CONSTRAINTS FOR ENERGY/ENVIRONMENTAL TAXATION IN SPAIN

Xavier Labandeira
Economics for Energy and rede, University of Vigo

ENTRACTE-CECILIA Joint Climate Workshop
Dublin, 13 September 2013

rede research in economics, business and the environment

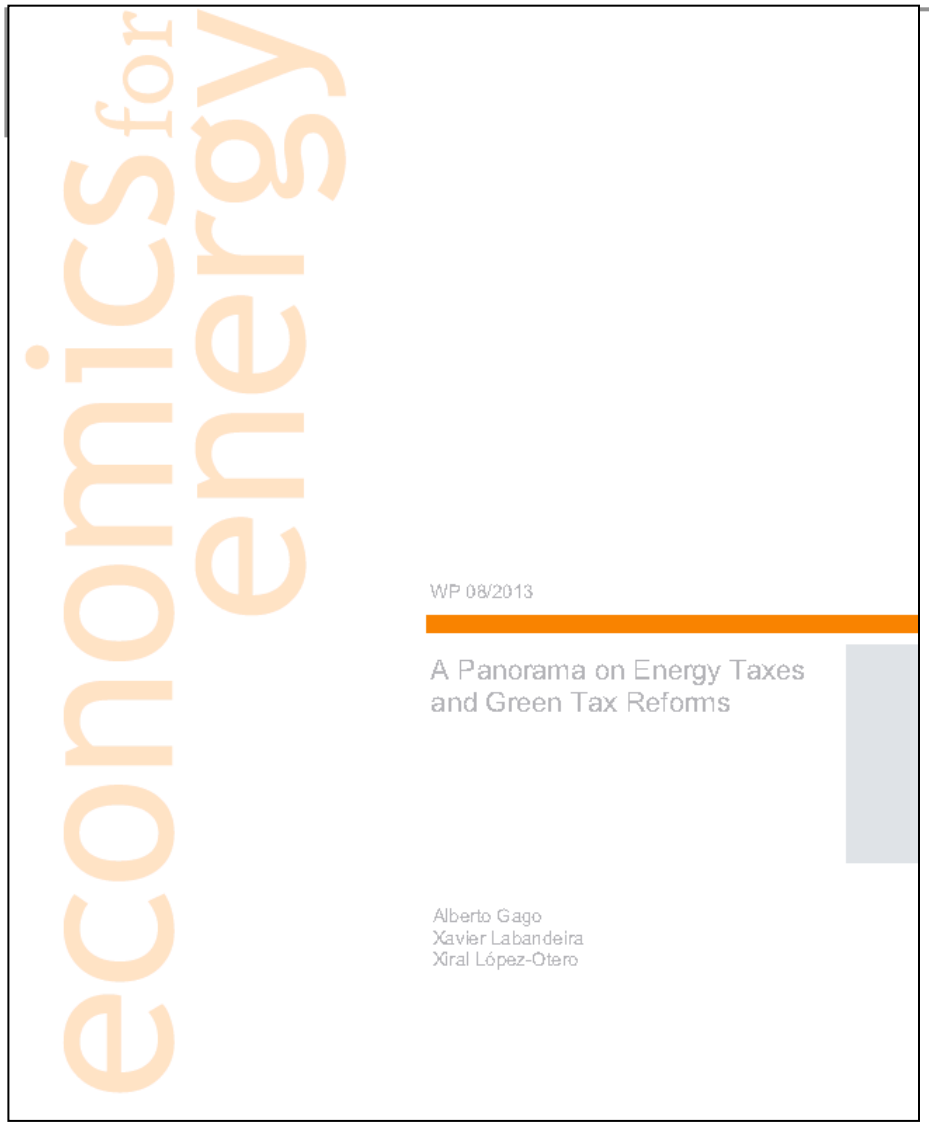
economics for energy

Contents

- Reasons for energy taxes
- Green tax reforms
- Prospective
- **Spain**
  - **Anomalies**
  - **Potentials**
- **Conclusions**

rede research in economics, business and the environment

economics for energy



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

rede research in economics, business and the environment

economics for energy

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

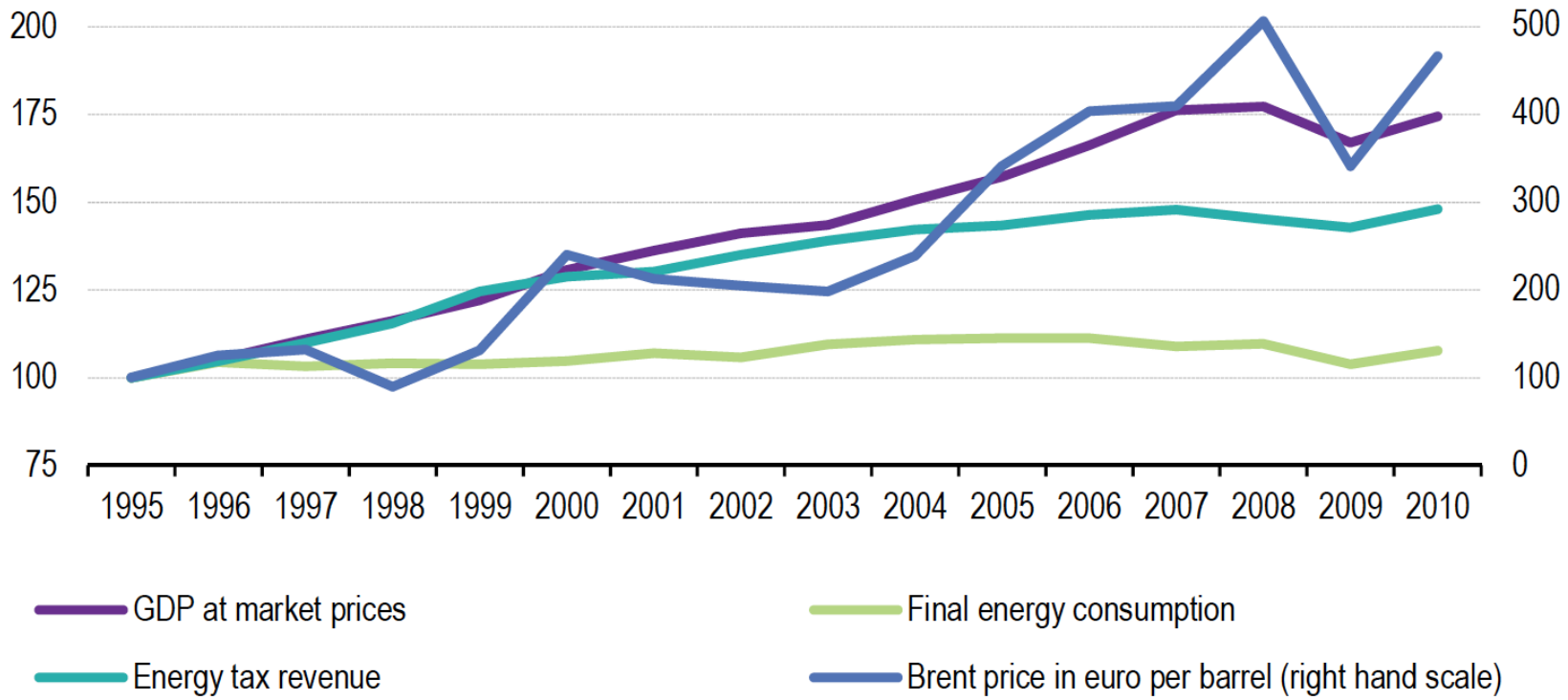
but,

- 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
- Competitiveness
  - Exemptions

