Fiscalidad Ambiental y Reforma Fiscal Verde en España: Algunas Reflexiones

Xavier Labandeira
Universidade de Vigo y Economics for Energy

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A Panorama on Energy Taxes and Green Tax Reforms*

ALBERTO GAGO**
XAVIER LABANDEIRA**
XIRAL LÓPEZ-OTERO**
Universidade de Vigo and Economics for Energy

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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.


Impuestos
energético-ambientales
en España
[Informe 2013]
economics for energy

Contents lists available at ScienceDirect

Energy Economics

journal homepage: www.elsevier.com/locate/eneeco

Elasticities of transport fuels at times of economic crisis: An empirical analysis for Spain☆

Mohcine Bakhat [a], Xavier Labandeira [b,c], José M. Labeaga [a,*], Xiral López-Otero [b]

[a] Departamento de Análisis Económico, UNED, Senda del Rey 11, 28040 Madrid, Spain
[b] Rede, Universidade de Vigo, Campus As Lagoas, 36310 Vigo, Spain
[c] FSR Climate, European University Institute, Via Boccaccio 121, 50133 Florence, Italy

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D12
Q41

Keywords:
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Gasoline
Income
Price
Regions
Panel data

ABSTRACT

This paper provides an updated calculation of the price and income responsiveness of Spanish consumers of transport fuels, with an explicit exploration of the effects of the recent economic crisis. We examine separate gasoline and diesel demand models using a set of estimators on a panel of 16 Spanish regions over the period 1999–2015. The paper confirms the persistence of low own-price elasticities both for diesel and gasoline in the short and long runs. It also shows that the crisis of 2008–2013 slightly increased the price elasticity of demand for transport fuels, with a higher effect on diesel than on gasoline. By contrary, the crisis slightly reduced the income elasticity of transport fuel demand. Given the intensity and length of the economic recession in Spain, the results of this paper may be useful to anticipate the effects of domestic public policies that impact transport fuel prices as well as to advance some of the potential consequences of crises elsewhere.

1. Introduction

From the mid-1990s until the outbreak of the 2008 crisis, the demand of transport fuels in Spain witnessed an impressive and unprecedented evolution: between 1999 and 2007, gasoline and diesel consumption grew at an average annual rate of respectively 5.1% and 6.5%, reflecting both the robust growth of the Spanish economy and a limited responsiveness of demand to price changes (which in this period respectively grew at annual average rates of 1.8% and 3.5%). Yet, six years of crisis led to a completely different picture: between 2008 and 2013 gasoline and diesel demand, respectively, fell at an average annual rate of 5% and 4.3%; while prices increased at average annual rates of 3.2% (gasoline) and 1.9% (diesel) –although with significant reductions in the years 2009 and 2013. It is obvious that such a boom-and-bust evolution, depicted by Fig. 1, brings about remarkable socio-economic and environmental effects.

It is widely known that the economy of Spain, one of the developed countries that suffered the sharpest falls in economic activity and employment after 2008, was badly shaken by the global financial crisis and its aftermath. Given the aforementioned observed changes in energy consumption over the last few years, the interest of this paper is to provide an updated calculation of the price and income responsiveness of transport fuel demand in Spain. The paper particularly devotes special attention to testing whether the crisis has influenced price and income elasticities in Spain. Its results may therefore be useful for illustrating the consequences of other pervasive and long economic crises on transport fuel demand. This is very relevant, as the availability of reliable demand elasticities is a necessary condition for a proper design and evaluation of energy, environmental or fiscal policies and strategies that impact prices of transport fuels (Hughes et al., 2008).

When facing a strong economic crisis, agents are likely to react more to an increase in the price of transport fuels given the presence of a higher opportunity cost of consumption due to less disposable income. Indeed, the large increase observed in the price of transport fuels during most of the Spanish economic recession (2009–2012) provides an ideal setting for an empirical evaluation of this phenomenon. Yet, as the demand for transport fuels is price inelastic (see Labandeira et al., 2017), the income elasticity of demand for these goods is likely to witness reductions during recessive periods because agents have less capacity to adjust their consumption to (lower) income levels. Again, the Spanish recession yields a good context for testing this phenomenon in light of the strong reduction of disposable income noted during those years.

The academic evidence on these matters is, however, rather limited and mostly located in the area of marketing. In this sense, Estelami et al. (2001) point out higher incentives to react to prices in the presence of

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* Corresponding author.
E-mail address: jlabeaga@cee.uned.es (J.M. Labeaga).

