	448,5
Agosto 2011	4.368,2	12,4	481,0
Septiembre 2011	3.409,0	15,4	453,9
Octubre 2011	2.985,5	13,0	344,1

(*) Los datos se revisan con carácter definitivo al final del año.

Saldo por turismo.

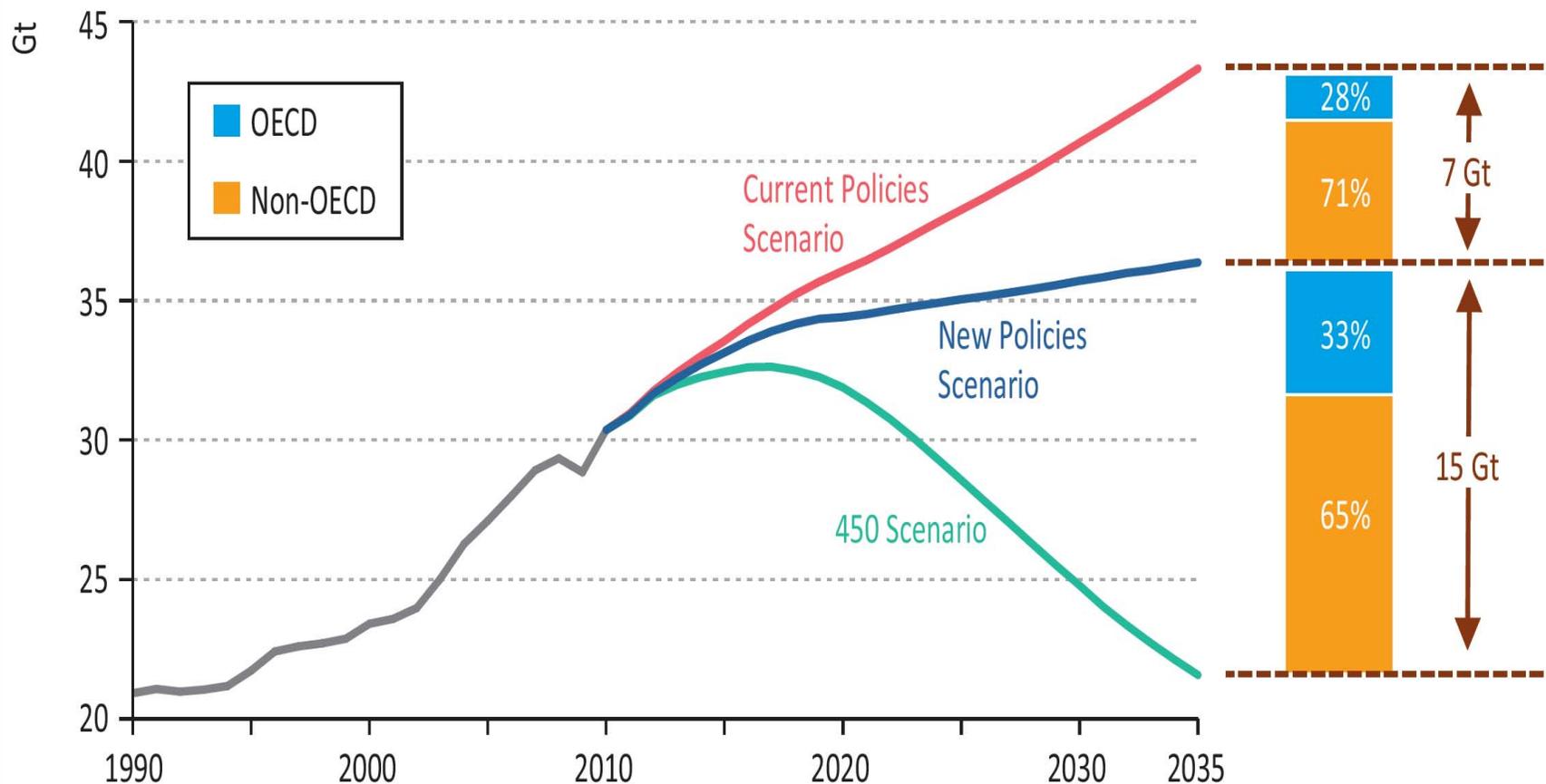
Año 2011.