Figure 5: Energy taxes, GDP and final energy consumption, EU-27, 1995-2010 (index 1995=100)



Source: Eurostat (online data codes: env_ac_tax; nama_gdp_c; nrg_100a and INSEE)

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

rede research in economics, business and the environment

economics for energy

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

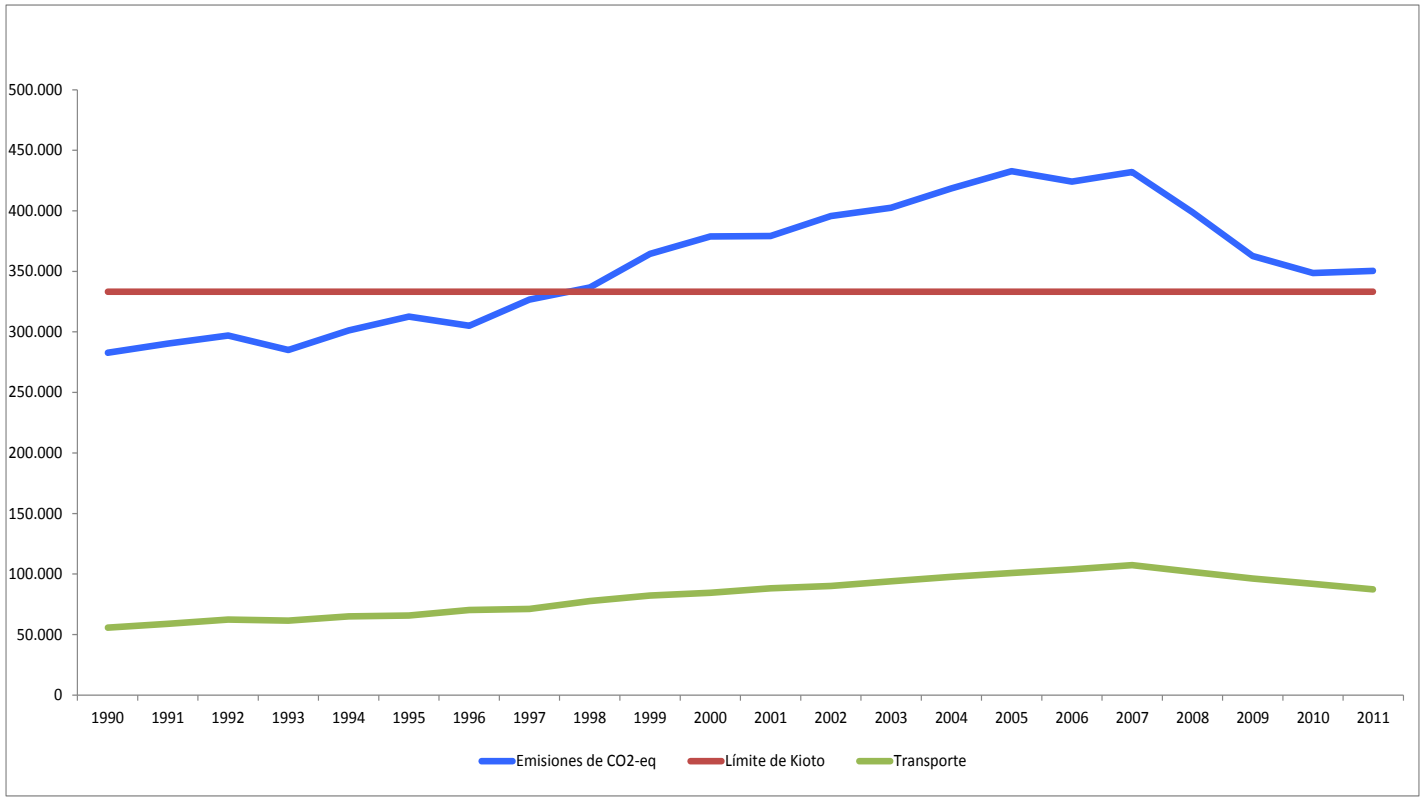
http://www.eforenergy.org/docpublicaciones/documentos-de-trabajo/WPFA04-2012.pdf

