CONSTRAINTS FOR ECONOMIC INSTRUMENTS IN SPANISH ENERGY AND ENVIRONMENTAL POLICIES

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European Environment Agency
Policy Evaluation Lecture

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economics for energy
19 JUNIO, 2014
La imposición energético-ambiental en España, meses después del informe de la Comisión de Expertos y antes de la propuesta fiscal del gobierno
Durante los últimos meses me he estado poniendo excusas diversas para no hacer una nueva entrada sobre imposición energético-ambiental en España: falta de tiempo, esperanza de que hubiese más movimientos o debate socio-político sobre estas cuestiones, etc. Pero creo que lo que realmente ha pesado más en mi silencio es el cansancio por haber trabajado durante muchos años en un tema, que culminó con la publicación de nuestro último informe anual, que no parece interesar demasiado en España y la sensación de que no tiene sentido, ni por mí ni por los sufridos lectores, seguir repitiendo lo mismo. Y si no veamos como comenzaba otra de mis entradas publicada hace nueve meses en este blog: Como ya hemos indicado con anterioridad en este blog (aquí y aquí) y podéis ver en esta presentación que me acaban de pedir para un workshop sobre política climática en la UE, o en este trabajo, la imposición energético-ambiental española presenta algunas anomalías en relación a los países de nuestro entorno. Sin ánimo de ser reiterativo, estas se refieren a una baja tributación de los combustibles de automoción y a una actuación en muchos casos oportunista y descoordinada por parte de las comunidades autónomas (...). Creo que, salvo las referencias puntuales a presentaciones específicas, a día de hoy no hay razones para modificar una coma de ese texto.
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Impuestos energético-ambientales en España
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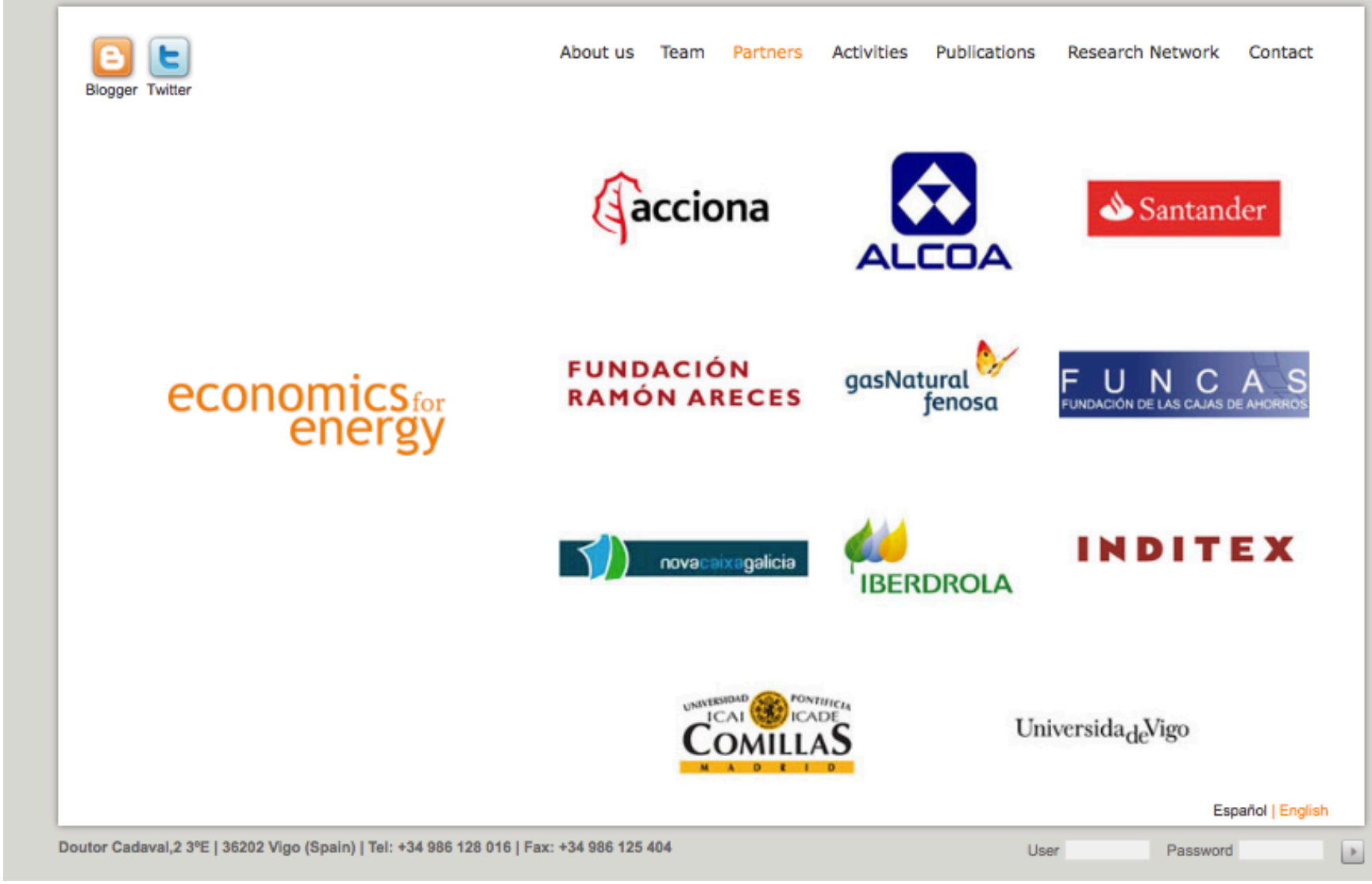
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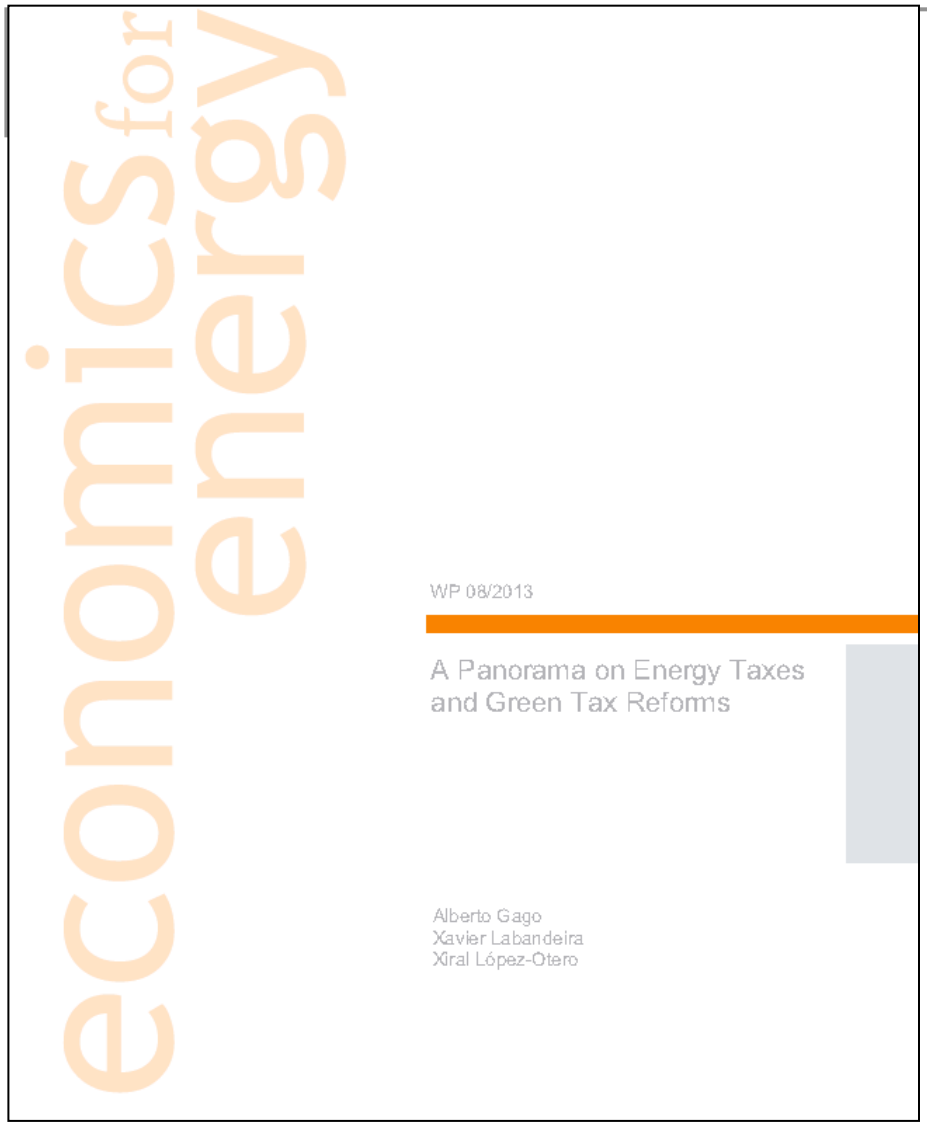
- **Conclusions**



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A Panorama on Energy Taxes and Green Tax Reforms*

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Summary

This article provides an overview of specific and systemic applications of energy taxes and environmental (or green) tax reforms. To do so it combines a theoretical and empirical assessment of the literature, with a non-exhaustive description of the practice of these instruments and packages in the real world. Besides yielding a comprehensive approximation to the specific and systemic use of energy taxes, the paper contributes to the research in this area by reflecting on the present and future of these instruments in a particularly shifting world.

Keywords: Taxes, Energy, Environment, Externalities, Natural Resources.

JEL classification: H21, H23, Q48, Q58.

1. Introduction

Energy issues play an increasingly important role in contemporary developed and developing societies. This is due to the fact that the availability of reliable and sufficient energy is crucial for the development of economic activities and, therefore, the energy sector is nowadays very relevant and quite sizeable in most economies. But energy is also the source of important external (negative) environmental effects, particularly those related to the emissions of greenhouse gases (GHG) that are the cause of climate change phenomena. Moreover, the varying availability of energy resources across the globe brings about dependence relationships among countries that give prominence to energy security concerns.

http://www.eforenergy.org/docpublicaciones/documentos-de-trabajo/PW08-2013.pdf

Reasons for energy taxes

- Revenue-raising (Ramsey)
  - 1970s
  - Low price-elasticities
- Environmental correction (Pigou)
  - 1990s
  - Static and dynamic efficiency
- Capture of economic rents
  - Oil-shock related

Reasons for energy taxes (*Tax rules*)

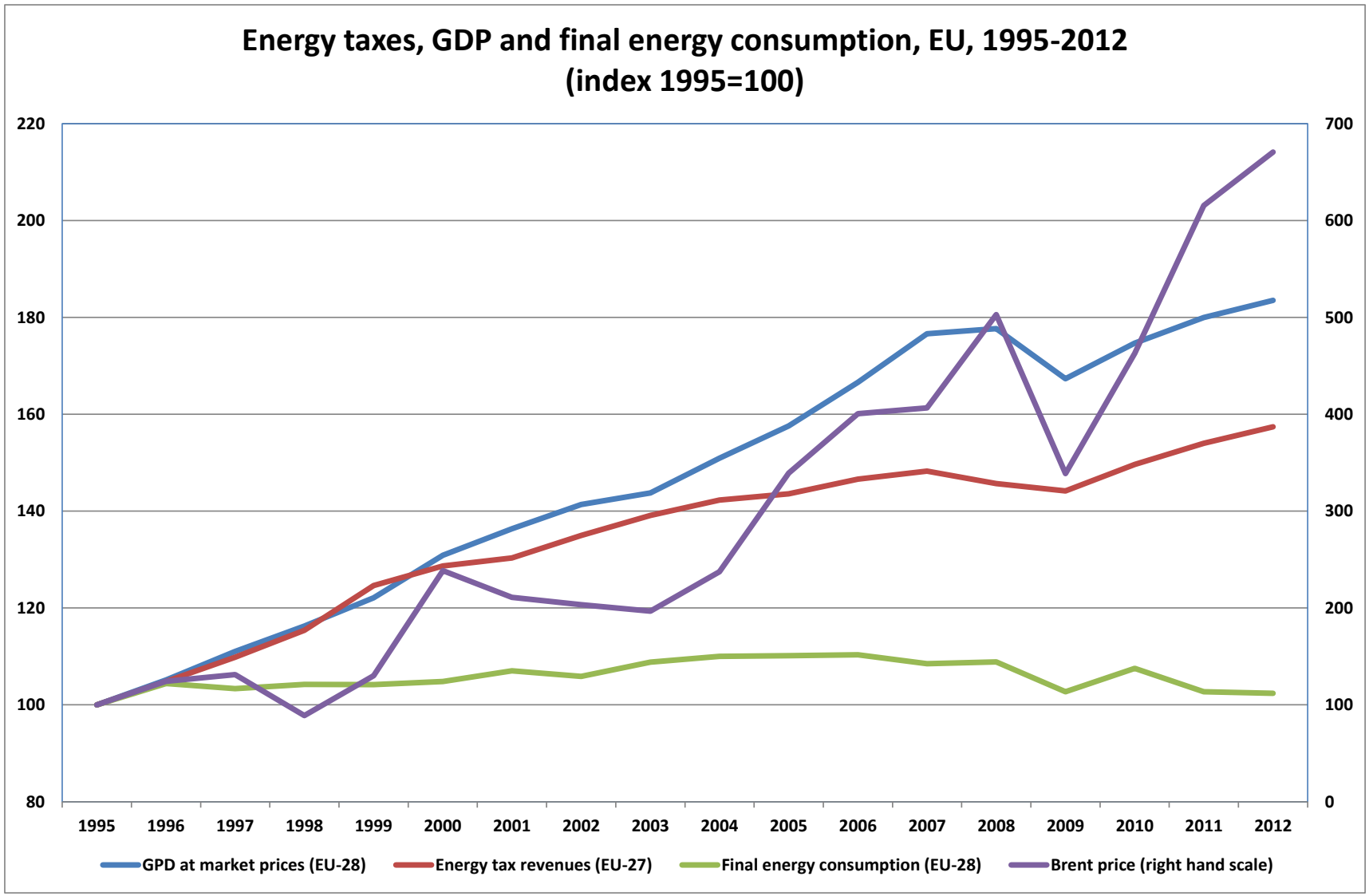
- Final consumption
- Price-inelastic energy goods
- Origin of externalities
- Foreign supply

but,

- Trade-offs
  - Revenue-raising vs. externality correction/ capture of rents
  - Price-elasticity vs cost-efficiency