NPS: emisiones de CO₂ relacionadas con la energía por país-región (2008-2010) o el efecto pasajero de la crisis...



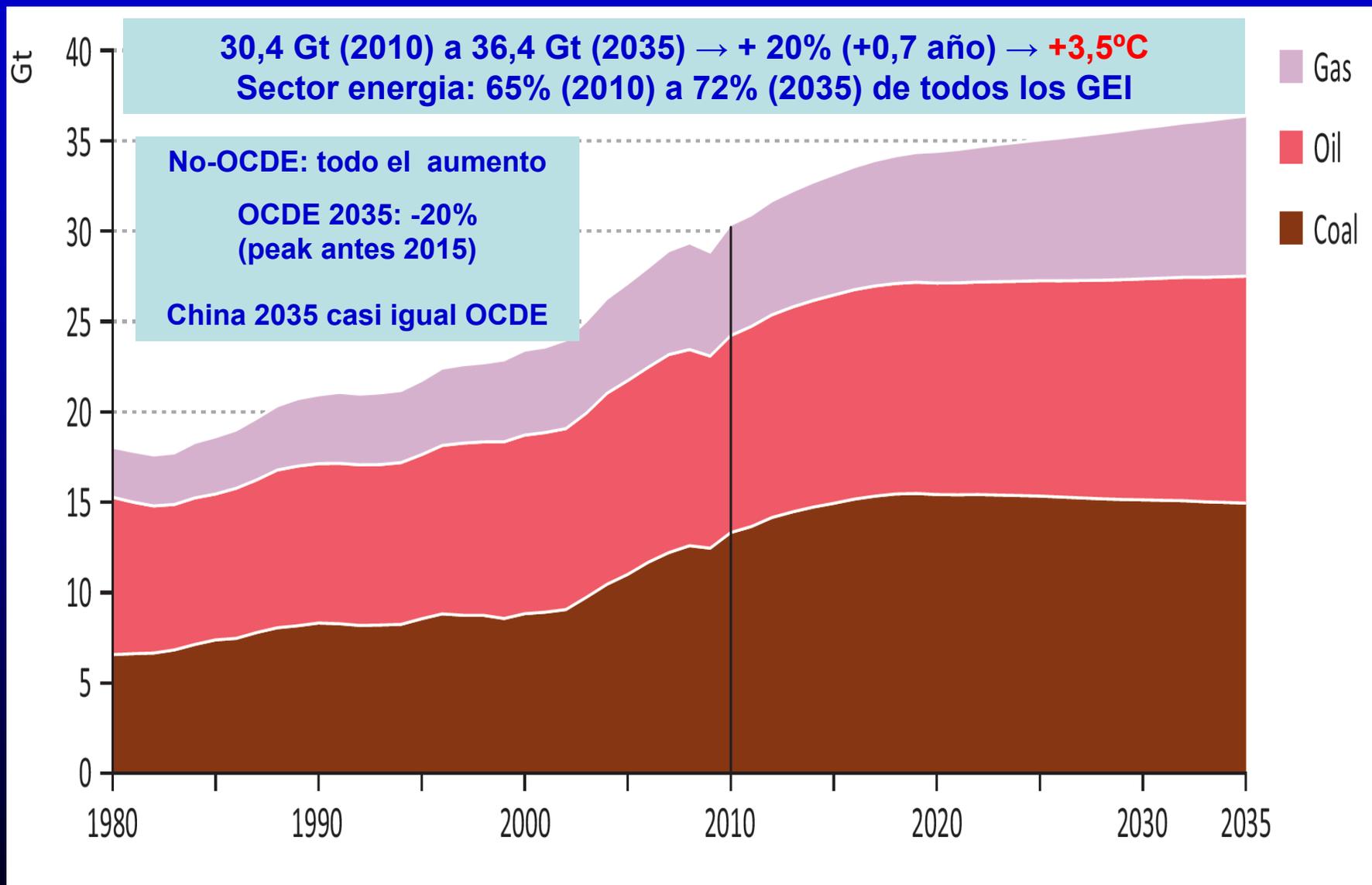
*Estimated.