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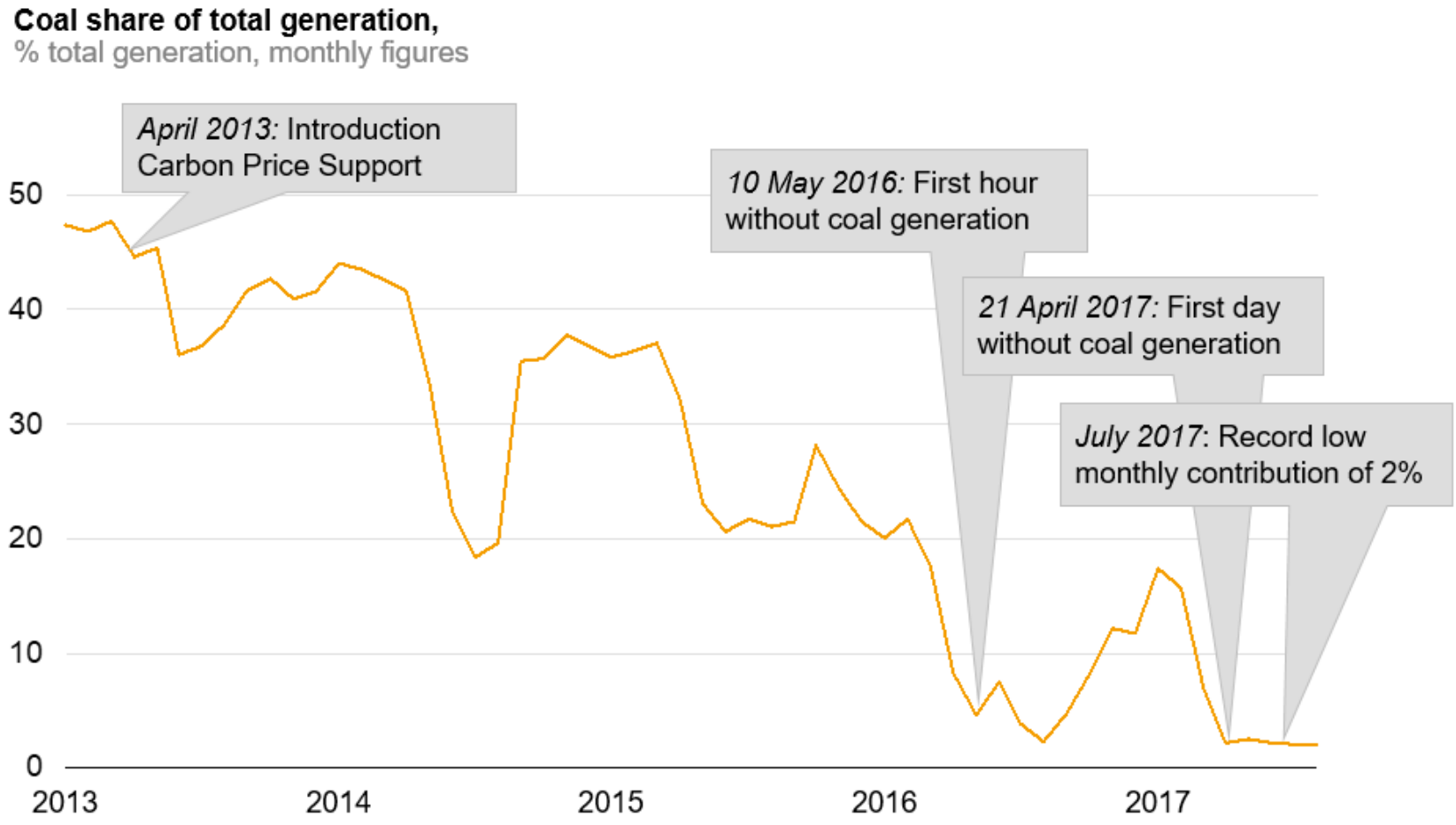
0140-9883/

- **Por qué impuestos ambientales?**
  - ‘Poner los precios bien’
  - Coste-efectividad
  - Inversión e innovación
  - Energía: dependencia

- **Por qué reformas fiscales verdes?**
  - Recaudación: doble dividendo
  - Compensaciones distributivas
  - Afectación ambiental
  - Marketing político

Can carbon prices work? The Carbon Price Floor in the UK has gradually wiped out coal



Source: Aurora analysis

Fuente: Hepburn (2017)

- **Luces**
  - Las demandas de las políticas climáticas
  - Consenso académico: el Manifiesto de París
  - Instituciones internacionales: BM, FMI, OCDE
  - El tirón del norte de Europa
  - Plataformas empresariales

- **Sombras**
  - No se cumplen expectativas
  - El fiasco del Manifiesto de París
  - Instrumentos impopulares
  - Dificultades en la gestión de problemas globales

- **Novedades**
  - Un entorno cambiante: tecnología, crisis, etc.
  - Revolución (fiscal) en el transporte
  - Ajustes en frontera?
  - Reformas fiscales verdes heterodoxas
  - Atención a sinergias e interacciones

