DG TAXUD course

Environmental Taxation

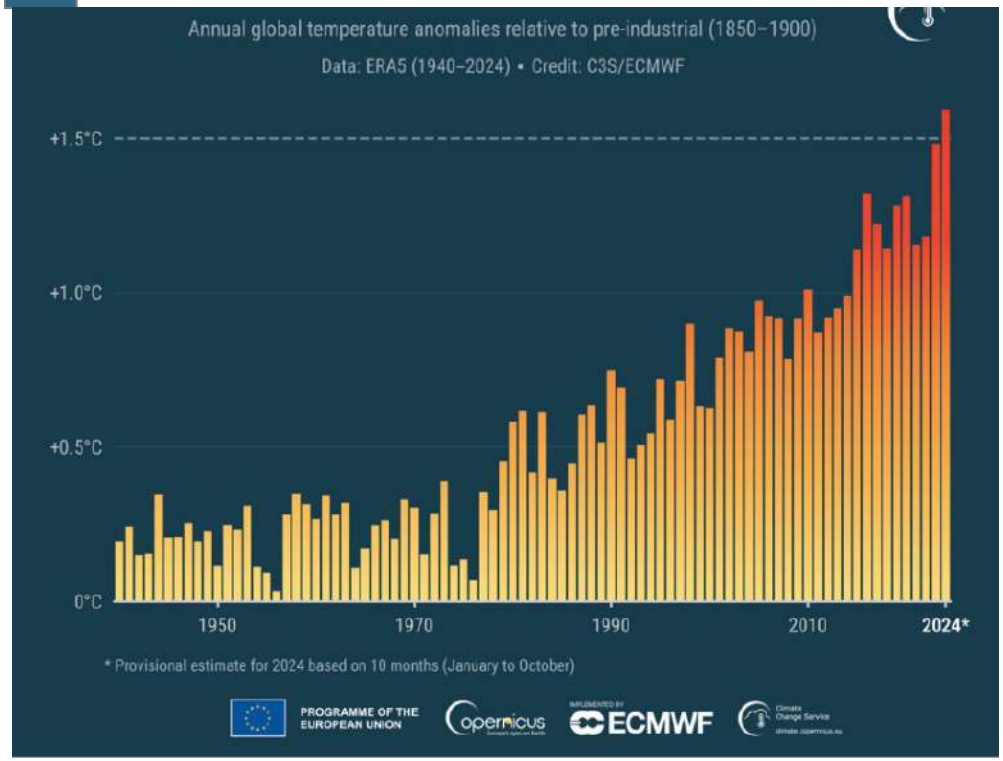
Xavier Labandeira

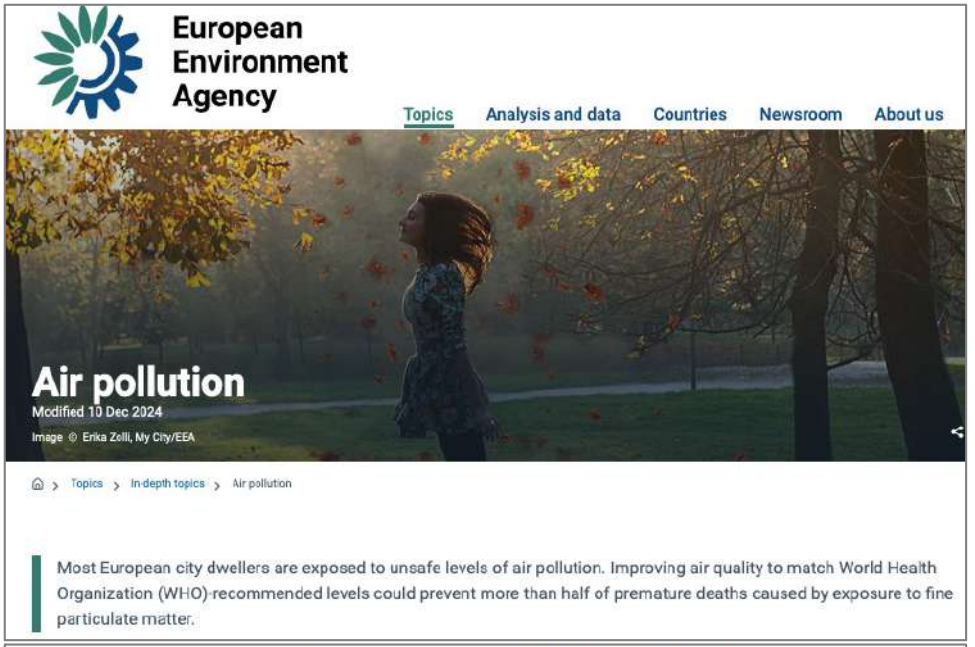
Universidade Vigo

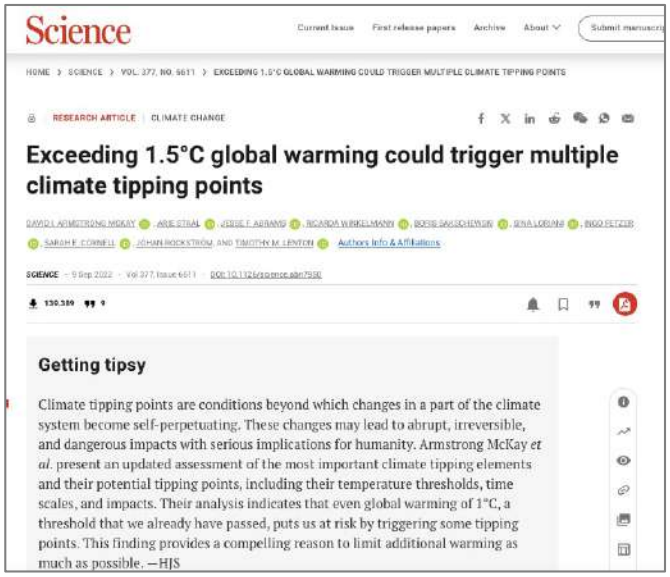
ECOBAS
Economics and Business Administration for Society

