Issues on Energy Transition

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Economics for Energy and Universidade de Vigo

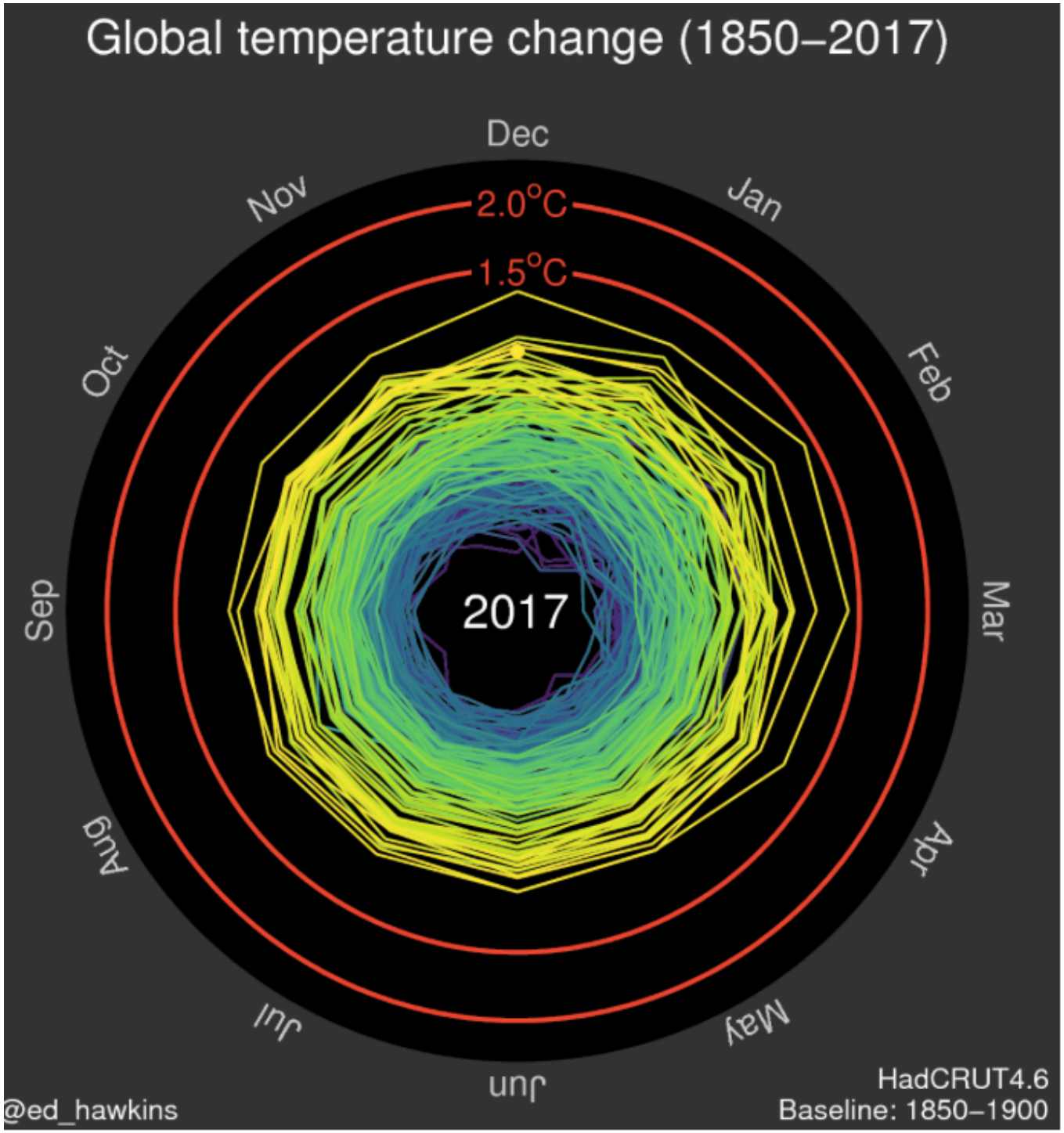
Ferrovial Global Meeting
El Escorial, 27 September 2018

Universidade Vigo

economics for energy

Issues:

- ‘Update’ on climate change
- Energy scenarios for Spain (plus EfE Barometer)
- Environmental taxes in Spain and elsewhere


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

Dealing with climate change

- A ‘perfect’ negative externality
  - Global (with varying responsibilities and impacts)
  - Intergenerational (and non-reversible)
  - Uncertainty and extreme events
- The Paris Agreement
  - Context: UNFCCC (and IPCC)
  - The best possible solution?
  - NDCs: objectives and policies

Update 1: Impacts

PERSPECTIVE

Trajectories of the Earth System in the Anthropocene

Will Steffen[a,b,1], Johan Rockström[a], Katherine Richardson[c], Timothy M. Lenton[d], Carl Folke[a,e], Diana Liverman[f], Colin P. Summerhayes[g], Anthony D. Barnosky[h], Sarah E. Cornell[a], Michel Crucifix[i,j], Jonathan F. Donges[a,k], Ingo Fetzer[a], Steven J. Lade[a,b], Marten Scheffer[l], Ricarda Winkelmann[k,m], and Hans Joachim Schellnhuber[a,k,m,1]

Edited by William C. Clark, Harvard University, Cambridge, MA, and approved July 6, 2018 (received for review June 19, 2018)

We explore the risk that self-reinforcing feedbacks could push the Earth System toward a planetary threshold that, if crossed, could prevent stabilization of the climate at intermediate temperature rises and cause continued warming on a "Hothouse Earth" pathway even as human emissions are reduced. Crossing the threshold would lead to a much higher global average temperature than any interglacial in the past 1.2 million years and to sea levels significantly higher than at any time in the Holocene. We examine the evidence that such a threshold might exist and where it might be. If the threshold is crossed, the resulting trajectory would likely cause serious disruptions to ecosystems, society, and economies. Collective human action is required to steer the Earth System away from a potential threshold and stabilize it in a habitable interglacial-like state. Such action entails stewardship of the entire Earth System—biosphere, climate, and societies—and could include decarbonization of the global economy, enhancement of biosphere carbon sinks, behavioral changes, technological innovations, new governance arrangements, and transformed social values.

Earth System trajectories | climate change | Anthropocene | biosphere feedbacks | tipping elements

Update 2: EU ETS

Update 3: China's ETS

Una nueva buena señal desde China: el mercado nacional de emisiones de CO_2

xavierlabandeira / 13 abril, 2018

Estos días me encuentro en Beijing, invitado a participar en una consulta a puerta cerrada con expertos internacionales sobre su incipiente mercado nacional de derechos de emisión. Los organizadores del evento, que contó con la participación de los principales decisores políticos y representantes del sector eléctrico chino, pidieron discreción con las cuestiones discutidas para no dificultar el ya de por sí complejo proceso de puesta en marcha del sistema. Voy a seguir sus indicaciones, pero quiero aprovechar mi trabajo preparatorio sobre el mercado chino para detallar sus características y lanzar algunas reflexiones genéricas.

Estas siguiendo este blog

Estás siguiendo este blog (administrar).

Buscar …

ecoforenergy

Pedro Linares

xavierlabandeira

Siguiendo Economics for Energy Blog

Comentarios recientes

xavierlabandeira en Fiscalidad y emisiones en la v…

Carlos en Fiscalidad y emisiones en la v…

La hora de los tribu… en

Update 4:

OPINION ›

Trump's latest absurdity

The president's decision to pull the US out of the Paris accord is inexplicable and potentially very damaging

XAVIER LABANDEIRA

2 JUN 2017 - 18:02 CEST

Donald Trump announces the US will be pulling out of the Paris climate deal. **ANDREW HARNIK (AP)**

Donald Trump announced yesterday with great paraphernalia that the United States was pulling out of the Paris climate agreement, although his decision to dismantle the federal policies so painfully put together by the Obama administration, and his intention not to comply with the accord, were well known since January.

Update 4:


GLOBAL CLIMATE ACTION SUMMIT
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GLOBAL CLIMATE ACTION SUMMIT
September 12-14, 2018
San Francisco, CA
HEALTHY ENERGY SYSTEMS
INCLUSIVE ECONOMIC GROWTH
SUSTAINABLE COMMUNITIES
LAND AND OCEAN STEWARDSHIP
TRANSFORMATIVE CLIMATE INVESTMENTS


economics for energy
Scenarios for Energy Transition in Spain: 2030 - 2050

This is not a prospective exercise

…for strictly logical reasons, it is impossible for us to predict the future course of history

Karl R. Popper, Misery of historicism (1957)