economics for energy

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ALCOA FOUNDATION

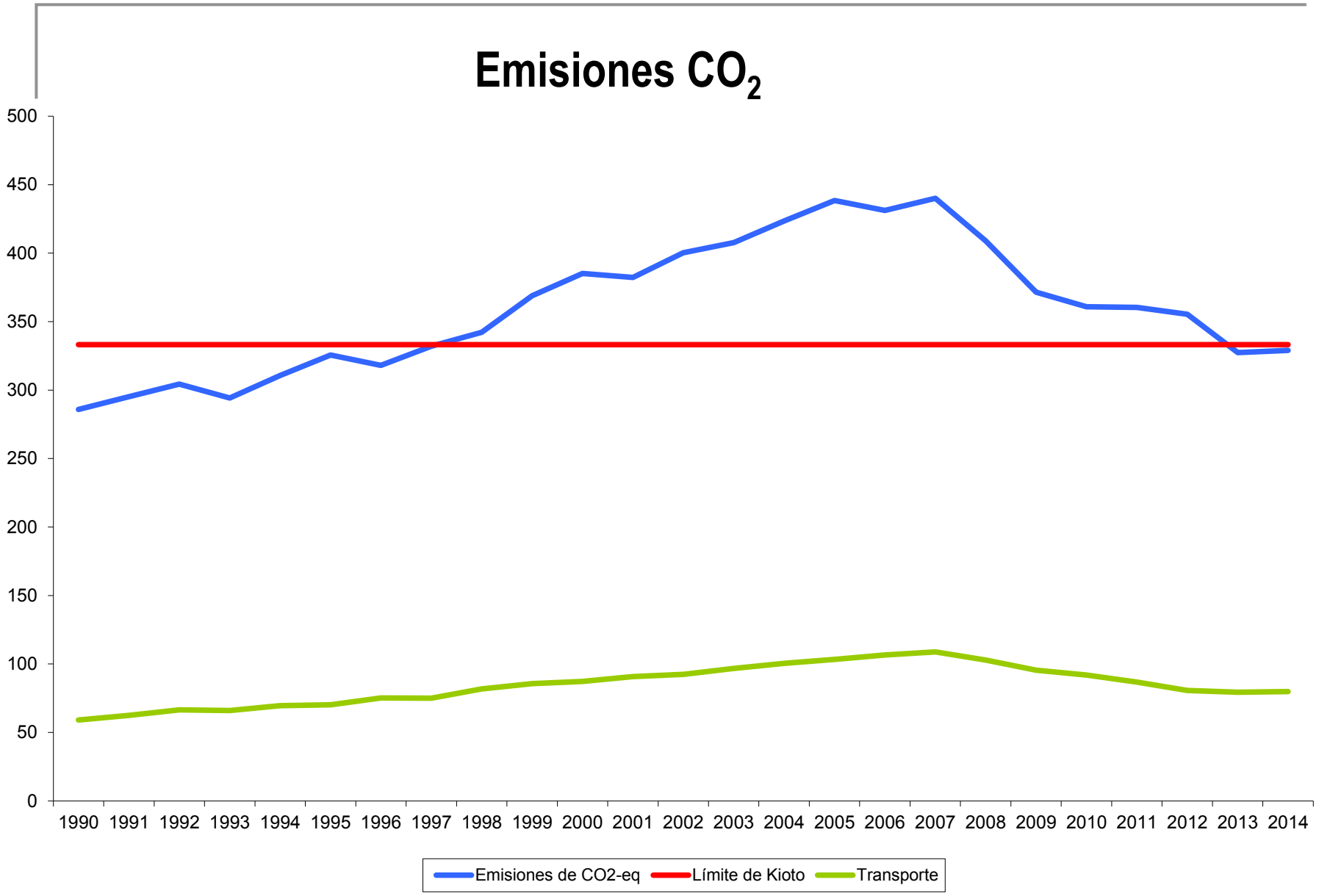
WP FA04/2012

Climate Change, Buildings and Energy Prices

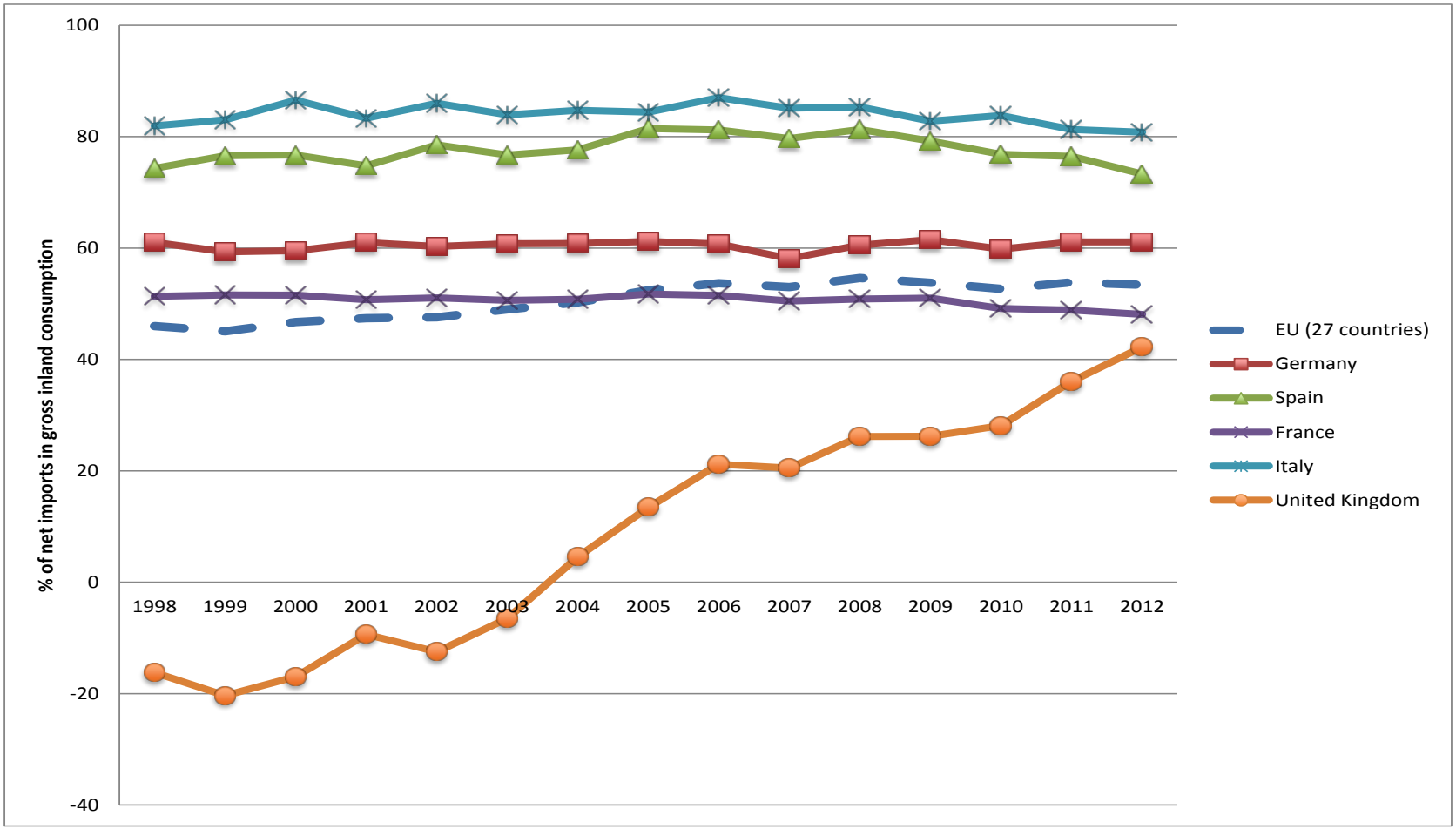
Alberto Gago, Michael Hanemann, Xavier Labandeira, Ana Ramos

- **La Paradoja española**
  - Necesidad de reducir emisiones
  - Alta dependencia energética
  - Necesidades fiscales
  - Baja presión fiscal energético-ambiental…
  - que no en la imposición del trabajo, IRPF, etc.
  - Elevados potenciales de eficiencia energética
  - Estudios ex-ante positivos
  - Recomendaciones internacionales…

