Reforma Fiscal Verde en España:
Por qué y cómo diseñar soluciones eficientes y equitativas

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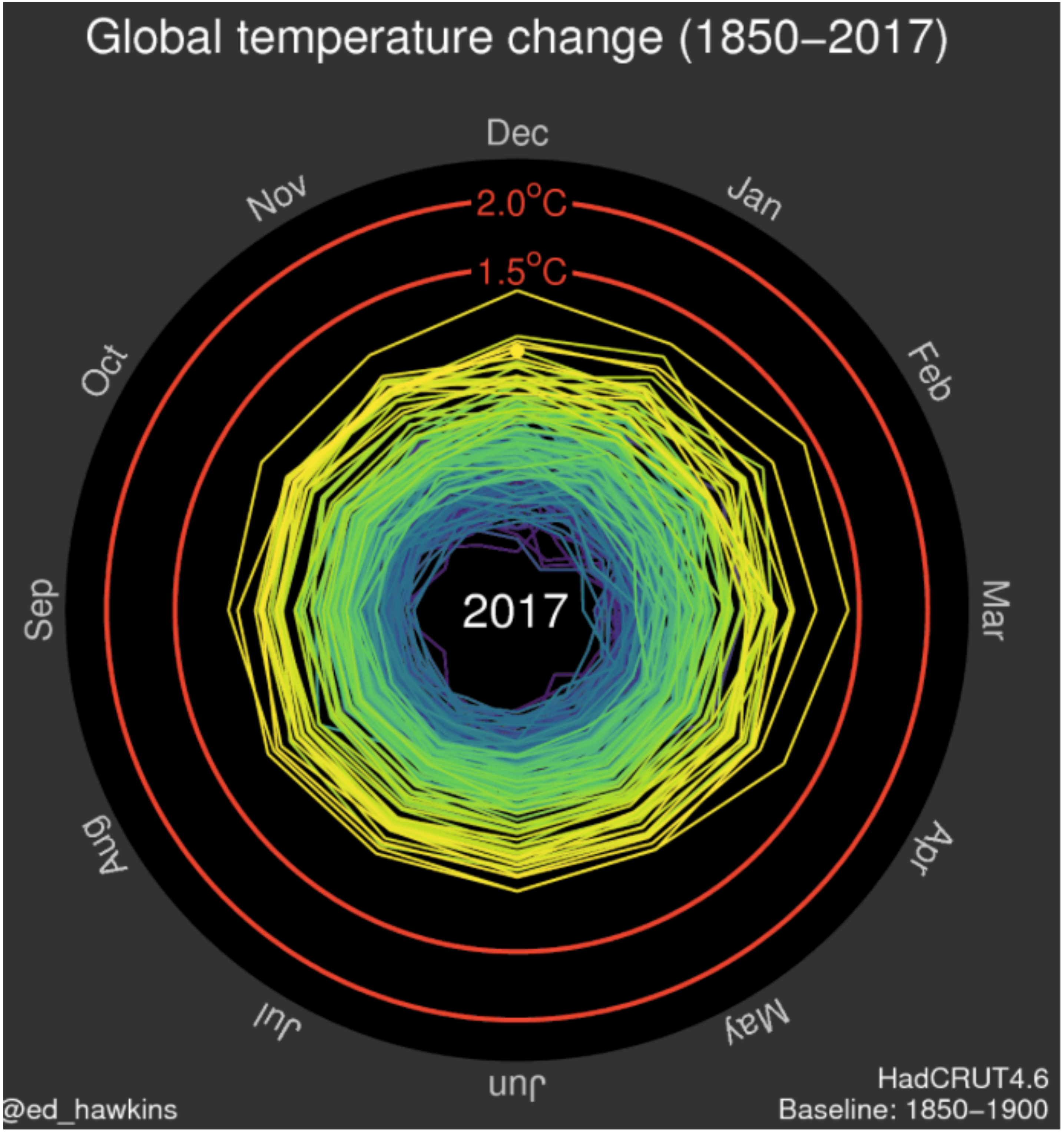
XIII Jornadas Andaluzas de Enseñanza de Economía
Málaga, 14-02-2020

UniversidadeVigo

economics for energy


Global temperature change (1850–2017)
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
2.0°C
1.5°C
2017
HadCRUT4.6
Baseline: 1850–1900
@ed_hawkins

1. Por qué? Cambio climático

- Sólida base científica
- Una externalidad negativa “perfecta”
  - Inmensa
  - Global
  - Intergeneracional (irreversibilidades)
  - Incertidumbres
- Soluciones globales: Acuerdo de París
  - Objetivo de aumento de temperatura: 2ºC (1,5ºC)
  - “Contribuciones Nacionales”, con políticas

Bloomberg Green

Climate Models Are Running Red Hot, and Scientists Don’t Know Why

The simulators used to forecast warming have suddenly started giving us less time.