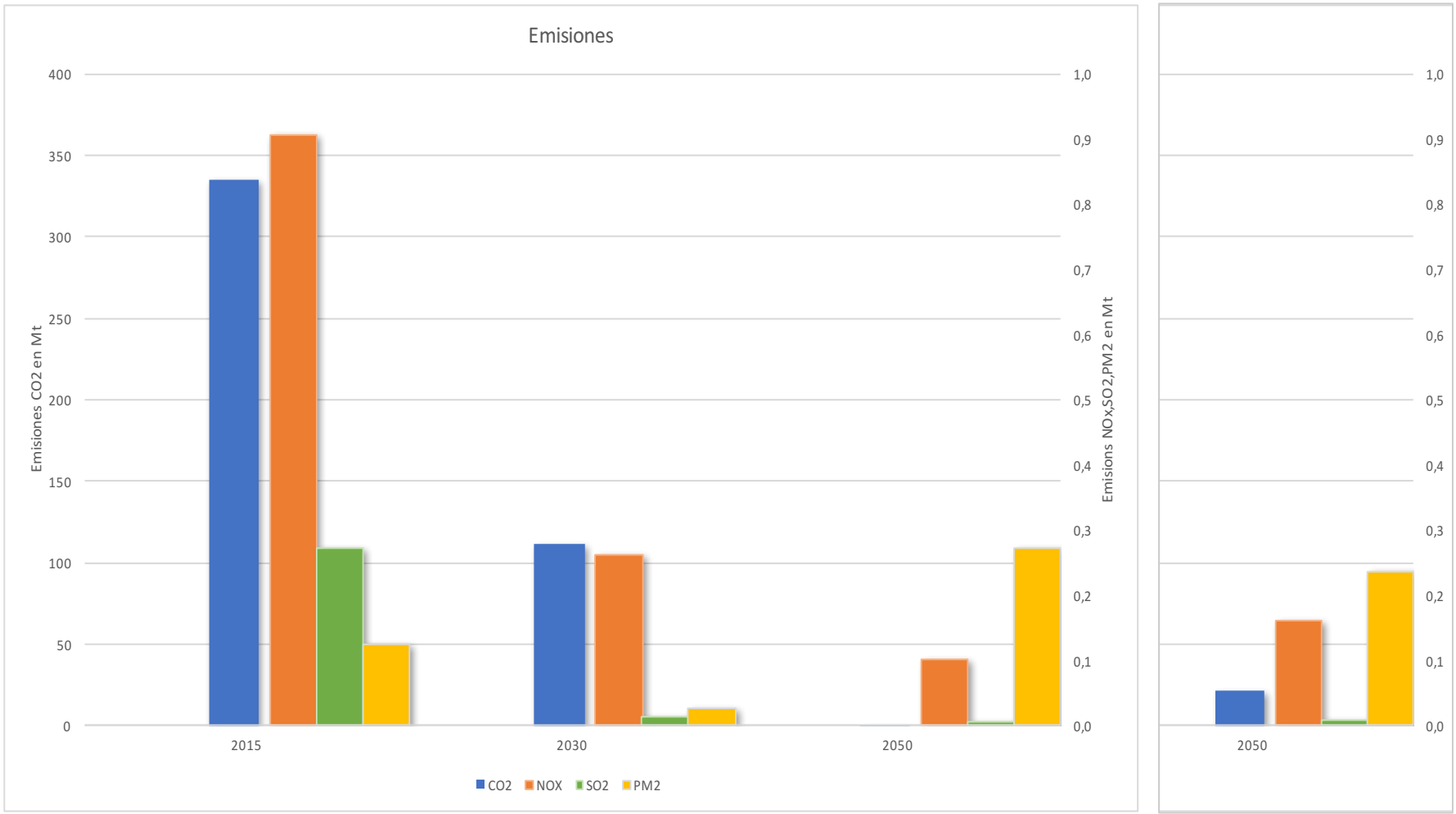
Without vision, the people perish

Proverbs 29:18

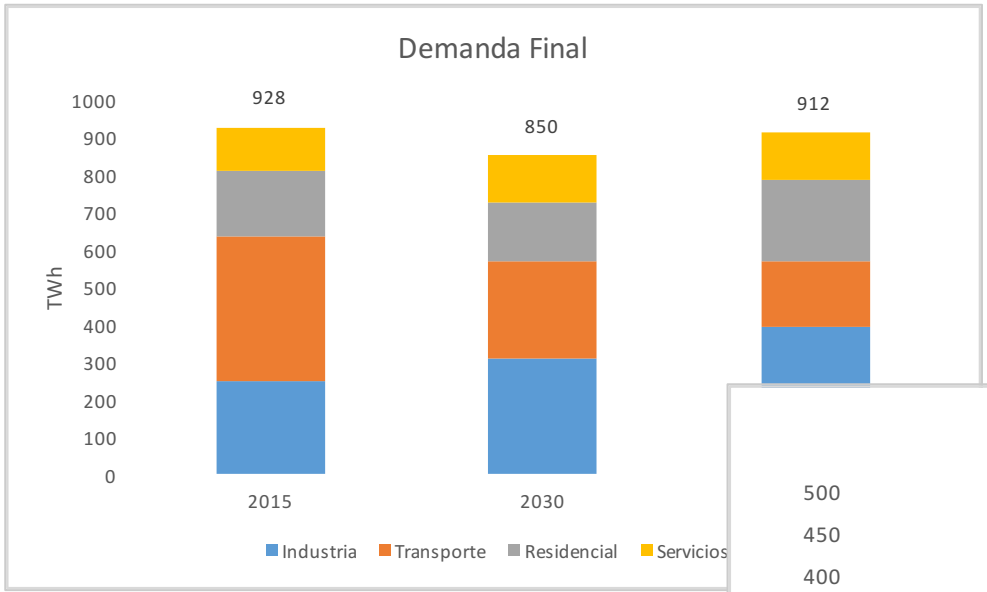
Basics

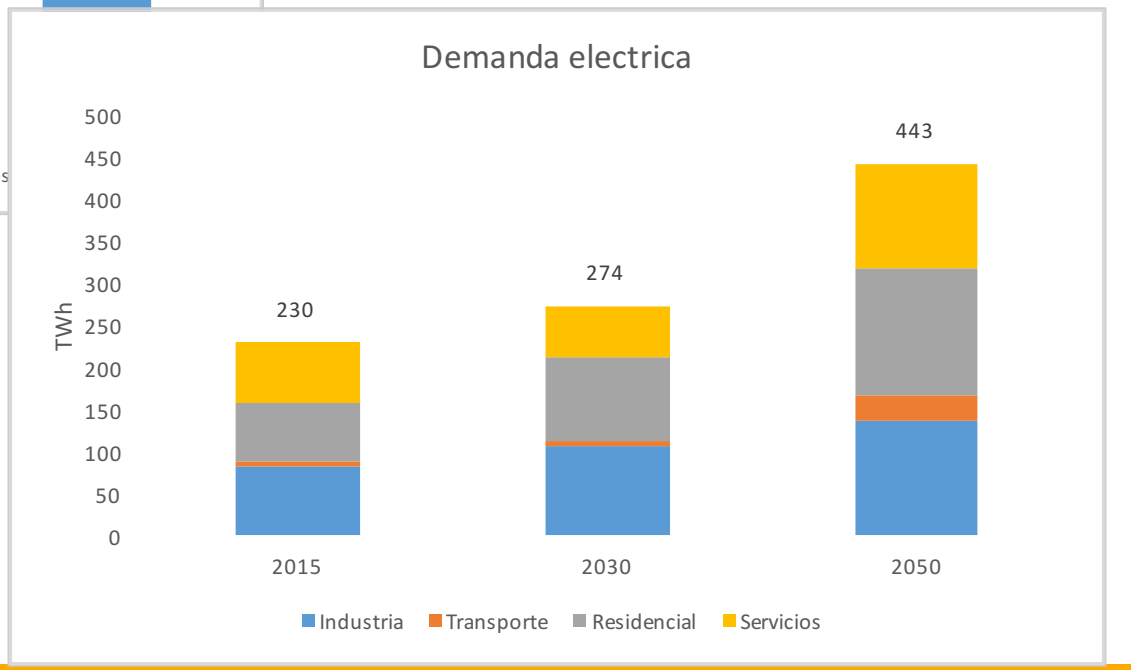
- Four scenarios:
  - Decarbonisation
  - Current policies
  - Technological progress
  - Stagnation
- Internally consistent (model-validated)
- Not normative: simulated results respond to assumptions (sensitivity analysis)
- Policies not contemplated. But implications to decision makers and agents