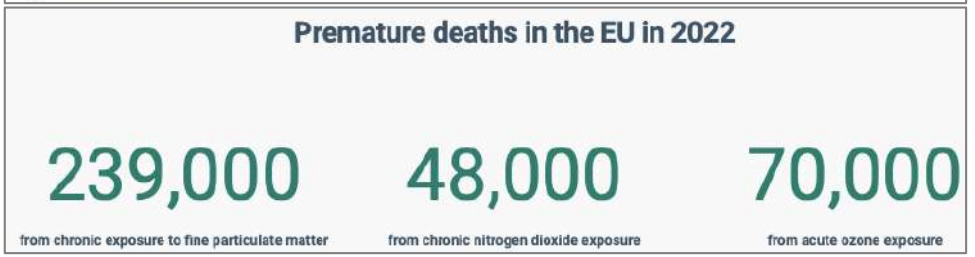
Brussels, 16 January 2025

Introduction and objectives


Annual global temperature anomalies relative to pre-industrial (1850–1900)
Data: ERA5 (1940–2024) • Credit: C3S/ECMWF
+1.5°C
+1.0°C
+0.5°C
0°C
1950
1970
1990
2010
2024*
* Provisional estimate for 2024 based on 10 months (January to October)
PROGRAMME OF THE EUROPEAN UNION
Copernicus
ECMWF
Climate Change Service

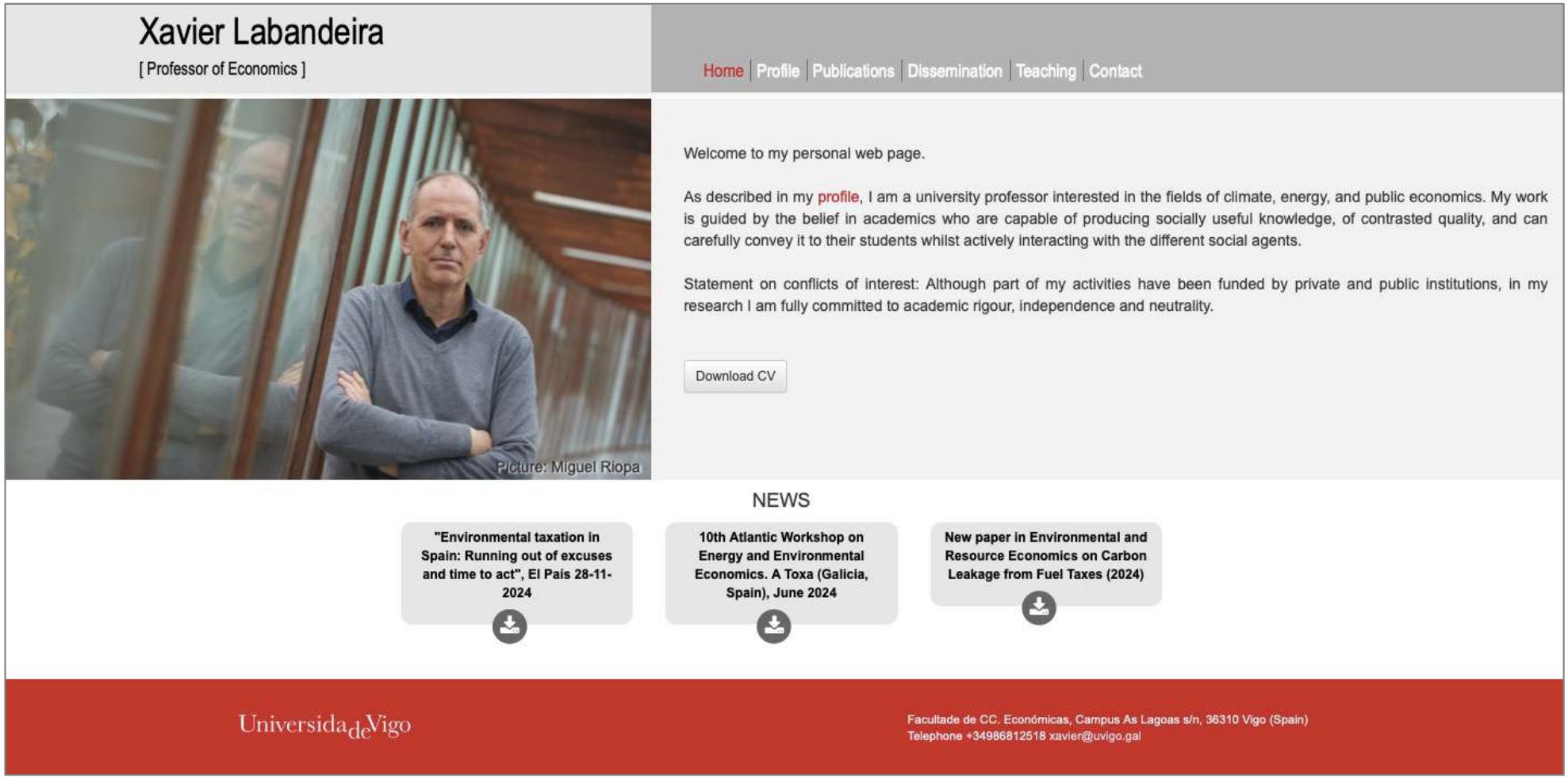

European Environment Agency
Topics
Analysis and data
Countries
Newsroom
About us
Air pollution
Modified 10 Dec 2024
Image © Erika Zelli, My City/EEA
Topics > In-depth topics > Air pollution
Most European city dwellers are exposed to unsafe levels of air pollution. Improving air quality to match World Health Organization (WHO)-recommended levels could prevent more than half of premature deaths caused by exposure to fine particulate matter.