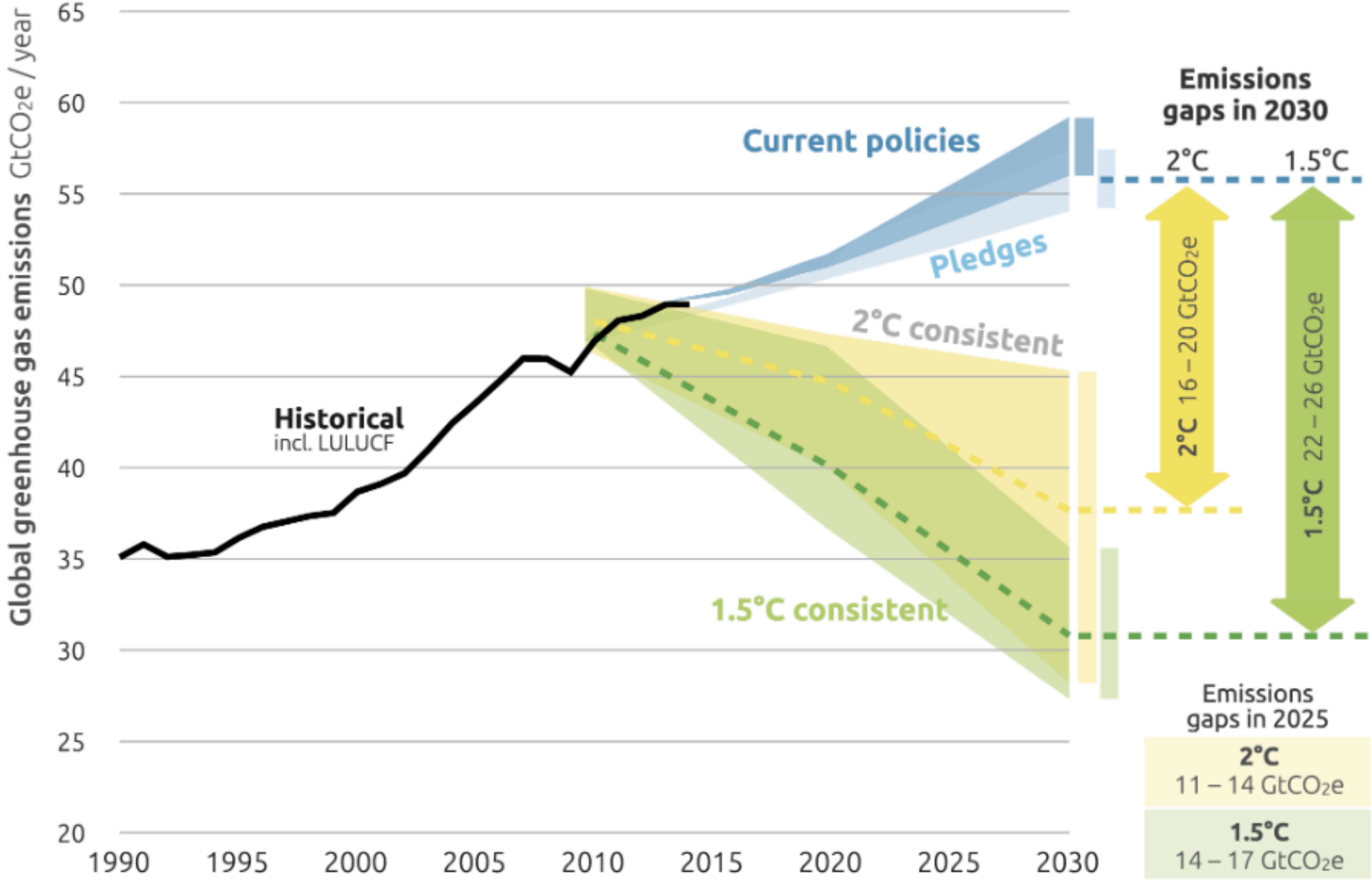
By **Eric Roston**

3 de febrero de 2020 11:00 CET

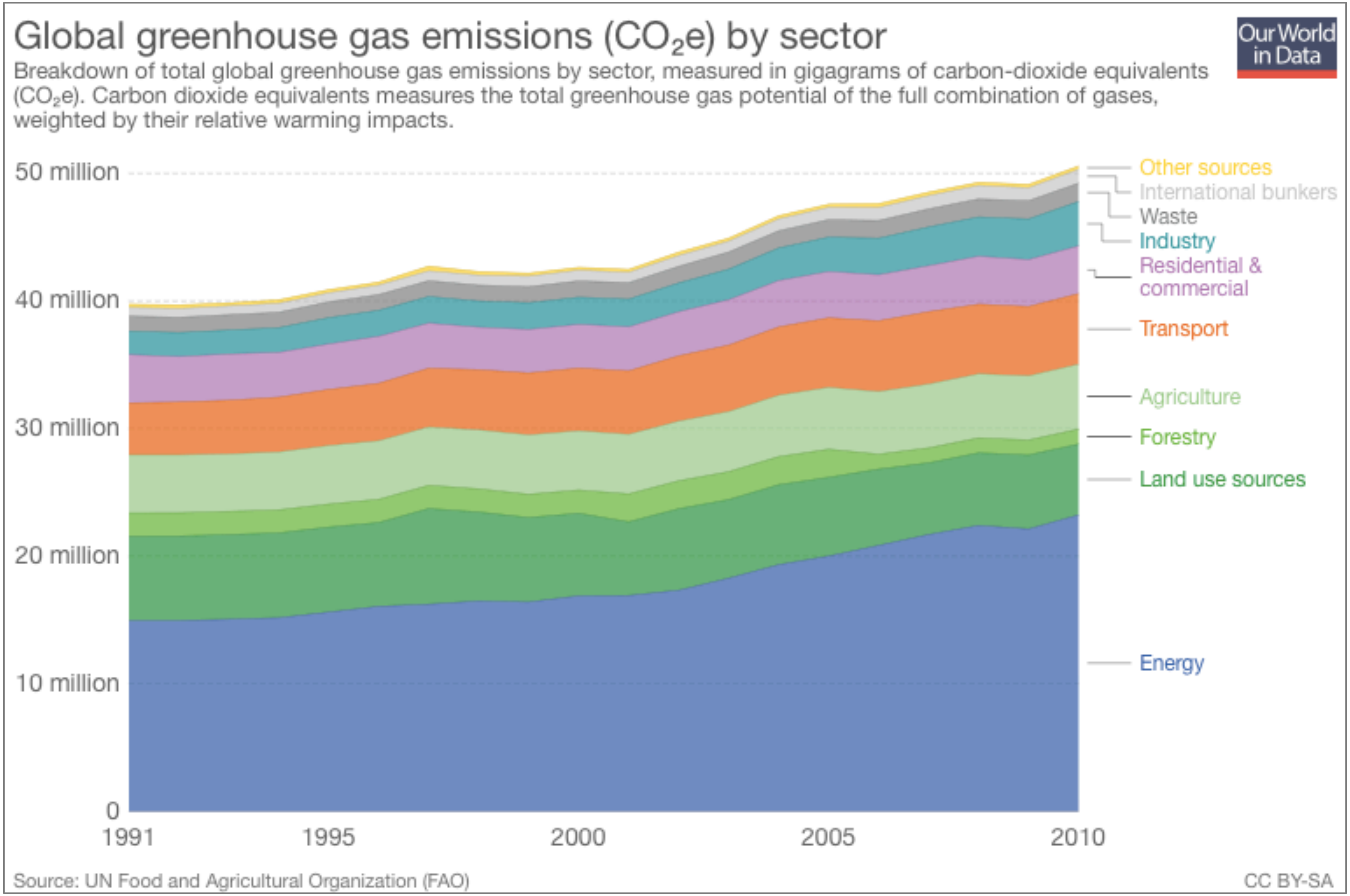
There are dozens of climate models, and for decades they’ve agreed on what it would take to heat the planet by about 3° Celsius. It’s an outcome that would be disastrous—flooded cities, agricultural failures, deadly heat—but there’s been a grim steadiness in the consensus among these complicated climate simulations.

2030 EMISSIONS GAPS

CAT 2017 projections and resulting emissions gaps in meeting the Paris Agreement's temperature goals



The "gap" range results only from uncertainties in the pledge projections. Gaps are calculated against the mean of the benchmark emissions for 1.5°C and 2°C.


Global greenhouse gas emissions (CO2e) by sector
Breakdown of total global greenhouse gas emissions by sector, measured in gigagrams of carbon-dioxide equivalents (CO2e). Carbon dioxide equivalents measures the total greenhouse gas potential of the full combination of gases, weighted by their relative warming impacts.
Our World in Data
50 million
40 million
30 million
20 million
10 million
0
1991
1995
2000
2005
2010
Other sources
International bunkers
Waste
Industry
Residential & commercial
Transport
Agriculture
Forestry
Land use sources
Energy
Source: UN Food and Agricultural Organization (FAO)
CC BY-SA

2. Políticas públicas de mitigación

– Regulación convencional
– Innovación y despliegue tecnológico
– Precios: mercados e impuestos
– Limitaciones:
    - Variables de control
    - Ventana de oportunidad para coste-efectividad

El Confidencial

Tribuna

XAVIER LABANDEIRA

Cambio climático: nuestro margen de maniobra se agota

¿Cómo podemos afrontar el cambio climático? Además de adaptarnos a él de la mejor manera posible, nuestra variable de control fundamental son las emisiones de gases de efecto invernadero

El movimiento Fridays se manifiesta a favor del clima. (EFE)

Por qué precios sobre el carbono?

– Precios finales reflejan costes sociales
– Coste-efectividad
– Promueven innovación
– Cambio de entorno: Inversión "verde"
– Obtienen recursos públicos:
    - Compensaciones distributivas
    - Financian cambio de modelo

→ **Facilitan Transición**

THE WALL STREET JOURNAL.

THURSDAY, JANUARY 17, 2019

ORIGINAL CO-SIGNATORIES INCLUDE

4 Former Chairs of the Federal Reserve (All)

27 Nobel Laureate Economists

15 Former Chairs of the Council of Economic Advisers

2 Former Secretaries of the U.S. Department of Treasury

Economists' Sign-On Form

ECONOMISTS' STATEMENT ON CARBON DIVIDENDS

Global climate change is a serious problem calling for immediate national action. Guided by sound economic principles, we are united in the following policy recommendations.