rede research in economics, business and the environment

economics for energy

Spain: A picture

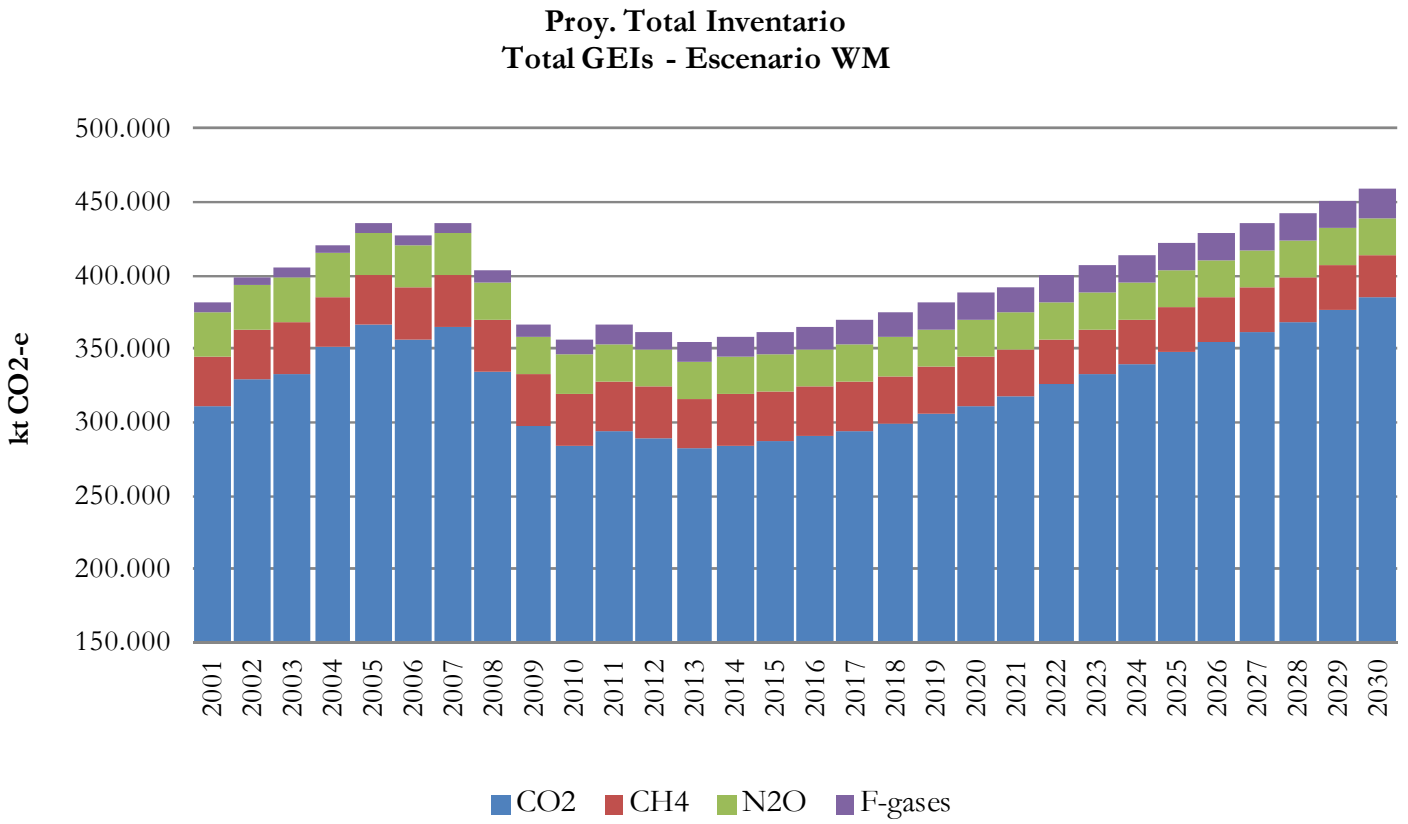
Spanish CO_2 emissions



rede research in economics, business and the environment

economics for energy

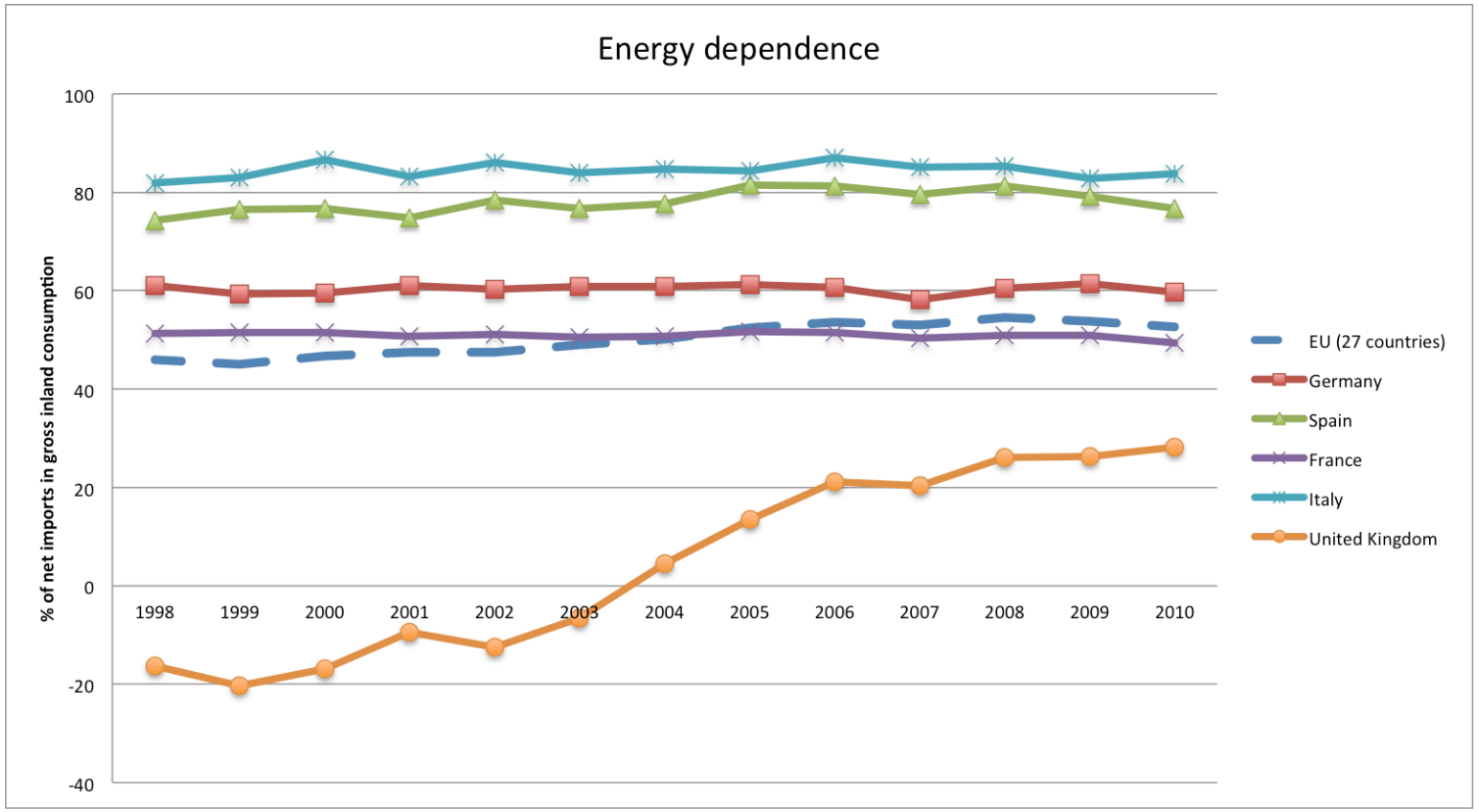
Spanish CO_2 emissions (official forecast)