Science
Exceeding 1.5°C global warming could trigger multiple climate tipping points
Getting tipsy
Climate tipping points are conditions beyond which changes in a part of the climate system become self-perpetuating. These changes may lead to abrupt, irreversible, and dangerous impacts with serious implications for humanity. Armstrong McKay et al. present an updated assessment of the most important climate tipping elements and their potential tipping points, including their temperature thresholds, time scales, and impacts. Their analysis indicates that even global warming of 1°C, a threshold that we already have passed, puts us at risk by triggering some tipping points. This finding provides a compelling reason to limit additional warming as much as possible. —HJS


Premature deaths in the EU in 2022
239,000
from chronic exposure to fine particulate matter
48,000
from chronic nitrogen dioxide exposure
70,000
from acute ozone exposure

My profile

- Academic in the crossroads of environmental, energy and public economics
- PhD on environmental taxation (1997), which has played a big role in my academic career
- Lead author (AR5) and Review editor (AR6) for the IPCC for the chapter on national and subnational climate policies(2010-2022)
- Engaged with EU Climate Policy (mostly EU ETS) at the EUI (2014-2017)
- Member of the Spanish tax reform committee 2021-2022 in charge of the environmental chapter



https://labandeira.eu

- **Environmental taxation**
  - Foundations and design issues
  - Assessments for Spain
  - Green tax reforms
  - Transport taxation
  - (EU ETS)

Hacienda Pública Española/Review of Public Economics 238-(3/2021): 101-136
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https://dx.doi.org/10.7866/HPE-RPE.213.5

Transport Taxes and Decarbonization in Spain: Distributional Impacts and Compensation*

ALBERTO GAGO**
XAVIER LABANDEIRA***
Rede, Universidade de Vigo
JOSÉ M. LABEAGA****
XIRAL LÓPEZ-OTERO*****
Departamento de Teoría Económica y Economía Matemática, UNED

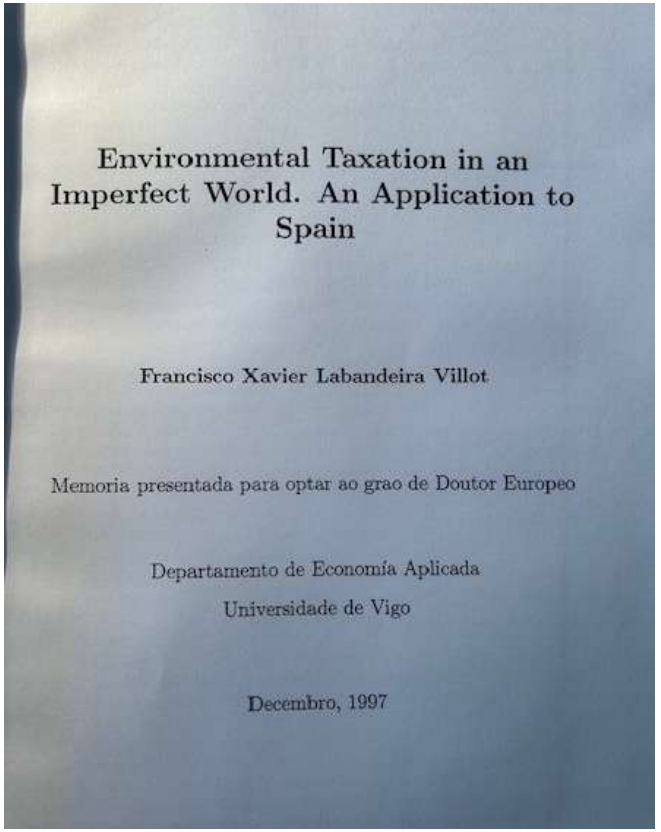
Received: February, 2020
Accepted: July, 2020

Abstract

The importance of energy-environmental taxation in the transition to decarbonized economies does not correspond to its actual role due to several constraints on its application. This paper emphasizes one of the main barriers, the negative impacts on distribution and equity, and suggests alternatives to mitigate these effects. In particular, it lists a series of fiscal proposals for road transport and aviation, sources of significant emissions, defined and empirically evaluated for the specific case of Spain, with compensatory packages to reduce their regressive nature and thus support their viability in practice.

Keywords: Energy, Environment, Distribution, Aviation, Hydrocarbons.

JEL Classification: H23, H31, I38, Q48, Q58, R48.