I. A carbon tax offers the most cost-effective lever to reduce carbon emissions at the scale and speed that is necessary. By correcting a well-known market failure, a carbon tax will send a powerful price signal that harnesses the invisible hand of the marketplace to steer economic actors towards a low-carbon future.

II. A carbon tax should increase every year until emissions reductions goals are met and be revenue neutral to avoid debates over the size of government. A consistently rising carbon price will encourage technological innovation and large-scale infrastructure development. It will also accelerate the diffusion of carbon-efficient goods and services.

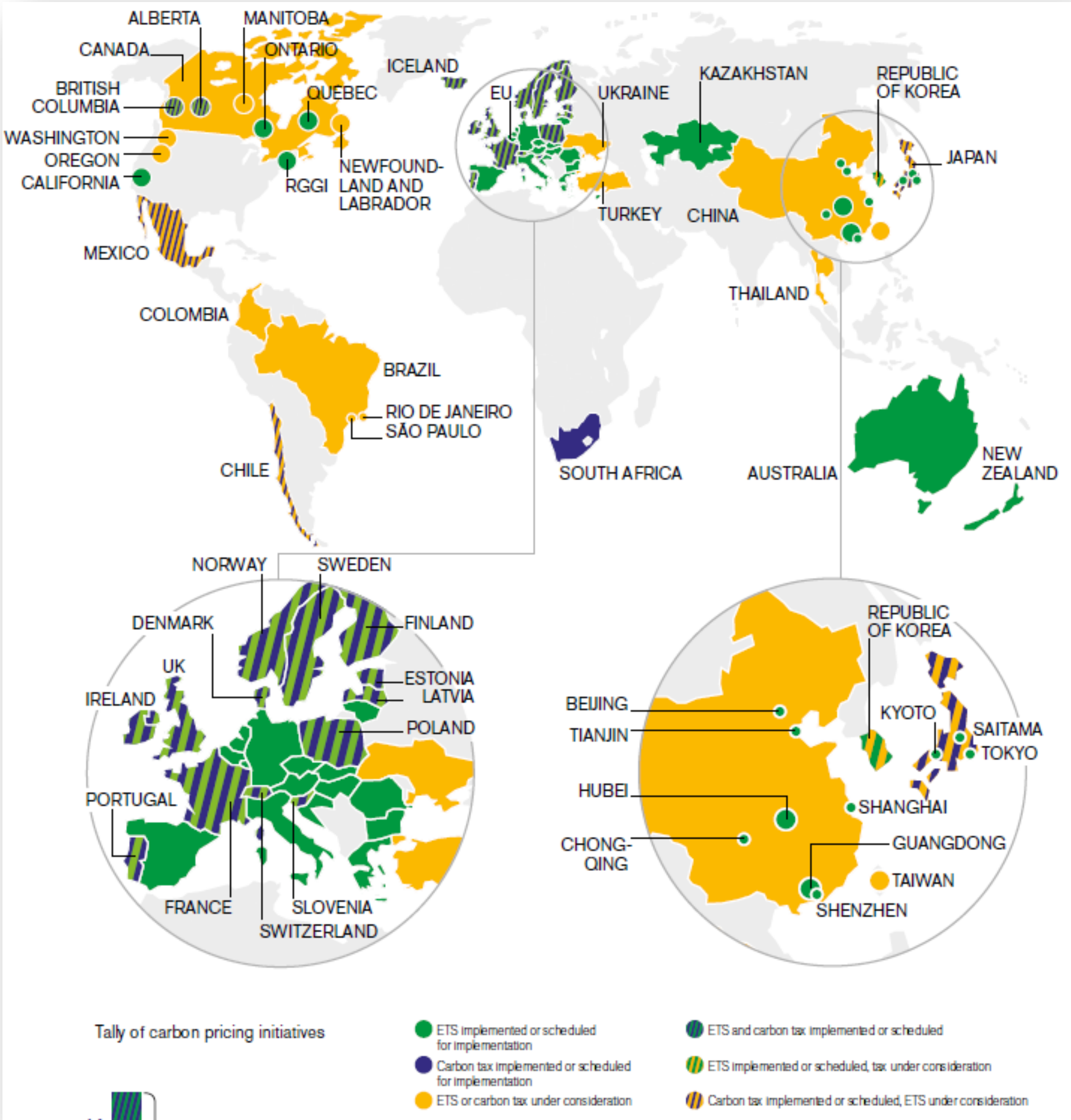
III. A sufficiently robust and gradually rising carbon tax will replace the need for various carbon regulations that are less efficient. Substituting a price signal for cumbersome regulations will promote economic growth and provide the regulatory certainty companies need for long- term investment in clean-energy alternatives.

IV. To prevent carbon leakage and to protect U.S. competitiveness, a border carbon adjustment system should be established. This system would enhance the competitiveness of American firms that are more energy-efficient than their global competitors. It would also create an incentive for other nations to adopt similar carbon pricing.

V. To maximize the fairness and political viability of a rising carbon tax, all the revenue should be returned directly to U.S. citizens through equal lump-sum rebates. The majority of American families, including the most vulnerable, will benefit financially by receiving more in "carbon dividends" than they pay in increased energy prices.

ORIGINAL CO-SIGNATORIES

George Akerlof Nobel Laureate Economist	**Alan Greenspan** Former Chair, Federal Reserve Former Chair, CEA	**Eric Maskin** Nobel Laureate Economist	**William Sharpe** Nobel Laureate Economist
Robert Aumann Nobel Laureate Economist	**Lars Peter Hansen** Nobel Laureate Economist	**Daniel McFadden** Nobel Laureate Economist	**Robert Shiller** Nobel Laureate Economist
Martin Baily Former Chair, CEA	**Oliver Hart** Nobel Laureate Economist	**Robert Merton** Nobel Laureate Economist	**George Shultz** Former Treasury Secretary
Ben Bernanke Former Chair, Federal Reserve Former Chair, CEA	**Bengt Holmström** Nobel Laureate Economist	**Roger Myerson** Nobel Laureate Economist	**Christopher Sims** Nobel Laureate Economist
Michael Boskin Former Chair, CEA	**Glenn Hubbard** Former Chair, CEA	**Edmund Phelps** Nobel Laureate Economist	**Robert Solow** Nobel Laureate Economist
Angus Deaton Nobel Laureate Economist	**Daniel Kahneman** Nobel Laureate Economist	**Christina Romer** Former Chair, CEA	**Michael Spence** Nobel Laureate Economist
Peter Diamond Nobel Laureate Economist	**Alan Krueger** Former Chair, CEA	**Harvey Rosen** Former Chair, CEA	**Lawrence Summers** Former Treasury Secretary
Robert Engle Nobel Laureate Economist	**Finn Kydland** Nobel Laureate Economist	**Alvin Roth** Nobel Laureate Economist	**Richard Thaler** Nobel Laureate Economist
Eugene Fama Nobel Laureate Economist	**Edward Lazear** Former Chair, CEA	**Thomas Sargent** Nobel Laureate Economist	**Laura Tyson** Former Chair, CEA
Martin Feldstein Former Chair, CEA	**Robert Lucas** Nobel Laureate Economist	**Myron Scholes** Nobel Laureate Economist	**Paul Volcker** Former Chair, Federal Reserve
Jason Furman	**N. Gregory Mankiw**	**Amartya Sen**	**Janet Yellen**



Fuente: Banco Mundial (2017)

Precios de carbono en la empresa

SHADOW CARBON PRICING

A tool has been developed to implement a carbon price on Ferrovial's most relevant investments in shadow pricing mode in order to quantify the associated risks and opportunities and accelerate the portfolio towards decarbonized business models.

The evolution of the price of carbon over time (from 2020 to 2050) is to be established in the main sectors and in the 15 most important territories for the company to quantify the risks and the opportunities for new investments and provide information for making decisions.