rede research in economics, business and the environment

economics for energy

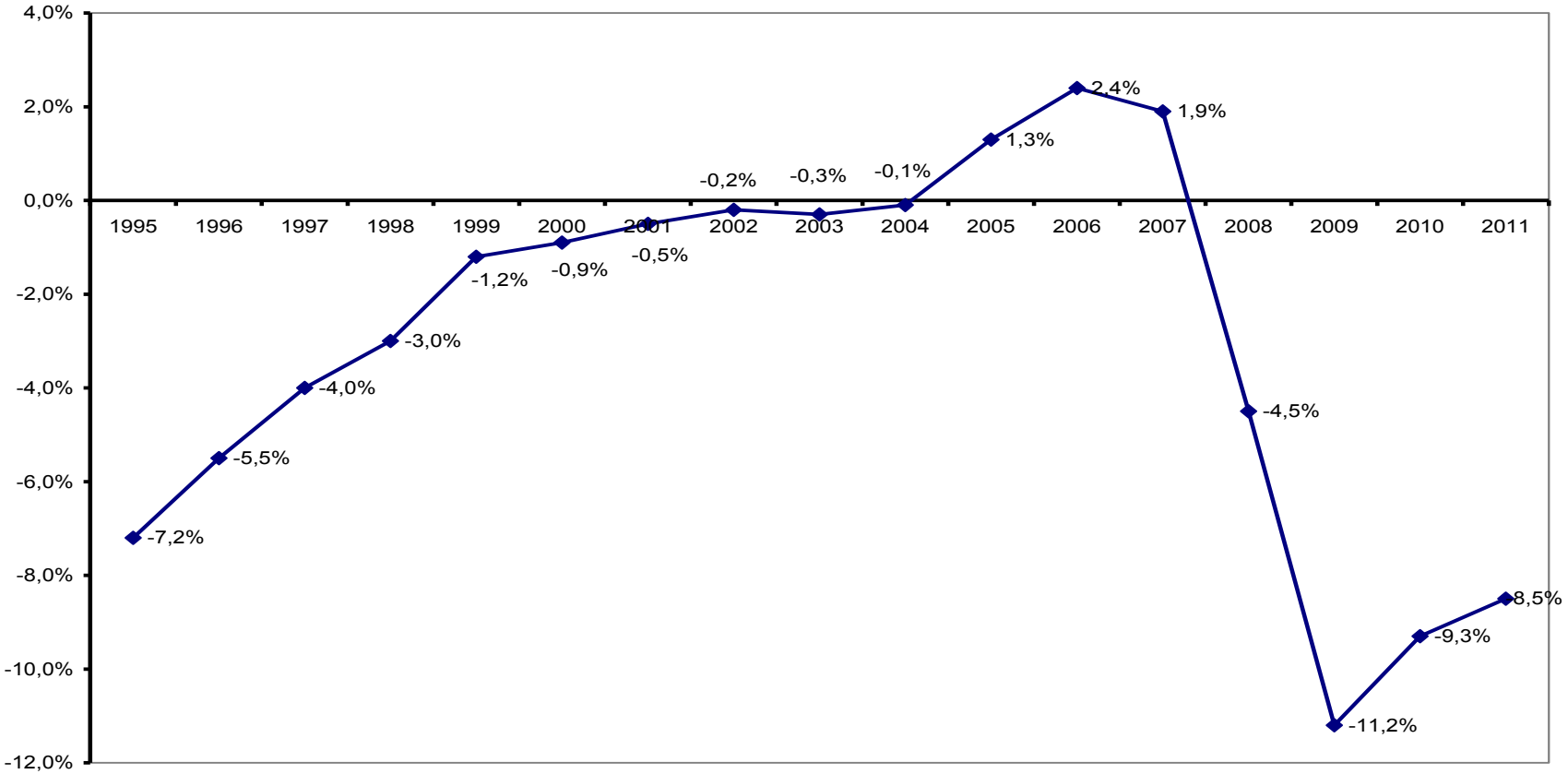
Spanish energy dependence



rede research in economics, business and the environment

economics for energy

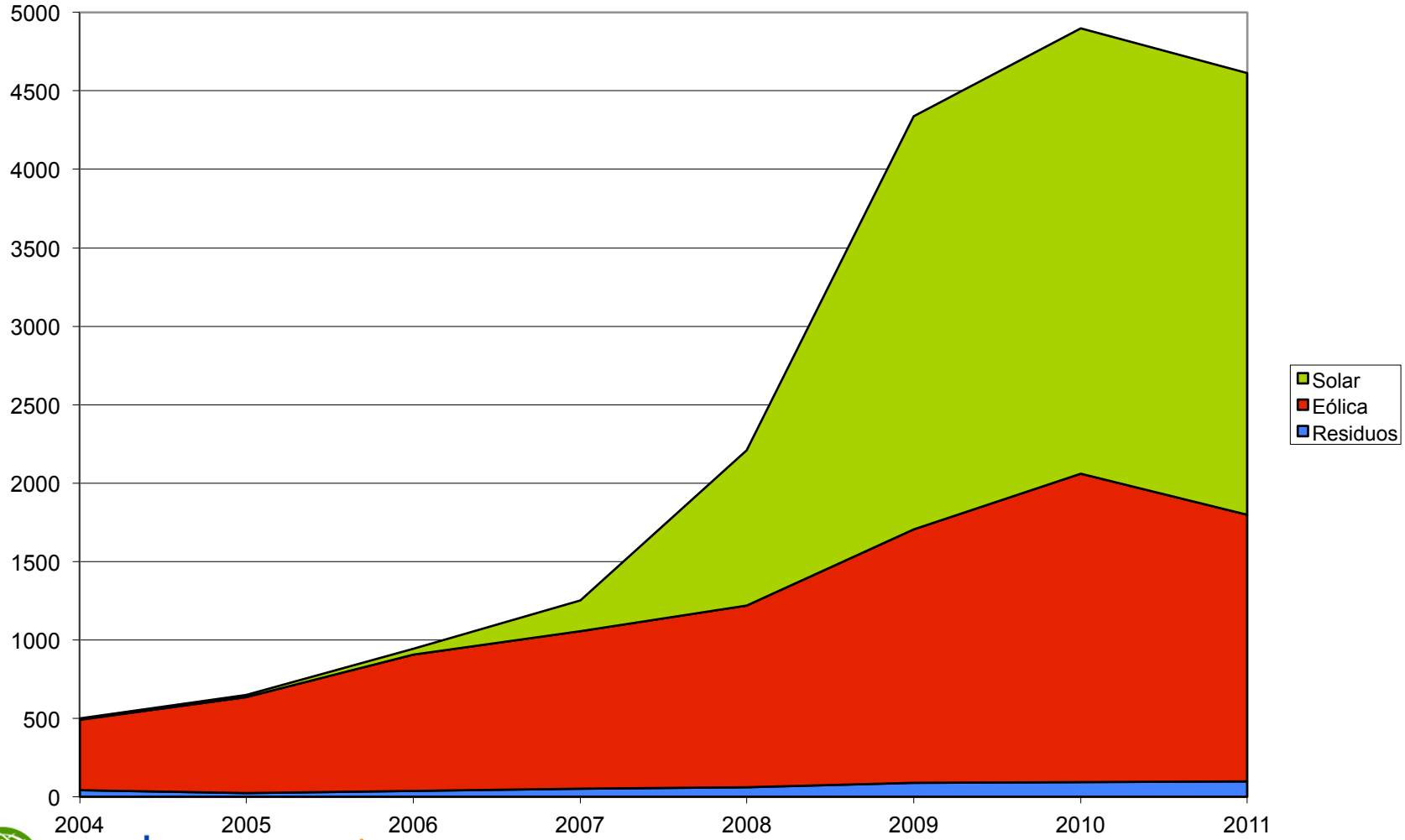
Spanish public finances (deficit/superavit on GDP)