Environmental Taxation in an Imperfect World. An Application to Spain

Francisco Xavier Labandeira Villot

Memoria presentada para optar ao grao de Doutor Europeo

Departamento de Economía Aplicada
Universidade de Vigo

Decembro, 1997

- **Energy demand and policy**
  - Price elasticities
  - Demand systems
  - Energy efficiency, subsidies

Environment and Development Economics

Article | Supplementary materials | Metrics

First View — Get access

Energy taxation, subsidy removal and poverty in Mexico

José M. Labeaga [a1] [a2], Xavier Labandeira [a2] [a3] and Xiral López-Otero [a1]

DOI: https://doi.org/10.1017/S1355770X20000364 Published online by Cambridge University Press: 23 September 2020

Abstract

Equity and efficiency are crucial issues behind any tax reform, but they are particularly relevant in countries with high inequality and large shares of poverty. This paper provides a comprehensive socio-economic empirical assessment of Mexico's proposed (and partially implemented) tax reforms in the energy domain, and of a hypothetical partial removal of existing electricity subsidies. Using a rich household income and expenditure survey within the context of a demand system adjustment of non-durable goods, the article provides the public-revenue, environmental and distributional impacts from the simulation of different combinations of energy taxation, subsidy-removal and distributive offsets. The paper also provides detailed ex-ante evidence on the effects of compensatory devices that may contribute to the successful implementation of energy reform packages and significant poverty alleviation in Mexico.

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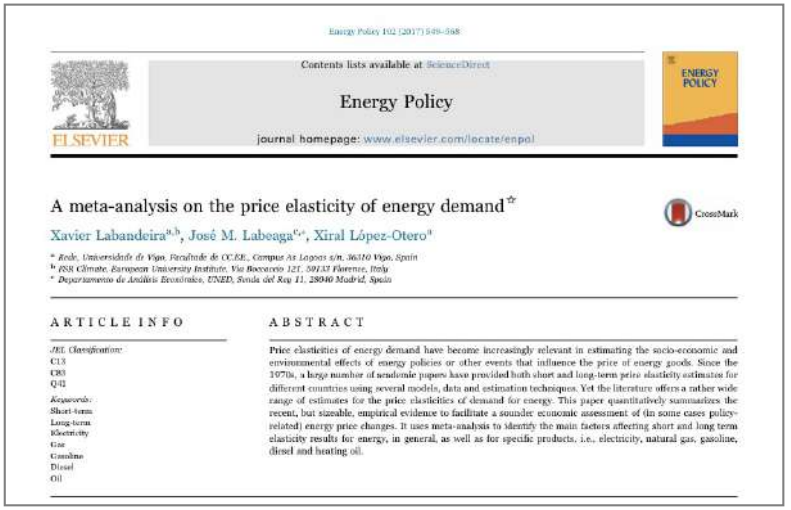


Energy Policy 102 (2017) 549–568

Contents lists available at ScienceDirect

Energy Policy

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

A meta-analysis on the price elasticity of energy demand☆

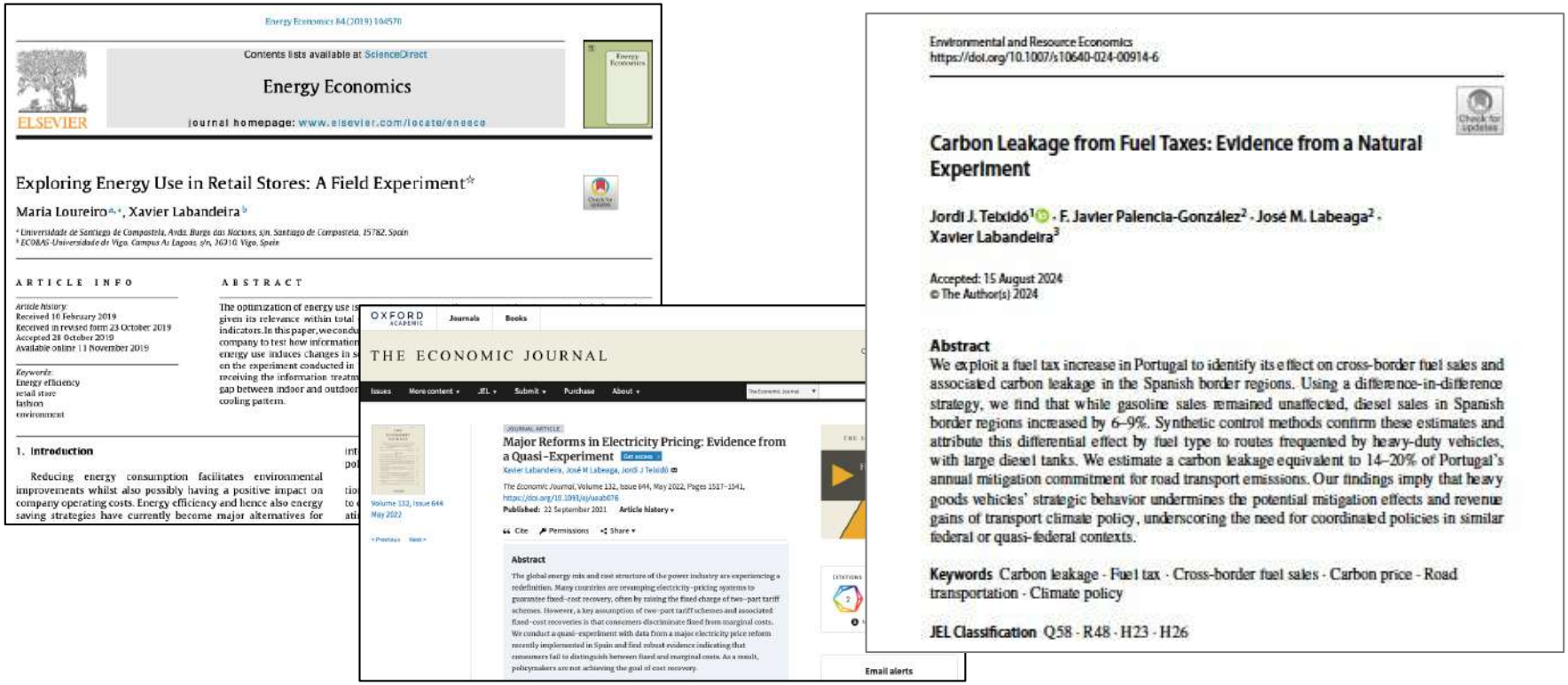
Xavier Labandeira[a,b], José M. Labeaga[c,*], Xiral López-Otero[a]