Descarbonisation – Emissions

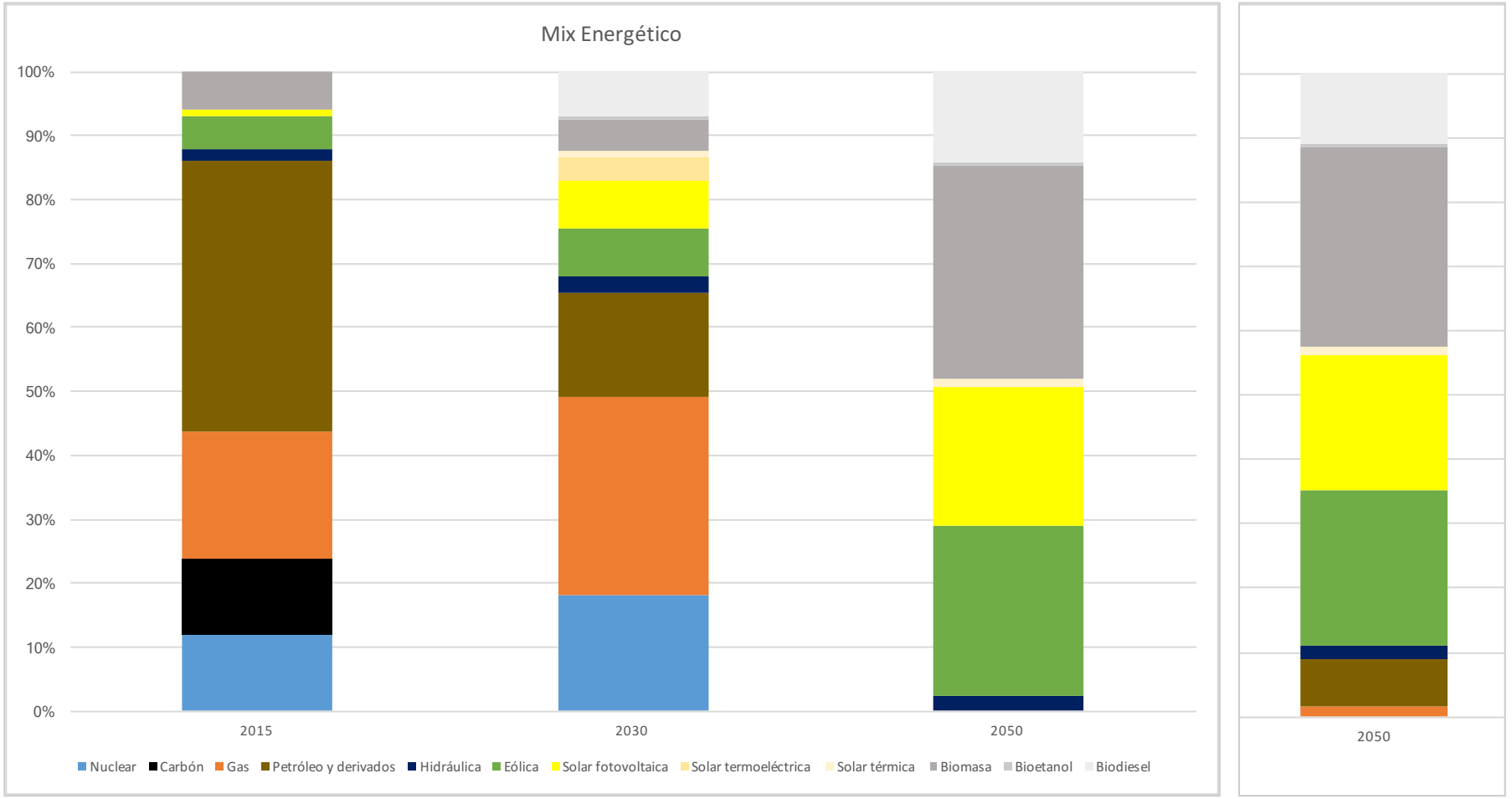


Descarbonisation – Demand

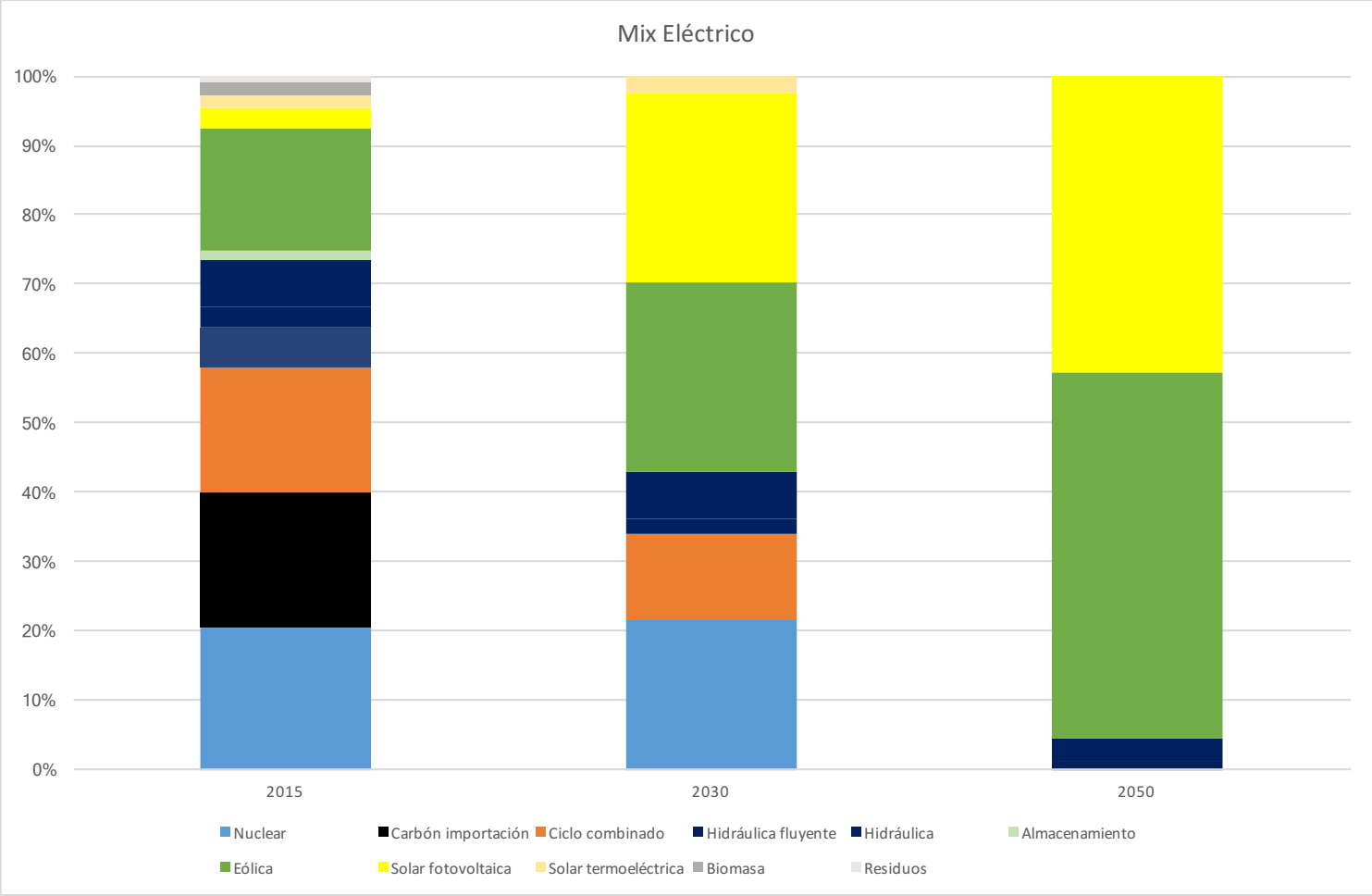




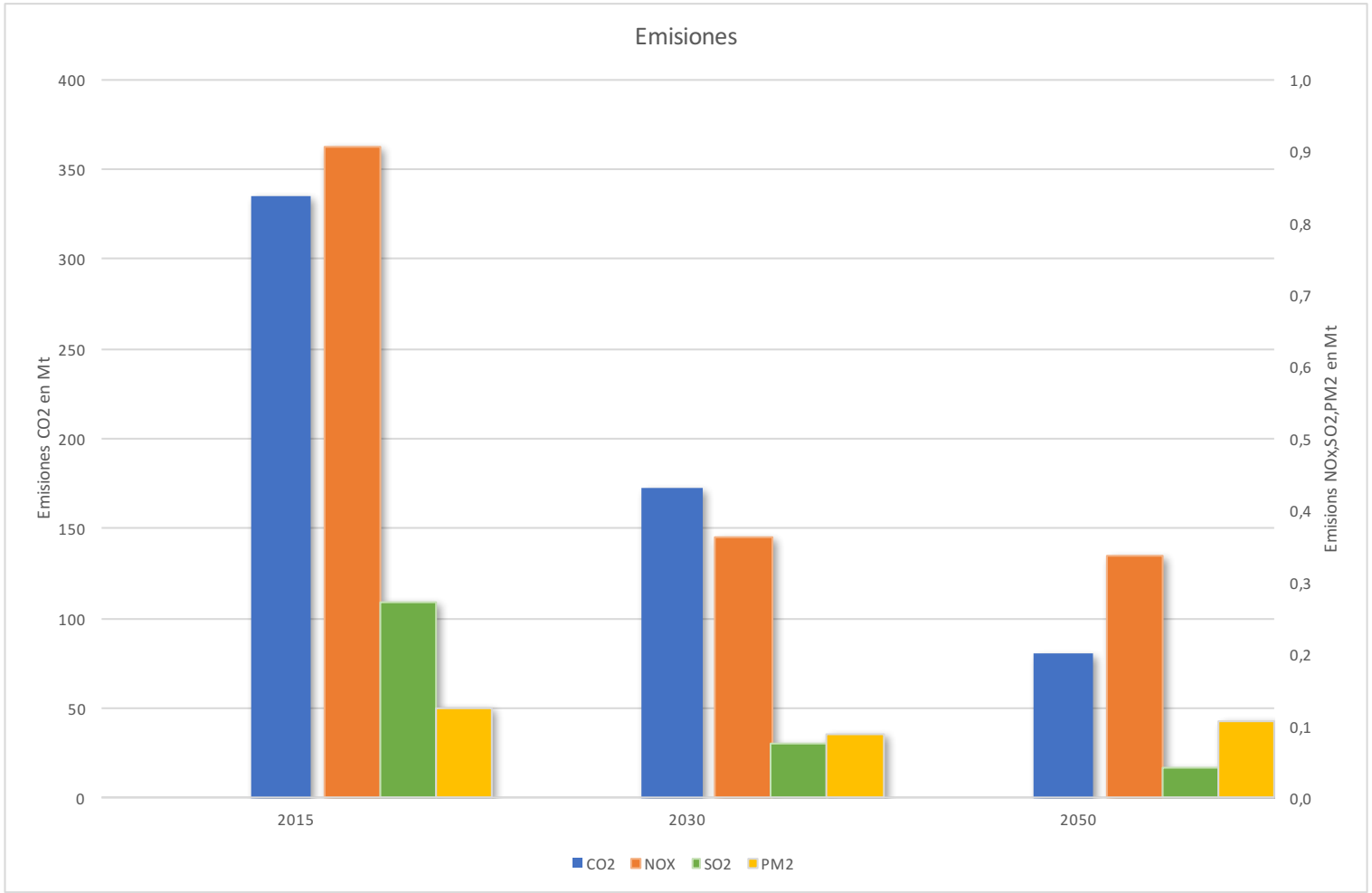
Descarbonisation – Energy mix



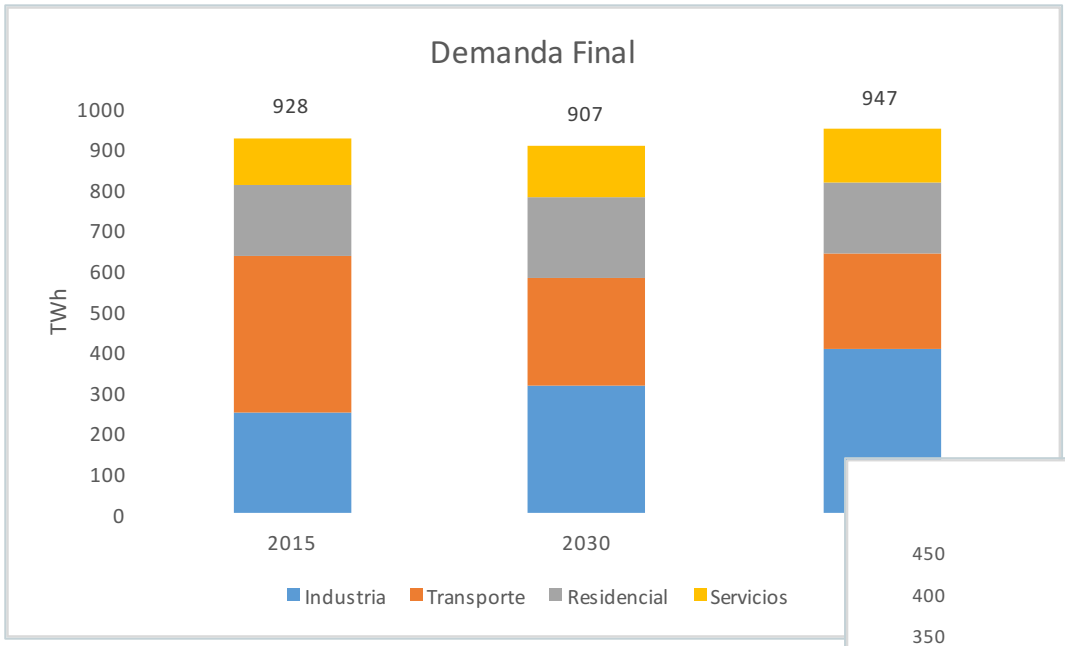
Descarbonisation – Electricity mix

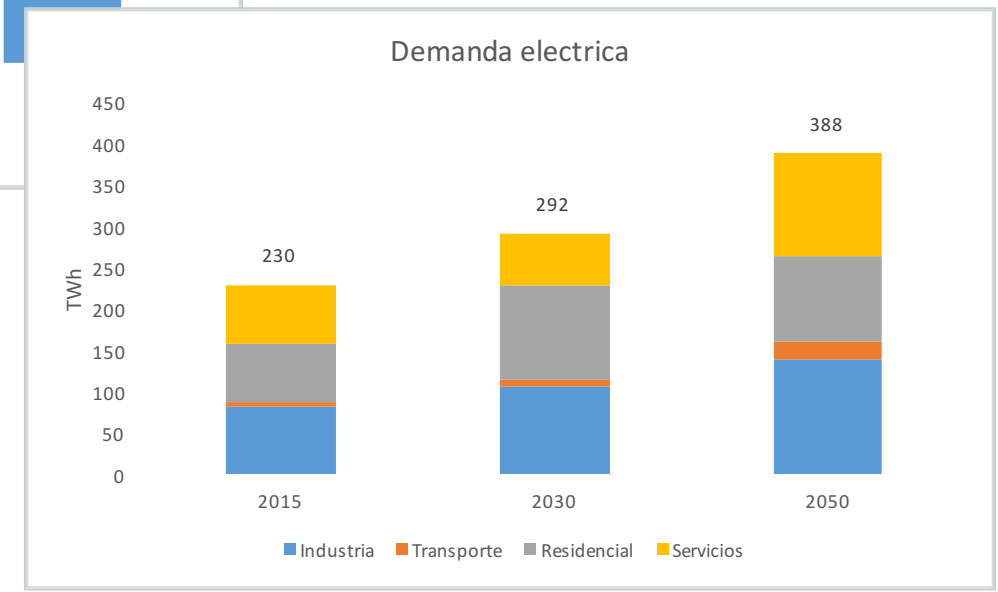


Current policies – Emissions

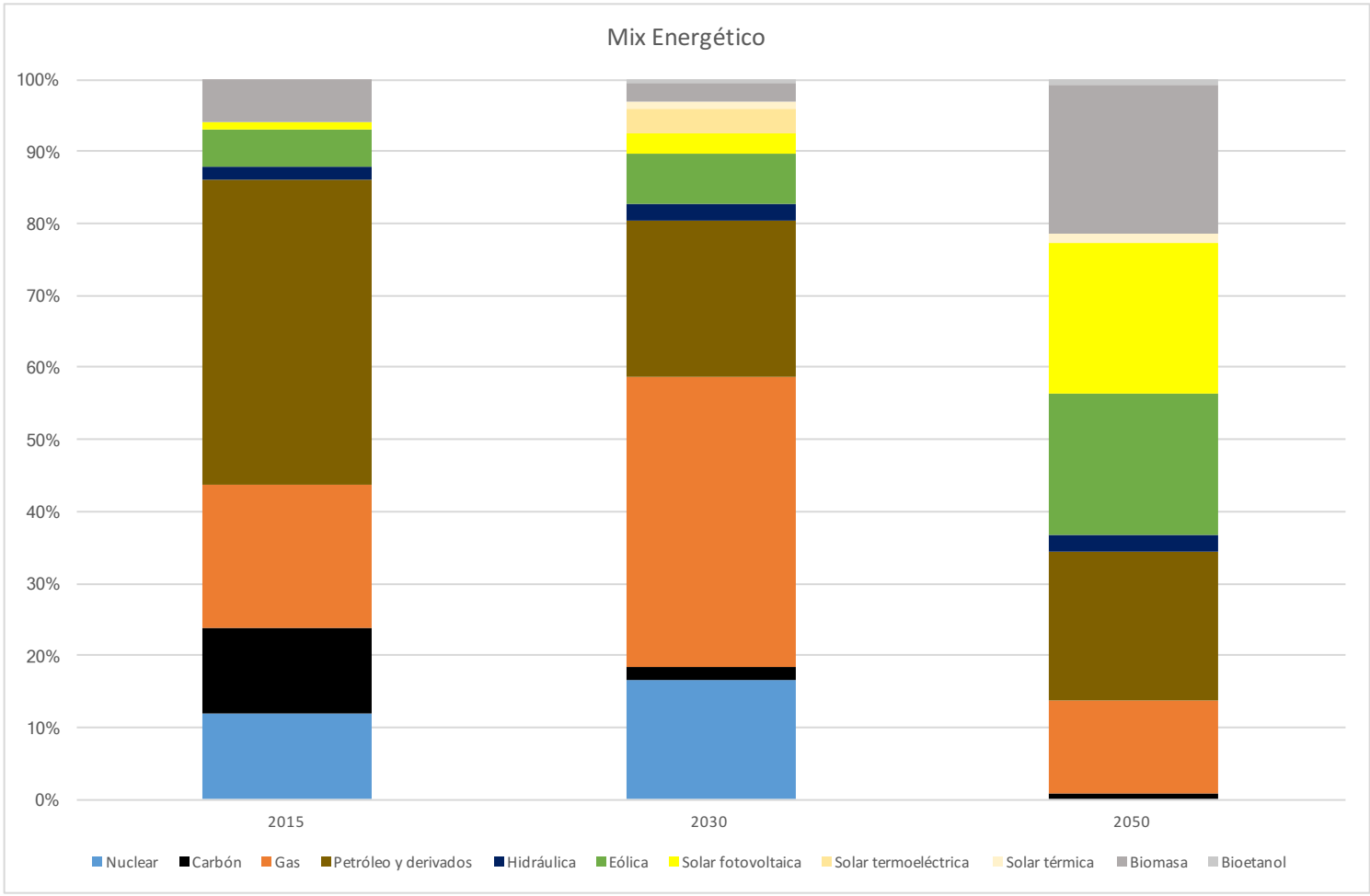


Current policies – Demand

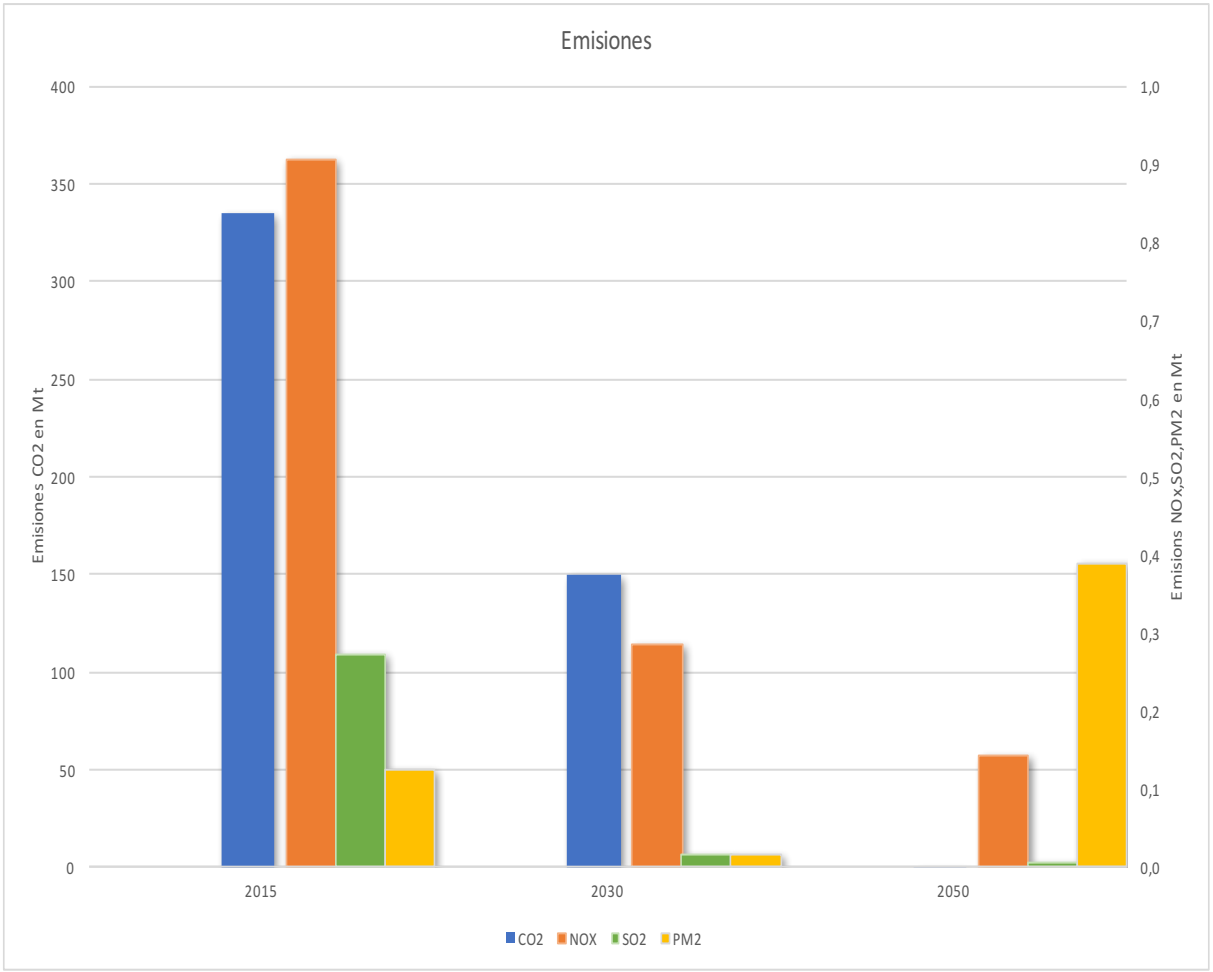


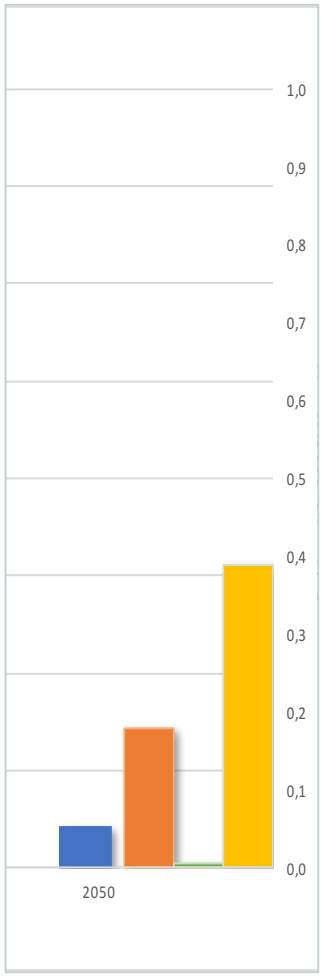


Current policies – Energy mix