Reasons for energy taxes (*Limits*)

- Energy/GDP decoupling
  - Applicable to evolution
- Distributional concerns
  - Country and product dependent
- Visibility and blocking minorities
  - ‘Packages’
- Competitiveness
  - Exemptions


Energy taxes, GDP and final energy consumption, EU, 1995-2012
(index 1995=100)
220
200
180
160
140
120
100
80
700
600
500
400
300
200
100
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
GPD at market prices (EU-28)
Energy tax revenues (EU-27)
Final energy consumption (EU-28)
Brent price (right hand scale)

Green Tax Reforms

- Systemic approach based on energy-related taxation
- Based on the theory of double dividend
  - Externality correction
  - Fiscal improvement
- Two generations
  - Scandinavian model (1990s)
    - Income and carbon taxation
  - German model (2000s)
    - Labour and (conventional) energy taxation

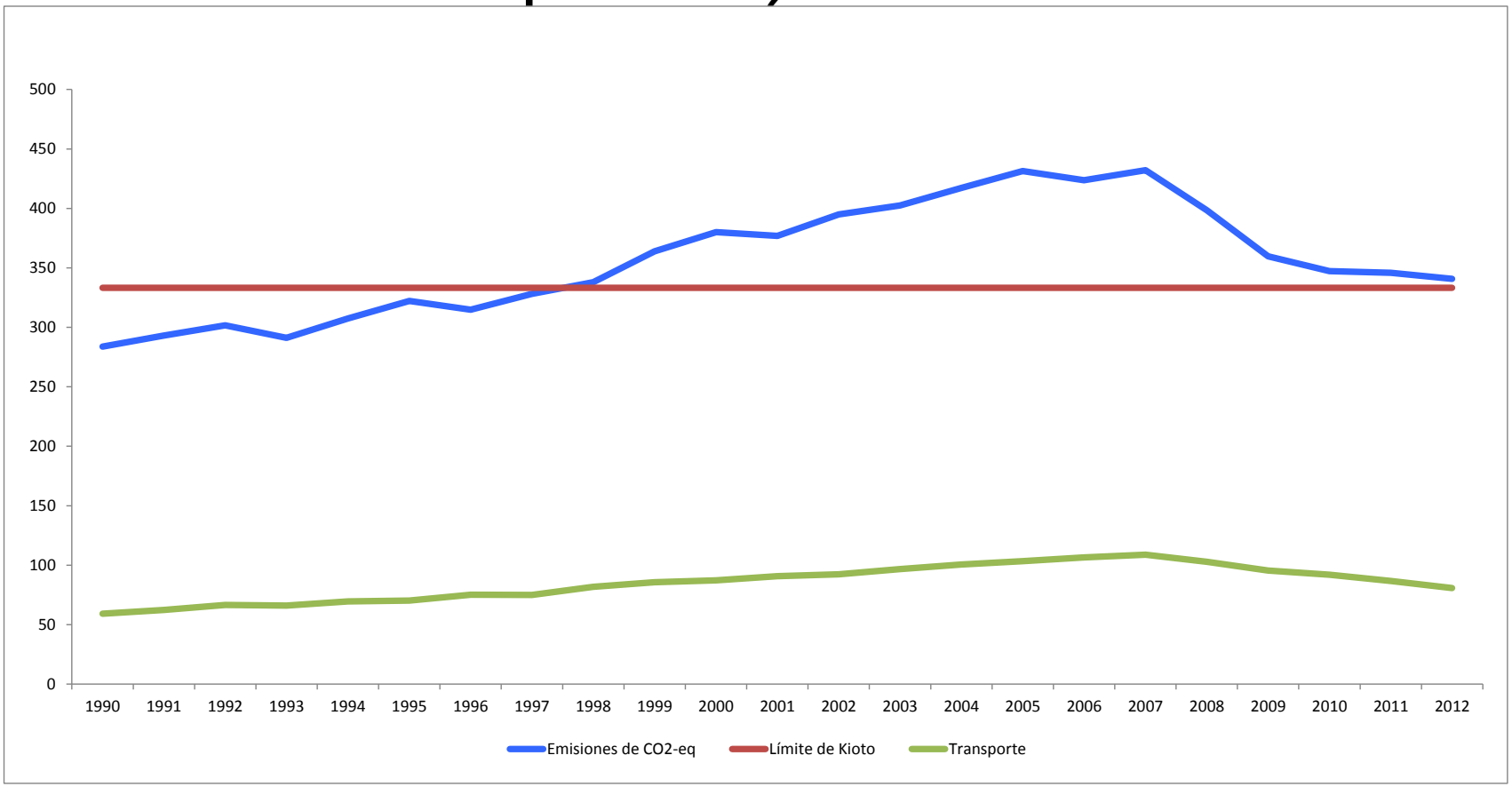
Prospective

- Innovation in energy taxes
  - Taxes on car usage
  - Border tax adjustments
  - A new tax on energy inefficiency?
- A new model of green tax reform
  - Australia, Ireland, Japan
  - Less connected to theory of double dividend. Extra revenues devoted to:
    - Fiscal consolidation
    - Renewable/energy efficiency promotion
    - Distributional offsets

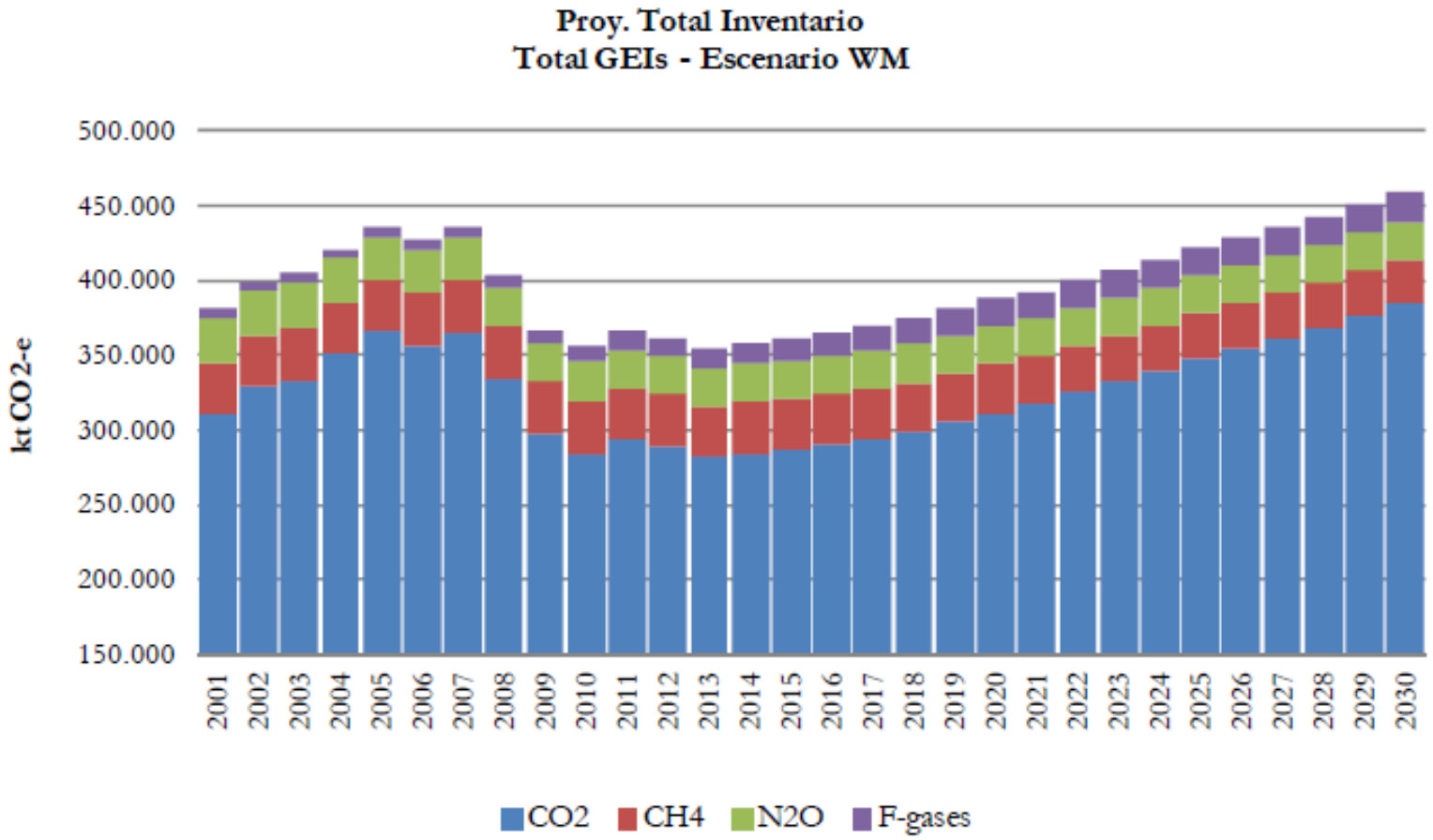
http://www.eforenergy.org/docpublicaciones/documentos-de-trabajo/WPFA04-2012.pdf