ARTICLE INFO

ABSTRACT

Price elasticities of energy demand have become increasingly relevant in estimating the socio-economic and environmental effects of energy policies or other events that influence the price of energy goods. Since the 1970s, a large number of academic papers have provided both short and long-term price elasticity estimates for different countries using several models, data and estimation techniques. Yet the literature offers a rather wide range of estimates for the price elasticities of demand for energy. This paper quantitatively summarizes the recent, but sizeable, empirical evidence to facilitate a sounder economic assessment of (in some cases policy-related) energy price changes. It uses meta-analysis to identify the main factors affecting short and long term elasticity results for energy, in general, as well as for specific products, i.e., electricity, natural gas, gasoline, diesel and heating oil.

- **Experimental approaches**
  - Energy efficiency in firms
  - Electricity reform
  - Differential fuel tax changes



Energy Economics 84 (2019) 104570

Contents lists available at ScienceDirect

Energy Economics

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

Exploring Energy Use in Retail Stores: A Field Experiment☆

Maria Loureiro, Xavier Labandeira

ARTICLE INFO

ABSTRACT

1. Introduction

Reducing energy consumption facilitates environmental improvements whilst also possibly having a positive impact on company operating costs. Energy efficiency and hence also energy saving strategies have currently become major alternatives for

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Major Reforms in Electricity Pricing: Evidence from a Quasi-Experiment

Xavier Labandeira, José M Labeaga, Jordi J Teixidó

The Economic Journal, Volume 132, Issue 644, May 2022, Pages 1537–1541,

Published: 22 September 2021 Article history

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Abstract

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Environmental and Resource Economics
https://doi.org/10.1007/s10640-024-00914-6

Carbon Leakage from Fuel Taxes: Evidence from a Natural Experiment

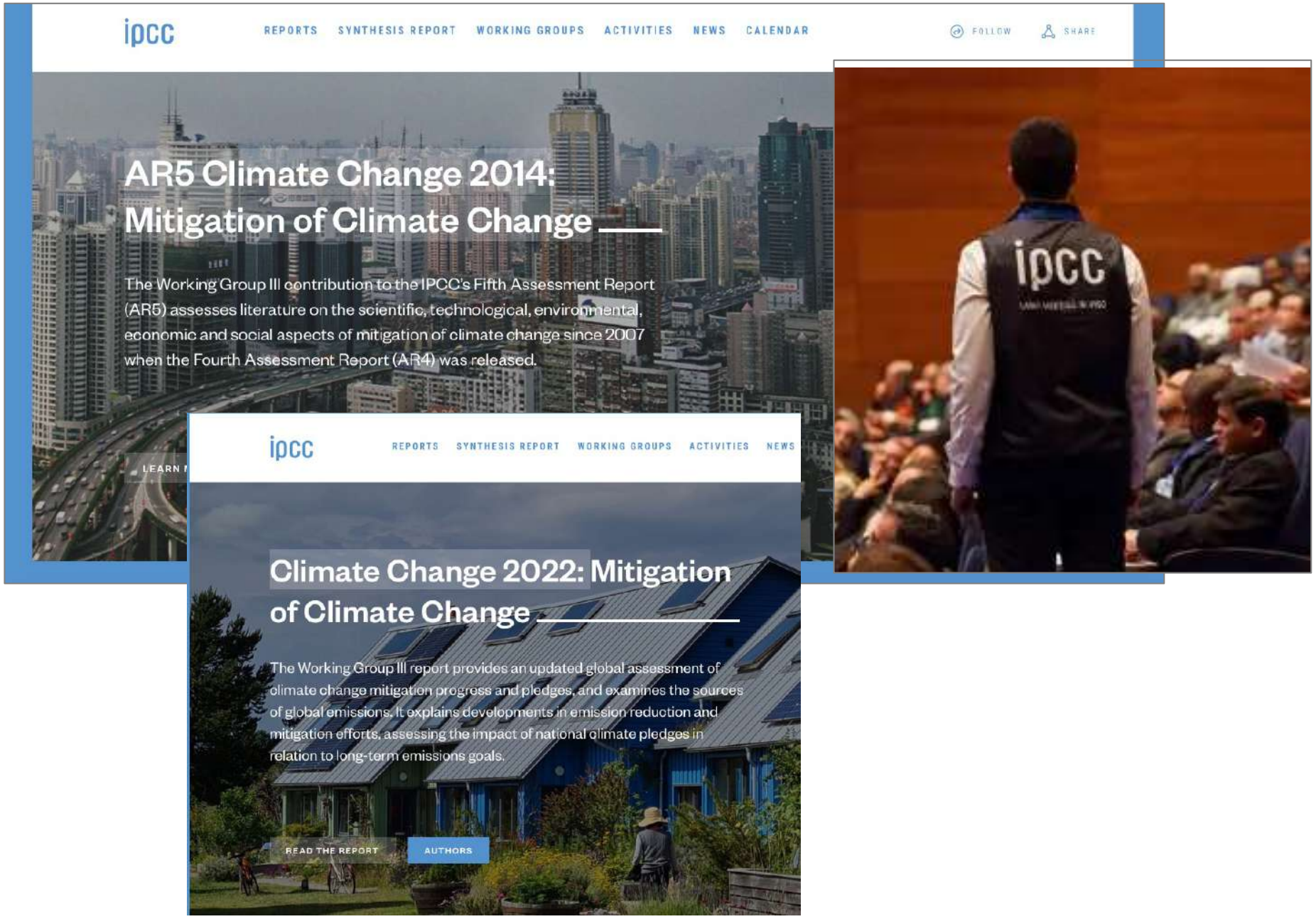
Jordi J. Teixidó[1] · F. Javier Palencia-González[2] · José M. Labeaga[2] · Xavier Labandeira[3]