Emisiones mundiales de CO₂ en relación con la energía por escenario

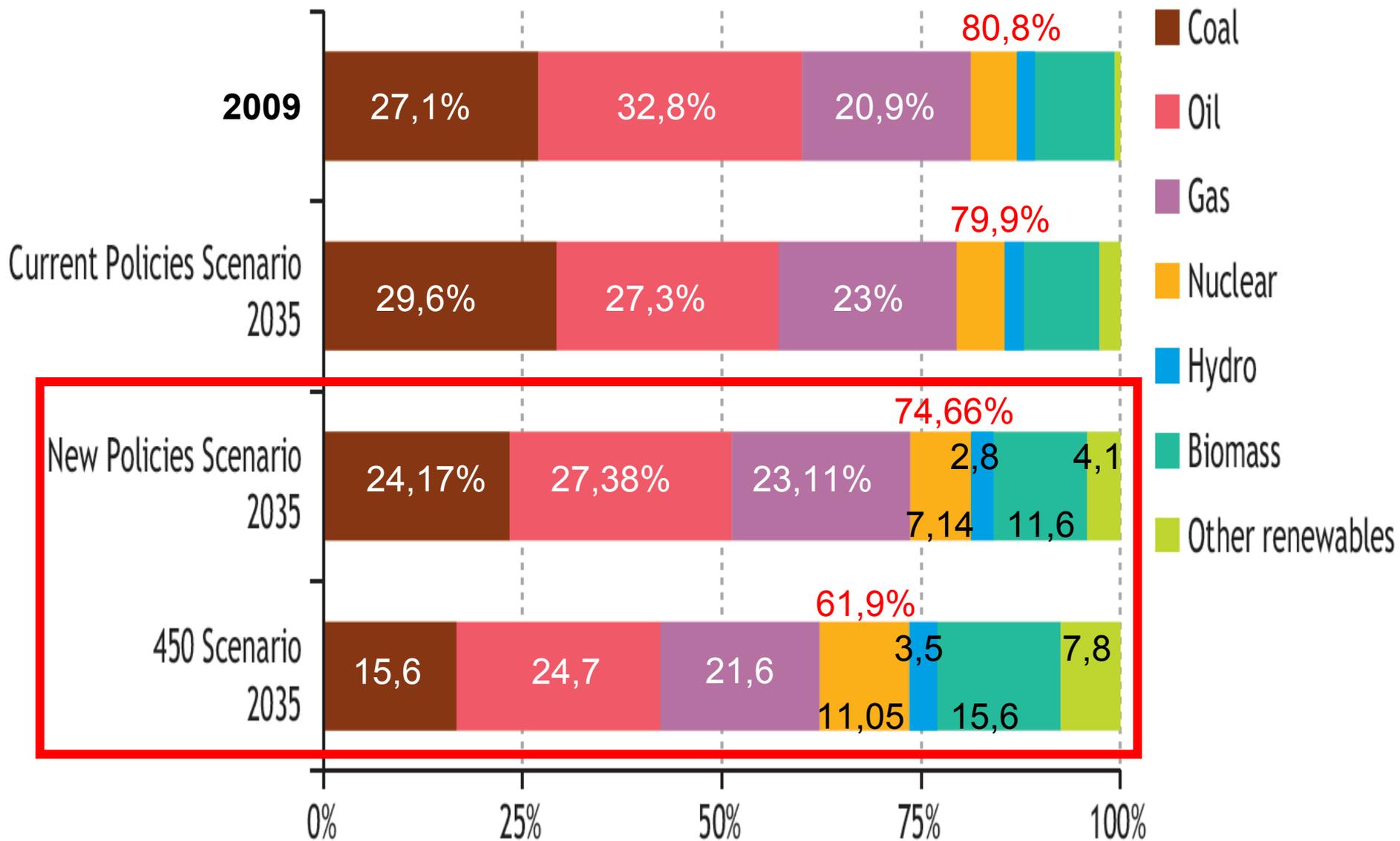


Note: There is also some abatement of inter-regional (bunker) emissions which, at less than 2% of the difference between scenarios, is not visible in the 2035 shares.