rede research in economics, business and the environment

economics for energy

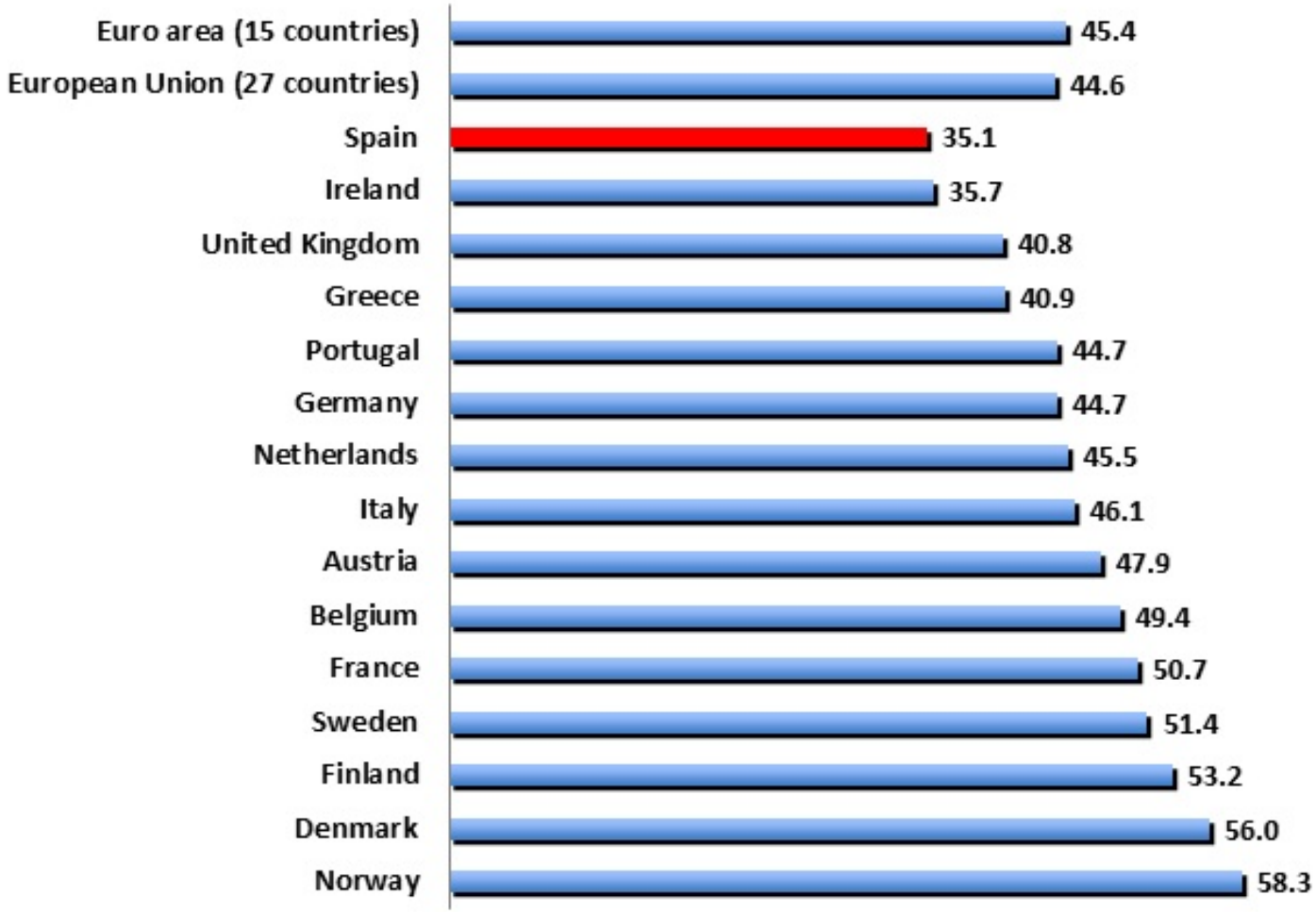
Costs of renewable support (M€)



rede research in economics, business and the environment

economics for energy

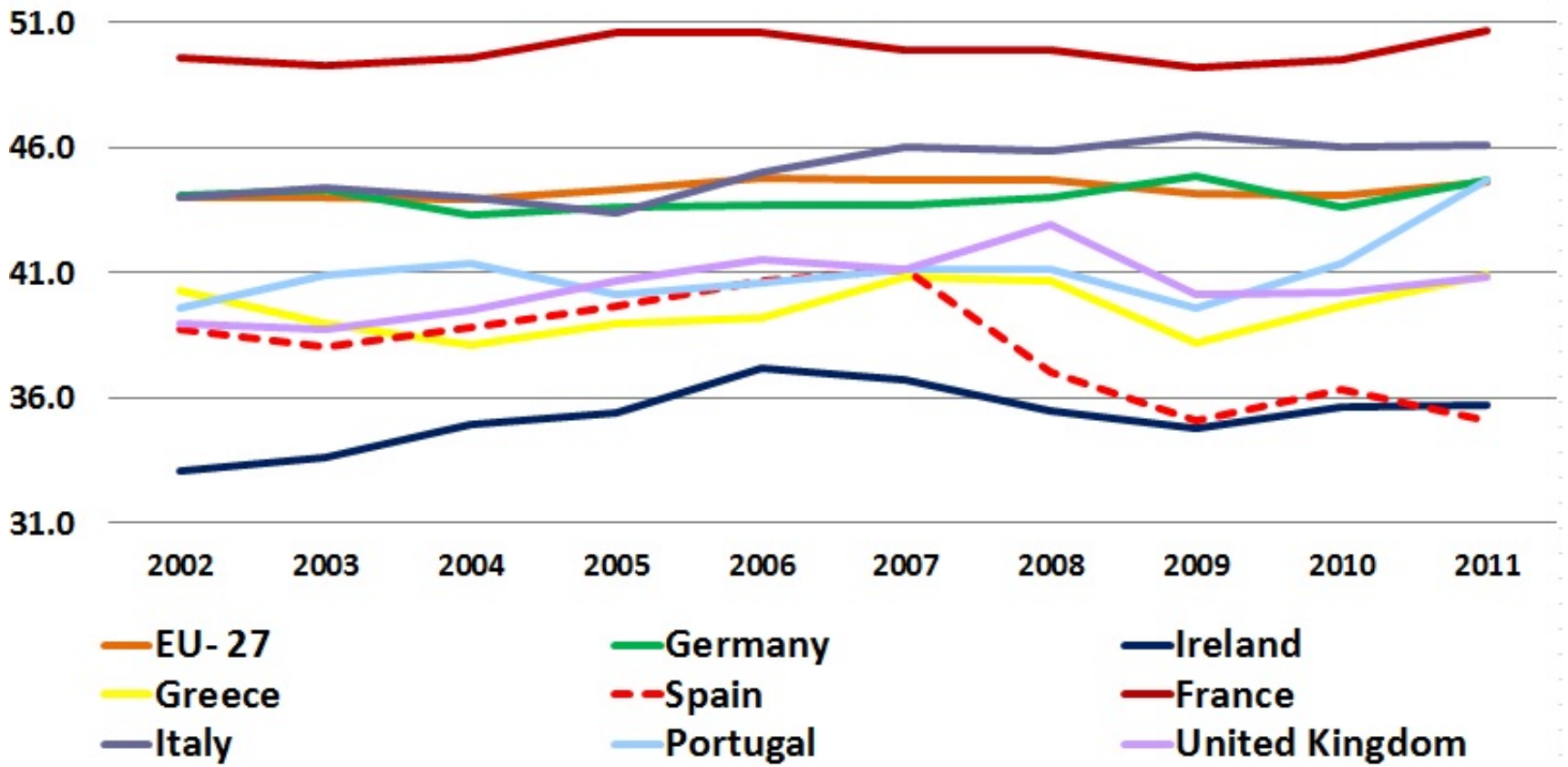
Figura 1. Ingresos sector público sobre PIB (2011)



rede research in economics, business and the environment

economics for energy

Figura 2. Evolución Ingresos Fiscales sobre PIB (2002-2011)



rede research in economics, business and the environment

economics for energy

Millones de euros

	2004	2005	2006	2007	2008	2009	2010	2011
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**
	100,0	*118,3*	*135,6*	*159,3*	*133,8*	*114,0*	*112,8*	*117,2*
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
	100,0	*114,7*	*131,6*	*152,2*	*149,5*	*133,8*	*140,3*	*146,3*
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
	100,0	*124,9*	*143,0*	*172,3*	*104,9*	*77,6*	*62,3*	*63,8*
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**
	100,0	*109,5*	*118,1*	*122,0*	*109,0*	*85,3*	*111,1*	*110,1*
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
	100,0	*112,0*	*122,8*	*125,5*	*107,9*	*75,4*	*110,3*	*110,8*
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**
	100,0	*102,9*	*106,2*	*113,0*	*111,7*	*110,5*	*113,1*	*108,4*
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
	100,0	*100,9*	*102,9*	*105,8*	*100,3*	*97,3*	*97,9*	*91,8*
Electricidad	809,0	854,9	973,4	1.065,5	1.187,4	1.270,7	1.363,0	1.372,0
	100,0	*105,7*	*120,3*	*131,7*	*146,8*	*157,1*	*168,5*	*169,6*
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
	100,0	*105,7*	*109,6*	*121,6*	*125,0*	*125,0*	*129,6*	*126,4*