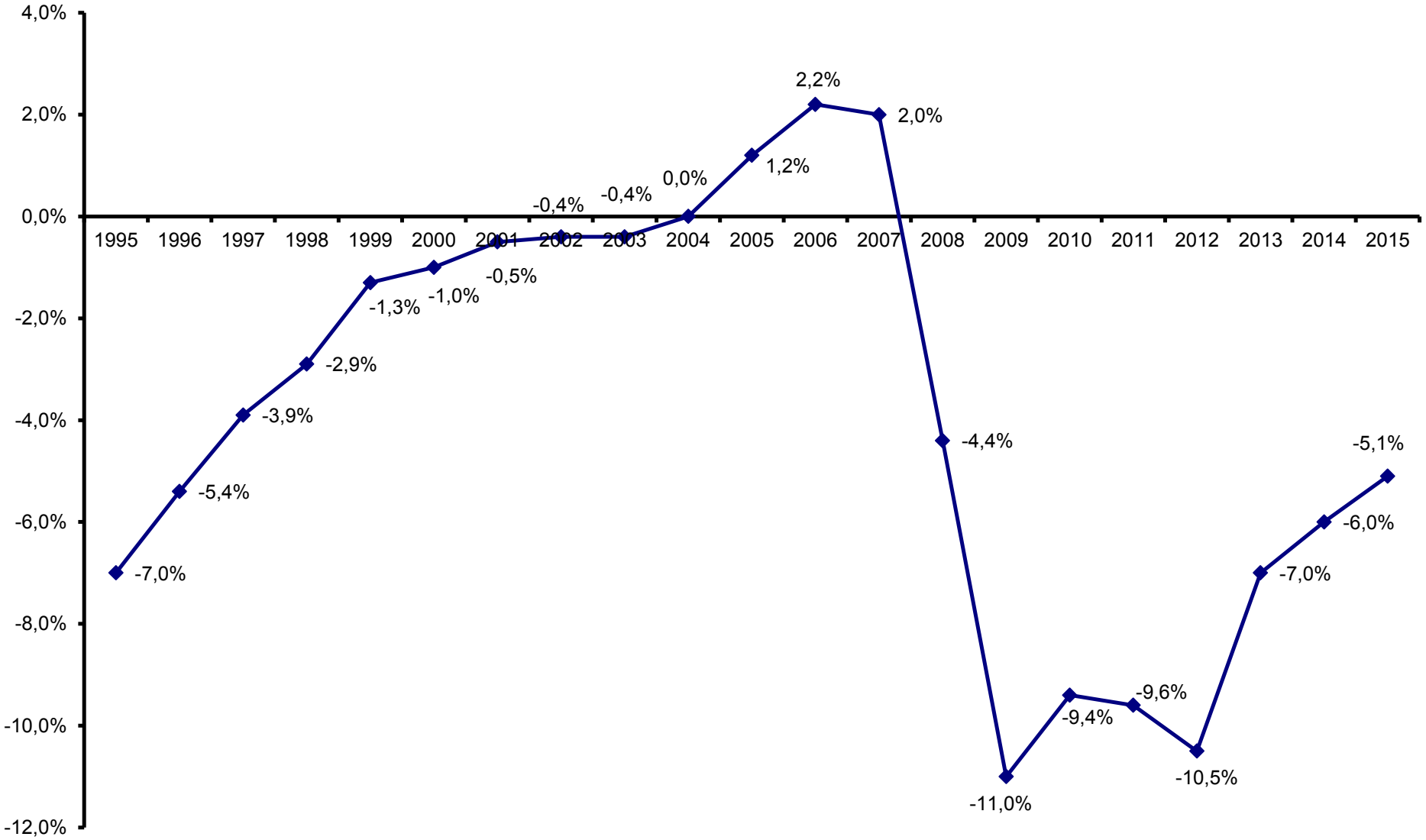
  - No materializadas


Emisiones CO_2
500
450
400
350
300
250
200
150
100
50
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
Emisiones de CO2-eq
Límite de Kioto
Transporte

