Carbon Border Adjustment Mechanism (CBAM)

27 May 2021

Andreas Biermann Director Sustainable Finance Globalfields Itd.



Plan of the presentation

Part 1: What is a CBAM?

- How does a CBAM affect importers?
- What are Belarus' most vulnerable sectors?

Part 2: Actions to be taken by exporters

- Paths to reducing carbon intensity in industry
- Corporate emissions reporting

Part 3: Potential government actions

Summing up



Part 1: What is a CBAM?

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US raises concerns over Europe's planned carbon 'border tax'

By Kira Taylor | EURACTIV.com

🋗 May 11, 2021

Carbon border levy should start with steel, cement and fertilisers, says Poland By Kira Taylor | EURACTIV.com How an EU Carbon

How an EU Carbon Border Tax Could Jolt World Trade

Biden Exploring Border Adjustment Tax to Fight Climate Change

By <u>Ari Natter</u>, <u>Jennifer A Dlouhy</u>, and <u>David Westin</u> April 23, 2021, 8:50 PM GMT+1

border tax as prices soar

EU industry calls for urgent carbon

Record costs in bloc's Emissions Trading Scheme are a gift to rivals,

A carbon border tax on fertilisers? Think twice, EU told

By Frédéric Simon | EURACTIV.com

🛗 Mar 1, 2021

Climate Capital Carbon tax + Add to myFT

OPINION

To fight climate change, fight carbon leakage

The EU needs a Carbon Border Adjustment Mechanism that is effective, legitimate and fair.

Climate Capital Carbon tax + Add to myFT

Russian businesses start counting cost of EU carbon border tax

Some of Europe's metal groups call for a different approach as they weigh up billions of dollars in fees

20 Jan 2021, 13:29 Kerstine Appunn

German agriculture ministry wants EU carbon border tax for farming imports

say companies

#Agriculture #EU

f 🎔 in

Warnings EU's proposed carbon levy system could unfairly damage developing market exports

Understanding the coming EU CBAM

- High CO₂ prices make energy-intensive industries such as steel, fertiliser, chemicals less competitive in the EU – this is referred to as 'carbon leakage'
- A border levy on similar products raised when they cross into the EU will restore the equilibrium and allow competition on other aspects such as quality and service
- This is primarily an issue for industries with high energy input or process emissions
- The CBAM is addition to tariffs

A word of warning

- Until the publication of the EU legislative proposal, and the finalisation of subsequent discussions, we know very little about the details of how the CBAM would work
- We are in the position of a medieval illustrator who is asked to draw an elephant based on the description he receives from a traveller who may have seen one.
- The result is recognisable, but has a lot of errors in the detail.



How likely is it?

- There is now strong support in the EU for a CBAM – the view is that if it is not introduced:
 - EU jobs will be lost and the EU will deindustrialise; and
 - The climate objectives will not be achieved because other, less efficient producers will emit more CO2 making the same goods
- Energy-intensive industries lobby heavily
- Carbon leakage and the threat to EU industries is viewed as "existential" (Frans Timmermans)
- This is no longer a question of 'if' but 'when'

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Why is Belarus exposed to CBAM?

Status

- Belarus is an Annex I country under the UNFCCC and therefore will not get privileges like developing, non-Annex I countries
- Proximity
 - Belarus is close to the EU and many EU countries are key trading partners
- Structure
 - Belarus is structurally energy inefficient, with an energy intensity almost twice the EU average.
 - This means inputs into e.g. steel, chemicals or metals carry a high carbon content (footprint)

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ENERGY INTENSITY IN TOE/USD1,000 GDP1



Can it be circumvented?

- Ukraine, Moldova and Russia are also exposed as they have similarly high energy intensities
- It is not clear how e.g. components exported to a Ukrainian manufacturer who then exports the finished product to the EU would be treated – may be okay for a while



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What do we know about it – 1?

Target sectors:

- Initially Carbon-heavy sectors, likely power production, metals, cement because Carbon content easier to assess
- Possibility for other sectors depending on political considerations, such as fertilisers chemicals and agriculture
- ► Timeline
 - Legislative proposal next month
 - Expect gradual introduction from 2022 if EU-ETS prices remain high
- Politics should be straightforward as it benefits all EU members

What do we know about it -2?