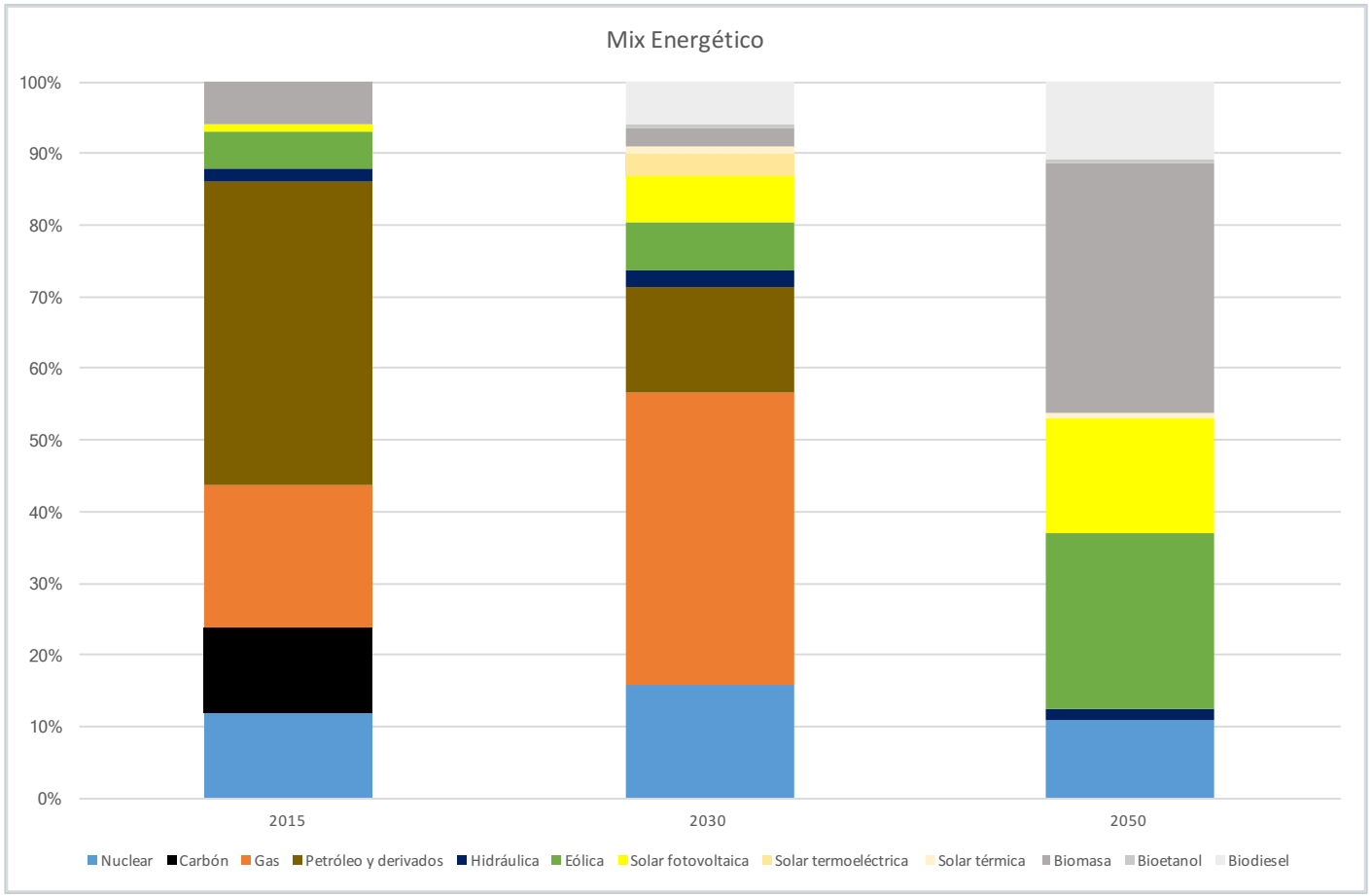


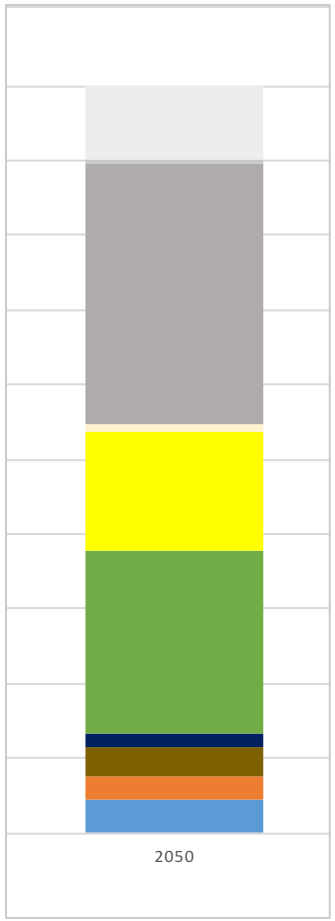
Technological progress – Emissions



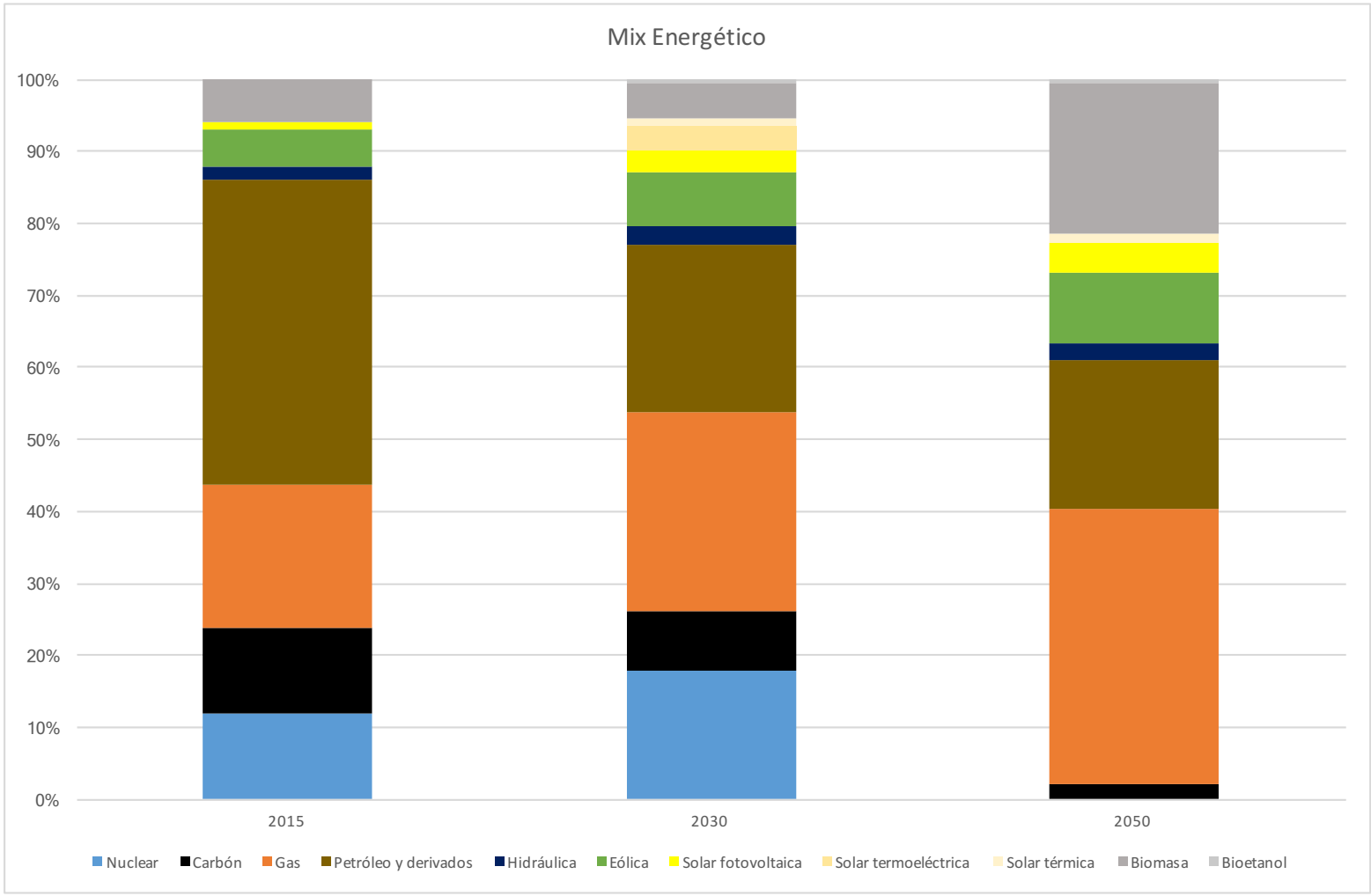


Technological progress – Energy mix





Stagnation – Energy mix



Summing-up (1): Importance of long-term signals

- The importance of investment
- Long-term economic signals and institutions are needed
  - Price and regulations
  - Market design
  - Climate finance
- And also technical innovation

Summing-up (2): Importance of energy efficiency

- All scenarios include feasible saving measures