The project includes a detailed analysis of what are the current prices, the optimal prices in order to meet the decarbonization goal of the Paris Agreement and the compliance roadmap in each of the countries. Carbon shadow pricing takes into account fossil fuels prices, emission tax, and rights-based emission markets.

TIME HORIZON

- 2020
- 2030
- 2040
- 2050

GEOGRAPHIES

AUSTRALIA	PERU
BRASIL	POLAND
CANADA	PORTUGAL
CHILE	SPAIN
GERMANY	UNITED KINGDOM
IRLAND	UNITED STATES
MEXICO	CALIFORNIA
MIDDLE EAST	

PROJECT TYPE

- AIRPORTS
- HIGHWAYS & TOLL ROADS
- WASTE MANAGEMENT FACILITIES (LANDFILL)
- WATER MANEGEMENT FACILITIES
- ENERGY ASSETS (NATURAL GAS)

The average carbon prices in the different time horizons are approximately:

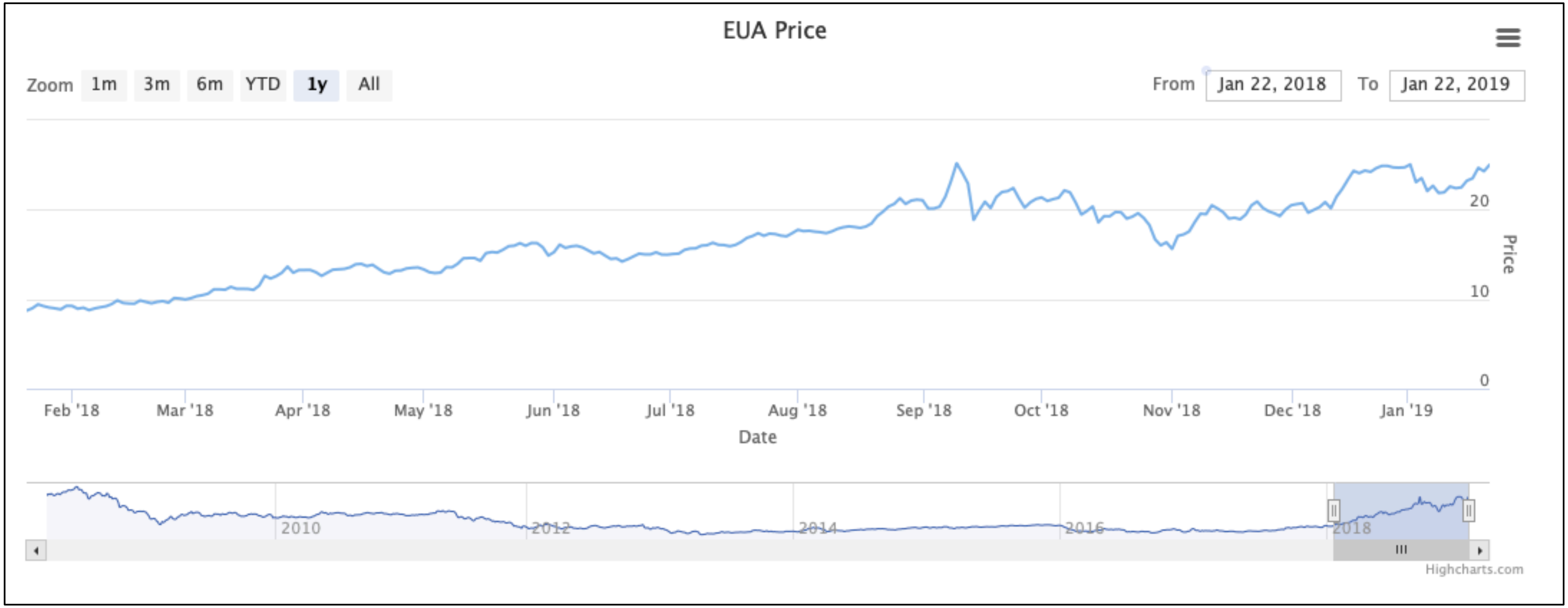
2020	2030	2040	2050
16€	66€	79€	134€

These prices vary by sector and country, with the policies imposed by governments having a great impact on the same.

3. Política climática europea

- **Ambición creciente (**-55% entre 2030/1990?)
- **Un mercado como elemento central: EU ETS**
- **Eficiencia energética**
- **Promoción de renovables**
- **Algunas dificultades**
  - **Competitividad**
  - **Interacción de instrumentos**
  - **Impuestos sobre sectores no EU ETS (*Effort Sharing*)**
- **Un prototipo para el mundo?**