- WTO compliance requirements give us some insight:
 - CBAM cannot be used as trade barrier if another country has a similar mechanism, goods must pass without levy
 - CBAM revenues cannot be used to subsidise affected industries – but can be used to support clean growth and sustainability
- Not enough known yet
 - Structure, price level
 - What would constitute an appropriate mitigation in a 3rd country



How does a CBAM affect exporters?



How much Carbon is in your product?

- Carbon content is a function of:
 - Product
 - Location and
 - Process
- **Examples:**
 - Product electric arc versus blast furnace steel
 - Location Norwegian vs. Polish aluminium
 - Process wet kiln vs. dry kiln cement
- Combinations are not just possible but likely

How much will you pay?

- CBAM should be a function of two things:
 - Carbon content of your product and
 - Cost of CO2 allowances in the EU ETS

BMZ Steel	Value	Unit
Annual Exports	925,000	Tons STL
CO ₂ Content	2	tCO2/tSTL
EU ETS CO ₂ Price	55	EUR/tCO2
Annual CBAM Cost	101,750,000	EUR

How will it affect you?

- A CBAM could have a significant impact on your competitive position, depending on the value of your product and its Carbon content
- Using steel as an example, non-EU imports with slightly higher transport cost would not be competitive inside the EU



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Assessing sector exposure

Simple methodology to assess key sectors, focussing on product value and carbon content, assuming high EU-ETS prices





Belarus' most vulnerable sectors

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How vulnerable are you?

- Two key considerations:
 - How much Carbon is in your product?
 - ► How much of your product ends up in the EU?
- Uncertainty there are no final decisions about:
 - Scale of CBAM
 - Sectors to be covered
 - Mitigation potential in country (e.g. by purchasing renewable electricity)
 - Treatment of finished products

Key vulnerable sectors

Metals

- EU-27 accounts for 34% of metals exports of Belarus
- Total value of exports is EUR665 million
- CO₂ emissions are 2 tons CO₂ per ton of steel

Metals	Value	Unit
Annual Exports	710,000,000	EUR
Assumed price	570	EUR/t
Annual volume	1,246,000	tons
EU ETS CO ₂ Price	55	EUR/tCO2
Annual CBAM	137,000,000	EUR
Share of Export value	19	%

Key vulnerable sectors

► EU-27 accounts EUR60 million of value

- Combined EU/Ukraine USD790 million
- Cement emits ca. 1.25 tons $CO_2/tCement$

Cement	Value	Unit
Annual Exports	50,000,000	EUR
Assumed price	120	EUR/t
Annual volume	417,000	tons
EU ETS CO ₂ Price	55	EUR/tCO2
Annual CBAM	29,000,000	EUR
Share of Export value	58	%

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Key vulnerable sectors

EU-27 accounts for EUR460 million of Belarus fertiliser exports

Assumed CO₂ content is 160kgCO2/tFertilizer

Fertiliser

Fertiliser	Value	Unit
Annual Exports	460,000,000	EUR
Assumed price	165	EUR/t
Annual volume	2,800,000	tons
EU ETS CO ₂ Price	55	EUR/tCO2
Annual CBAM	25,000,000	EUR
Share of Export value	5	%



Part 2: Actions to be taken by exporters

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What are the options?

- Accept
 - Pay the CBAM
- Avoid:
 - Find other markets
 - Move production inside the EU
- Mitigate:
 - Reduce carbon content of your products

Accept

- Advantage
 - It's the least hassle and requires no changes
- Disadvantages
 - Competitiveness may be impaired and you are likely to lose market share
 - CBAM needs to be paid in EUR, so hit on your Forex reserve

Avoid

- Advantages
 - It broadens the export base and makes your company overall more resilient
- Disadvantages
 - It may be difficult to achieve, due to Belarus' geographic location
 - Higher transport cost and potentially lower realised prices may eat into exporter margins
 - Some export destinations may themselves consider CBAM (e.g. US) or similar Carbon measures
 - Setting up international production sites takes time and is not straightforward

Mitigate

Advantages

- Will lead to modernisation of your operations, in particular the industrial sector
- Contributes to achieving Paris Agreement commitments
- Has ancillary benefits, such as cleaner air, less local pollution
- Can be based on local resources, improving your forex balance
- Disadvantages
 - Compared to other countries, Belarus renewable resources are more costly (e.g. solar) or not uncontroversial (e.g. biomass)
 - Substantial investment may be needed
 - Can not be achieved overnight