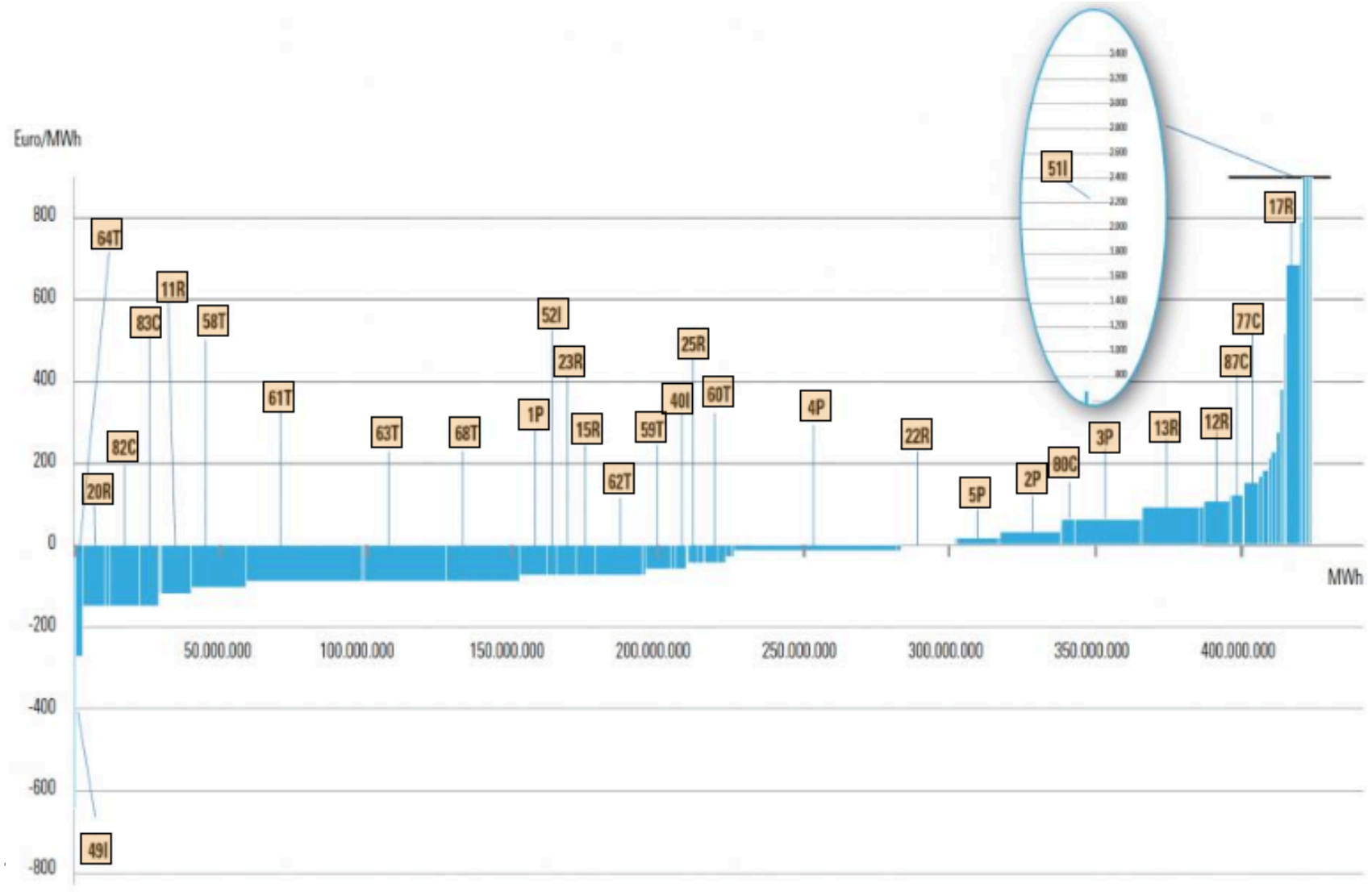
Dependencia energética



Cuentas públicas

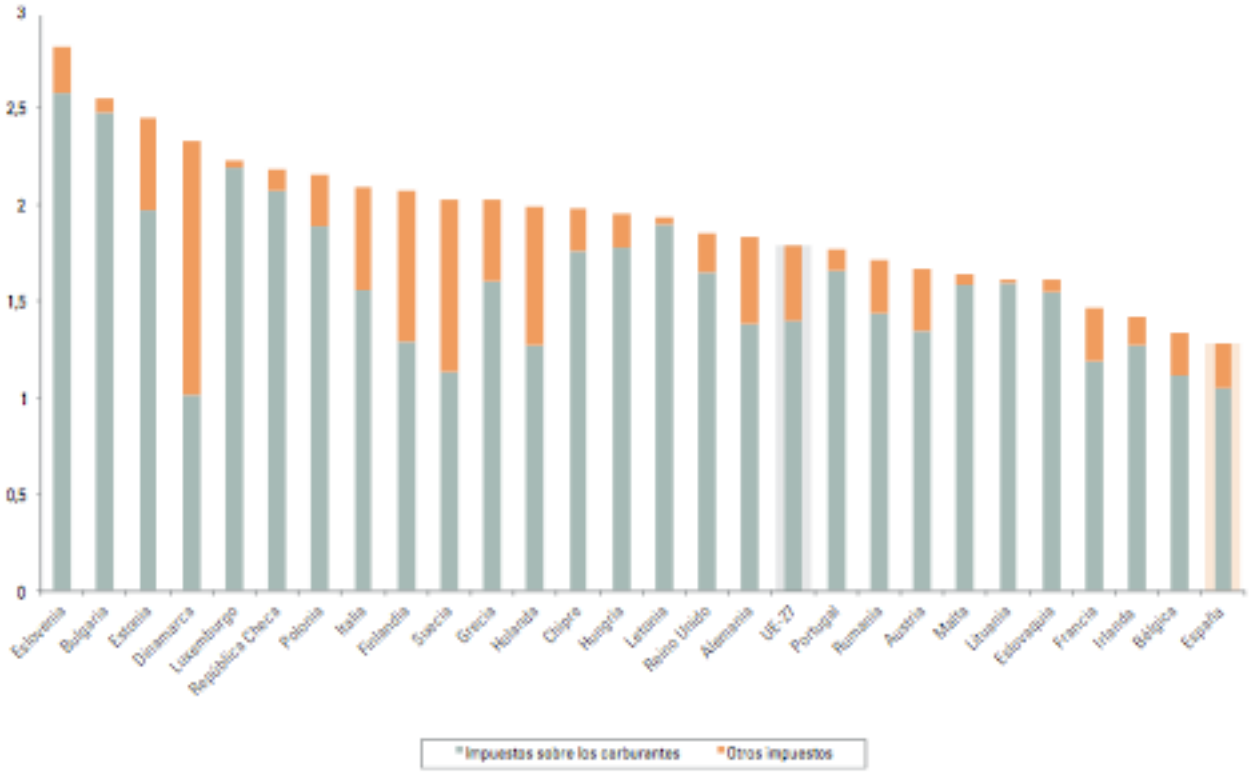


Eficiencia energética



Baja fiscalidad energético-ambiental

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



Fuente: Comisión Europea (2013) y elaboración propia

	Fueóleo ligero para hogares (por 1000 litros)				Gasóleo de automoción para uso no comercial (por litro)				Gasolina 95 (por litro)				Gas Natural para hogares (por MWh GCV)				Electricidad para hogares (por MWh)			
	Accisa	IVA (%)	Total	% carga fiscal media ponderada de la UE-22	Accisa	IVA (%)	Total	% carga fiscal media ponderada de la UE-22	Accisa	IVA (%)	Total	% carga fiscal media ponderada de la UE-22	Accisa	IVA (%)	Total	% carga fiscal media ponderada de la UE-22	Accisa	IVA (%)	Total	% carga fiscal media ponderada de la UE-22
Alemania	77,66	19	177,01	47,66	0,59	19	0,81	84,50	0,83	19	1,09	94,69	6,96	19	20,82	95,93	140,13**	19	200,13**	219,53
Austria	133,15	20	256,82	69,14	0,50	20	0,71	73,89	0,60	20	0,83	71,75	9,28*	20	24,63*	113,49	53,62*	20	94,63*	103,81
Bélgica	22,76*	21	120,53*	32,45	0,58*	21	0,82*	85,83	0,75*	21	1,03*	89,60	4,76**	21	16,10**	74,16	59,39**	21	108,78**	119,33
Dinamarca	329,73***	25	540,53***	145,53	0,42***	25	0,64***	66,57	0,61***	25	0,88***	76,47	28,48*	25	42,72*	196,83	118,00*	25	179,02*	196,38
Eslovaquia	n.d.	n.d.	n.d.	n.d.	0,74	20	1,09	113,45	1,03	20	1,44	124,79	0,00	20	16,48	75,92	0,00	20	51,00	55,95
Eslovenia	406,67*	22	620,44*	167,04	0,80*	22	1,12*	116,95	0,94*	22	1,30*	112,43	10,84*	22	28,81*	132,71	35,28*	22	83,94*	92,08
España	131,94	21	277,46	74,70	0,55	21	0,81	84,67	0,69	21	0,99	85,62	3,49*	21	24,36*	112,22	13,13*****	21	61,34*****	67,29
Estonia	198,13	20	384,38	103,48	0,70	20	1,01	105,40	0,76	20	1,07	92,98	6,27**	20	18,11**	83,42	25,18**	20	48,21**	52,89
Finlandia	230,14*	24	383,66*	103,29	0,55*	24	0,79*	82,08	0,73*	24	1,02*	88,12	n.d.	n.d.	n.d.	n.d.	24,19*	24	55,99*	61,41
Francia	117,44	20	245,89	66,20	0,62	20	0,85	88,42	0,79	20	1,05	91,54	5,43*	20	14,16*	65,23	42,40*	20	72,98*	80,06
Grecia	323,94**	24	516,23**	138,98	0,46*	24	0,74*	77,49	0,94*	24	1,31*	113,43	7,61*	13	24,22*	111,59	50,85**	13	79,44**	87,14
Hungría	n.d.	n.d.	n.d.	n.d.	0,83*	27	1,35*	140,55	0,91*	27	1,43*	123,94	0,00*	27	17,74*	81,73	0,00*	27	56,22*	61,67
Irlanda	143,86*	13,5	221,88*	59,74	0,59*	13,5	0,84*	87,30	0,72*	13,5	0,99*	86,34	4,35*	13,5	14,82*	68,27	0,00*	13,5	31,18*	34,20
Italia	537,61*	22	796,60*	214,47	0,82*	22	1,13*	117,79	0,97*	22	1,32*	114,13	20,29**	22	34,81**	160,39	92,00**	10	122,67**	134,56
Letonia	86,86	21	283,59	76,35	0,69	21	1,01	105,49	0,87	21	1,24	107,20	n.d.	n.d.	n.d.	n.d.	52,55**	21	107,84**	118,30
Luxemburgo	11,11*	14	71,08*	19,14	0,37*	17	0,52*	54,17	0,51*	17	0,69*	59,69	1,20**	8	4,90**	22,57	27,22**	8	40,67**	44,61
Países Bajos	593,34	21	782,11	210,57	0,59*	21	0,83*	86,43	0,94*	21	1,24*	107,90	31,71*	21	47,60*	219,31	-1,20*	21	32,05*	35,16
Polonia	128,89*	23	391,85*	105,50	0,81*	23	1,23*	128,30	0,93*	23	1,37*	118,99	0,00*	23	22,04*	101,53	11,11*	23	74,43*	81,64
Portugal	588,14*	23	887,63*	238,97	0,77*	23	1,12*	117,10	1,13*	23	1,57*	135,96	3,59**	23	32,53**	149,85	1,69**	23	76,10**	83,48
Reino Unido	161,45*	5	189,47*	51,01	0,84*	20	1,10*	114,92	0,84*	20	1,10*	95,33	0,00*	5	3,15*	14,51	0,00*	5	10,58*	11,61