Spain: A picture

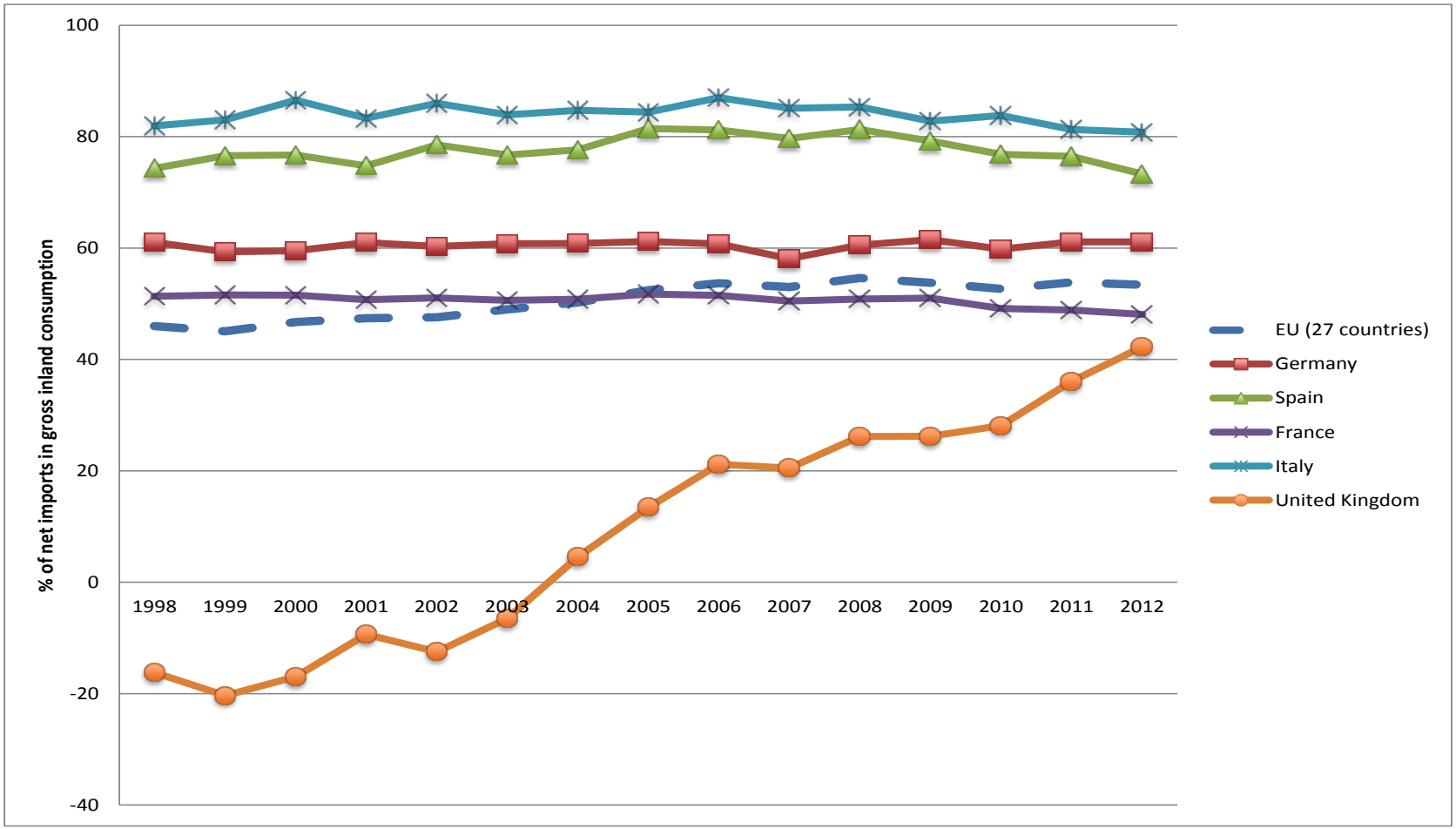
Spanish CO_2 emissions



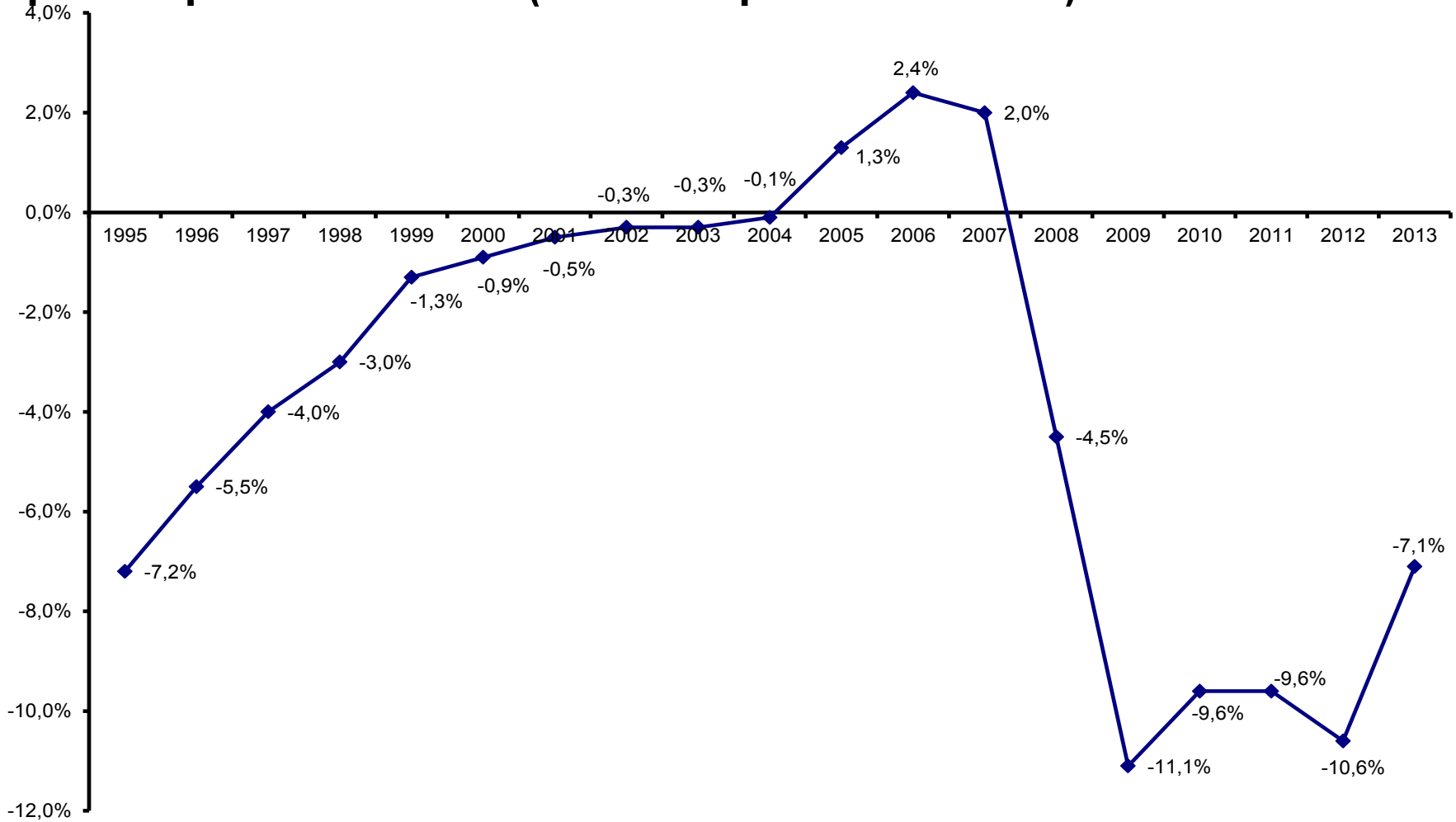
Spanish CO_2 emissions (official forecast)



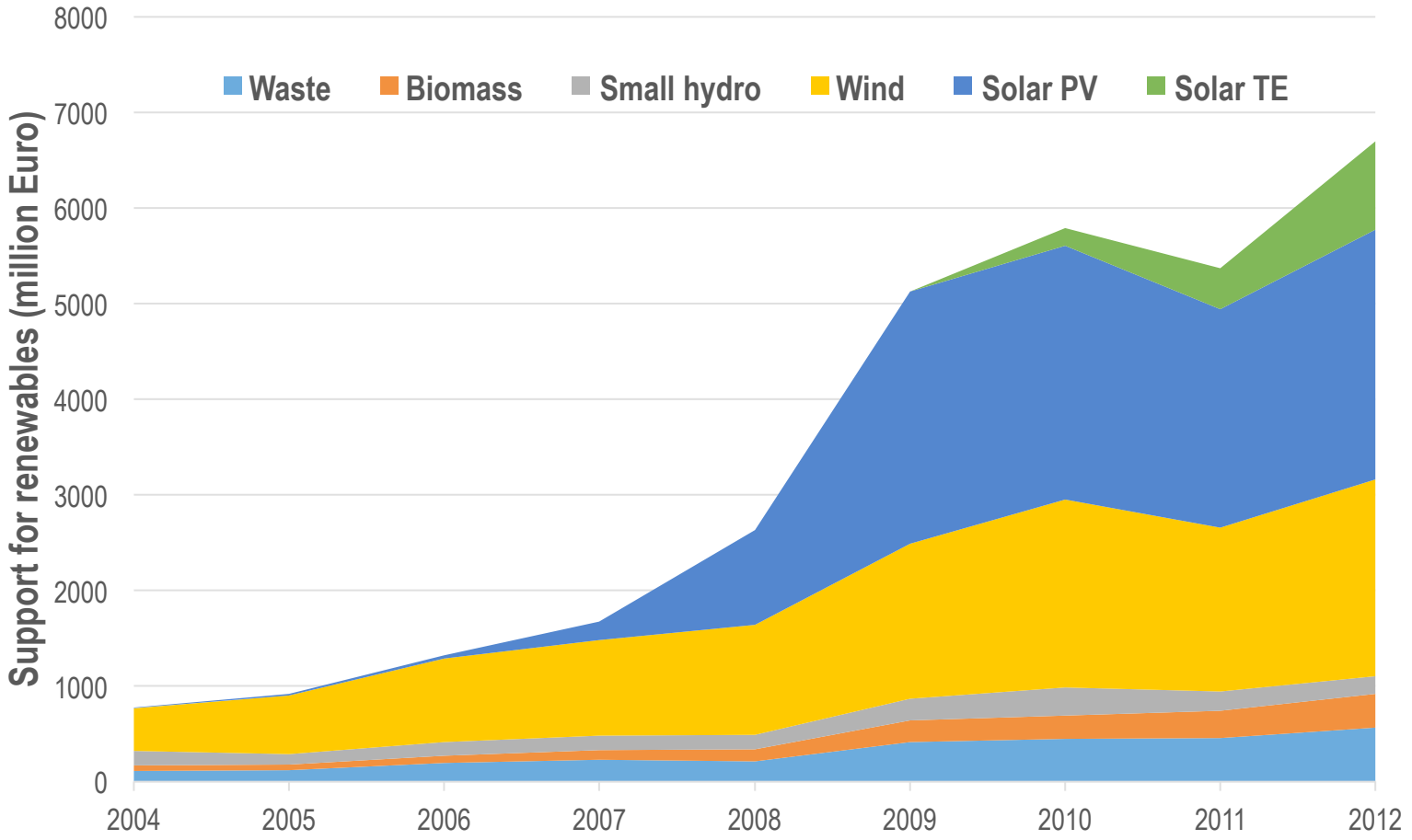
Spanish energy dependence



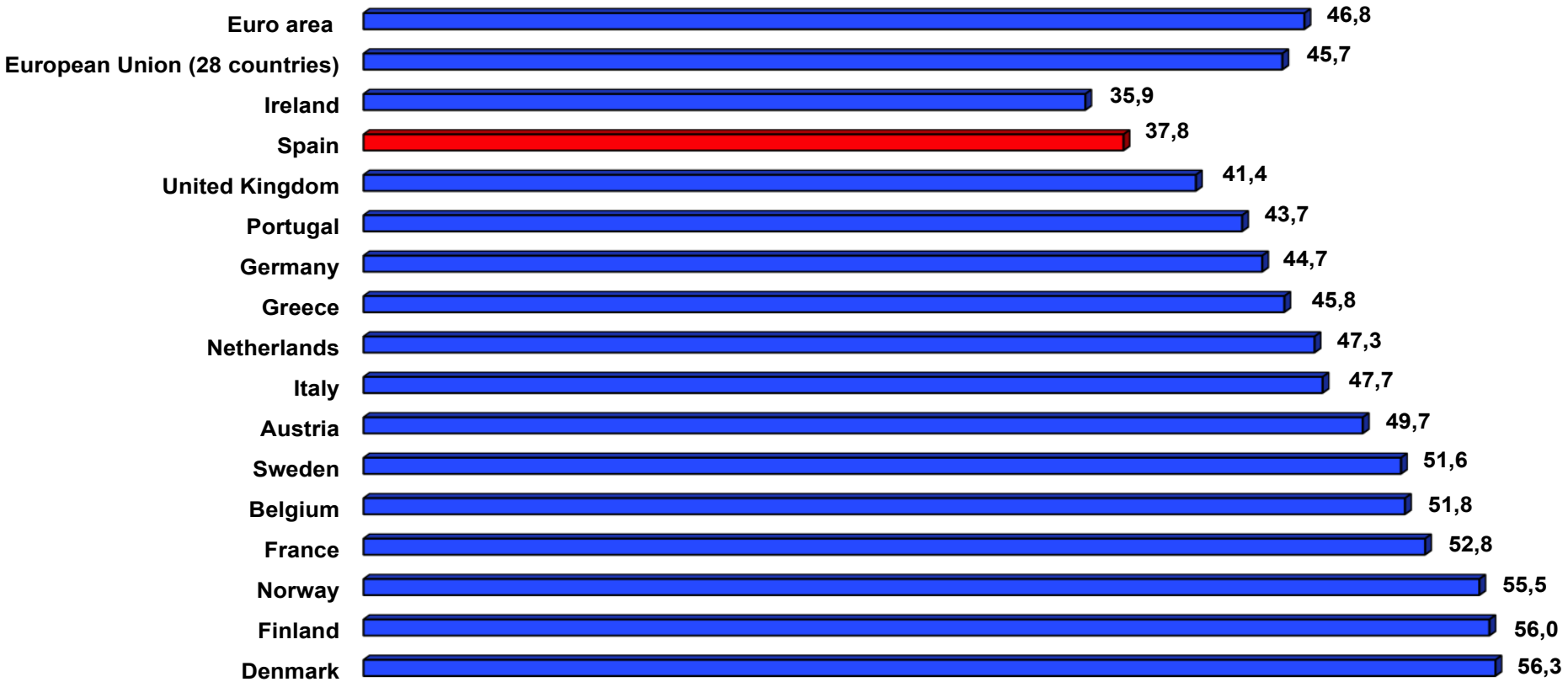
Spanish public finances (deficit/superavit on GDP)



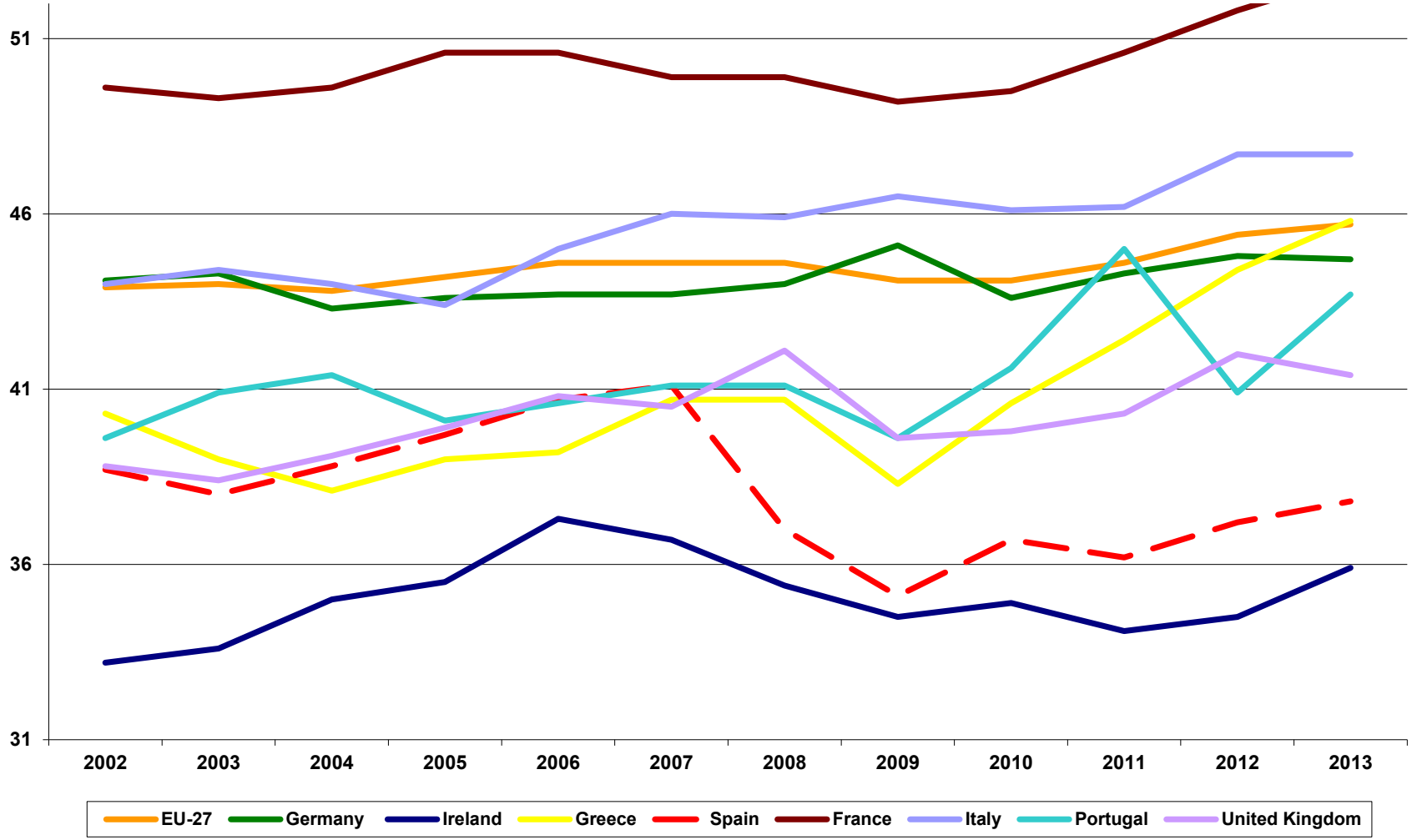
Costs of renewable support (M€)