Paths to reducing emissions in industry

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How to mitigate

- Things you and things you cannot affect:
 - Change process and improve your energy efficiency – you control this
 - Reduce average Carbon content of electricity outside your control
- Improving energy efficiency and reducing Carbon content of industry products can be based on two directions:
 - System-wide
 - ► Site-specific

System-wide

- Government actions in the form of new policies, rules and regulations
- ► These could include:
 - Minimum performance standards for e.g. motors
 - Support for renewable energy production
 - Energy efficiency policies and support
 - Carbon pricing through a sectoral or national ETS





Site-specific

- On-site actions:
 - Track energy use and carbon content
 - Undertake energy audits to identify savings potential such as:
 - Improved lighting
 - High-efficiency motors
 - Modernisation of HVAC and compressed air systems

- Installing on-site micro-generation
- Investment plans to address these needs
- Each unit/site needs to have an energy/Carbon manager to achieve maximum impact



German industry share of GDP <u>increased</u> by 1% from 2000 to 2018



Corporate Emissions Reporting

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Reporting to manage managing to report

- Reporting is a critical element of managing a CBAM:
 - Understand the extent of your exposure and risk
 - Identify measures to mitigate exposure
 - If you don't do it yourself, someone else will do it for you – will you like the results?
- Reporting has other benefits:
 - Raises potential for investment by outside entities, e.g. EBRD
 - Improves ability to manage a high cost factor such as energy more closely
 - Raises potential for modernisation investment

Corporate reporting schemes

- Corporate reporting is at an early stage
 - UK has mandatory reporting
 - Auditors are gearing up
- Substantial experience from voluntary carbon market reporting and standards
 - Clean Development Mechanism
 - Gold Standard
- Useful actions can be taken now

Initial steps

- Apply existing standards at audit quality level
- Define appropriate indicators and most important drivers of energy use and carbon emissions
 - Emissions from fuel use
 - Process (IPPU) emissions
- Begin to seek alternatives
- Talk to your auditors
Corporate reporting schemes

- Difficult to give recommendations as reporting is evolving
- Useful information
 - Climate Disclosure Standards Board
 - Gold Standard
 - Carbon Disclosure Project (CDP)
 - Climate Bonds Initiative



Part3: Potential government actions

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Options...



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Options...



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Decisions needed

- Does Belarus want to be exposed to a CBAM:
 - ► What is 'Plan B' e.g. exporting to non-EU?
 - Is the impact on the economy significant?
 - Are mitigating policies feasible?
 - Is do-nothing a possible policy?
- Assume mitigating policies are introduced:
 - What would you do with the funds raised from taxes, trading schemes or levies?
 - What support do target sectors require to be able to continue to export?

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Plan of action



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There are two levels of potential actions

- ► National, system level:
 - Taxation
 - Emissions Trading (could also be for specific sectors)
 - Policies to reduce carbon intensity of the economy
- Sector level:
 - Levies
 - Support aligned with EU state aid principles

National Level – 1

► Taxation:

- Introduction of a carbon tax at a level similar to that of the EU pricing of CO2 emissions
- Could maybe be adjusted for Purchasing Power Parity

Emissions Trading :

- Establish an emissions trading system to mirror the EU ETS, and compatible with it so that certificates can be traded across the border
- This could initially be restricted to the most exposed sectors, as well as e.g. electricity generation

National Level – 2

- Policy Support:
 - Introduce support for renewable energy production to reduce carbon intensity of the power sector
 - Establish energy efficiency requirements across sectors (e.g. minimum efficiency requirements for motors) to reduce energy consumption
- Engagement
 - Work with the EU they are in the driving seat
 - Engage early and learn as much as is possible to help prepare your industries

Sectoral Level

Levies

- Introduction of export levies based on CO₂ content for exports to the EU, at a level similar to EU ETS pricing
- Could possibly be adjusted for Purchasing Power Parity
- Direct support
 - Investment support to reduce energy/carbon intensity
 - Needs to be compatible with the state aid principles



Summing up

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Conclusions

- The CBAM will come and you need to be prepared
- Mitigating policies are national and sector level are most likely Belarus' best options
- The good news is that there is substantial potential for efficiency and Carbon improvement across sectors

What next?