Accepted: 15 August 2024
© The Author(s) 2024

Abstract
We exploit a fuel tax increase in Portugal to identify its effect on cross-border fuel sales and associated carbon leakage in the Spanish border regions. Using a difference-in-difference strategy, we find that while gasoline sales remained unaffected, diesel sales in Spanish border regions increased by 6–9%. Synthetic control methods confirm these estimates and attribute this differential effect by fuel type to routes frequented by heavy-duty vehicles, with large diesel tanks. We estimate a carbon leakage equivalent to 14–20% of Portugal's annual mitigation commitment for road transport emissions. Our findings imply that heavy goods vehicles' strategic behavior undermines the potential mitigation effects and revenue gains of transport climate policy, underscoring the need for coordinated policies in similar federal or quasi-federal contexts.

Keywords Carbon leakage · Fuel tax · Cross-border fuel sales · Carbon price · Road transportation · Climate policy

JEL Classification Q58 · R48 · H23 · H26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The Working Group III contribution to the IPCC's Fifth Assessment Report (AR5) assesses literature on the scientific, technological, environmental, economic and social aspects of mitigation of climate change since 2007 when the Fourth Assessment Report (AR4) was released.
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The Working Group III report provides an updated global assessment of climate change mitigation progress and pledges, and examines the sources of global emissions. It explains developments in emission reduction and mitigation efforts, assessing the impact of national climate pledges in relation to long-term emissions goals.
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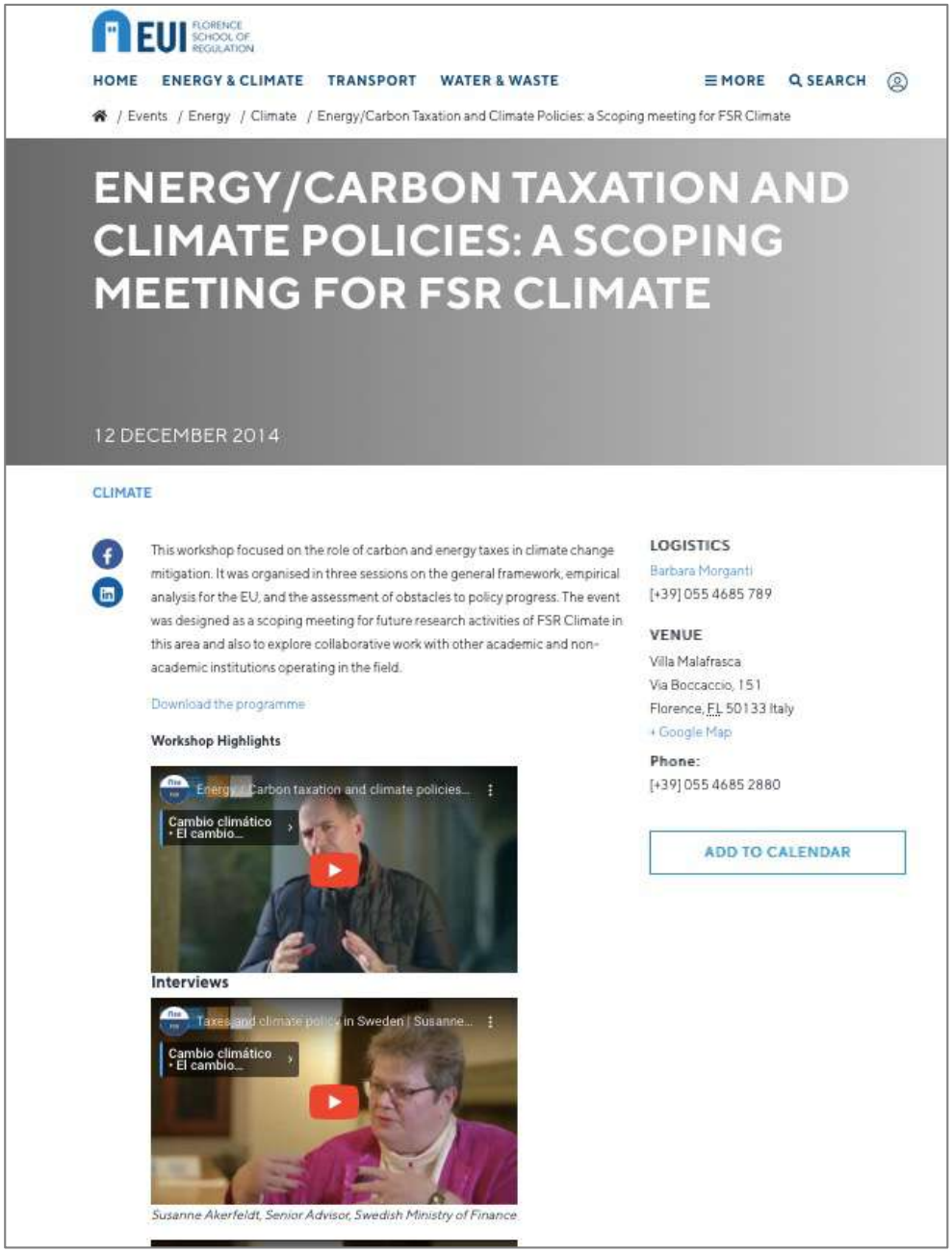