Public revenues on GDP (2013)



Public revenues on GDP (2002-2013)



The Spanish Tax System

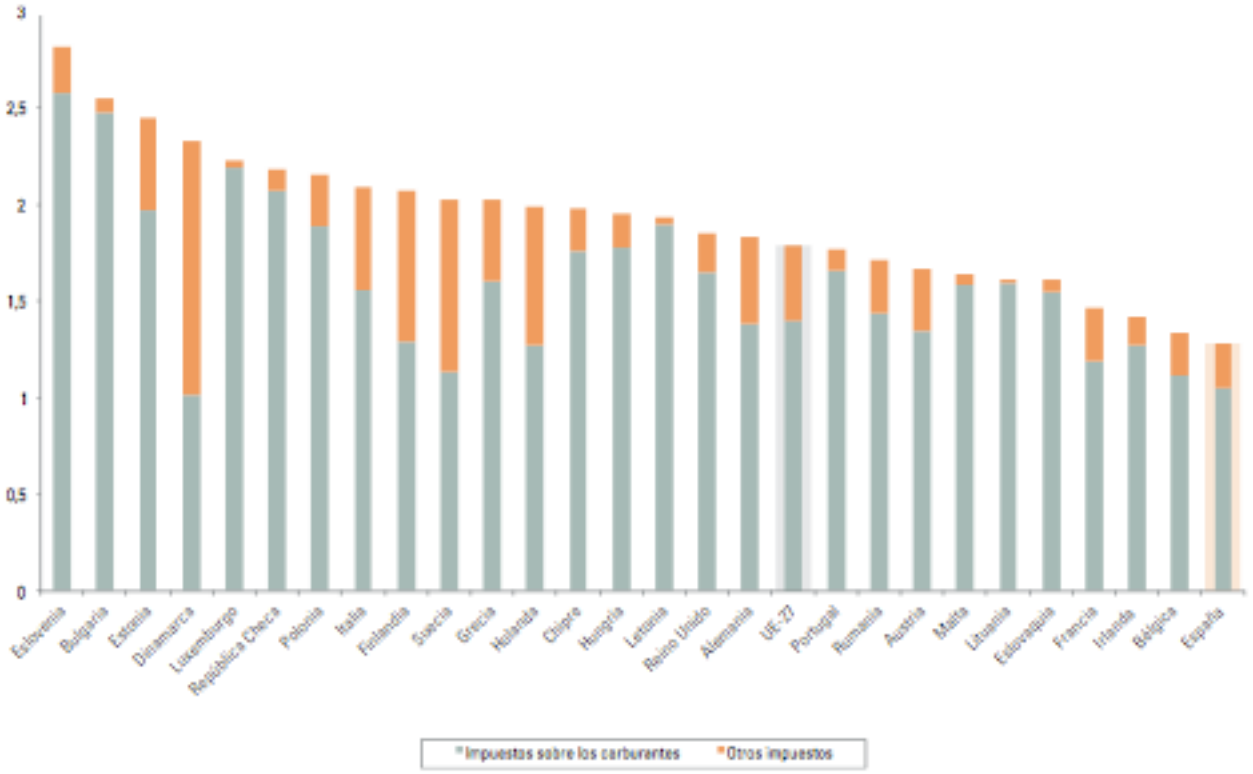
							Millones de euros			
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
1. Impuestos directos principales	**73.742,2**	**87.217,9**	**100.020,7**	**117.437,4**	**98.642,5**	**84.045,4**	**83.174,9**	**86.414,0**	**92.053,8**	**89.896,7**
	100,0	*118,3*	*135,6*	*159,3*	*133,8*	*114,0*	*112,8*	*117,2*	*124,8*	*121,9*
Impuesto sobre la Renta de las Personas Físicas	47.722,3	54.722,6	62.813,1	72.614,3	71.341,1	63.856,9	66.977,1	69.803,0	70.618,6	69.951,5
	100,0	*114,7*	*131,6*	*152,2*	*149,5*	*133,8*	*140,3*	*146,3*	*148,0*	*146,6*
Impuesto sobre sociedades	26.019,9	32.495,3	37.207,6	44.823,2	27.301,4	20.188,5	16.197,8	16.611,0	21.435,2	19.945,2
	100,0	*124,9*	*143,0*	*172,3*	*104,9*	*77,6*	*62,3*	*63,8*	*82,4*	*76,7*
2. Impuestos indirectos principales	**62.021,0**	**67.892,6**	**73.254,1**	**75.637,1**	**67.590,7**	**52.915,7**	**68.892,7**	**68.285,0**	**68.672,8**	**71.005,7**
	100,0	*109,5*	*118,1*	*122,0*	*109,0*	*85,3*	*111,1*	*110,1*	*110,7*	*114,5*
I.V.A.	44.507,3	49.870,4	54.651,8	55.850,7	48.020,8	33.566,7	49.086,5	49.302,0	50.463,5	51.931,8
	100,0	*112,0*	*122,8*	*125,5*	*107,9*	*75,4*	*110,3*	*110,8*	*113,4*	*116,7*
Impuestos Especiales	**17.513,7**	**18.022,2**	**18.602,3**	**19.786,4**	**19.570,0**	**19.349,0**	**19.806,2**	**18.983,0**	**18.209,3**	**19.073,9**
	100,0	*102,9*	*106,2*	*113,0*	*111,7*	*110,5*	*113,1*	*108,4*	*104,0*	*108,9*
Hidrocarburos	10.122,8	10.210,0	10.413,8	10.715,0	10.152,0	9.851,3	9.913,0	9.289,0	8.594,7	9.933,5
	100,0	*100,9*	*102,9*	*105,8*	*100,3*	*97,3*	*97,9*	*91,8*	*84,9*	*98,1*
Electricidad	809,0	854,9	973,4	1.065,5	1.187,4	1.270,7	1.363,0	1.372,0	1.506,5	1.444,7
	100,0	*105,7*	*120,3*	*131,7*	*146,8*	*157,1*	*168,5*	*169,6*	*186,2*	*178,6*
Otros	6.581,9	6.957,4	7.215,1	8.006,0	8.230,6	8.227,0	8.530,0	8.322,0	8.108,1	7.695,7
	100,0	*105,7*	*109,6*	*121,6*	*125,0*	*125,0*	*129,6*	*126,4*	*123,2*	*116,9*

Comparatively lower energy taxation (2013)

Impuestos sobre la energía (€) 2013	Fuelóleo ligero para hogares (por cada 1000 litros)				Gasóleo de automoción para uso no comercial (por litro)				Gasolina sin plomo (95 octanos) (por litro)				Gas natural para hogares (por cada MWh GCV)				Electricidad para hogares (por kWh)			
	Accisa	IVA (%)	Total	PPA (%)	Accisa	IVA (%)	Total	PPA (%)	Accisa	IVA (%)	Total	PPA (%)	Accisa	IVA (%)	Total	PPA (%)	Accisa	IVA (%)	Total	PPA (%)
Alemania	61,35	19,00	194,63	58,70	0,47	19,00	0,70	87,76	0,66	19,00	0,91	96,20	5,50	19,00	16,88	100,65	96,30	19,00	142,90	221,44
Austria	109,18	20,00	267,00	75,68	0,42	20,00	0,65	76,45	0,51	20,00	0,74	73,42	5,96	20,00	17,62	98,73	30,70	20,00	64,90	94,51
Bélgica	18,49	21,00	164,89	46,73	0,43	21,00	0,68	80,70	0,61	21,00	0,90	89,42	2,60	21,00	14,05	78,73	19,60	21,00	54,80	79,80
Dinamarca	403,87	25,00	714,14	164,00	0,40	25,00	0,71	67,69	0,59	25,00	0,93	74,87	35,39	25,00	54,96	249,53	109,95	25,00	169,35	199,82
Eslovenia	176,60	21,00	351,40	137,78	0,45	21,00	0,69	111,80	0,57	21,00	0,82	113,25	4,79	21,00	16,78	130,07	16,50	21,00	44,30	89,24
España	87,30	21,00	245,60	84,97	0,37	21,00	0,61	87,27	0,47	21,00	0,71	86,46	0,18	21,00	14,33	98,01	8,80*	21,00	41,10*	73,06
Estonia	110,95	20,00	277,03	118,49	0,39	20,00	0,61	109,32	0,42	20,00	0,64	96,25	2,18	20,00	10,51	88,87	13,20	20,00	35,15	77,25
Finlandia	163,43	24,00	377,19	97,51	0,47	24,00	0,76	82,00	0,65	24,00	0,97	87,63	10,33	24,00	19,85	101,45	17,00	24,00	46,50	61,76
Francia	56,60	19,60	208,59	58,42	0,44	19,60	0,66	76,94	0,61	19,60	0,87	84,92	1,29	19,60	11,29	62,51	25,14	19,60	46,65	67,13
Grecia	330,00	23,00	567,24	205,30	0,33	23,00	0,59	88,44	0,67	23,00	0,98	124,71	5,40	13,00	18,53	132,59	26,10	13,00	44,85	83,40
Hungría	n.d.	27,00	n.d.	n.d.	0,38	27,00	0,69	157,35	0,42	27,00	0,71	137,68	0,00	27,00	8,27	89,90	4,10	27,00	32,37	91,45
Irlanda	88,66	13,50	215,50	62,59	0,48	23,00	0,76	92,24	0,59	23,00	0,89	90,10	3,70	13,50	12,39	71,14	0,00	13,50	26,20	39,10
Italia	403,21	21,25	650,56	204,06	0,62	21,25	0,91	118,56	0,73	21,25	1,04	113,80	n.d.	21,25	26,67**	165,38	56,20	10,00	77,10	124,26
Luxemburgo	10,00	12,00	96,58	24,70	0,34	15,00	0,49	52,58	0,46	15,00	0,64	57,01	1,08	6,00	4,44	22,45	11,40	6,00	20,20	26,54
Países Bajos	254,42***	21,00	360,89	102,29	0,45	21,00	0,69	81,76	0,75	21,00	1,05	104,72	19,28	21,00	32,84	184,02	11,40	21,00	45,00	65,53
Polonia	55,27	23,00	229,66	125,99	0,35	23,00	0,59	134,87	0,40	23,00	0,64	123,33	0,00	23,00	9,58	103,87	4,76	23,00	32,40	91,32
Portugal	323,70	23,00	564,40	221,29	0,37	23,00	0,63	102,33	0,59	23,00	0,88	121,08	0,00	23,00	16,55	128,29	0,00	23,00	39,40	79,37
Reino Unido	131,17	5,00	170,27	49,30	0,68	20,00	0,96	115,53	0,68	20,00	0,95	95,97	0,00	5,00	2,76	15,77	0,00	5,00	8,24	12,26
República Checa	25,40	21,00	254,62	117,00	0,42	21,00	0,66	126,79	0,49	21,00	0,74	118,55	0,00	21,00	10,97	99,66	1,15	21,00	28,02	66,16
República Eslovaca	n.d.	20,00	n.d.	n.d.	0,37	20,00	0,60	115,59	0,52	20,00	0,77	123,69	0,00	20,00	8,87	80,89	0,00	20,00	29,50	69,92
Suecia	451,94	25,00	760,10	179,05	0,53	25,00	0,87	85,40	0,62	25,00	0,95	78,61	30,62	25,00	55,13	256,77	31,90	25,00	67,04	81,14
Media ponderada (PPA)	201,39	18,74	425,08	100	0,66	20,88	1,02	100	0,83	20,88	1,21	100	3,96	18,50	21,50	100	42,76	17,07	82,73	100