- Start working closely with the EU now to understand what will come and be able to prepare
- Investigate 'no-regrets' policies the things that make sense as they will benefit the economy regardless
- Think systemically consider CBAM mitigating action in the context of delivering the NDC, for example
- Engage with the process ignore and avoid won't work

This isn't the solution to your CBAM challenge





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The EU's Green Deal and the Eastern Neighbourhood

27 May 2021

Andreas Biermann Director Sustainable Finance Globalfields Itd.



Plan of the presentation



Why the Green Deal

The Green Deal

Where do we go from here?



Why the Green Deal?

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Objectives

- The Green Deal's vision is to continue to allow us to live well, while respecting the boundaries of the planetary system.
- ► The Green Deal sets out:
 - ▶ How to ensure a just and inclusive transition.
 - Investments needed and financing tools available.
 - ► The timeline to deliver the objectives.

Climate Change and Global Warming



Climate change: the complex shifts that emerge due to human activity (greenhouse gas emissions into the atmosphere) that affect the planet's weather and climate systems (The National Geographic). Encompasses extreme weather events, shifting wildlife populations and habitats, rising seas etc.



Global warming: "Global warming is the long-term heating of Earth's climate system observed since the preindustrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in the Earth's atmosphere" (NASA).

The Climate Problem – Why the urgency?



As of 2018, **41.5 billion metric tonnes of carbon dioxide** were emitted into the atmosphere.

This means **79%** of the global carbon budget has already been used up.

In 2017, the global average surface temperature increased by 1°C since pre-industrial levels and is **likely to** reach 1.5°C between 2030 and 2052 at the current rate.

20-40% of the global human population live in regions that have **already** experienced warming on 1.5°C.



Global warming is **melting** ice, which is contributing to sea level rise. **Global sea** levels are currently rising at **3.2 millimetres a year**. Since the 1900s, sea levels have risen by **16** centimetres.

At current rates, sea level rise is expected to reach **40 centimetres** (best case scenario) or **80 centimetres** (worst case scenario) by 2100.

Oceans are more acidic, so 70-90% of reefs could collapse.



Rain and snowfall patterns are shifting and many regions are beginning to experience severe droughts, wildfires, lost crops and water shortages.

Hurricanes, typhoons, and other storms are stronger. Floods and droughts are more common.



By 2018, the number of **weather-related natural disasters** had **tripled** since 1960.

The cost of dealing with them has also increased and reached USD 100 bn in 2019, of which 15 were >USD 1 bn in scale,



The Paris Agreement 2015

- Restrict global warming to no more than 2 degrees Celsius, but aim to achieve no more than 1.5 degrees Celsius
- Countries are asked to prepare Nationally Determined Contributions (NDCs) to deliver this aim
- Countries are also asked to provide a roadmap in the form of Low Emission Development Strategies
- 197 countries signed and 190 ratified the Agreement

Emission gaps – the Challenge



Defining action...



"I think you should be more explicit here in step two."





"Living well, within planetary boundaries"



Operationalising the Paris Agreement

- Three core objectives:
 - No net emissions of greenhouse gases by 2050

 climate neutrality
 - Economic growth is decoupled from resource use
 - ▶ No person and no place is left behind
- Reaching this target will require action by all sectors of the EU economy.
- This will be achieved by action designed to:
 - Boost the efficient use of resources by moving to a clean, circular economy and
 - Restore biodiversity and cut pollution

Objectives

- The Green Deal's vision is to continue to allow us to live well, while respecting the boundaries of the planetary system.
- ► The Green Deal sets out:
 - ▶ How to ensure a just and inclusive transition.
 - Investments needed and financing tools available.
 - ► The timeline to deliver the objectives.

Implementation

- The operational plan of the Green Deal is to be achieved by:
 - investing in environmentally-friendly technologies
 - supporting industry to innovate
 - rolling out cleaner, cheaper and healthier forms of private and public transport
 - decarbonising the energy sector
 - ensuring buildings are more energy efficient
 - working with international partners to improve global environmental standards



Implementation

- ► The Green Deal is implemented now
- Member States will undertake actions in line with what is needed for them to comply
- Outside the EU, DG NEAR and DG DEVCO will lead on implementation
- EIB and EBRD both have strong climate mandates with minimum investment requirements at portfolio level:
 - ► EIB Climate Windows
 - EBRD Green Economy Transition



The EU Green Deal and the Eastern

Partnership



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"Living well, within planetary boundaries"





The EU Green Deal and the Eastern

Partnership



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The EU Green Deal and the Eastern Partnership:

Objectives and Actions

- Transforming the region to achieve:
 - ► Fair and prosperous societies
 - Modern, resource-efficient, clean, circular and competitive economies,
 - Increased environmental and climate action
 - More sustainable use of natural resources
 - Scaled up action in areas that are critical for people's health and well-being.
- Continuing investment in environmental governance and in raising awareness to:
 - Accelerate the shift to sustainable and smart mobility
 - Developing new green jobs and economic opportunities linked to the green transition
 - Developing local and renewable energy sources, thus halting the loss of biodiversity



The EU Green Deal and the Eastern Partnership:

Impacts

- In the EU Neighbourhood, including the EaP, there will be direct and indirect impacts from the Green Deal.
- Direct impacts:
 - EU support and EIB/EBRD financing for the EaP will focus even more strongly on climate action, energy efficiency, renewables, clean transport
 - Enhanced performance standards for specific products (e.g. white goods) will require redesign over time
 - A Carbon Border Adjustment Mechanism is almost certain to be introduced to prevent carbon 'leakage'
- Indirect impacts:
 - Fuel switching of e.g. vehicles or home heating to electricity will reduce demand for some products over time (e.g. engine/boiler parts, oil products)
 - Increased environmental concerns will change consumption habits



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EU4Climate

Discussion meeting on EU's Green Deal and CBAM The Theory of carbon pricing: carbon taxes and carbon markets

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Agenda

- Why pricing carbon
 - Market failures and government intervention
- How pricing carbon
 - Market based instruments: taxes vs. markets (prices vs. quantities)
 - Which is better? Carbon tax vs. carbon markets
- The practice of designing and implementing carbon pricing
 - Carbon leakage risk -- the problem
 - Carbon leakage risk -- available solutions:
 - Free allowance allocation
 - Carbon Border Adjustment Measures
 - Linking carbon markets
- What does an EU CBAM mean for the UK?





Why pricing carbon

Environmental externality, market failure and environmental regulation



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Why pricing carbon

- When there are externalities, markets tends to over produce (if negative externalities) or under produce (if positive externalities).
- In other words, markets do not function properly because they do not allocate resources in the most efficient way.
- Governments can correct ("internalise") externalities through policy action.

VOLUME III OCTOBE	R 1960
THE PROBLEM OF SOCIAL COST R. H. COASE University of Manifes	
I. The Problem To BE Examined ¹	JOURNAL OF ECONOMIC THEORY 5, 395-418 (1972)
THIS paper is concerned with those actions of business firms we harmful effects on others. The standard example is that of a factory t from which has harmful effects on those occupying neighbouring p The economic analysis of such a situation has usually proceeded in t divergence between the private and social product of the far.ory, economists have largely followed the treatment of Pigou in <i>The Econ</i> <i>Welfare</i> . The conclusions to which this kind of analyris seems to most economists is that it would be desirable to make the owner of th liable for the damage caused to those injured by the smoke, or alter to place a tax on the factory owner varying with the amount of sm duced and equivalent in money terms to the damage it would cause, c to exclude the factory from residential districts (and presumably fr	Markets in Licenses and Efficient Pollution Control Programs* W. DAVID MONTGOMERY Division of the Humanities and Social Sciences, Colifornia Institute of Technology, Pasadena, California 91109 Received May 19, 1972
¹ This article, although concerned with a technical problem of economic anal out of the study of the Political Economy of Broadcasting which I am now c The argument of the present article was implicit in a previous article dealing problem of allocating radio and television frequencies (The Federal Comm Commission, 2). Law & Econom 1995) but comments which I have received suggest that it would be desirable to deal with the question in a more explicit without reference to the original problem for the solution of which the analys veloped.	1. INTRODUCTION Artificial markets have received some attention as a means of remedyin market failure and, in particular, dealing with pollution from vario sources. Arrow [1] has demonstrated that when externalities are prese in a general equilibrium system, a suitable expansion of the commodi space would lead to Pareto optimality by bringing externalities under the control of the price system. Since his procedure is to define new commo ties, each of which is identified by the type of externality, the person why produces it and the person who suffers it, his conclusion is pessimist Each market in the newly defined commodities involves but one buy and one seller, and no forces exist to compet the behavior which wou
Source: <u>Coase (1960)</u> <u>Montgomery (1972)</u> Explainers:	bring about a competitive equilibrium. On the other hand, many forms of pollution are perfect substitutes f each other. Sulfur oxide emissions from one power plant trade off in til preferences of any sufferer with sulfur oxide emissions from some oth power plant at a constant rate. This fact leads to the possibility establishing markets in rights (or "licenses") which will bring togeth many buyers and sellers. Dales [2] has discussed a wide variety of suc arrangements. Unfortunately, because of the elements of public goods present in mo environmental improvements, it appears unlikely that markets in right containing many sufferers from pollution as participants, will lead i overall Pareto optimality. They can only serve the more limited, but st
What is a carbon price and why do we need one?	*Parts of this article appeared in my Ph.D. dissertation "Market Systems for the Control of Air Pollution," submitted to the Department of Economics at Harva University in May, 1977. Research on this theirs was partly supported under Gra No. AP-00842 from the Environmenial Protection Agency to Walter Isard. I am al- indebted to Kenneth Arrow and James Quirk for valuable advice. Needless to sa all errors are solely the responsibility of the author.