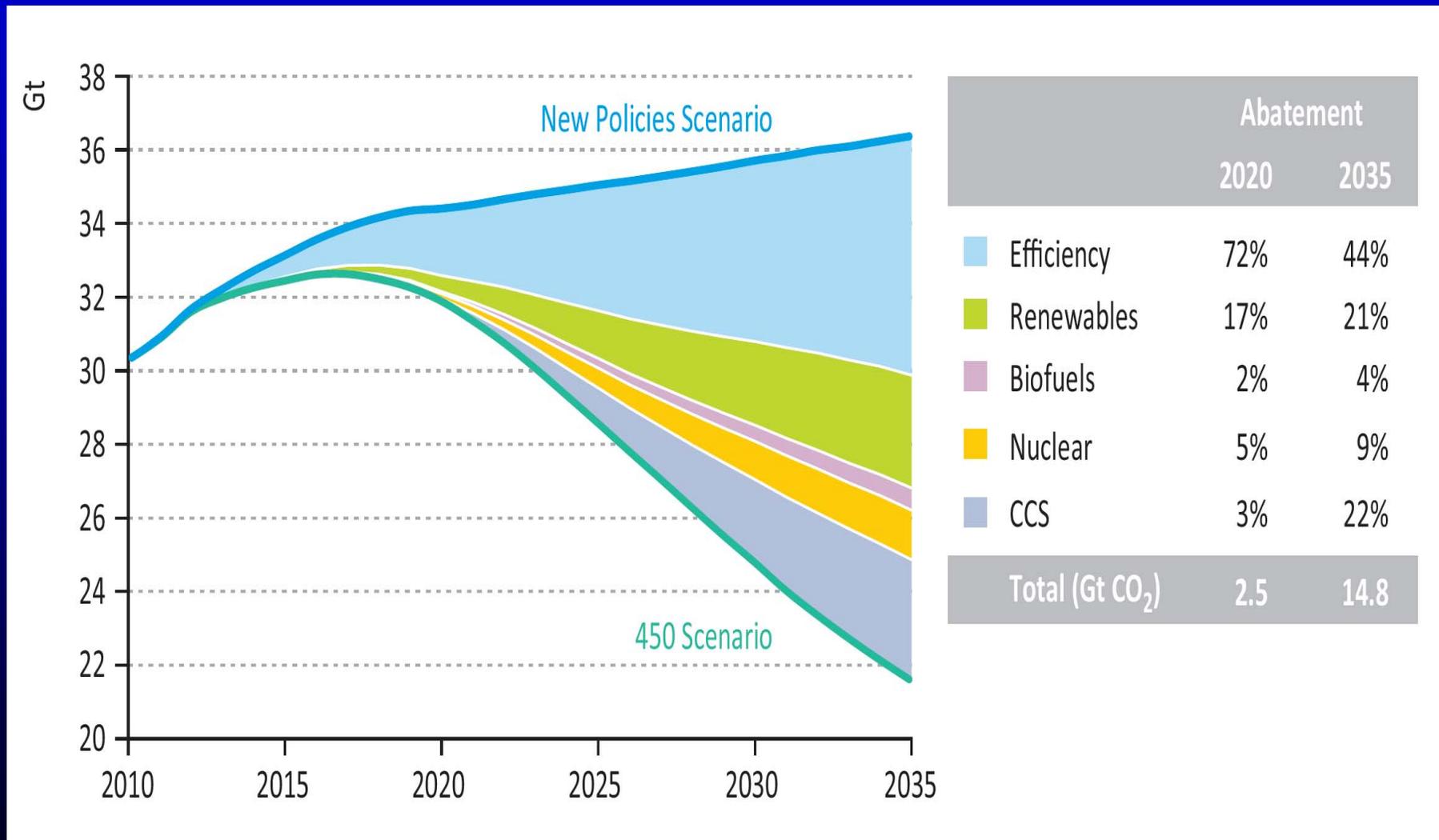
NPS: Emisiones globales de CO₂ relacionadas con la energía por tipo de combustible, 1980-2035