Sistema Europeo de Comercio de Emisiones



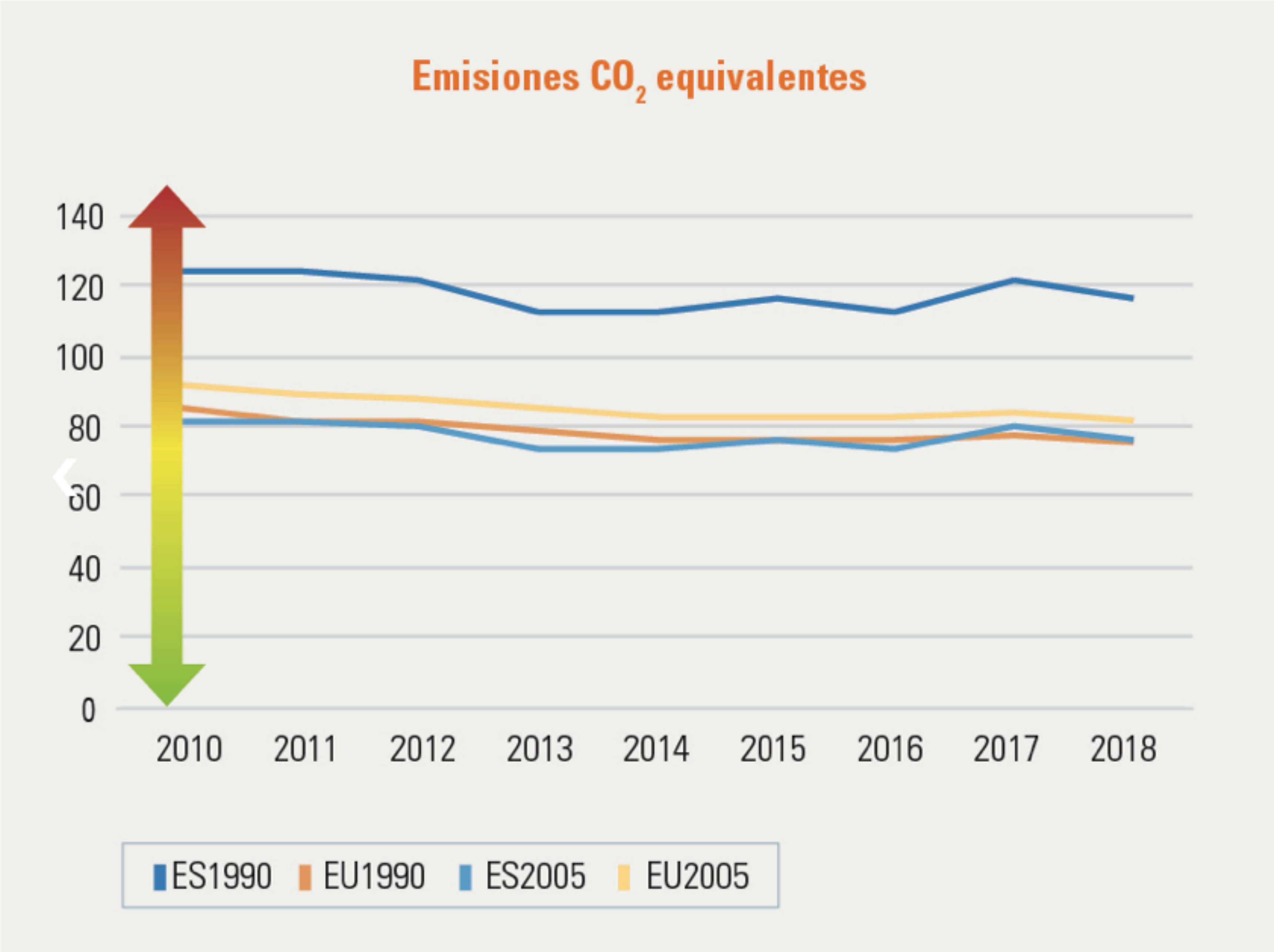
Fuente: Sandbag

4. El caso español

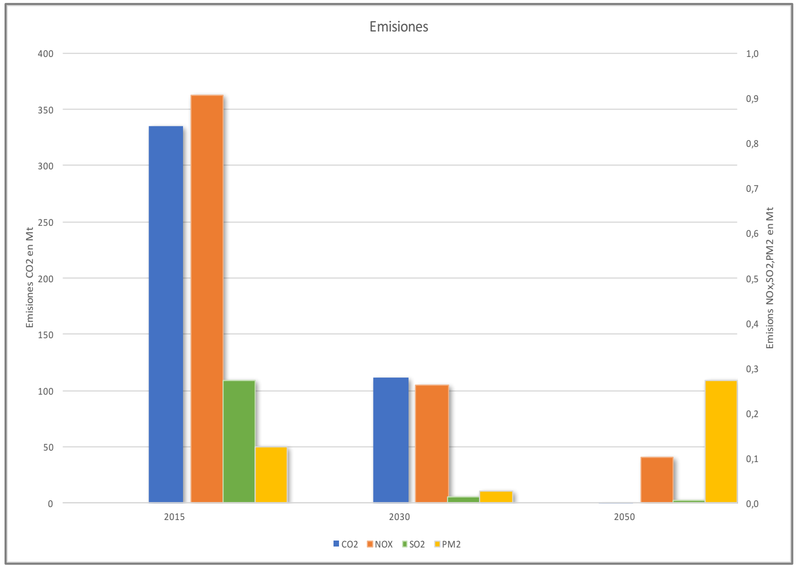
I. **Impactos significativos**

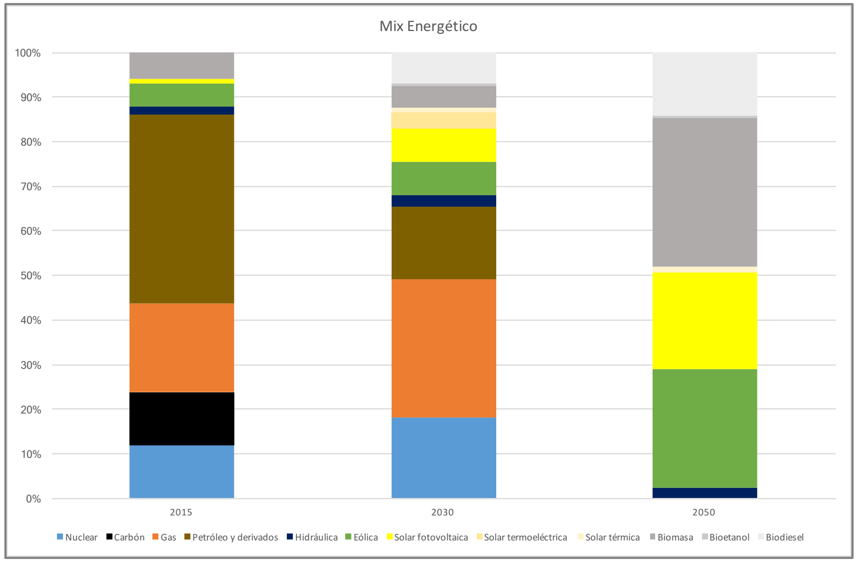
II. **Parálisis regulatoria y evolución de emisiones**

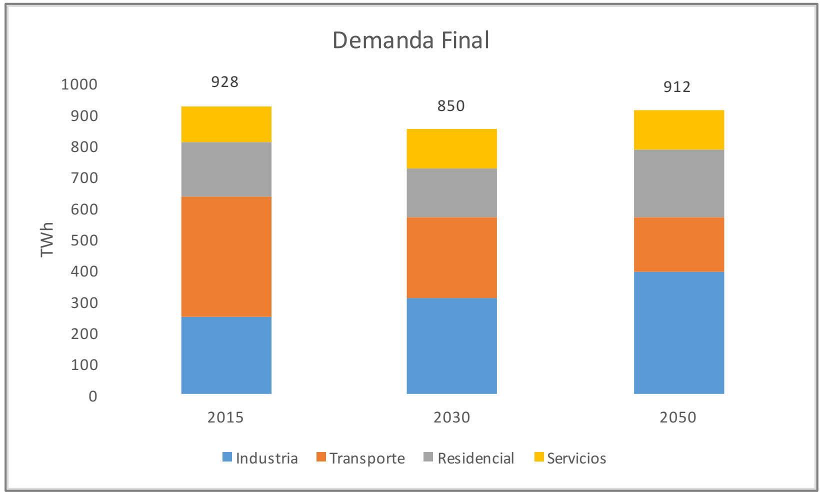
III. **Escenarios para la mitigación:**

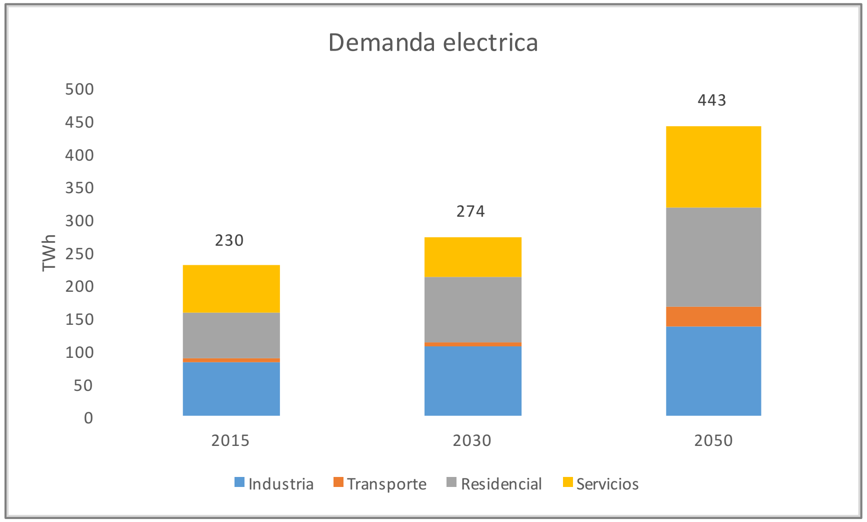

Emisiones CO_2 equivalentes
140
120
100
80
60
40
20
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
ES1990
EU1990
ES2005
EU2005

Escenario "Descarbonización" en España









Fracaso de las aproximaciones de mercado

Hacienda Pública Española / Review of Public Economics, 208-(1/2014): 145-190

DOI: 10.7866/HPE-RPE.14.1.5

A Panorama on Energy Taxes and Green Tax Reforms*

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XIRAL LÓPEZ-OTERO**
Universidade de Vigo and Economics for Energy

Received: September, 2013
Accepted: July, 2014

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.

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 (nunca es el momento?)

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

Cómo explicarlo?