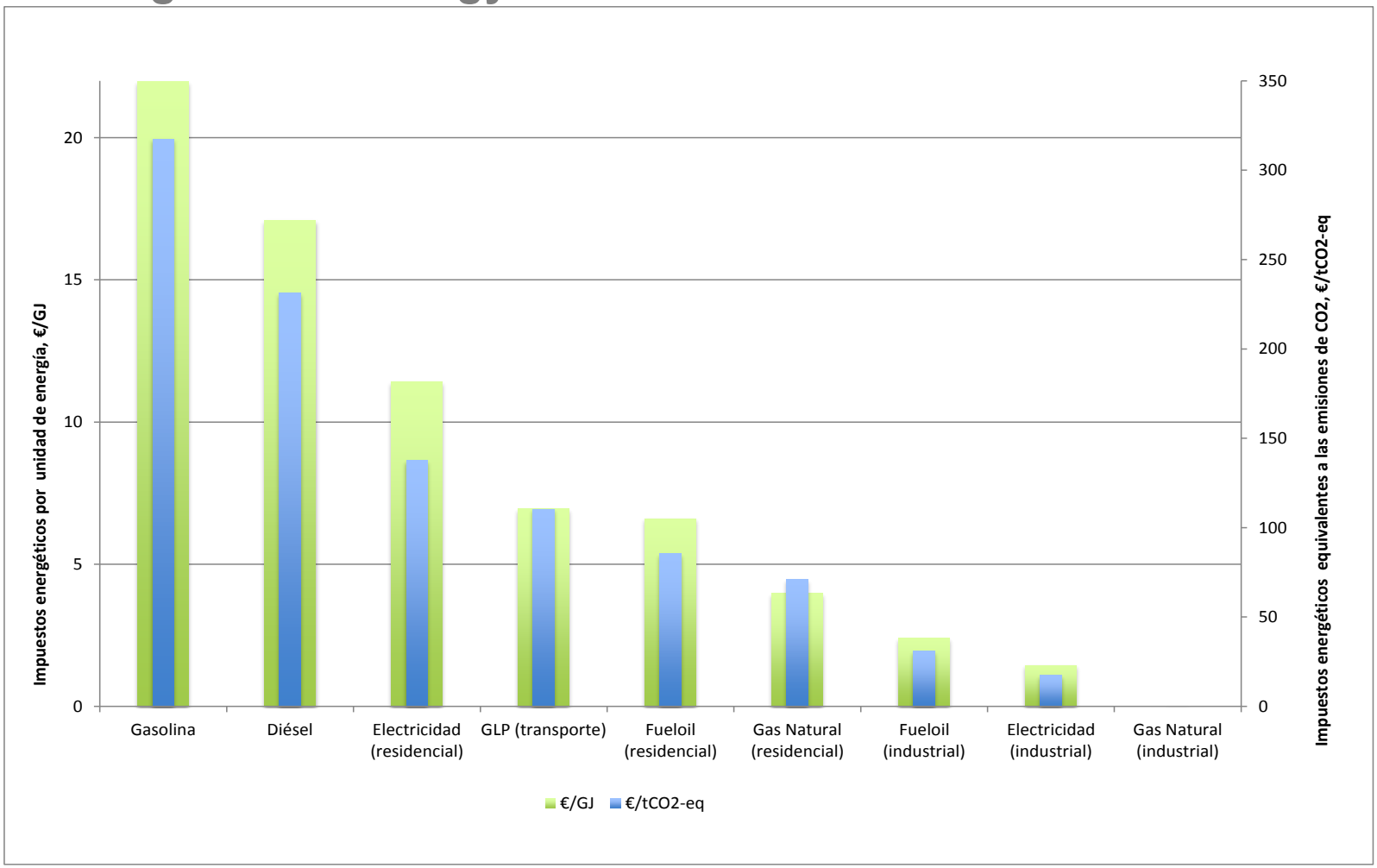
Comparatively lower energy taxation (2011)

Figura 7. Impuestos energético-ambientales como % del PIB en la EU-27. 2011



Fuente: Comisión Europea (2013) y elaboración propia

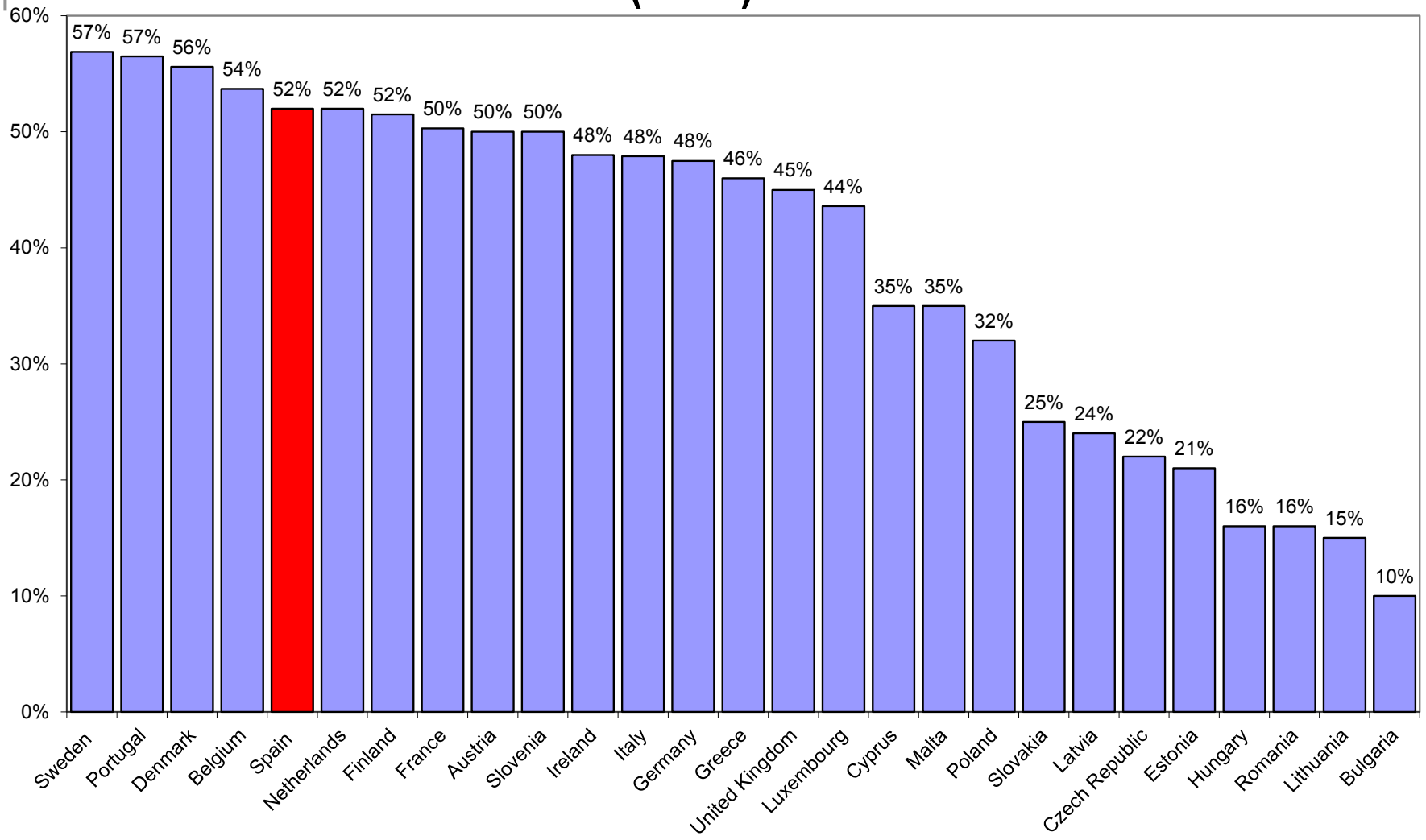
Heterogeneous energy taxation



Spanish anomalies

- **Low levels of energy taxes**
  - January 2012 increases of personal income tax and other minor taxes; September 2012 VAT increase
  - IMF & EC continuous recommendations to raise energy/environmental taxes
  - December 2012 New “environmental” taxes on electricity producers and natural gas
  - July 2013 New environmental tax on fluorinated greenhouse gases
  - The government does not pay attention to the proposals of the ‘expert’ commission
- **Regional involvement in energy taxation**

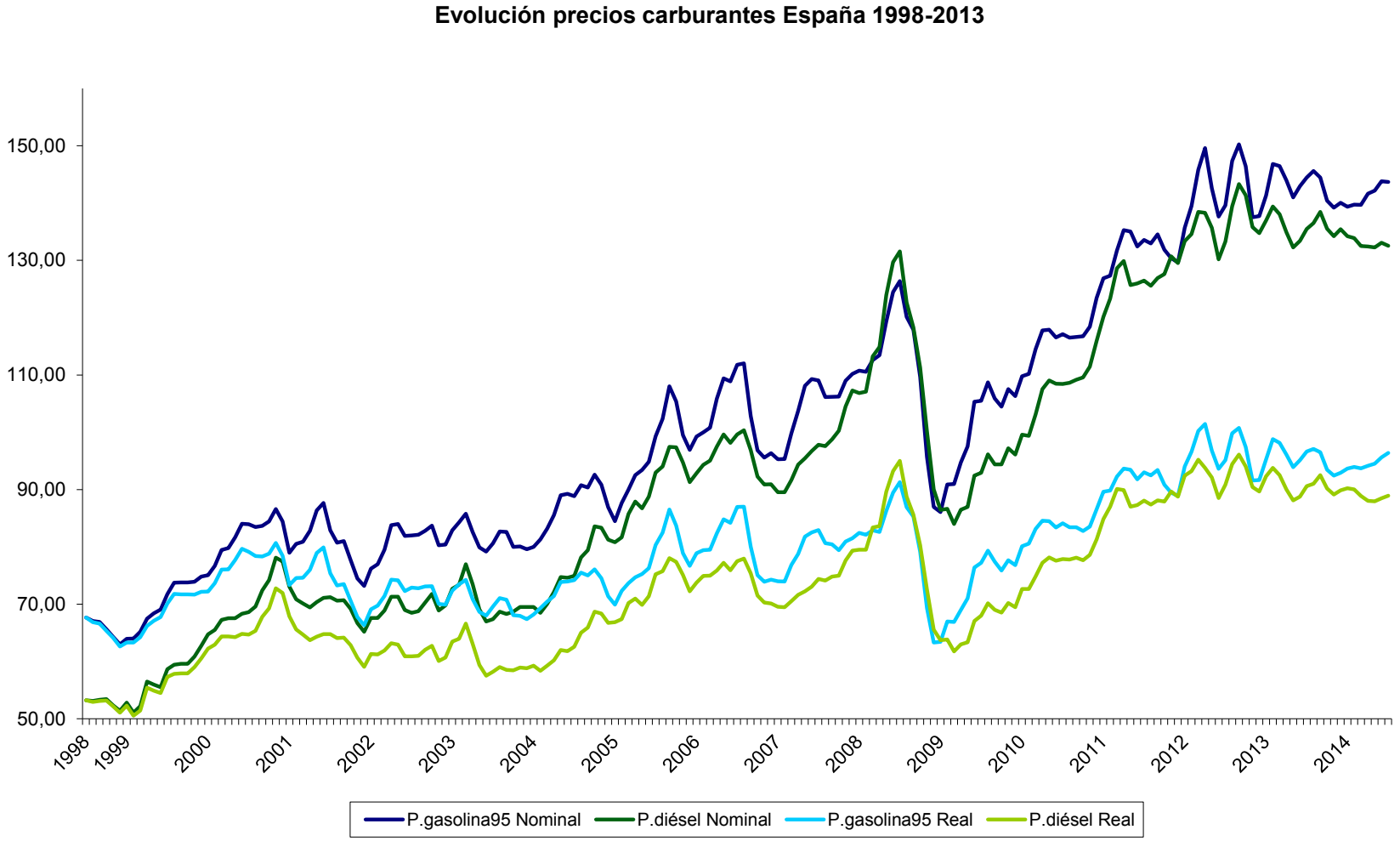
Income taxation in the EU (2014)



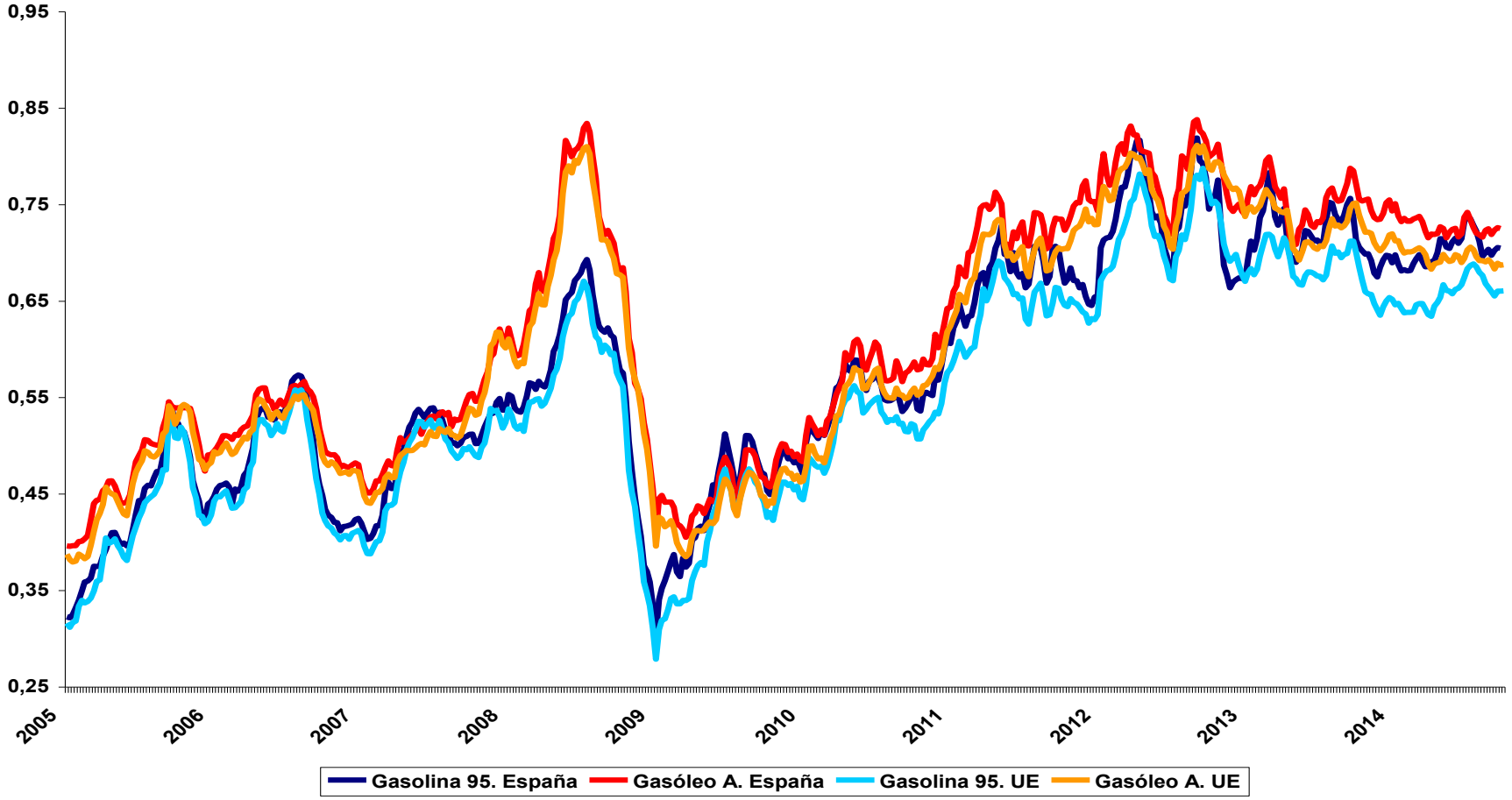
The Spanish anomalies (1)