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ECC EDINBURGH CLIMATE CHANGE INSTITUTE How pricing carbon

Putting a price tag on carbon



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How pricing carbon

Non market-based policies

Command-and-control policy (permission, prohibition, standard setting and enforcement).

Euro standards	Entry into force		Emission limits	Emission limits		
	New approvals	All new registrations	Petrol NOx	Diesel <u>NOx</u>	Diesel PM	
Euro 0	1 Oct 1991	1 Oct 1993	1,000mg/km	1600mg/km	(no limit)	
Euro 1	1 Jul 1992	31 Dec 1992	490mg/km	780mg/km	140mg/km	
Euro 2	1 Jan 1996	1 Jan 1997	250mg/km	730mg/km	100mg/km	
Euro 3	1 Jan 2000	1 Jan 2001	150mg/km	500mg/km	50mg/km	
Euro 4	1 Jan 2005	1 Jan 2006	80mg/km	250mg/km	25mg/km	
Euro 5	1 Sep 2009	1 Jan 2011	60mg/km	180mg/km	5mg/km	
Euro 6	1 Sep 2014	1 Sep 2015	60mg/km	80mg/km	5mg/km	

Market-based policies

Price-based instruments (e.g. taxes and subsidies) and

Quantity-based instruments (e.g. cap-and-trade schemes and renewable obligation certificates)



Carbon trading



Carbon taxes

Further readings: <u>Economic Incentives Versus</u> <u>Command and Control: What's</u> <u>the Best Approach for Solving</u> <u>Environmental Problems?</u>





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Tax vs. carbon markets: key differences

- With a tax, the price of emitting a unit of pollution is fixed, but the total quantity of emissions is not.
- With a cap-and-trade, the total quantity of emissions is set but the price of the permits vary depending on the demand for permits
- In an ETS, the carbon price may be higher when the economy is booming and lower during a downturn

Track, visualize, and download carbon prices from emissions trading systems around the world https://icapcarbonaction.com/en/ets-prices

Explainers: Which is better: carbon tax or cap-and-trade?







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Tax vs. carbon markets: simplicity vs. flexibility

 A carbon tax can be easier to implement as it often uses the established channels of the tax system and does not require new infrastructure for trading emission permits

• A carbon market provides more flexibility: for example, provisions such as offsets, and provisions to bank emission permits give regulated firms options for where and when to reduce emissions



Hobal Green Growth

Source: Doda (2014)

Explainers: Carbon Pricing 101





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Climate Change and the Environment



Who is pricing carbon around the world?



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CARBON TAX RATES IN 2019 (USD/TCO2)







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How do cap-and-trade programmes work?

Set-up and design: the case of the European Union Emission Trading System EU ETS



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Carbon market set up



EU ETS stationary was implemented in an effort to reduce CO, emissions

2020

-21%

as compared

to 2005

-21% target

20

2030

- 43%

as compared

to 2005

Source:



Richard Schmalensee* and Robert N. Stavins**

The design of environmental markets:

What have we learned from experience

by GILBERT E. METCALF

Oxford Review of Economic Policy, Volume 33, Number 4, 2017, pp. 572-588

Date: DECEMBER 10, 2020

with cap and trade?