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/ Events / Energy / Climate / Energy/Carbon Taxation and Climate Policies: a Scoping meeting for FSR Climate

ENERGY/CARBON TAXATION AND CLIMATE POLICIES: A SCOPING MEETING FOR FSR CLIMATE

12 DECEMBER 2014

CLIMATE

This workshop focused on the role of carbon and energy taxes in climate change mitigation. It was organised in three sessions on the general framework, empirical analysis for the EU, and the assessment of obstacles to policy progress. The event was designed as a scoping meeting for future research activities of FSR Climate in this area and also to explore collaborative work with other academic and non-academic institutions operating in the field.

Download the programme

Workshop Highlights

Interviews

Susanne Akerfeldt, Senior Advisor, Swedish Ministry of Finance

LOGISTICS

Barbara Morganti
[+39] 055 4685 789

VENUE

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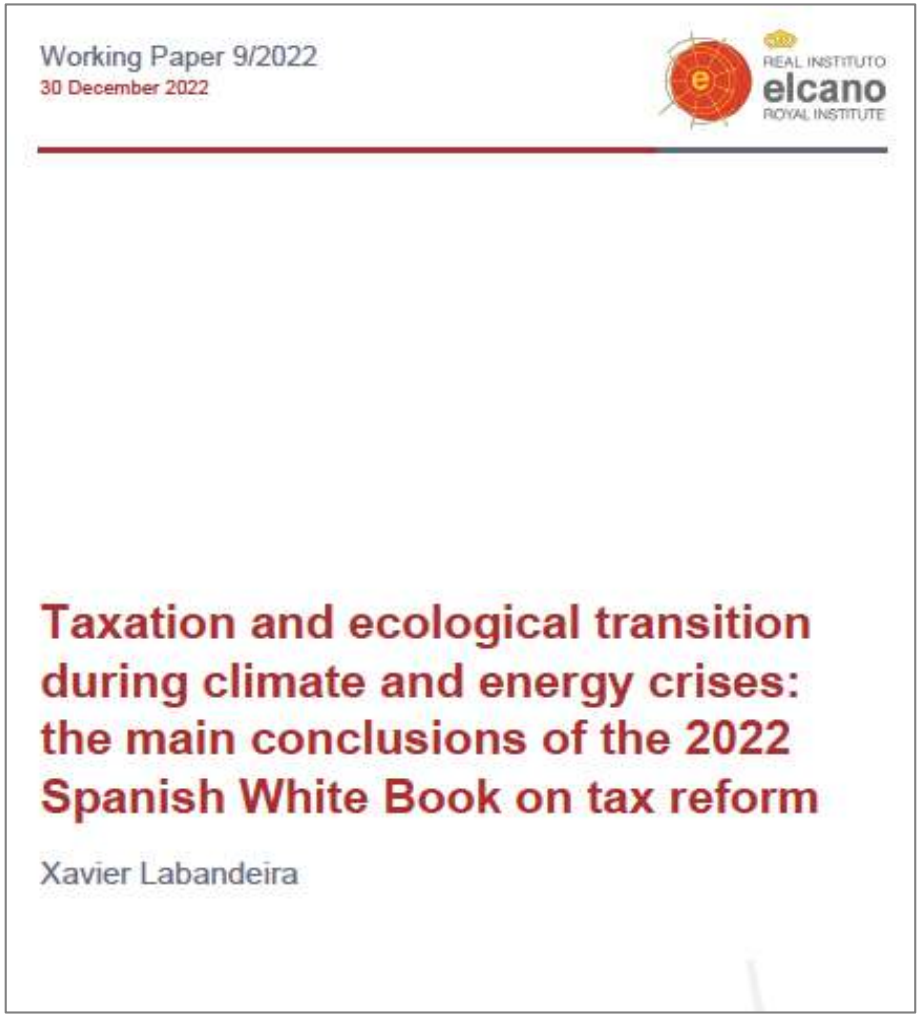
Working Paper 9/2022
30 December 2022
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Taxation and ecological transition during climate and energy crises: the main conclusions of the 2022 Spanish White Book on tax reform
Xavier Labandeira

- **The White Book on Tax Reform**
  - "Academic" exercise for non-academics
  - Taking stock after decades of academic work and applications
  - Common approach
  - My reason to be here…

Public engagement

EL PAÍS

Clima y Medio Ambiente

HAZTE PREMIUM MERCEDES

EMERGENCIA CLIMÁTICA > OPINIÓN

Fiscalidad ambiental: se agotan las excusas y el tiempo para actuar

El Congreso bloquea una medida necesaria para conseguir la reducción y eliminación del uso de los combustibles fósiles, causa principal del cambio climático

Vista general del embalse del Guadalteba, en Málaga, afectado por la escasez de lluvias.
GARCÍA-SANTOS