Contents lists available at ScienceDirect

Energy Economics

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

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

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A R T I C L E I N F O

Available online 21 September 2013

JEL classification:
Q54
Q58
R48

Keywords:
Biofuels
WTP
Contingent valuation

A B S T R A C T

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

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0140-9883/$ – see front matter
http://dx.doi.org/10.1016/j.eneco.2013.09.010

Actuaciones Autonómicas

	Emisiones	Instalaciones y actividades que inciden en el medio ambiente	Canon eólico	Aguas embalsadas	Hidrocarburos
Andalucía	2004 (4,63)				
Aragón	2006 (2,13)	2016 (1,45)		2016 (14,91)	
Asturias		2011 (2,64)		2014 (n.d.)	
Canarias		2013 (-)			1987 (327,1)
Castilla y León		2012 (20,83*)	2012 (20,83*)	2012 (20,83*)	
Castilla LM	2001 (0,61)		2012 (14,02)		
Cataluña	2014 (3,98)	2017 (60)		2003 (n.d)	
Extremadura		1997 (40,25)			
Galicia	1995 (3,88)		2010 (23,23)	2009 (13,99)	
Murcia	2006 (1,13)				
La Rioja		2013 (2,45)			
C. Valenciana	2013 (9,99*)	2013 (9,99*)			
R. Total	26,35	137,61	58,08	49,73	327,1

Elevada recaudación potencial (y necesidades)

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)

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

Un sector clave: el transporte

Economics for Energy Blog

economics for energy

Energía | Energías renovables | Política energética | Eficiencia energética | Cambio climático | Electricidad | El centro

La hora de los tributos energético-ambientales (I): Aspectos generales y transporte

xavierlabandeira / 11 septiembre, 2018

Estas siguiendo este blog

Estás siguiendo este blog (administrar).

Buscar …

OPINIÓN

TRIBUNA ›

La hora de la fiscalidad energético-ambiental

No tiene sentido seguir dando un trato favorable a un carburante que afecta a la calidad del aire que respiramos y genera cuantiosos daños ambientales

XAVIER LABANDEIRA | JOSÉ MARÍA LABEAGA AZCONA

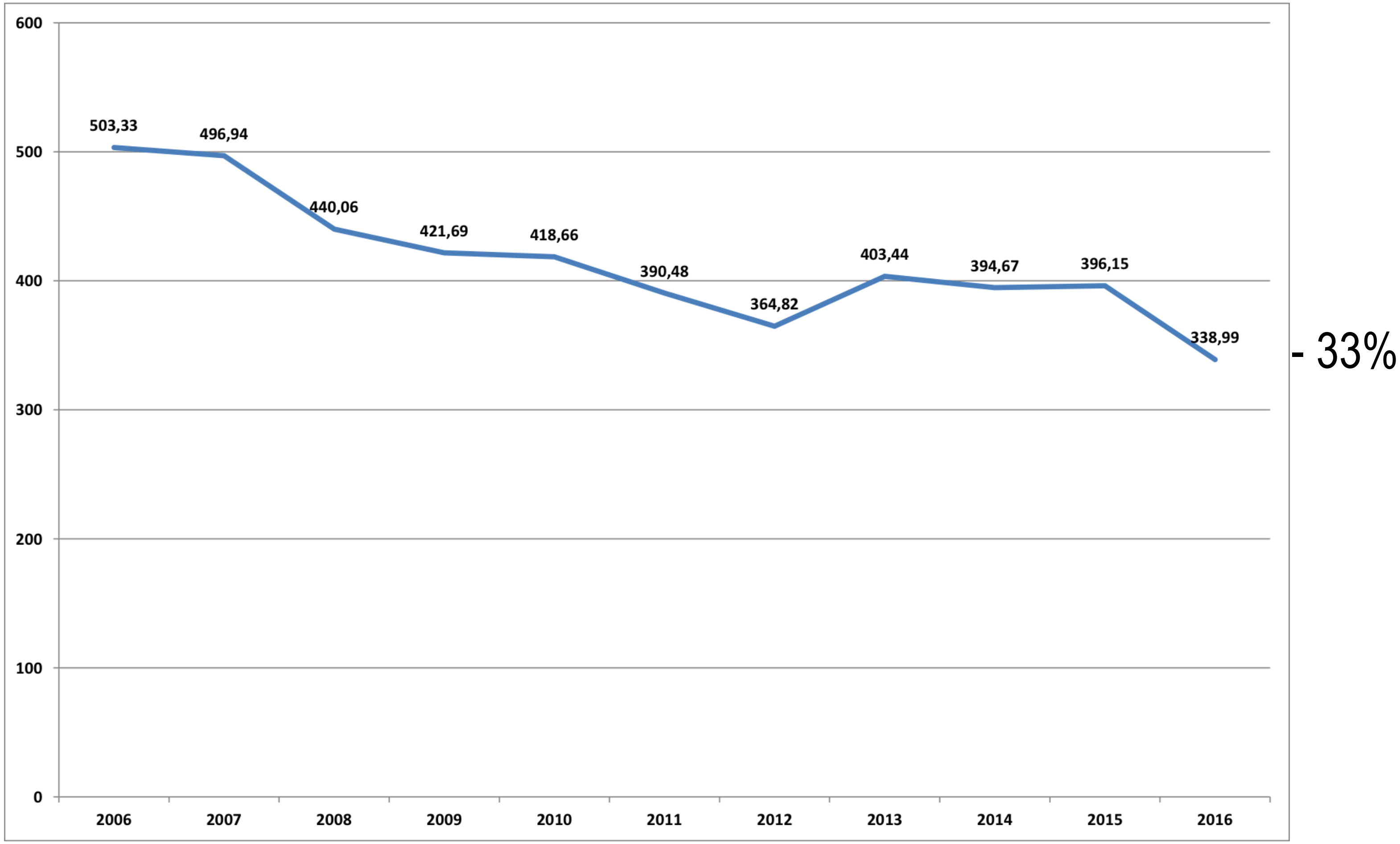
5 SEP 2018 - 00:00 CEST

Dispositivo de medición de contaminación instalado en Madrid. **JUAN LÁZARO**

NEWSLETTERS
Recibe el boletín de Opinión

En las últimas semanas hemos asistido a un intenso debate sobre la oportunidad de cambios fiscales en nuestro país. Se han ido detallando propuestas para crear nuevas figuras impositivas que graven a las denominadas tecnológicas y a la banca o, más recientemente, para elevar los tipos del IRPF a las rentas más altas. No obstante, una vez abierto el debate, sería un error no priorizar la reforma cuantitativa y cualitativa de otro ámbito fiscal del que se ha hablado menos: los impuestos energético-ambientales.