Rep. Checa	50,00*	21	377,60*	101,66	0,83*	21	1,18*	123,70	0,97*	21	1,34*	116,72	0,00*	21	20,78*	95,72	2,12*	21	52,27*	57,34
Suecia	428,26****	25	720,26****	193,92	0,59*	25	0,87*	91,28	0,66*	25	0,94*	81,60	29,92**	25	52,92**	243,82	30,23**	25	61,45**	67,40
Media ponderada	216,04	18,70	371,43	100,00	0,68	20,96	0,96	100,00	0,84	20,96	1,15	100,00	7,76	18,56	21,71	100,00	50,51	17,10	91,16	100,00

Literatura académica (1)

- 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)

Literatura académica (2)

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

Una posible explicación?

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Transport and low-carbon fuel: A study of public preferences in Spain

Maria L. Loureiro [a,*], Xavier Labandeira [b,c], Michael Hanemann [d]

[a] Universidade de Santiago de Compostela, Departamento de Fundamentos da Análise Económica, Facultade de C. Económicas e Empresariais, Avda. das Ciencias s/n, Campus Norte, 15782, Spain
[b] Rede, Universidade de Vigo, Facultade de CC.EE., Campus As Lagoas s/n, 36310 Vigo, Spain
[c] Economics for Energy, Doutor Cadaval 2, 3°E, 36202 Vigo, Spain
[d] Arizona State University, Department of Economics, PO Box 879801 Tempe, AZ 85287, USA

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JEL classification:
Q54
Q58
R48

Keywords:
Biofuels
WTP
Contingent valuation

ABSTRACT

Transport is essential for the control of future greenhouse gas (GHG) emissions and thus a target for active policy intervention in the future. Yet, social preferences for policies are likely to play an important role. In this paper we first review the existing literature on preferences regarding low-GHG car fuels, but also covering policy instruments and strategies in this area. We then present the results of a survey of Spanish households aimed at measuring preferences for climate change policies. We find a positive willingness to pay (WTP) (in the form of higher car fuel prices) for a policy to reduce GHG emissions through biofuels. There is, however, significant heterogeneity in public preferences due to personal motivations (accounted for via factor analysis of responses to attitudinal questions) and to socio-demographic variables.

1. Introduction

Economic development has been historically associated with an increase in personal mobility. Industrialized countries have satisfied such a growing demand for mobility through larger transport infrastructures, public transport networks and, above all, mass private motorization. Yet, given the traditional high reliance of private transport on oil products, the so-called 'energy problems' of transport are a growing concern (Proost and Van Dender, 2012). Acute energy dependence, for instance, has prompted most oil importers to introduce various regulations (e.g. taxes, speed limits, energy efficiency standards) to deal with energy security concerns and reduce the export of rents to petroleum producing countries. Another pressing issue is local pollution (e.g. volatile organic compounds, nitrogen oxides, noise), which produces significant welfare impacts mainly through health-related morbidity and mortality effects (Krzyzanowski et al., 2005).