I. Introduction

Some readers may not recall that just 30 years ago the notion of a government allocat-ing tradable rights to emit pollution was novel, indeed controversial. Most environmen-tal advocates were hostilt to the concept of trading rights to pollute', and others were sceptical about the feasibility of such market-based approaches to environmental protection. Nearly all pollution regulations were of a conventional 'command-and-control' variety, setting uniform emission limits or specifying the pollution-control equipment to be used.

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target -43%



Source: Burtrow and Lofgren (2020)

Evolution of market design for emissions trading – economic theory meets real world

Dallas Burtraw¹ and Åsa Löfgren²



Dallas Burtraw is Darius Gaskins Senior Fellow at Resources for the Future. He has provided technical support in the design of carbon diaxide emissions trading programs in the Northeast states, California, and the European Union. Burtraw currently serves as Chair of



Introduction

Asa Löferen is Associate Professor at the Department of Economics As Longers is Associate Professor at the Department of accounts, University of Gottenburg, Her main research focus is on climate change and efficient environmental regulation, including behavioral agrects and distributional outcomes of climate policies. Udgren is principal limestigator and part of the management teams of the Mistro Controb Int Research Program and also the Center for Collective Action Research at the University of Gothenburg. She served as a council member of the Sweich Cimate Policy Council 2018-2020.

In this article we consider the institutional

The theoretical advantages of carbon pricing in which carbon pricing is introduced including many preexisting standards and are well-known to environmental econo- regulations. We describe the shortcomings o mists. A carbon tax sets an explicit price on a conventional emissions trading program to carbon emissions that provides an incentive incentivize significant emissions reduction carbon emissionis trait provides an interentive indentivate significant emissions resourcions to the EU ETS as a quantity limit on emissi- megaratic can be improved to samplify the cel-sions and allow emissions rights (often fertiveness of existing regulations, and over remend "allowance") to be traded, which time, evolve to arrengthem the influence of identifies a price. Both approaches assign the price signal it provides and improve the a value to carbon emissions that causes cost effectiveness of overall climate price and the signal polluters to account in their decision-making for the damages that accrue to society The problem of low prices

from carbon emissions. In a world with no uncertainty and full information, these two Policy makers have nearly three decades of

approache's yield the same marginal incen- experience using cap and trade to address tives that achieve equivalent cost-effective emissions of sulfur dioxide and nitrogen emissions reductions and social welfare. oxides, and more recently carbon dioxide. Due to its theoretical advantages carbon A prominent concern—especially of indus

pricing has strong advocates within the try—has been that prices might spike to (foremost economic) research communi- unacceptable levels. Experience has been y (Baranzini et al 2017), but also many the opposite; allowance prices in emissions

Source: Burke and Taschini (2020)

COVID-19, emissions trading and the implications for a future UK ETS

Commentary on 31 March 2020

The impact of COVID-19 on the price of carbon illustrates just how important it is to build flexibility into cap-and-trade systems and this is something policymakers should remember for the design of the UK's post-Brexit emissions trading system, argue Josh Burke and Luca Taschini.

The spread of COVID-19 across the globe has seen commodity prices taking a battering from the turbulence of stock markets, which have experienced unprecedented pandemonium for the last two months. According to the Bloomberg Commodity Index 7, commodity prices are down by 23 per cent since the start of this year.

The price of carbon is no exception. Despite being one of the best performing commodities over the last 18 months, reaching highs not seen since 2008, it has not escaped this bear market. At the time of writing, prices have fallen by almost <u>30 per cent</u> 7 over the last two months.

Why are emissions trading schemes vulnerable?



Authors

Josh Burke Senior Policy Fellow

Luca Taschini Associate Professorial Research Fellow

How does a carbon market work?

Emission allowance

An emission allowance offers the right to emit 1 tonne of CO., All EU ETS companies must surrender one emission allowance for each tonne of CO they have emitted over the course of the year.



Within the EU ETS, a maximum number of emission allowances is available: this amount equals the total allowable volume of CO_ emissions, or cap.



Trading consists of emission allowance transactions

Companies with insufficient allowances must purchase allowances to cover their deficit. surplus allowances.

Companies with lower CO, emissions may sell their



The emission allowances market operates on a supply and demand basis, effectively attaching a price tag to all CO, emissions. Businesses try to choose the most cost-effective option:



This system, whereby each company weighs the relevant pros and cons, ensures that the cheapest CO reduction measures are taken first





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Carbon leakage

Problem and solutions



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Carbon leakage

- Long-standing concern among policymakers: unilateral and ambitious climate policies may lead to carbon leakage - where production shifts offshore to countries with less stringent climate policy
- Carbon leakage typically focused on energy- and carbon-intensive industrial sectors.
- Sectors exposed to international competition:
 - emissions are considered 'hard to abate',
 - low-carbon technologies either have not yet been found or are too expensive.