Ingreso fiscal por vehículo en España



Fuente: Agencia Tributaria, 2018

	DIESEL de automoción uso no comercial (por litro)				GASOLINA sin plomo 95 octanos (por litro)			
	Accisa	IVA	Total	% carga fiscal media ponderada UE-22	Accisa	IVA	Total	% carga fiscal media ponderada UE-22
Alemania	0,47	19%	0,67	90,42%	0,66	19%	0,87	100,81%
Austria	0,41	20%	0,60	81,61%	0,49	20%	0,69	80,88%
Bélgica	0,55	21%	0,79	107,64%	0,62	21%	0,86	100,70%
Dinamarca	0,42	25%	0,68	92,35%	0,62	25%	0,93	107,93%
Eslovaquia	0,37	20%	0,57	76,86%	0,52	20%	0,74	85,89%
Eslovenia	0,50	22%	0,73	98,28%	0,58	22%	0,81	94,40%
España	0,37	21%	0,57	77,81%	0,46	21%	0,68	79,72%
Estonia	0,49	20%	0,71	95,71%	0,56	20%	0,79	91,61%
Finlandia	0,53	24%	0,79	106,96%	0,70	24%	0,98	114,57%
Francia	0,61	20%	0,83	113,06%	0,69	20%	0,93	108,74%
Grecia	0,41	24%	0,66	89,74%	0,70	24%	1,00	115,96%
Hungría	0,36	27%	0,61	82,56%	0,39	27%	0,64	74,10%
Irlanda	0,50	23%	0,74	100,32%	0,61	23%	0,87	101,05%
Italia	0,62	22%	0,88	118,62%	0,73	22%	1,01	117,60%
Letonia	0,41	21%	0,61	82,69%	0,51	21%	0,72	84,26%
Luxemburgo	0,34	17%	0,49	65,75%	0,46	17%	0,63	73,66%
Países Bajos	0,49	21%	0,71	96,79%	0,78	21%	1,05	122,61%
Polonia	0,34	23%	0,55	74,00%	0,39	23%	0,60	69,95%
Portugal	0,47	23%	0,71	96,66%	0,66	23%	0,94	109,44%
Reino Unido	0,66	20%	0,90	121,95%	0,66	20%	0,89	104,04%
Rep. Checa	0,43	21%	0,63	85,77%	0,50	21%	0,71	82,98%
Suecia	0,56	25%	0,85	115,14%	0,62	25%	0,90	105,31%
Media ponderada	0,51	20,53%	0,74	100%	0,62	20,53%	0,86	100%

Fuente: OECD (2018) Energy Prices and Taxes, second quarter 2018

Imposición Ambiental en España: Prioridades y Compensación

SOSTENIBILIDAD

Impuestos energético-ambientales en España: situación y propuestas eficientes y equitativas

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UNED

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Documento de Trabajo Sostenibilidad Nº 2/2019

economics for energy

WP 02a/2020

Impuestos sobre el Transporte, Descarbonización y Equidad. Propuestas y Evaluación para España

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Simulaciones

- Igualación diésel y gasolina (1)
- Convergencia fiscal con principales países europeos (2)
- Impuesto sobre billetes de avión (3 y 4)
- Compensaciones
  - General (A)
  - Restringidas a 5 primeras decilas (B)
  - Para reducir pobreza (C)

Tabla 1. Tipos impositivos considerados en las reformas de la fiscalidad sobre los carburantes

	Accisa en 2018	Simulación 1		Simulación 2	
		Accisa	Variación (%)	Accisa	Variación (%)
Gasolina 95	0,461	0,509	10,4%	0,680	47,4%
Diésel	0,367	0,509	38,7%	0,680	85,2%

Fuente: IEA (2019) y elaboración propia

Tabla 2. Tipos impositivos considerados sobre los billetes de avión

	Tipo de vuelo	LTO	Crucero
Simulación 3	Doméstico	0,645 €	0,482 cent€/km
	Internacional	0,817 €	0,442 cent€/km
Simulación 4	Doméstico	1,193 €	0,892 cent€/km
	Internacional	1,511 €	0,817 cent€/km

Fuente: Elaboración propia

Tabla 3. Simulación 1. Impactos sobre los productos energéticos y la recaudación

Carburante	Variación precio final (%)	Variación Consumo (%)	Variación Emisiones de CO_2 (%)	Recaudación adicional (M euros)		
				I. Hidrocarburos	IVA	Total
Gasolina 95	4,50	-1,14	1,14	249	44	293
Diésel no comercial	14,28	-2,87	-2,87	2.254	406	2.660
Diésel comercial	14,28	-2,87	-2,87	1.285	-	1.285
Total	-	-2,57	-2,60	3.788	450	4.238

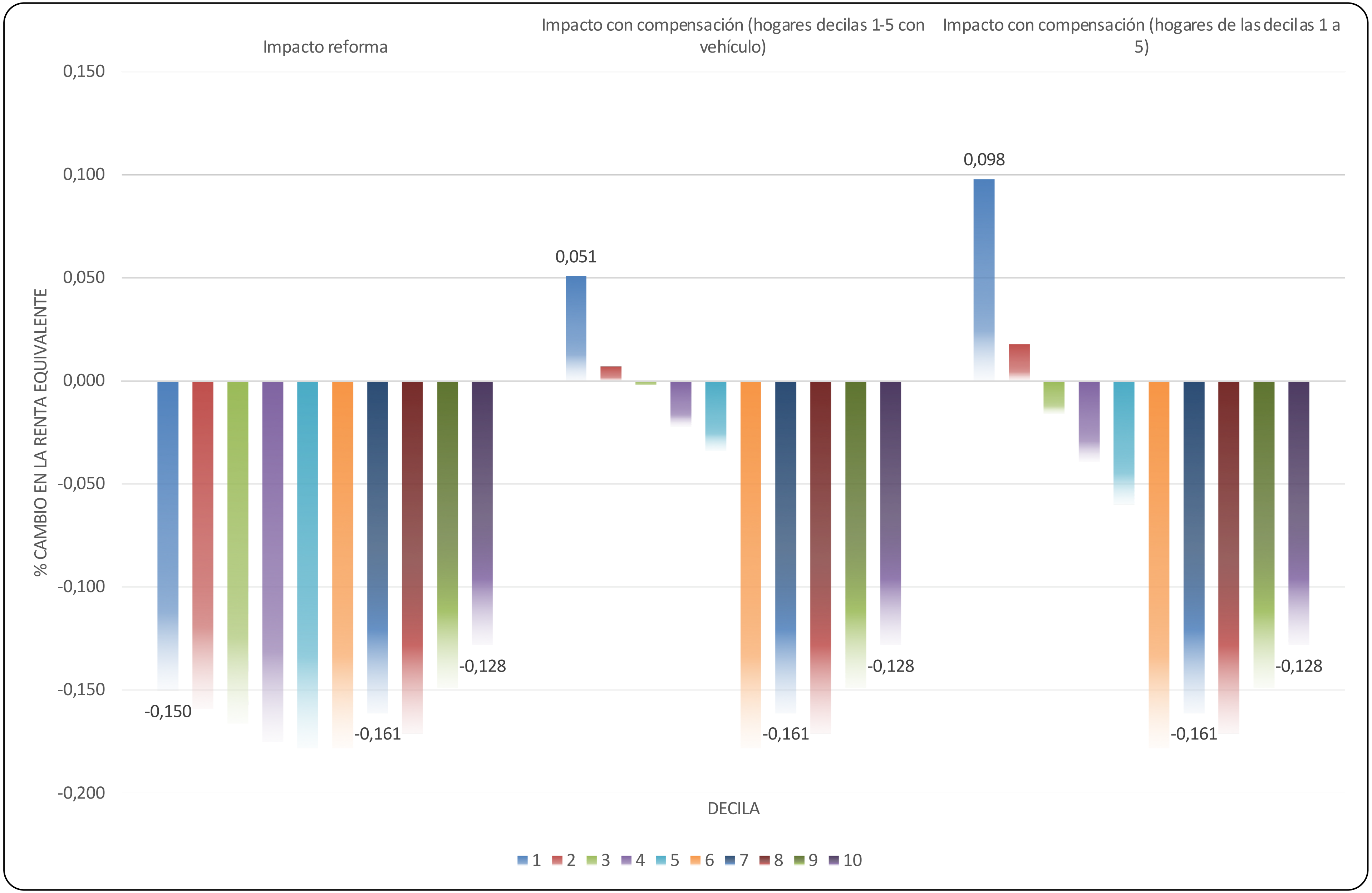
Fuente: Elaboración propia

Tabla 4. Simulación 1. Paquetes compensatorios considerados

Paquete	Hogares objetivo	Importe de la transferencia	Coste (M €)	Índice Reynolds-Smolensky	$\frac{dme^h}{dYe^h} = b$	
					Pagos impositivos finales netos	Pagos impositivos reforma netos
A	Todos	67,20 €/persona	2.954	0,0015	0,110**	0,780***
B	Decilas 1-5	46,76 €/hogar	408	0,0005	-0,553***	0,117***
C	Por debajo línea de pobreza	603,43 €/hogar	1.768	0,0033	1,260***	1,930***

Nota: ***, ** indican significatividad al 1%, 5%, respectivamente. Se presentan los valores estimados multiplicados por un millón.