- Electrification is also key

	Decarbonisation		Current policies		Technological progress		Stagnation	
	2030	2050	2030	2050	2030	2050	2030	2050
Residential	68	74	60	61	71	72	69	57
Services	51	100	52	100	52	100	51	100
Industry	34	34	34	34	34	34	34	34
Transport	5	79	5	47	5	79	5	47

Summing-up (3) Decarbonising the electricity sector

- How to manage a 100% renewable system?
  - Dispatchable renewable generation
    - Is CCS an option?
  - Storage
    - Hydro and pumping
    - Batteries
    - Hydrogen / Syngas
  - Demand management

Summing-up (4): Other critical sectors

- Industry
  - Renewable alternatives needed to supply high-temperature thermal energy
  - Process emissions
- Heavy transport
  - If electrification is not an option...

Main messages

- 2030 may seem easy
  - As long as energy efficiency is activated
- 2050 is the true challenge
  - Several critical sectors
  - Technological challenges
  - Time consistency
- It is necessary to be proactive, even taking into account external forcings.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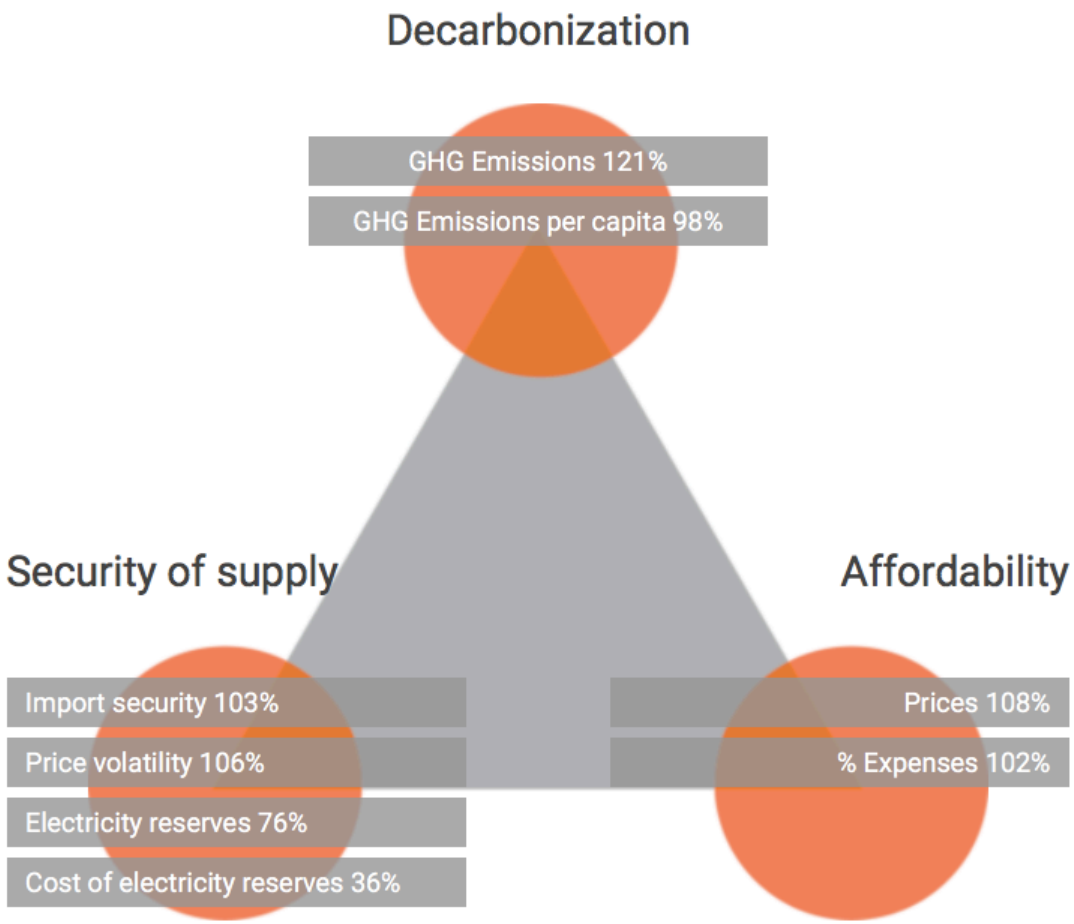
www.eforenergy.org