- Low energy taxation
  - Positive results from academic simulations
    - Environmental effectiveness
    - Distributional effects
    - Economic dividend
  - Political constraints?
    - Competitiveness and growth
    - Social preferences
      - Results from a CV study on Spanish CC policies
    - Fiscal inertia

Evolution of car fuels in Spain (1998-2013)



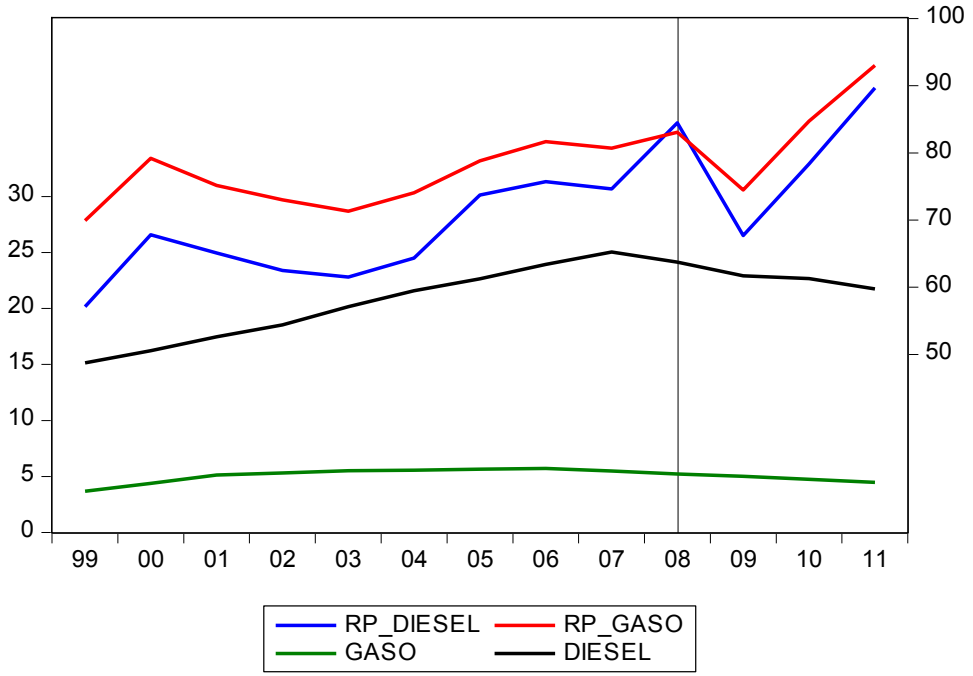
Fuel prices before taxes (€/liter)



rede research in economics, business and the environment

economics for energy

Figure 1. Gasoline and diesel real prices (Euros/litres) and annual consumption (Million litres) in Spain (1999-2011)



Source: The authors with data from Ministry of Industry and CNE.

Academic Literature

- General simulations for Spain (within EU modeling)
  - Carraro et al. (JPE, 1996); Barker and Köhler (1998); Conrad and Schmidt (1998); Bosello and Carraro (Energy Economics, 2001), mainly through GEM
  - Broadly positive effects (employment, GDP) when recycling carbon tax revenues (usually designed to achieve -10% reductions of EU CO_2 emissions) to reduce labour taxes (social security contributions paid by employers)

Academic Literature

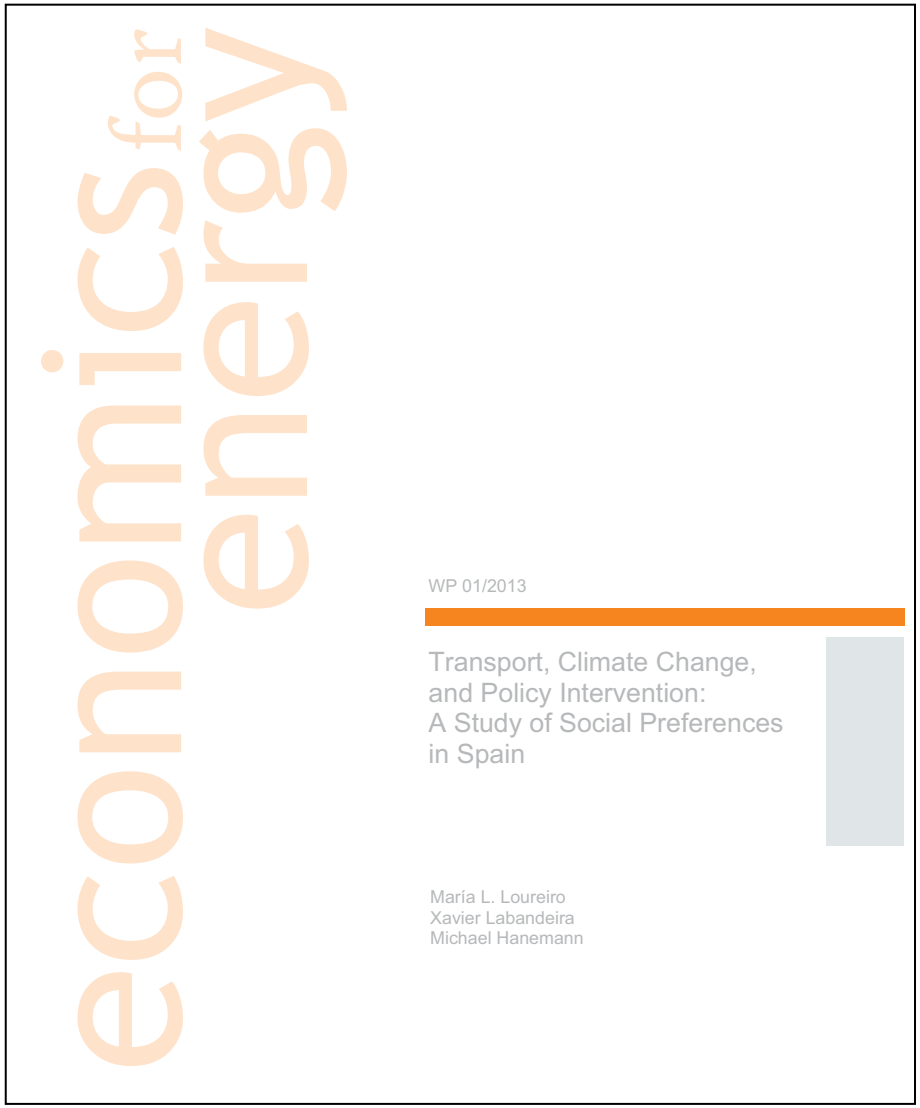
Specific simulations for Spain

- Labandeira and Labeaga (*Fiscal Studies*, 1999): input-output + microsimulation (after energy demand estimation); Labandeira and Labeaga (*Energy Policy*, 2002) input-output price-effects; Labandeira et al. (*European Environment*, 2004) GEM+microsimulation; Labandeira and Rodríguez (*Climate Policy*, 2010) GEM. Recent demand results: Labandeira et al. (*Energy Journal*, 2006), Labandeira et al. (*Energy Economics*, 2012)
- Environmental effectiveness (reaction); broadly positive effects (employment, GDP) when recycling carbon tax receipts to reduce distortionary taxes; efficiency gains from extending the EU ETS to non subject sectors; (decreasing) trend to proportionality (slight regressivity)
- Results confirmed by Gallastegui et al. (*Series*, 2011), González-Eguino (*Ecological Economics*, 2011) and Manresa and Sancho (*Energy Policy*, 2005) through GEM and different alternatives

Tabla 4. Efectos de la fiscalidad energético-ambiental en el caso español

Artículo	Reforma simulada	PIB	Empleo	Emisiones
Carraro *et al.* (1996)	Reducción CC.SS	0,00%	0,70%	2,00%
Barker y Köhler (1998)	No Reducción CC.SS	-0,20% 1,20%	-0,40% 1,40%	-8,70% -11,40%
Conrad y Schmidt (1998)	Reducción CC.SS	0,03%	[0,37%, 0,40%]	[-10,64%, -10,00%]
Labandeira y Labeaga (1999)	No	-	-	-3,00%
Labandeira y Labeaga (2000)	No	-	-	-7,30%
Bosello y Carraro (2001)	Reducción CC.SS (trabajo no cualificado) Reducción CC.SS (trabajo no cualificado)	-0,20% 3,60%	0,30% 0,80%	0,10% 3,60%
Labandeira y López-Nicolás (2002)	No	-	-	[-1,52%, -0,28%]
Labandeira *et al.* (2004)	Reducción CC.SS	0,20%	0,10%	-7,70%
Labandeira *et al.* (2005)	Reducción CC.SS	0,16%	0,10%	-7,68%
Manresa y Sancho (2005)	No Reducción CC.SS	- -	[-0,82%, 0,00%] [0, 06%]	[-3,81%,-0,77%] [-3,21%, -0,70%]
Labandeira *et al.* (2007)	Reducción IVA	1,00%	0,00%	-5,70%
Labandeira y Rodríguez (2006)	No	[-1,60%, -0,20%]	[-0,80%, -0,10%]	[-16,00%, -2,00%]
Labandeira y Rodríguez (2010)	No	[-0,70%, -0,42%]	-	-16,00%
González-Eguino (2011)	No	[-2,25%, -0,38%]	[-1,74%, -0,35%]	-15,00%
Gallastegui *et al.* (2012)	No	[-1,60%, -0,60%]	-	-30,00%
Markandya *et al.* (2013)	No Reducción CC.SS Reducción impuestos capital	-1,55% 7,65% -1,55%	-1,40% 0,10% -1,50%	-15,00% -15,00% -15,00%

Fuente: Elaboración propia a partir de la literatura citada



http://www.eforenergy.org/docpublicaciones/documentos-de-trabajo/WP01-2013.pdf

The study on Spanish preferences

- Hanemann, Labandeira and Loureiro (2011a, 2011b, 2013)
- CV application to assess policy options, with exploration of attitudinal questions
- Questions on electricity and transport influenced by
- Focus groups
- Positive WTP for electricity and transport policies

The Spanish anomalies (2)

- Subnational growing use of (energy-related) environmental taxes
  - Why?
  - Strange recent (inefficient) experiences: Regional taxes on hydro generators and on windmills
  - Another reason to act in this area (use of extra revenues to compensate regions)

A simulation

- Based on the Directive proposal (April 2011) on harmonized energy taxation
- Energy and CO_2 components
- Objective for Spain: Taxation of all energy goods (energy efficiency), the increase of transport taxes to EU average levels, with an equal tax treatment of petrol and diesel.

Results

Tax simulations on energy content (A) and transport (B)

	Base case 2010				Simulation A: energy component without transport					Simulation B: transport				
	Current tax rates	Tax rates (energy)	VAT on excises	Total	Tax rates (CO2)	Tax rates (energy)	Tax rates (CO2+energy)	VAT on excises	Total	Tax rates (CO2)	Tax rates (energy)	Tax rates (CO2+energy)	VAT on excises	Total
		€/GJ	*Million €*	*Million €*	*€/GJ*	*€/GJ*	*€/GJ*	*Million €*	*Million €*	*€/GJ*	*€/GJ*	*€/GJ*	*Million €*	*Million €*
Petrol	0,403 €/litre	12,558	399,86	2.352,09	1,384	9,600	10,984	370,32	2.057,34	1,384	13,685	15,069	508,05	2.822,51
Diesel	0,307 €/litre	8,575	1.173,18	6.901,05	1,480	8,200	9,680	1.402,19	7.789,96	1,480	13,685	15,165	2.196,74	12.204,13
Subsidized diesel	0,079 €/litre	2,199	95,16	559,79	1,480	3,000	4,480	205,35	1.140,81	1,480	3,000	4,480	205,35	1.140,81
Total liquid fuels			**1.668,20**	**9.812,93**				**1.977,86**	**10.988,12**				**2.910,14**	**16.167,45**
Total Electricity	5,60 €/MWh	1,556	**234,76**	**1.380,95**	0,000	3,000	3,000	**479,39**	**2.663,27**	0,000	1,556	1,556	**248,57**	**1.380,95**
LPG (except transport sector)	0,00	0,000	0,00	0,00	1,260	3,000	4,260	79,64	442,44	1,260	0,150	1,410	26,36	146,44
Natural gas (except transport sector)	0,00	0,000	0,00	0,00	1,122	3,000	4,122	395,69	2.198,29	1,122	0,150	1,272	122,11	678,37
Total LPG and natural gas				**0,00**				**475,33**	**2.640,73**				**148,47**	**824,81**
Main fuels and electricity taxes			**1.902,96**	**11.193,89**				**2.932,58**	**16.292,12**				**3.307,18**	**18.373,21**
Total revenues			**13.096,85**				**19.224,70**					**21.680,39**		