Fuente: Elaboración propia



Impacto reforma
Impacto con compensación (hogares decilas 1-5 con vehículo)
Impacto con compensación (hogares de las decilas 1 a 5)
0,150
0,100
0,050
0,000
-0,050
-0,100
-0,150
-0,200
% CAMBIO EN LA RENTA EQUIVALENTE
0,051
0,098
-0,150
-0,161
-0,128
-0,161
-0,128
-0,161
-0,128
DECILA
1 2 3 4 5 6 7 8 9 10

Figura 10. Impacto distributivo por decilas de renta equivalente con compensaciones

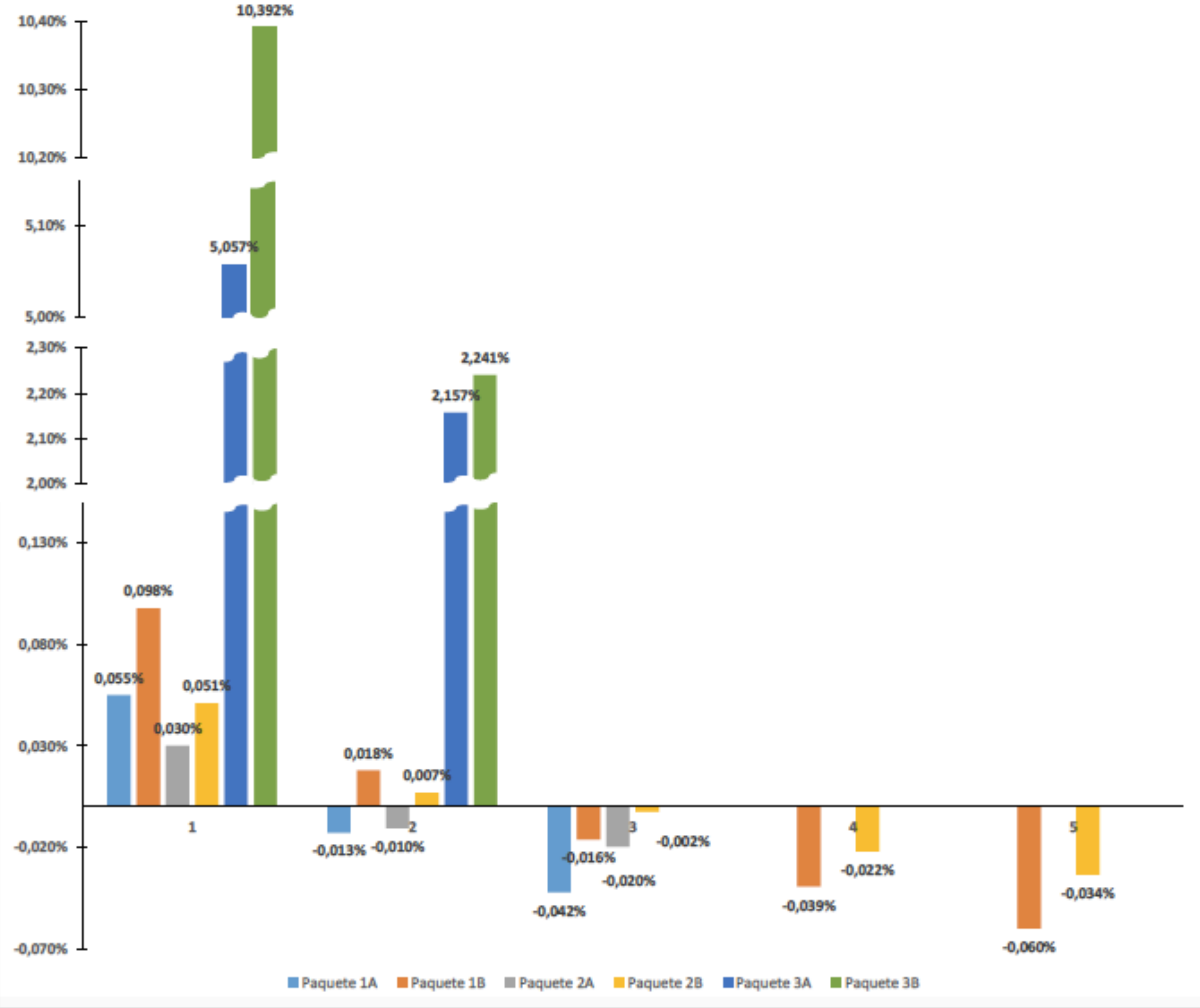


Tabla 7. Simulación 3. Efectos sobre emisiones y recaudación

Tipo de consumidor	Tipo de vuelo	Variación precio final (%)	Variación Consumo (%)	Variación Emisiones de CO_2 (%)	Recaudación adicional (millones de euros)		
					I. Aviación	IVA	Total
Residencial	Doméstico	5,38	-7,54	-7,54	89,34	-4,59	84,75
	Internacional	7,17	-6,69	-6,69	199,86	-	199,86
No residencial	Doméstico	5,38	-4,57	-4,57	19,70	0,22	19,91
	Internacional	7,17	-2,73	-2,73	587,18	-	587,18
Total		-	-4,77	-4,18	896,08	-4,37	891,70

Fuente: Elaboración propia

Tabla 8. Simulación 3. Paquetes compensatorios considerados

Paquete	Hogares objetivo	Importe de la transferencia	Coste (M €)	Índice Reynolds-Smolensky	$\frac{dme^h}{dYe^h} = b$ Pagos impositivos finales netos
A	Todos	6,47 €/persona	284,61	0,0001	0,094***
B	Decilas 1-5	32,65 €/hogar	284,61	0,0004	0,177***
C	Por debajo línea de pobreza	304,33 €/hogar	891,7	0,0017	1,040***

Nota: *** indica significatividad al 1%. Se presentan los valores estimados multiplicados por un millón.
Fuente: Elaboración propia

Cómo compensar?

- Transferencias/subsidios/impuestos
- Generalizadas/limitadas
- Efectos directos/indirectos
- Sin vinculación a precios energéticos
- Decreciente con el tiempo y cambio de stock?

Tabla 2. Ilustración tarifaria del IGAV

<table>
<tr><th></th><th>Zona 1 (urbana)</th><th>Zona 2</th><th>Zona ... (no urbana)</th></tr>
<tr><td rowspan="2">Vehículo tipo 1</td><td>Tarifa Acceso 1
Tarifa horaria 1a (...)
Tarifa valle</td><td>Tarifa horaria 2a (...)
Tarifa valle</td><td rowspan="2">Tarifa valle</td></tr>
<tr><td>Tarifa valle</td><td>Tarifa valle</td></tr>
<tr><td rowspan="2">Vehículo tipo ...</td><td>Tarifas horarias/acceso/valle</td><td>Tarifas horarias/acceso/valle</td><td rowspan="2">Tarifa valle</td></tr>
<tr><td>Tarifa valle</td><td>Tarifa valle</td></tr>
</table>

Vehículo tipo 1	Pago	Externalidades				
		Congestión	C. local/ruido	C. global	Accidentes	Infraestructuras
Tarifa Acceso	Euros	X	-	-	-	X
Tarifa horaria 1a	Euros/hora	X	X	-	-	-
Tarifa valle	Euros/km	-	-	X	X	X

Fuente: Gago et al. (2018)

Gracias

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