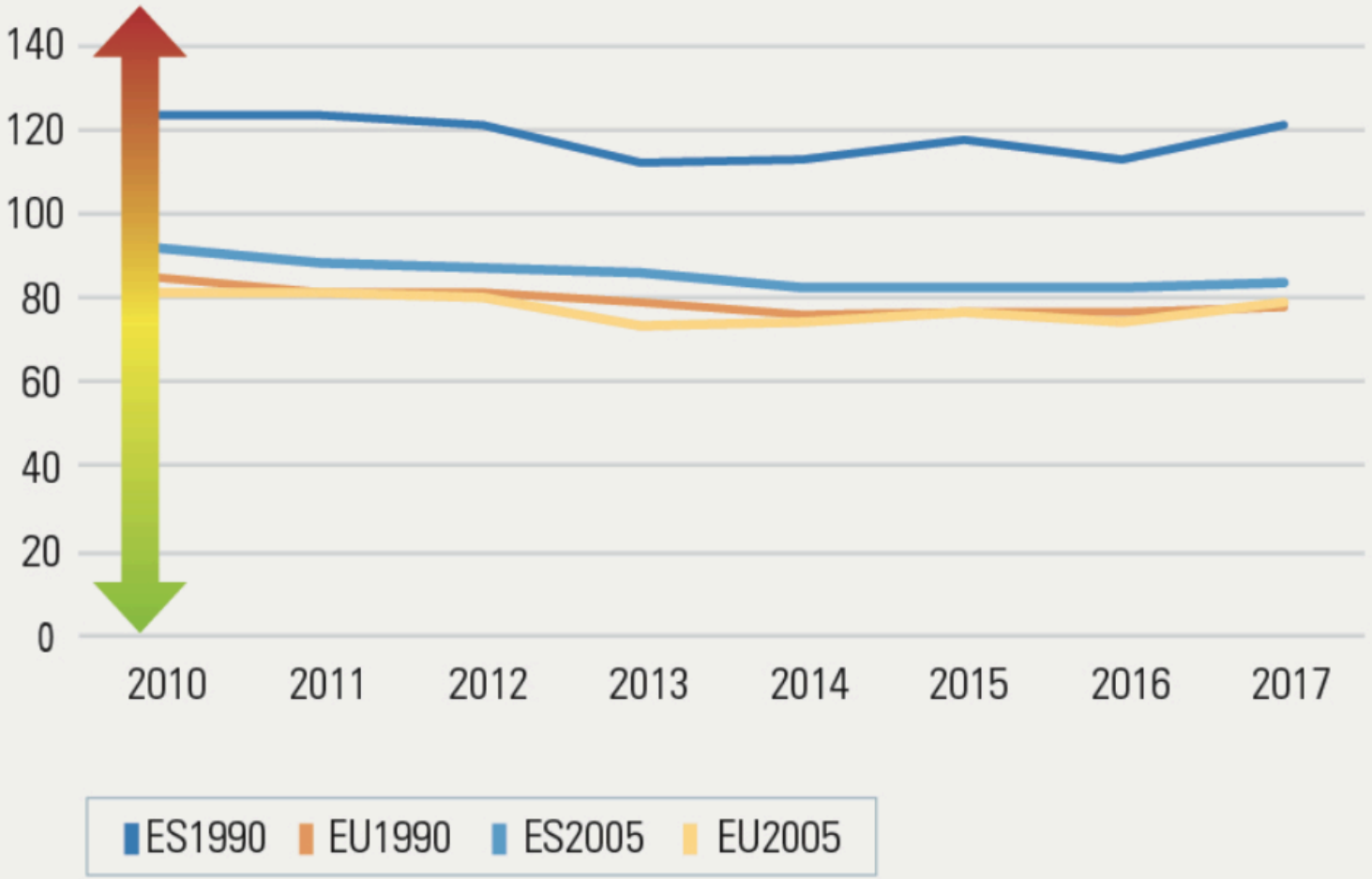
Barómetro de **Transición Energética**

economics for energy

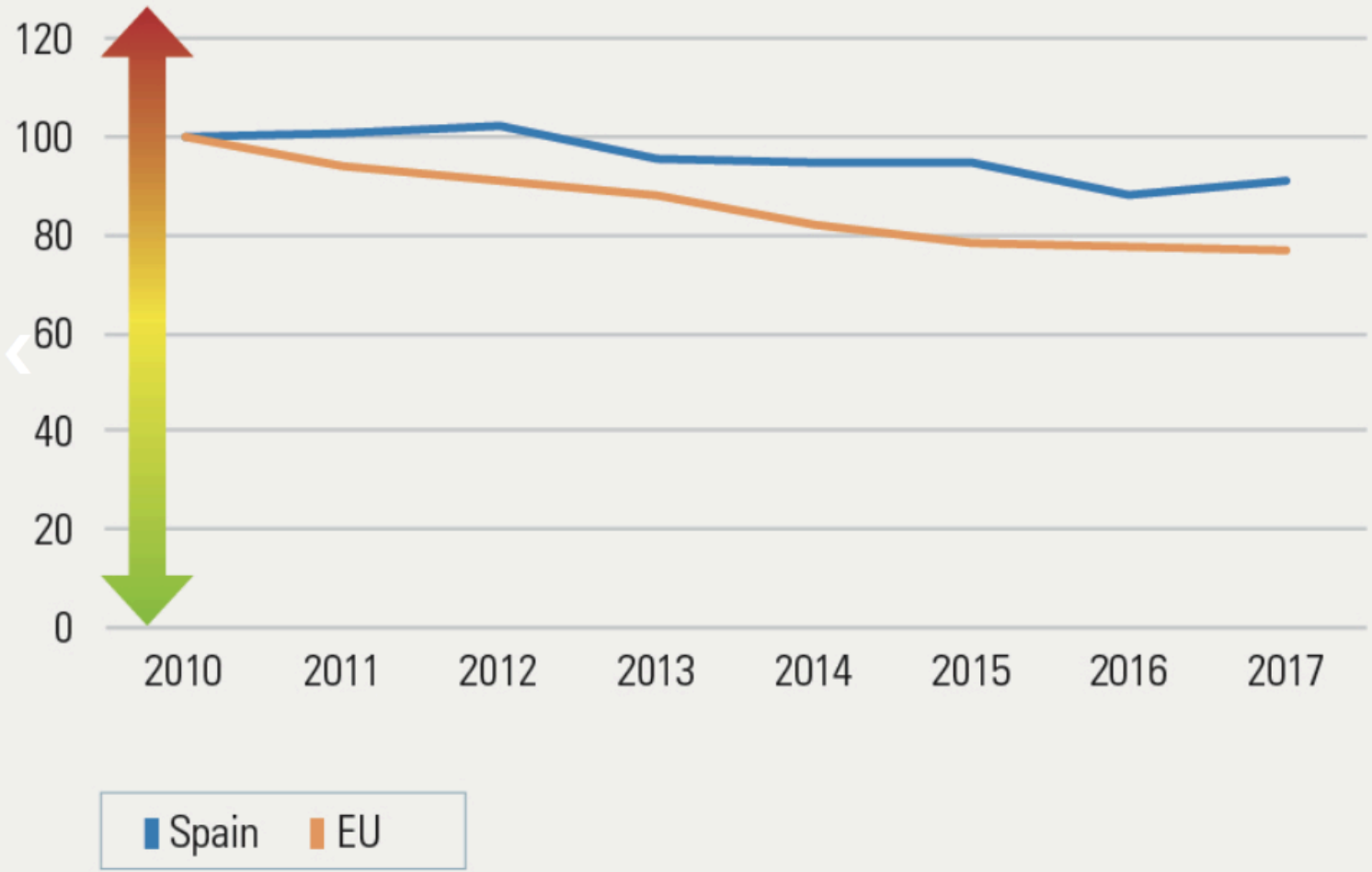
Energy Transition Barometer



Greenhouse gas emissions (CO_2eq)



Greenhouse gas emissions per unit of GDP (CO_2eq, 2010=100)

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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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XAVIER LABANDEIRA**
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.

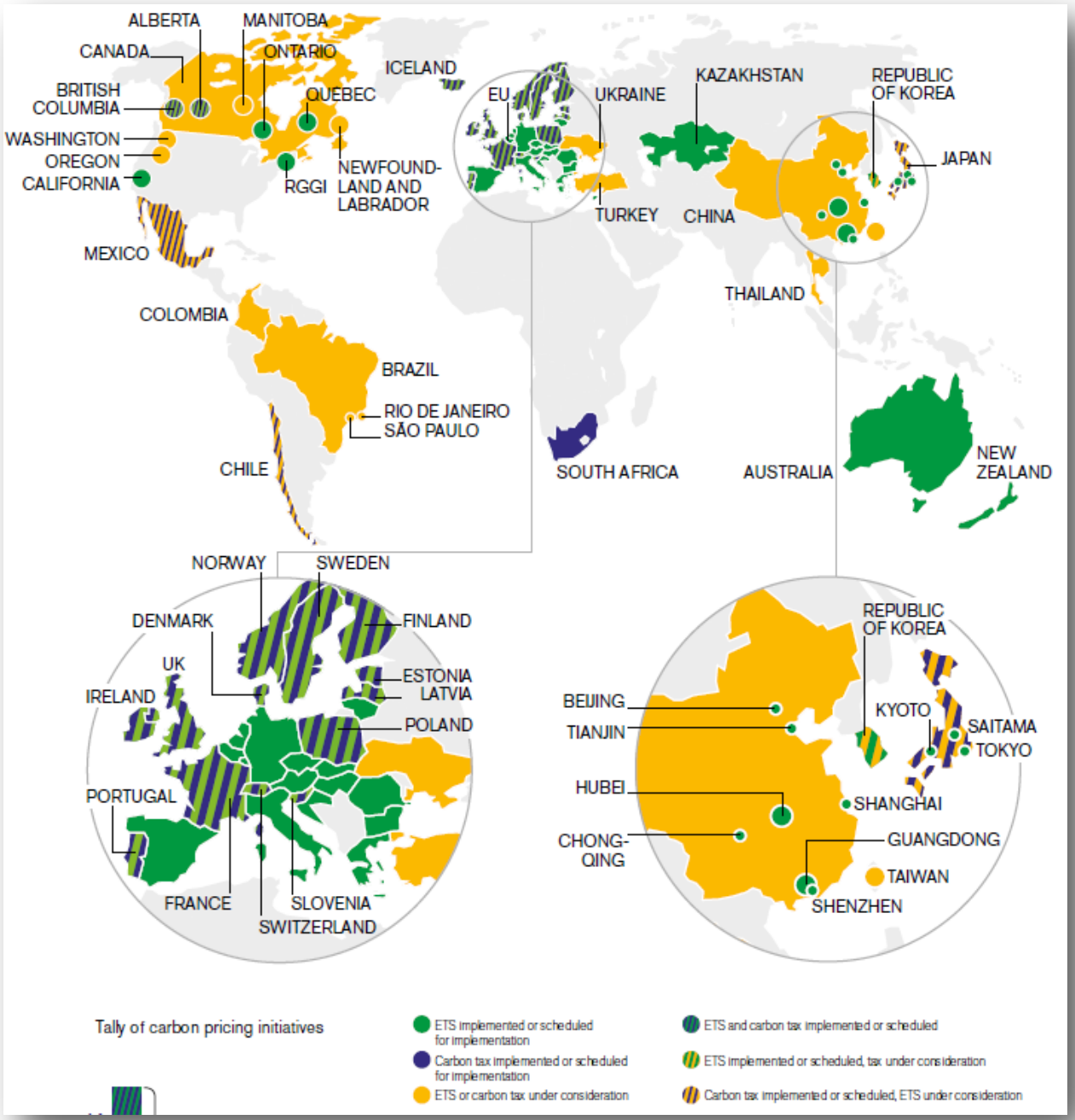
1. Introduction

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.