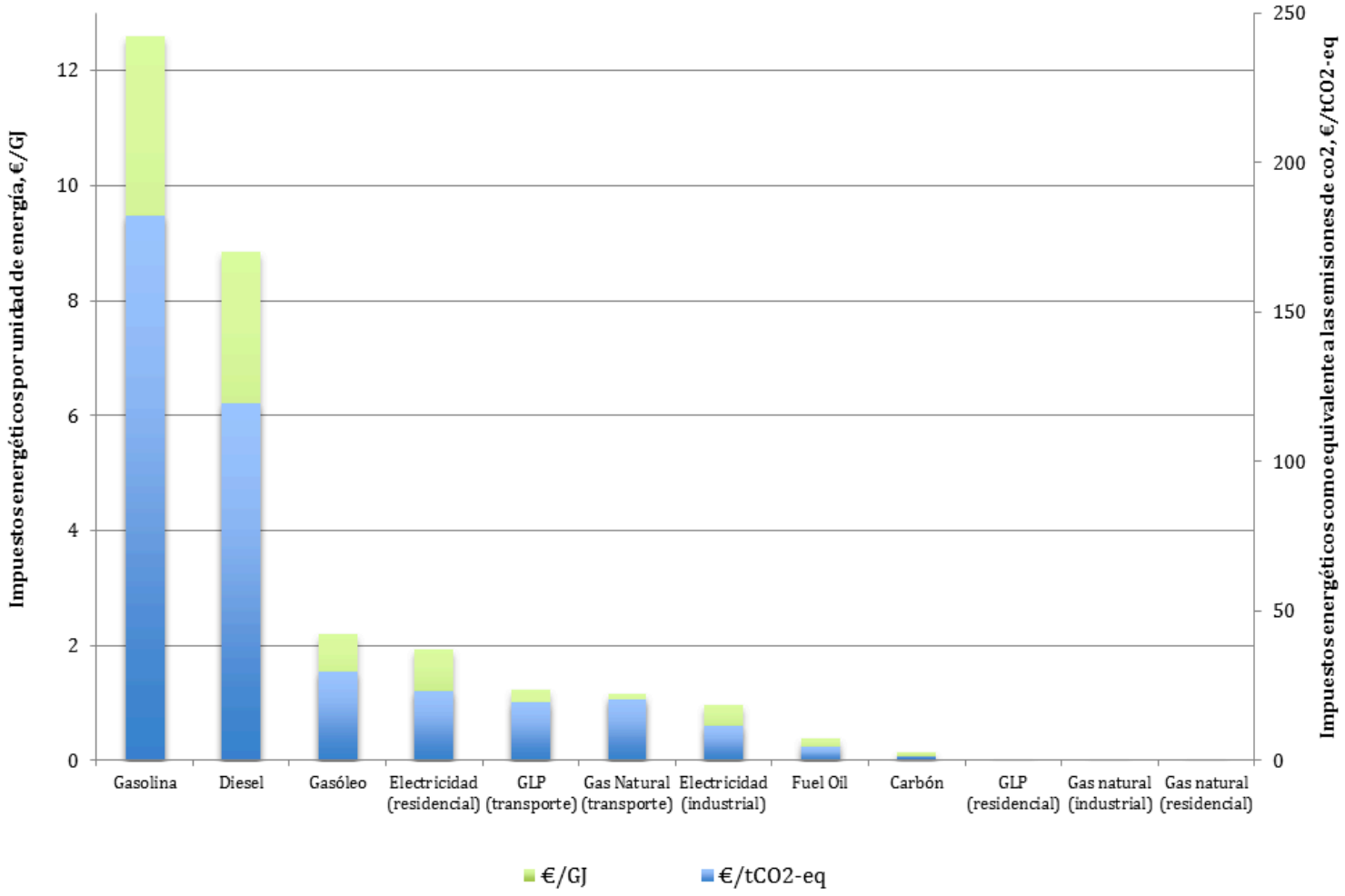
Comparatively lower energy taxation (2012)