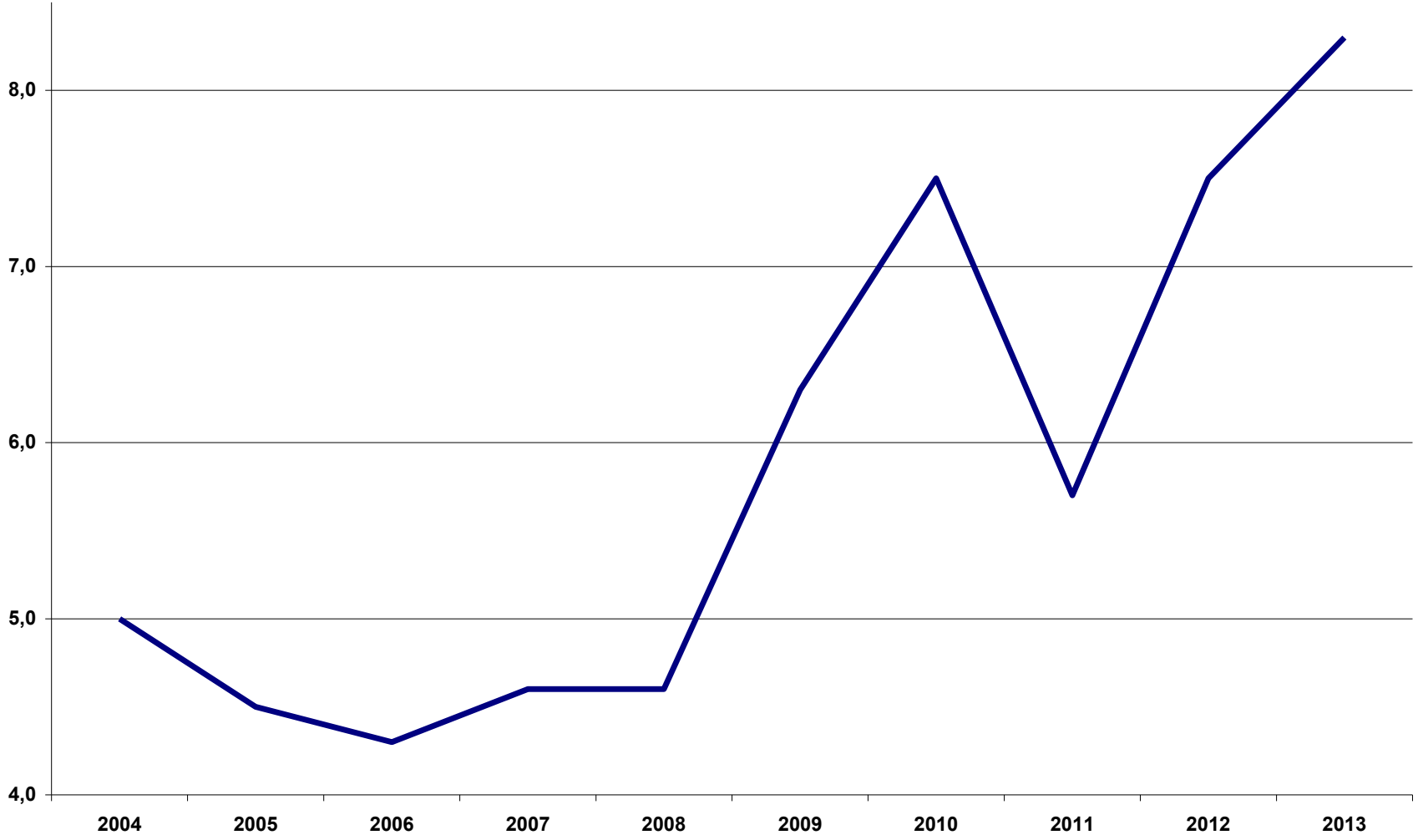
Note: Assuming consumption of 2010 and not including País Vasco and Navarra.
Source: Compiled from AEAT (2011), IDAE (2010) and European Commission (2007)

Distributional concerns

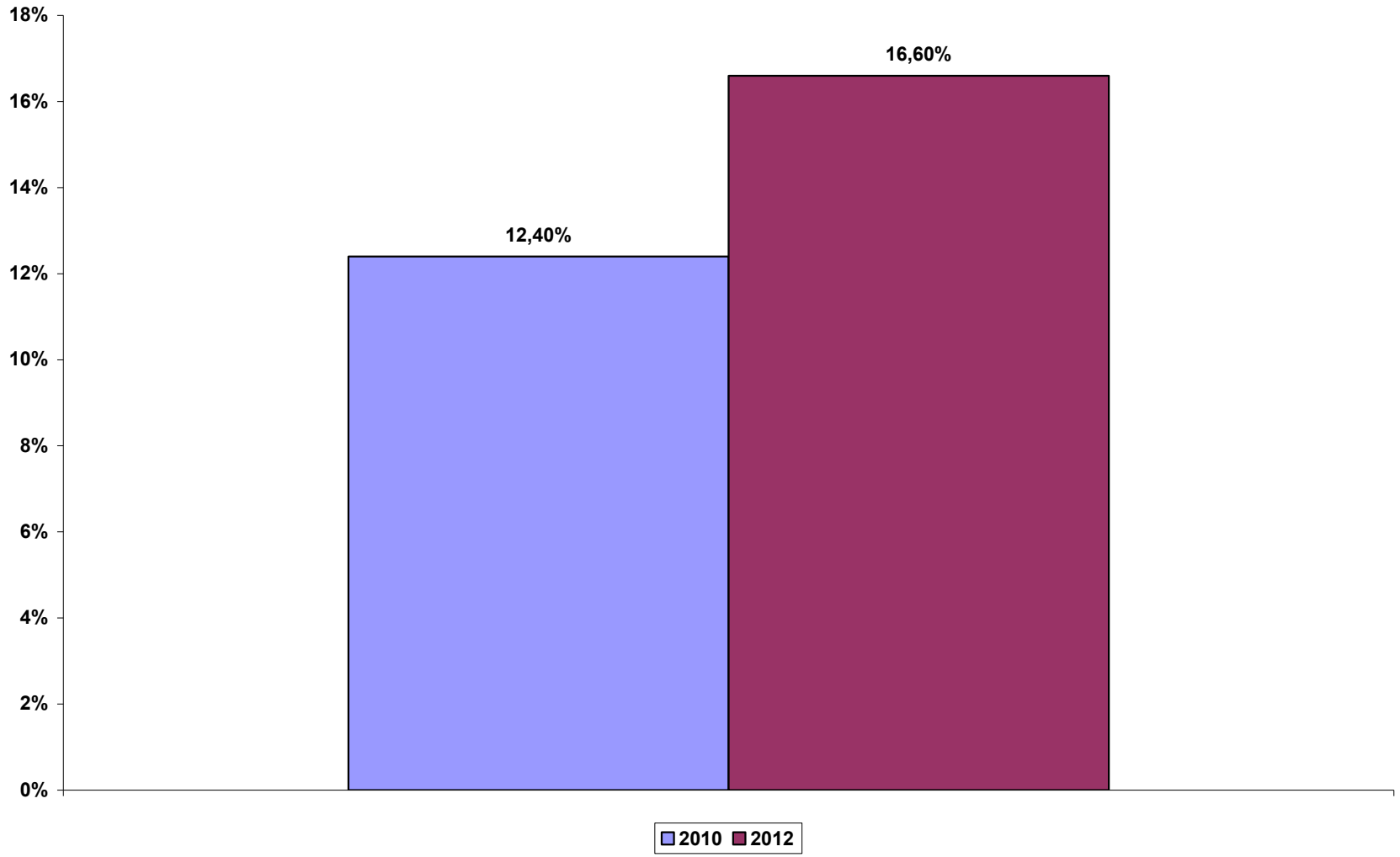
		Simulación A	Simulación B
Recaudación adicional	Total[a] (M€)	6.127,85	8.583,45
	Media hogar[b] (€)	141,82	314,40
Modificación de la renta disponible (media por hogar, en %)	Decila 1	-1,26	-1,43
	Decila 2	-1,08	-1,74
	Decila 3	-0,80	-1,39
	Decila 4	-0,82	-1,70
	Decila 5	-0,66	-1,43
	Decila 6	-0,65	-1,58
	Decila 7	-0,63	-1,52
	Decila 8	-0,57	-1,42
	Decila 9	-0,52	-1,28
	Decila 10	-0,39	-0,99
	Media	-0,61	-1,35
Efecto redistributivo (índice de Reynolds-Smolensky)		-0,0010698	-0,0011550

Compensación 3 primeras decilas			
Compensac. necesaria	Total (M€)	497,65	759,26
	Media hogar (€)	96,58	147,36
Modificación de la renta disponible (media por hogar, en %)	Decila 1	0,00	+0,49
	Decila 2	0,00	-0,09
	Decila 3	0,00	-0,18
Efecto redistributivo (índice de Reynolds-Smolensky)		0,0001851	0,0007716
Compensación 5 primeras decilas			
Compensac. necesaria	Total (M€)	927,7	1.667,00
	Media hogar (€)	108,5	194,16
Modificación de la renta disponible (media por hogar, en %)	Decila 1	+0,03	+0,89
	Decila 2	+0,03	+0,25
	Decila 3	+0,02	+0,07
	Decila 4	-0,03	-0,27
	Decila 5	-0,01	-0,26
Efecto redistributivo (índice de Reynolds-Smolensky)		0,0007722	0,0021752

Delays in payment of energy bills (% of population)



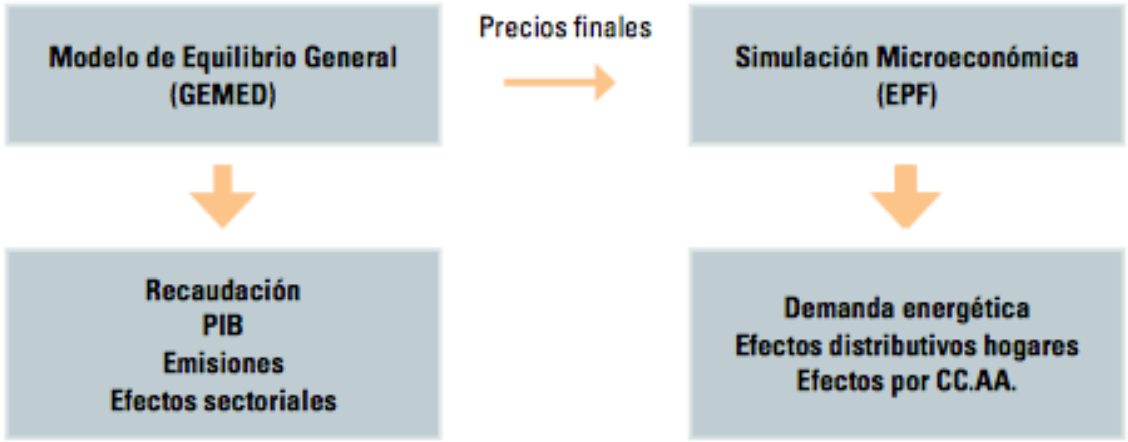
% of Spanish households spending more than 10% of their income in Energy



Some comparisons

- Combined A+B potential revenue increase: + 11.700 M€ (+90% over 2010)
- Other consolidation efforts
  - Greece: +42% increase in energy tax revenues (2011/2008)
  - Italy: +27% (petrol) and +43% (diesel) increases (June 2012/April 2011)
- Previous Spanish revenue increases:
  - Zapatero's 2010/11 tax rises: VAT + 5500 M€, IT +200 M€
  - Rajoy's 2012 tax rises: VAT +7500 M€, IT +4000 M€, 'Environment' 2700 M€
  - Regional energy and energy-environmental taxes (2012): 250 M€
  - New tax on fluorinated greenhouse gases (2013): 340 M€
- 'Experts' commission and reduction of income taxation

Figura 12. Métodos de simulación



Fuente: Elaboración propia

Tabla 44. Resumen de los datos empleados en el modelo GEMED

Tipo de datos	Descripción	Fuente
Macroeconómicos	• Matriz de Contabilidad Social (Tablas input-output y agregados macroeconómicos) • Elasticidades (entre factores de producción, bienes importados y exportados)	• Instituto Nacional de Estadística • Global Trade Analysis Project
Tecnológicos y Microeconómicos	• Perfiles de demanda de electricidad • Tecnologías de generación eléctrica (tiempo de construcción, vida útil, costes de construcción, costes de operación y mantenimiento, factores de disponibilidad, eficiencia termodinámica, precios del del combustible, emisiones de contaminantes, capacidad instalada, ...)	• Base de datos e-sios (REE) • Comisión Nacional de Energía • Atlas de la Demanda Eléctrica Española (REE) • Base de datos e-sios (REE) • European Union Joint Research Centre • U.S. Energy Information Agency

Fuente: Rodrigues y Linares (2013b)