- **Why environmental taxes?**
  - 'Put prices right'
  - Cost-effectiveness
  - Promote innovation
  - Change of environment: Investment
  - Energy: less dependence

Facilitate Transition

- **Why environmental tax reforms?**
  - Revenues: double dividend
  - Distributional offsets
  - Earmarking



Source: World Bank (2017)

Spanish paradoxes:

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

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.

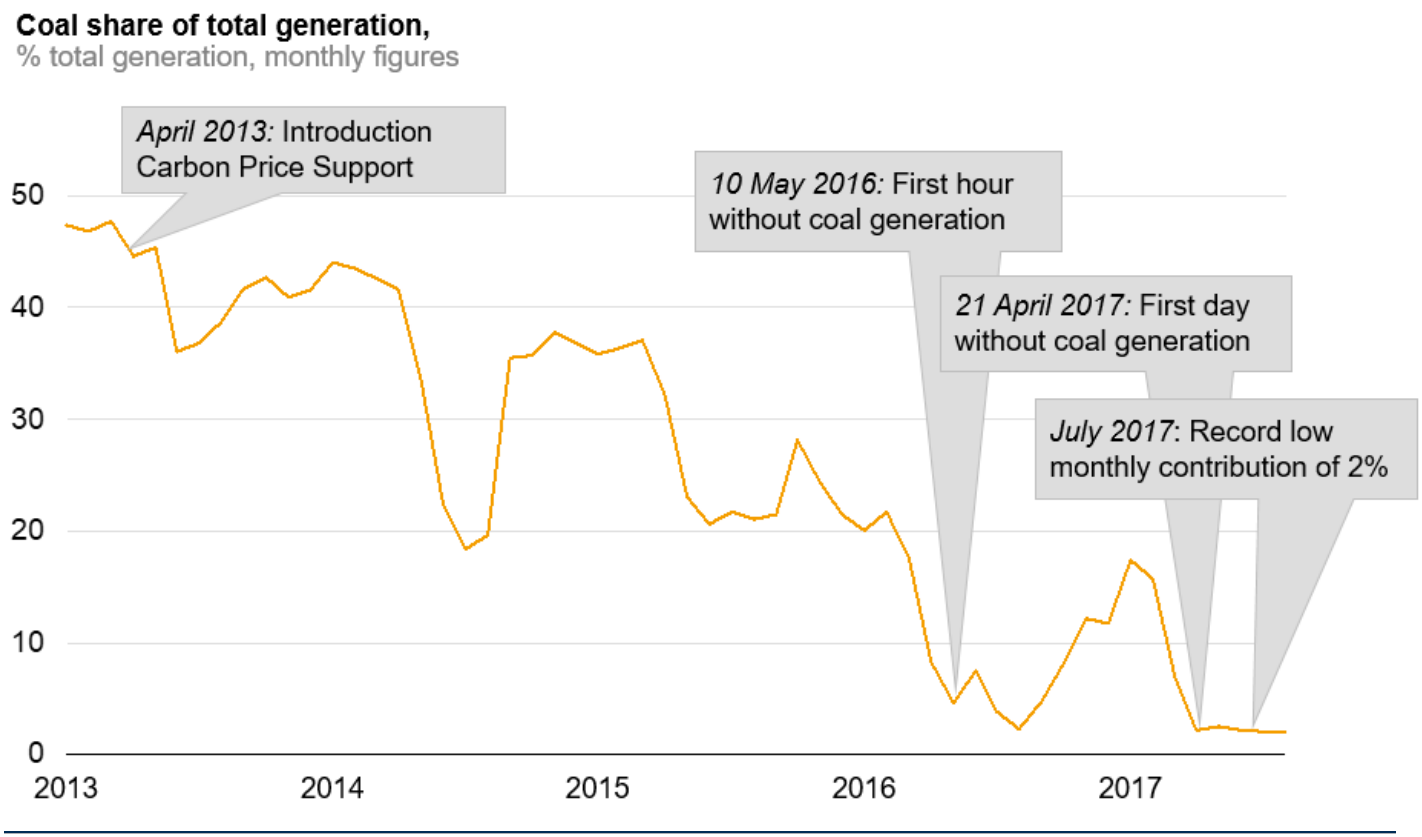
Frente a esto, qué sucede en España? De nuevo, hemos dedicado mucha tinta a esta cuestión en el blog (por ejemplo, en esta entrada reciente) y en seminarios públicos (por ejemplo, este reciente). Hace ya unos años argumentaba en la Agencia Ambiental Europea que la baja fiscalidad española sobre los carburantes de automoción era ciertamente inexplicable y requería identificar las fuertes barreras a que se enfrentaban estos instrumentos. Desde entonces la situación ha empeorado en términos relativos: como observamos en el cuadro que se reproduce a continuación, la carga fiscal del diésel (gasolina) se encuentra unos 25 (20) puntos por debajo de la media ponderada por población de la UE-22 (los países de la Unión que forman parte de la OCDE, de donde proceden los datos) por la aplicación de unas muy bajas accisas (e IVA).

	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%	0,48	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%	0,86	116,62%	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%	0,86	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

Fiscalidad del diésel y gasolina de automoción en la UE, 2018

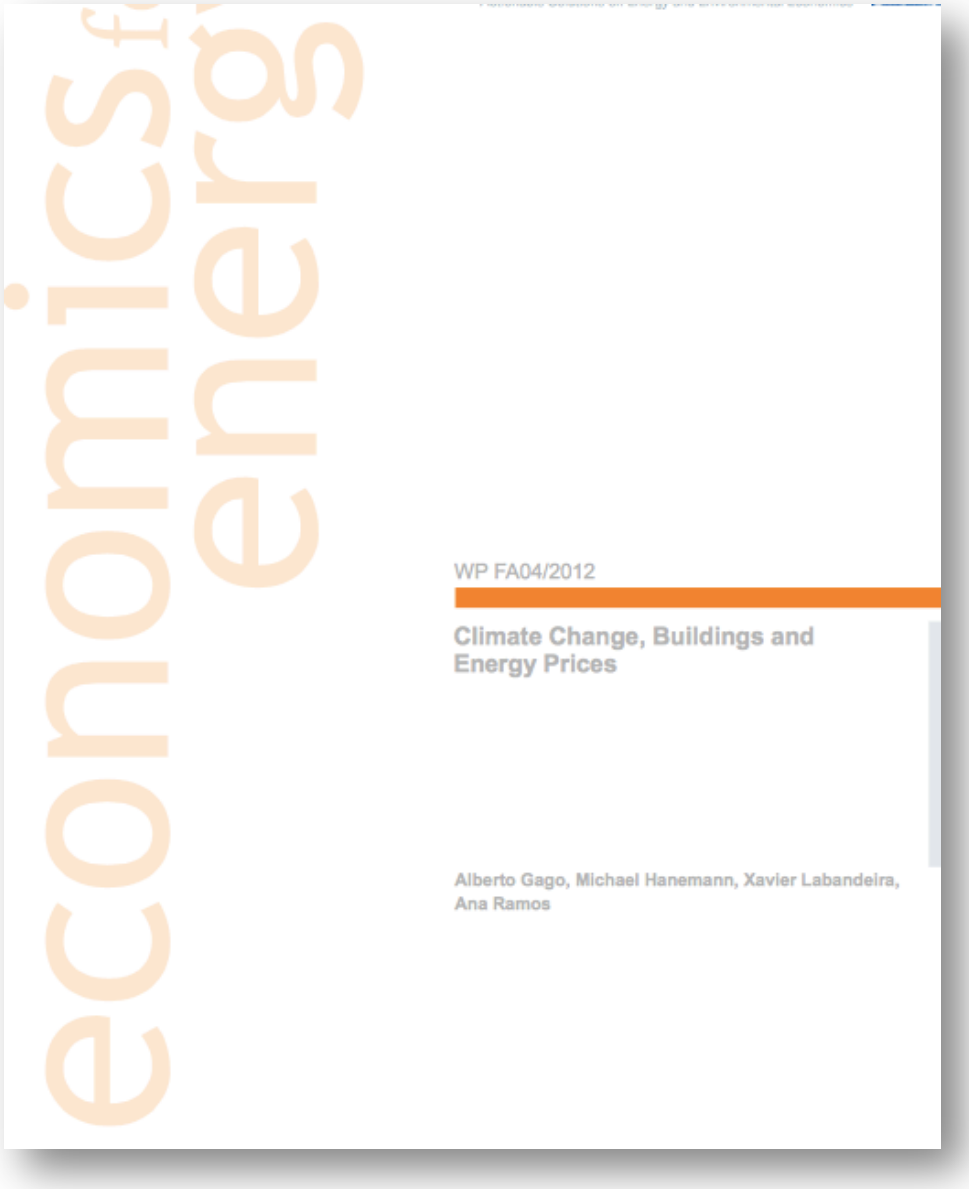
Can carbon prices work? The Carbon Price Floor in the UK has gradually wiped out coal



Source: Aurora analysis

Source: Hepburn (2017)

Tax innovations



Thanks

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