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 MWh)			
	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	198,21	63,43	0,47	19,00	0,70	88,03	0,66	19,00	0,91	96,36	5,50	19,00	16,84	103,00	77,90*	19,00	119,90*	205,32
Austria	109,18	20,00	270,86	81,58	0,44	20,00	0,67	78,60	0,53	20,00	0,76	75,73	5,96*	20,00	17,68*	101,77	26,40	20,00	59,90	96,54
Bélgica	18,49*	21,00	173,53	51,06*	0,43*	21,00	0,69*	80,02	0,61*	21,00	0,91*	88,71	2,20*	21,00	14,20*	79,86	17,10*	21,00	50,70*	79,83
Dinamarca	347,48*	25,00	646,86	156,59*	0,40*	25,00	0,70*	66,03	0,58*	25,00	0,92*	73,86	30,15*	25,00	49,31*	228,17	108,30*	25,00	167,96*	217,59
Eslovenia	153,10*	20,00	323,00	129,20*	0,40*	20,00	0,62*	97,81	0,53*	20,00	0,77*	102,30	4,45*	20,00	17,34*	132,57	8,90*	20,00	34,00*	72,78
España	87,00	21,00	250,70	90,39	0,37	21,00	0,61	85,90	0,46	21,00	0,71	85,17	0,00*	21,00	13,67*	94,21	8,80**	21,00	41,10**	79,30
Estonia	110,95	20,00	280,49	130,55	0,39	20,00	0,62	112,90	0,42	20,00	0,65	99,61	2,47*	20,00	10,76*	95,73	14,60*	20,00	31,80*	79,21
Finlandia	160,53*	23,00	372,41	101,42*	0,47*	23,00	0,76*	81,00	0,65*	23,00	0,96*	86,79	8,13*	23,00	17,22*	89,64	17,00*	23,00	45,40*	66,17
Francia	56,60	19,60	214,87	63,96	0,44	19,60	0,66	77,33	0,61	19,60	0,87	85,79	1,19	19,60	11,30	64,29	26,87	19,60	48,29	76,92
Grecia	60,00*	23,00	242,98	88,86*	0,39*	23,00	0,67*	96,59	0,67*	23,00	0,99*	119,46	5,40*	13,00	15,04*	105,13	16,60*	13,00	32,60*	63,80
Hungría	n.d.	27,00	n.d.	n.d.	0,39*	27,00	0,71*	156,41	0,43*	27,00	0,74*	137,48	0,00*	27,00	9,73*	104,20	5,05*	27,00	39,11*	117,30
Irlanda	88,66*	13,50	219,70	66,96*	0,48*	23,00	0,77*	91,95	0,59*	23,00	0,89*	89,86	3,39*	13,50	11,41*	66,46	0,00*	13,50	25,00*	40,77
Italia	403,21*	21,00	655,26	212,34*	0,61	21,00	0,90	114,54	0,72	21,00	1,03	110,25	n.d.	21,00	26,67***	165,19	48,10*	10,00	68,50*	118,79
Luxemburgo	10,00*	12,00	97,27	26,21*	0,33*	15,00	0,49*	52,16	0,46*	15,00	0,64*	57,31	1,08**	6,00	4,07**	20,96	13,20**	6,00	22,20**	32,01
Países Bajos	254,42****	21,00	360,89	111,31****	0,44*	21,00	0,67*	81,22	0,74*	21,00	1,02*	104,53	17,05*	21,00	29,59*	174,44	7,80*	21,00	38,00*	62,72
Polonia	55,50*	23,00	240,67	136,26*	0,35*	23,00	0,60*	132,96	0,40*	23,00	0,65*	122,46	0,00*	23,00	10,19*	110,29	4,78*	23,00	32,56*	98,65
Portugal	292,50*	23,00	534,30	220,61*	0,37*	23,00	0,64*	103,23	0,58*	23,00	0,89*	121,88	0,00*	23,00	14,88*	117,43	0,00*	23,00	37,90*	83,74
Reino Unido	137,35*	5,00	178,90	54,63*	0,72*	20,00	1,01*	120,38	0,72*	20,00	0,99*	100,40	0,00*	5,00	2,72*	15,90	0,00*	5,00	8,14*	13,30
República Checa	26,28*	20,00	257,16	119,80*	0,44*	20,00	0,68*	123,79	0,51*	20,00	0,75*	116,52	0,00*	20,00	11,36*	101,19	1,19*	20,00	27,00*	67,31
República Eslovaca	n.d.	20,00	n.d.	n.d.	0,37*	20,00	0,61*	115,27	0,52*	20,00	0,77*	123,85	0,00*	20,00	8,87*	81,89	0,00*	20,00	28,90*	74,70
Suecia	450,43	25,00	766,62	192,50	0,51*	25,00	0,85*	83,41	0,62*	25,00	0,96*	79,71	30,52*	25,00	54,47*	261,42	31,49*	25,00	66,32*	89,12
Media ponderada (PPA)	**178,00**	**18,70**	**390,63**	**100,00**	**0,64**	**20,81**	**1,00**	**100,00**	**0,81**	**20,81**	**1,18**	**100,00**	**3,63**	**18,45**	**20,44**	**100,00**	**35,77**	**17,02**	**73,00**	**100,00**

rede research in economics, business and the environment

economics for energy

Heterogeneous energy taxation



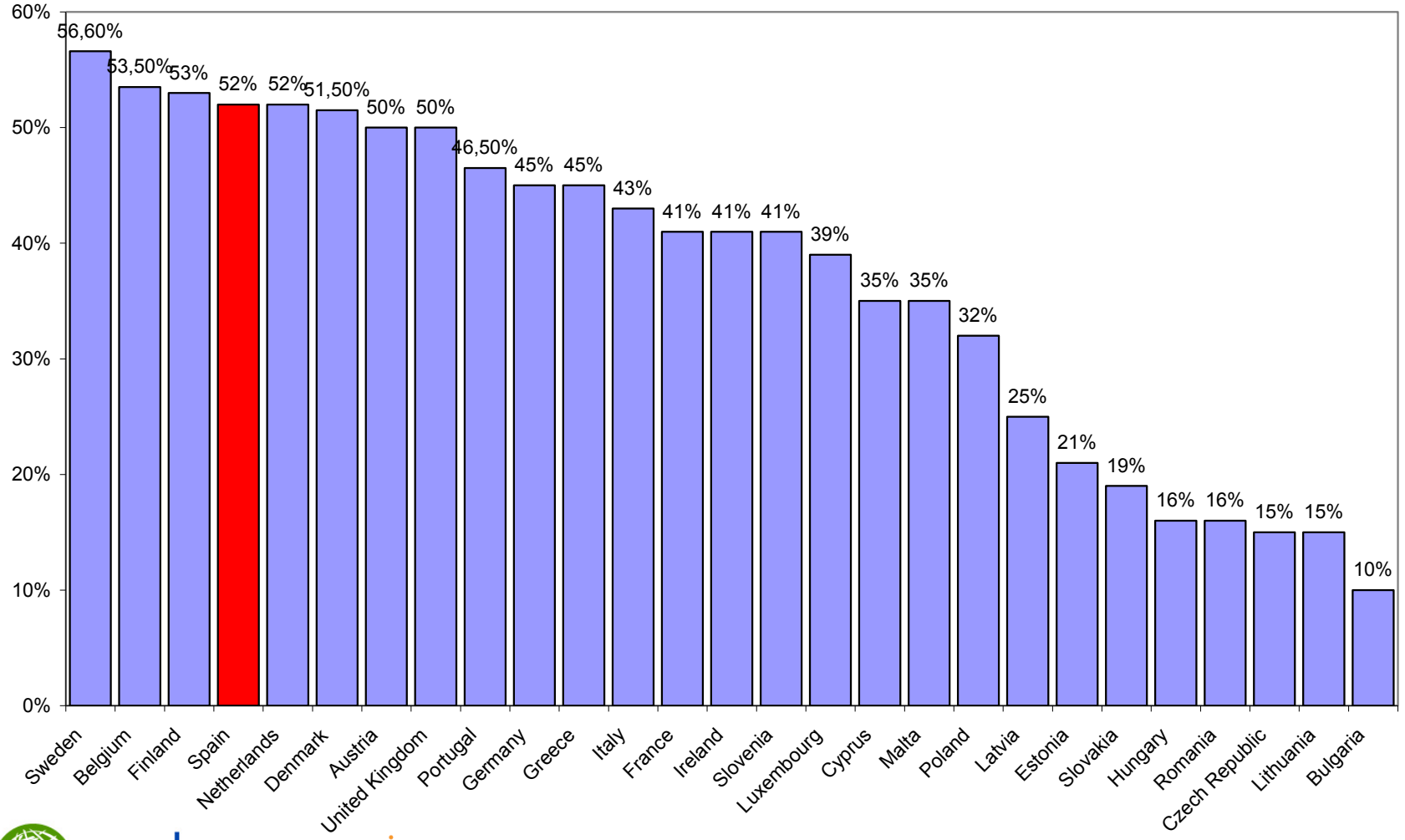
rede research in economics, business and the environment

economics for energy

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
- **Regional involvement in energy taxation**