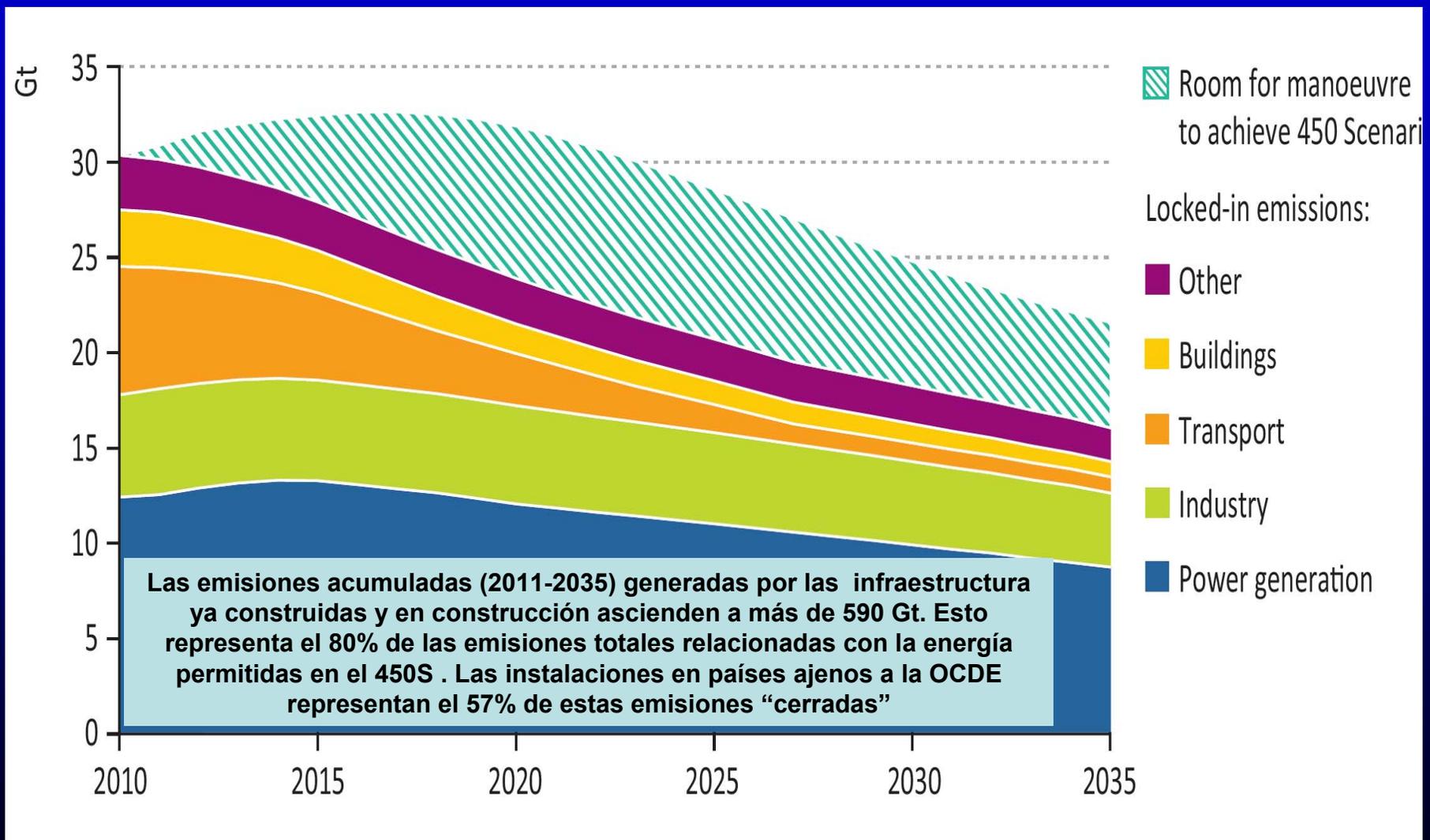
Demanda mundial de energía primaria por fuentes en diferentes escenarios. **NPS vs 450S**



Papel de las diferentes tecnologías en el recorte de las emisiones globales de CO₂ relacionadas con la energía. **NPS a 450 S**



Emisiones de CO₂ mundiales relacionadas con la energía de las infraestructuras “cerrada” en 2010 y espacio de maniobra para ajustarse al 450S



¡Muchas gracias por su atención!