Transport is also a major contributor to greenhouse gas (GHG) energy-related emissions, which have been identified as a cause of climate change. Indeed, in most developed countries GHG emissions from transportation are not only quite sizable (approximately 20% of total EU emissions in 2010, as reported by the EEA, 2012), but also are growing rapidly. This is due mainly to the rising demand for personal mobility, as noted above, the difficulty of switching to low-GHG technologies in this sector (when compared, for example, to switching the fuel source in electricity generation) and to the limited effectiveness of regulations. The latter is illustrated by the tendency for recent, mostly standard-related, energy-efficiency gains in cars to be partially or completely offset by the purchase of larger and more powerful automobiles (see e.g. Knittel, 2012) and by the growth in fleet size and vehicle usage.

How to deal with the problem of energy use in transportation, and particularly with its considerable GHG emissions? Public intervention should obviously play an important role, given the externalities involved. However, many options are available: pricing (e.g. fuel taxes), design standards (e.g. minimum miles-per-gallon standards), information (e.g. energy efficiency labels), promotion of public transit, subsidies to vehicles running on renewables or non-fossil fuels, etc. Despite the existence of such policy options, many countries seem to be failing to cope with the problem, given the continuing rise in vehicle usage and transportation fuel consumption (see e.g. IEA, 2012). Apart from possible failures of policy design and negative interactions among policy instruments, there seem to be social constraints on introducing stronger or more restrictive policies in this area because those would be seen as an outright attack on current lifestyles (Sandmo, 2009).

This is the general context for the paper, which focuses on the role of public preferences in explaining regulatory limits in this area. We deal with just one of the 'energy problems' of transport, namely GHG emissions, and with a policy to foster the production of low-GHG fuels by current suppliers. Although we recognize other options to mitigate GHG emissions from private transport (mostly behavioral changes and replacement of high-consuming cars for more efficient conventional units or for new technological alternatives, as briefly discussed in Section 2), our main focus is on the use of biofuels since this is currently

* Corresponding author. Tel.: +34 881811674.
E-mail addresses: maria.loureiro@usc.es (M.L. Loureiro), xavier@uvigo.es (X. Labandeira), michael.hanemann@asu.edu (M. Hanemann).

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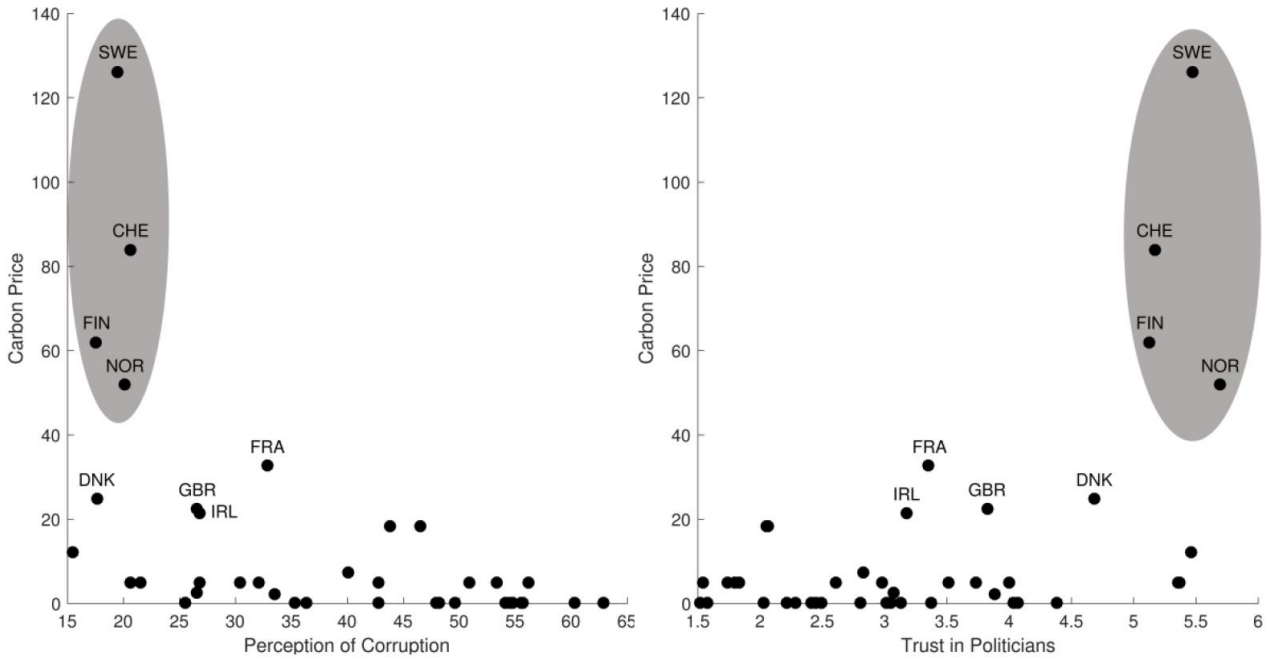
Political science suggests trust and corruption perceptions are correlated with high carbon prices

1. Support for carbon tax in Sweden **not** explained by generalised trust, but trust in politicians **is** a significant explanatory variable (Hammar & Jagers, 2006)
2. Party dynamics suggest stability in carbon prices can be achieved by sharing benefits with future powerful constituencies (Aklin & Urpelainen, 2013)



Source: Klenert et al (in review)

Fuente: Hepburn (2017)