Tabla 41. Simulaciones de la fiscalidad energético-ambiental para España

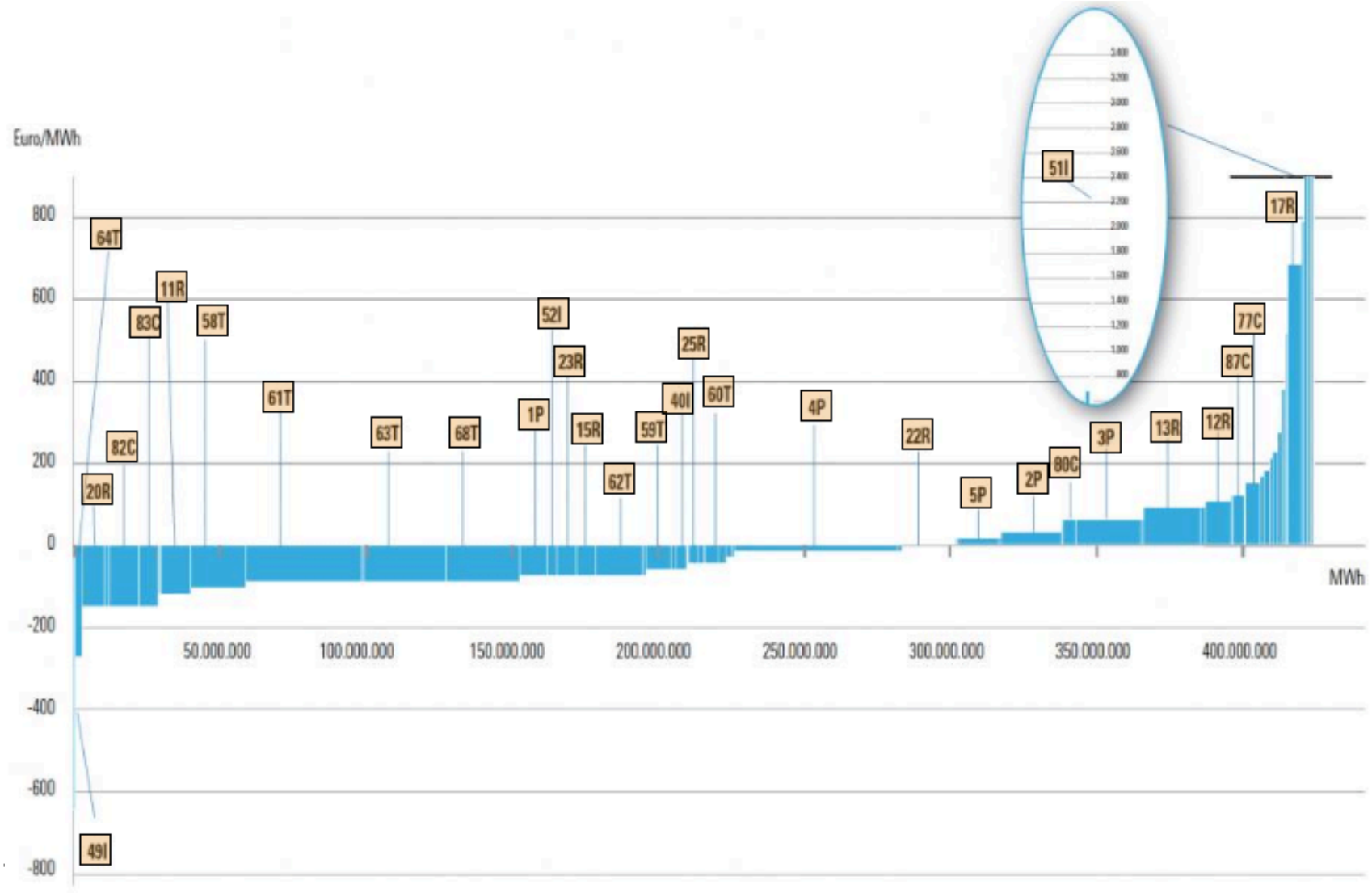
Simulación 1	Propuesta de Directiva de fiscalidad energética	1A. Niveles mínimos 2018
		1B. Convergencia principales países europeos
Simulación 2	Impuesto sobre las emisiones de SO_2 y NOx	2A. 1.000 €/tonelada
		2B. 2.000 €/tonelada
Simulación 3	Impuesto sobre el CO_2 aplicado sobre los sectores difusos	3A. 10 €/tonelada
		3B. 30 €/tonelada
Simulación 4	Financiación del coste de apoyo a las renovables mediante impuestos	4A. Impuestos sobre sectores energéticos
		4B. Impuesto sobre todos los sectores

Tabla 64. Resumen de los efectos de las distintas simulaciones

	Recaudación (millones de €)	Variación consumo energético	Variación PIB			Variación emisiones CO_2		
			DP	CC.SS	SP	DP	CC.SS	SP
Simulación 1								
1A	1.659	-0,38%	-0,174%	-0,171%	-0,179%	-0,51%	-0,50%	-0,45%
1B	5.283	-1,19%	-0,404%	-0,396%	-0,419%	-1,72%	-1,70%	-1,55%
Simulación 2								
2A	2.696	-0,41%	-0,068%	-0,063%	-0,077%	- 0,56%	-0,55%	-0,47%
2B	5.354	-0,83%	-0,137%	-0,128%	-0,155%	-1,09%	-1,06%	-0,91%
Simulación 3								
3A	2.214	0,01%	-0,057%	-0,053%	-0,064%	-0,10%	-0,09%	-0,04%
3B	6.620	0,03%	-0,169%	-0,159%	-0,191%	-0,30%	-0,26%	-0,07%
Simulación 4								
4A	7.477	0,15%		-0,288%			-0,41%	
4B	7.477	2,44%		0,000%			1,97%	

Fuente: Elaboración propia

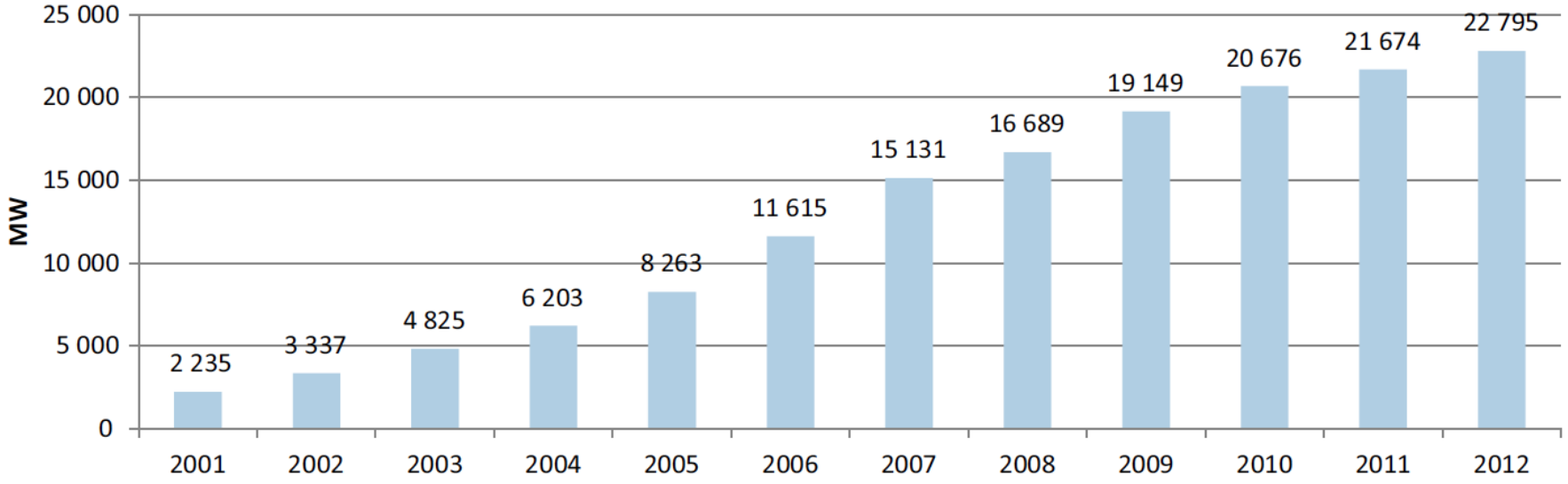
A wider energy and environmental picture (1)



A wider energy and environmental picture (2)

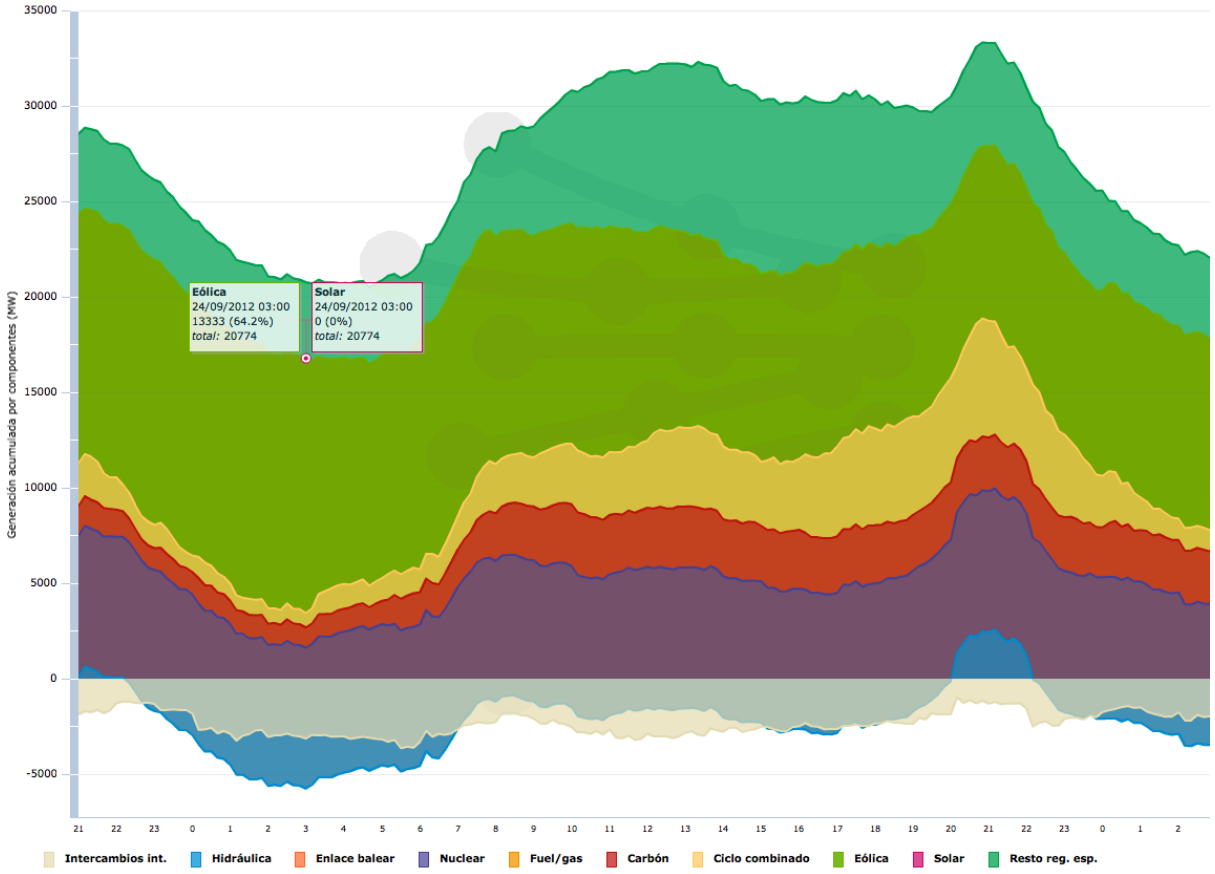
Free lunch?

- A good job with wind



Source: IRENA (2013)

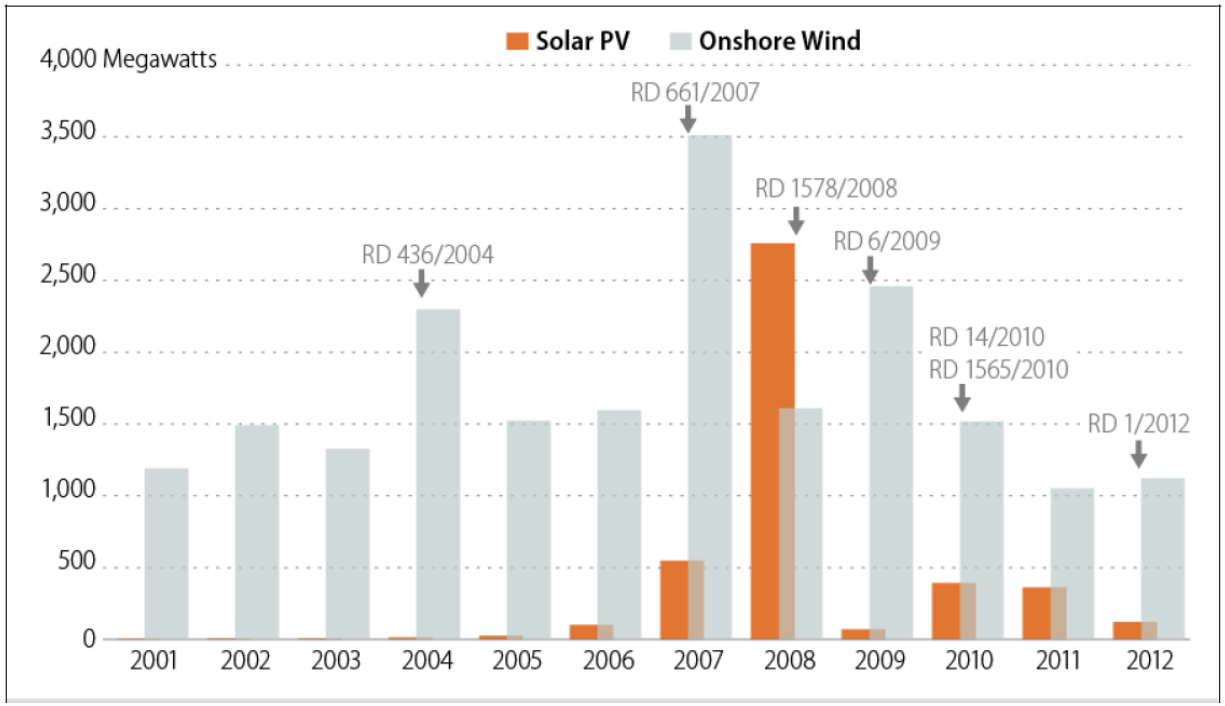
Wind again: Spain, 26 September 2012



Source: REE (2013)

- **Large installation of solar PV in a short time span**

Figure 4. Spain: Annual Wind and Solar PV Capacity Additions
(2001 to 2012)



Source: CRS; Bloomberg NEF (2013)

Conclusions

- Spain faces complex challenges in its economy, and particularly in its energy and public sectors
- The behavior of Spanish governments towards energy taxes has been reactive and completely unrelated to the positive signals received from academia
- The current crisis could bring out an opportunity to change this through a green tax reform of 3rd generation, with revenues partly allocated to fiscal consolidation, reduction of labour taxes (implicit devaluation) and funding of energy efficiency and renewables
- However, energy and environmental taxes were left untouched, in contrast to other EU countries and the opinion of tax and environmental experts

THANKS

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