XAVIER LABANDEIRA

28 NOV 2024 - 13:29 CET

(Environmental taxation in Spain: Running out of excuses and time to act)

https://n9.cl/4wx1z

Objectives of the course

- Show the foundations, relevance and policy integration of environmental taxes
- Define the areas of special interest for the introduction of environmental taxes
- Show the basic design rules for implementation
- Discuss how to assess environmental taxes and tax reform
- Deal with the efficiency, revenue and distributional trade-offs
- Policy-oriented approach, although I am an academic!
- Extensive set of issues: biased selection, superficial approach, areas beyond expertise…

Organization of the course

- Four lectures (1,5h)
  - 1. Foundations
  - 2. Implementation issues
  - 3. Experiences and potential areas for action
  - 4. A comprehensive exercise for proposing and assessing environmental taxes and packages
- Time for discussion per session (15')
- Short videos by key world academics in the field
- List of papers and materials available in personal website or by request

EIPA European Institute of Public Administration

Course
Environmental Taxation
Brussels, 16 January 2025

Programme

THURSDAY, 16 January 2025

09.00	**Welcome and introduction to the course** Objectives and organization; main sources of information
09.15	**Environmental Taxation: Foundations** Externalities and pre-determined objectives; cost-effectiveness and dynamic efficiency; salience; jurisdictional allocation; policy interactions; revenue use and green tax reforms; distributional and competitiveness trade-offs; summing up academic research on the issue and Q&A
10.45	Coffee break
11.00	**Applying environmental taxes: Design issues, policy assessment, overview of experiences and barriers** Precise definition; tax rates, bases and revenue; taxonomy and relevance (tax revenue share evolution) in the real world; assessing environmental taxes; dealing with distributional and competitiveness concerns; general barriers and delays in expected implementation; Q&A
12.30	Lunch
13.30	**Environmental taxes in action** General issues: EU and the world; energy transition (electrification); transport; non-global pollution; waste; water; more on equity effects and compensations; Q&A
15.00	Coffee break
15.15	**Case study: Proposals and comprehensive assessment for an EU member state** Where to introduce environmental taxes?; Specific or systemic approach; Detailed results of assessment and reactions (barriers); Precise compensations vs the 2022 packages; Summing up main conclusions of the course; General debate and Q&A
17.00	End of course

(GM1) On the benefits and realities of environmental taxes

Gilbert Metcalf, Professor, Tufts and MIT (visiting)

(AR1) On the need of environmental taxes

Aldo Ravazzi, Italian Ministry of the Environment

Oxford Review of Economic Policy, 2023, **39**, 680–693
https://doi.org/10.1093/oxrep/grad042
Article

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Five myths about carbon pricing

Gilbert E. Metcalf*

* Tufts University, MIT Center for Energy and Environmental Policy Research, and NBER, USA, e-mail: gilbert.metcalf@tufts.edu

I am grateful to Cameron Hepburn and other participants of the Stockholm+50 Workshop on the Political Economy of Climate Change held in Stockholm on 13–14 June 2022 for comments, and to Rob Williams for inspiring the analysis in section VI.

Abstract

While carbon pricing, in general, and carbon taxes, in particular, are popular with economists, they are subject to considerable misunderstanding among policy-makers and the public. In this paper I consider and refute five myths about carbon taxes: (i) that a carbon price will hurt economic growth; (ii) that carbon pricing will kill jobs; (iii) that a carbon tax and cap-and-trade programme have the same economic impacts; (iv) that we can't achieve carbon reduction targets with a carbon tax; and (v) that carbon pricing is regressive. I then discuss implications for policy-making.

Keywords: climate change, carbon pricing, carbon tax, distribution, economic growth

JEL classification: H23, Q43, Q48, Q54

I. Introduction

While it is difficult to get economists to agree on any particular policy, there is near unanimous agreement that a necessary component of any portfolio of cost-effective policies to address climate change includes carbon pricing. There is some disagreement over the desirability of a carbon tax or fee versus using a cap-and-trade programme, but the disagreement here is more about political viability than efficacy or fairness. Much of the political opposition to carbon pricing in general and carbon taxes in particular is driven by vested interests in fossil fuel production (e.g. Wright and Nyberg, 2021) and obfuscation to scientific facts (e.g. Supran and Oreskes, 2017, 2020). But some of the opposition is driven by confusion or misunderstanding of the policy impacts. This paper addresses those misunderstandings and focuses, in particular, on five myths.

The five myths that I address in this paper are: (i) that a carbon price will hurt economic growth; (ii) that carbon pricing will kill jobs; (iii) that a carbon tax and cap-and-trade programme have the same economic impacts; (iv) that we can't achieve carbon reduction targets with a carbon tax; and (v) that carbon pricing is regressive. All five of these statements are false as I detail in this paper. I then discuss the implications of dispelling these myths for policy.

II. Myth 1: carbon pricing will hurt economic growth[1]

Any programme to reduce pollution will have economic costs as well as benefits. After all, there is no such thing as a free lunch. But a common myth about carbon pricing is that it will significantly hurt the economy. The Trump Administration's retreat from a climate policy in 2017 is emblematic. In initiating a process to withdraw the United States from the global Paris Agreement, for example, the President claimed that the cost to the US economy of the Paris Agreement would be 'close to $3 trillion in lost GDP and 6.5 million industrial jobs' (Trump, 2017).

But how large are the costs? One way to assess that is to look at the impact of existing carbon taxes on economic growth. Until recently, there was little work in this area and most analyses relied on the use of large-scale computable general equilibrium models such as the E3 model of Goulder and Hafstead (2017). Using their model,