Income taxation in the EU



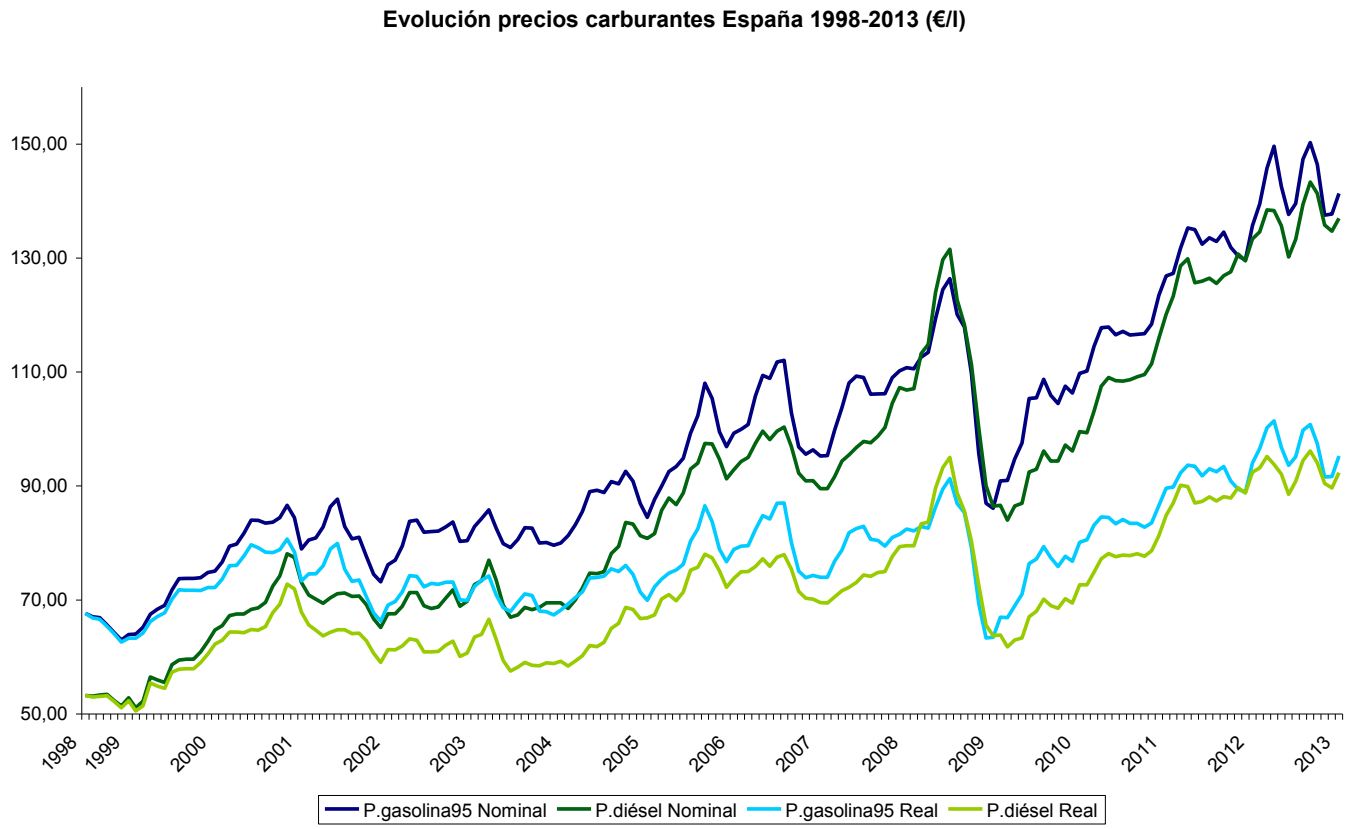
rede research in economics, business and the environment

economics for energy

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)



rede research in economics, business and the environment

economics for energy

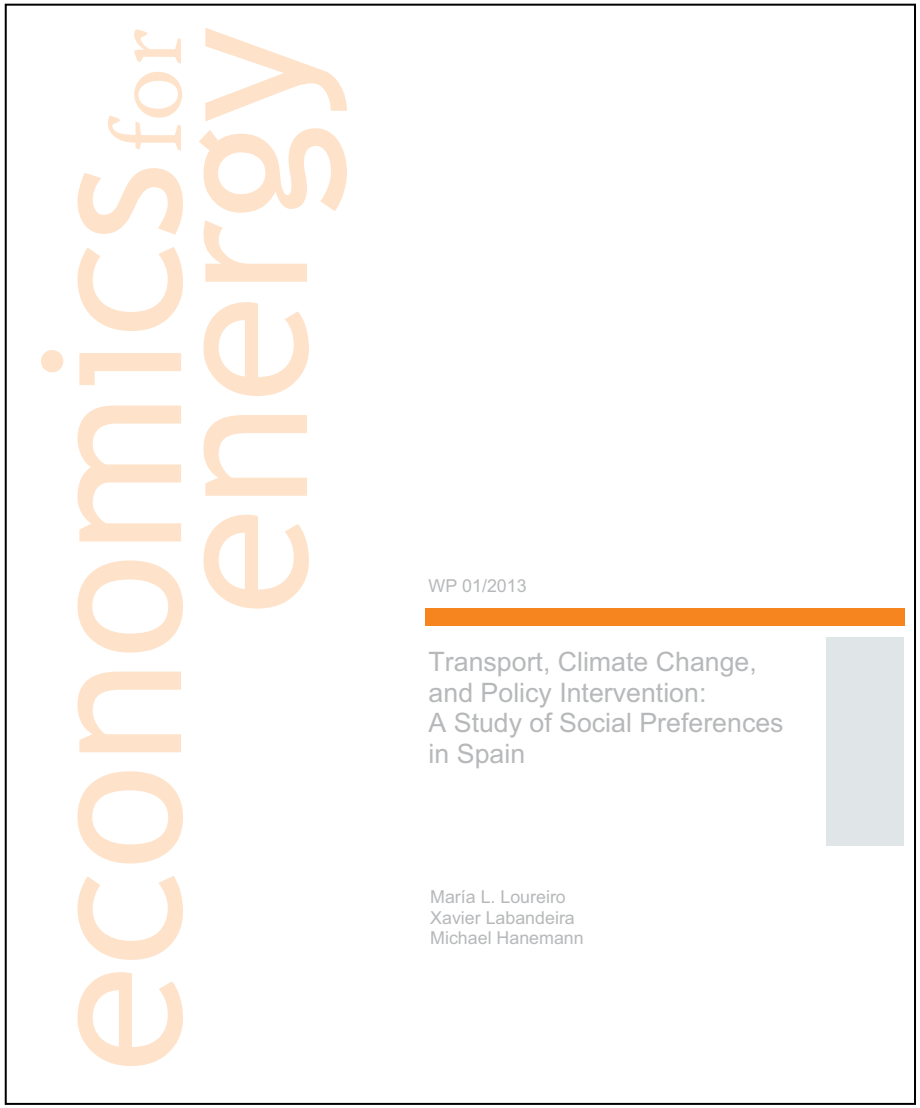
Academic Literature

- 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



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

rede research in economics, business and the environment

economics for energy

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 (CO_2)	Tax rates (energy)	Tax rates (CO_2+energy)	VAT on excises	Total	Tax rates (CO_2)	Tax rates (energy)	Tax rates (CO_2+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)

rede research in economics, business and the environment

economics for energy

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

rede research in economics, business and the environment

economics for 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 +5300 M€, 'Environment' 3000 M€
  - Regional energy and energy-environmental taxes (2012): 250 M€
  - New tax on fluorinated greenhouse gases (2013): 340 M€

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 may 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

THANKS

http://webs.uvigo.es/xavier

xavier@uvigo.es