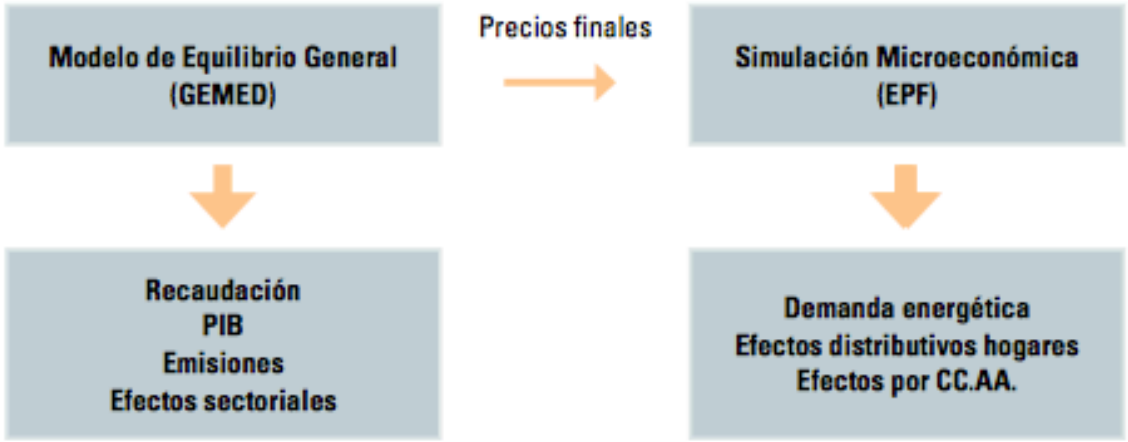
Potencial recaudatorio

Informe	Incremento recaudatorio (millones de €)	Incremento recaudatorio (% recaudación 2015)
VividEconomics (2012)	4000 (2013) 10584 (2020)	2,20 (2013) 5,82 (2020)
Economics for Energy (2013)	1659 (Reforma 1A) 5283 (Reforma 1B) 2696 (Reforma 2A) 5354 (Reforma 2B) 2214 (Reforma 3A) 6620 (Reforma 3B) 7477 (Reforma 4A) 7477 (Reforma 4B)	0,91 (Reforma 1A) 2,90 (Reforma 1B) 1,48 (Reforma 2A) 2,94 (Reforma 2B) 1,22 (Reforma 3A) 3,64 (Reforma 3B) 4,11 (Reforma 4A) 4,11 (Reforma 4B)
Comisión Europea (2016)	13365 (2018) 24429 (2020) 27348 (2025) 29923 (2030) 32801 (2035)	7,34 (2018) 13,42 (2020) 15,03 (2025) 16,44 (2030) 18,02 (2035)

Cambios fiscales

Año	Variación recaudatoria
2011	7853
2012	11237
2013	11897
2014	125
2015	-7846

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

Figura 5. Simulación 2A. Efecto total por decilas de renta

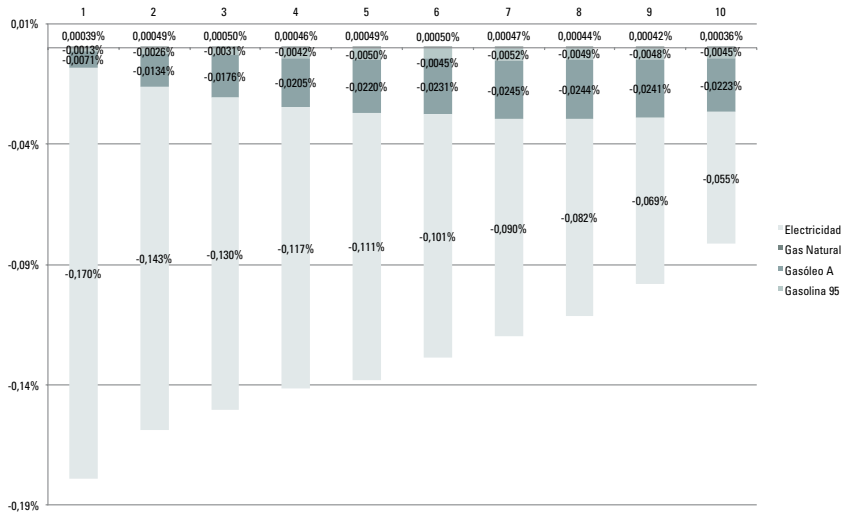
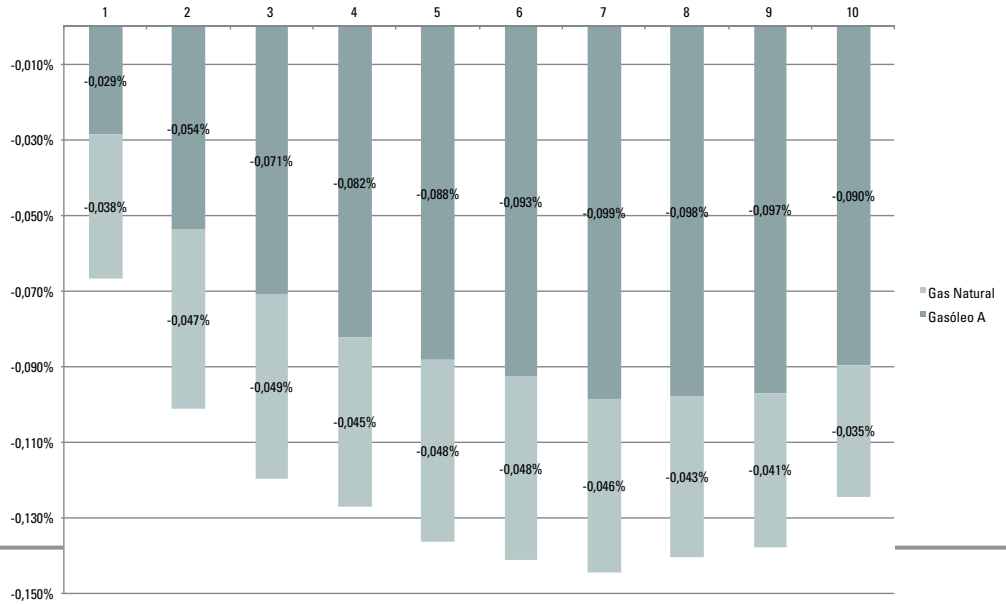


Figura 3. Simulación 1A. Efecto total por decilas de renta



Fuente: Elaboración propia.

En resumen,

- Una buena alternativa
- No ha cumplido expectativas
- Nuevas oportunidades en la lucha contra el cambio climático: Transición
- Paradoja española 
- Ser conscientes de las barreras

GRÀCIES

http://labandeira.eu

xavier@uvigo.es