Source: Dechezlepretre and Sato (2017)

Explainers: Carbon Pricing 301



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Carbon leakage concern and solutions

- Carbon leakage concerns have been addressed by largely shielding industry from the impact of the carbon price.
- Empirical evidence suggests that current carbon policies have had little impact on leakage (Dechezleprêtre and Sato, 2017; Venmans et al., 2020).
- Textbook solutions:
 - Free allocation to energy-intensive, tradeexposed [EITE] sectors;
 - ETS expansion and/or linking systems;
 - Carbon border adjustment measure.

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YNTHESIS ARTICLE	Check for updates	
Carbon pricing and competitiveness: are they at odd	;?	
rank Venmans ^a , Jane Ellis ^b and Daniel Nachtigall ^b		
Department of Microeconomics, University of Mons, Belgium; ^b OECD, Environment Directora	te, Paris, France	
 ABSTRACT This paper reviews ex-post empirical assessments on the impact of carbon pricing competitiveness in OECD and G20 countries, primarily in the European Union, in the electricity and industrial sectors. Most of these assessments find no statistica significant effects of carbon pricing or energy prices on different dimensions competitiveness, including net imports, foreign direct investments, turnover, valadded, employment, profits, productivity, and innovation. When statistical significant results have been found, the magnitude of such effects tends to 10 small carbon price levels of the abcause of exectors international competitiveness have not con to pass, at least to date. These findings are in part because carbon price levels habeen low and because of exectors international competitiveness have not con to pass, at least to date. These findings are in part because carbon price levels of free allowances to firms covered by emissions trading schemes. Key policy insights Most of the studies reviewed in this paper find no statistically significant effects carbon pricing or energy price fluctuations on different dimensions competitiveness (employment, profits, productive) passes long torm trends in overall ener costs have a small effect compared to other trends. Moreover, carbon cor levide on industry have been low, either because of carbon tax heaks or fullowances to firms. Grabon pricing has a small and positive effect on productivity and innovation. particular all studies report tastistically significant increases in patenting. Studies that find small negative competitiveness effects tend to focus on nimports and outward foreign direct investment. 	A RTICLE HISTORY Received 20 December 2019 KEYWODDS For Environmental regulators, carbon principal carbon principal regulators, carbon principal regulators,	Source: <u>Venmans (</u> Explainers: <u>Carbon Prin</u>







2020)

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Carbon leakage - long term low-carbon framework

- The current solutions (free allocation) may have provided adequate protection against leakage while carbon prices were low.
- Robust leakage protection going forward might require alternative solutions to support a long-term low-carbon investment framework

The EU carbon price has soared this year as governments have upped their climate pledges



Source: FT May 2021





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Carbon leakage

Current solution: free allocation of permits



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Free allowances in the EU ETS

- Free allowances were generously allocated in Phases I and II to compensate firms for the potential competitiveness impacts.
- The justification for free allowances in Phase III has shifted towards addressing carbon leakage for energy-intensive trade-exposed sectors (see Directive (2009/29/EC).







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Source:

EU ITRE Committee (2020)

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Carbon leakage

ETS expansion and linkage



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EU ETS expansion

- Green Deal: cut emissions in energy systems, mobility, heating, and agriculture.
- The Commission considering implementation of an encompassing carbon-pricing mechanism covering all relevant sectors.
- To implement uniform carbon pricing, the Commission announced its intention to widen the scope of the EU-ETS by 2021 to beyond the industry and energy sectors (European Commission 2020a).



Clean Energy Wire



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EU ETS linkage

• Linking systems across borders via full fungibility creates larger markets

- Contributes to a level playing field that can facilitate international cooperation
 - Alleviates competitiveness concerns among economies;
- Direct unrestricted linking can lead to price convergence, mitigating carbon leakage.



Source: ICAP ETS Brief #4 Linking ETS

Source: ICAP Linking





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Carbon leakage

Carbon Border Adjustment Measure



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Carbon border adjustment measure on import

- The principal idea behind the CBAM would be to levy a charge on imported goods equivalent to the carbon payment of the same domestically produced good.
- Ideally, all goods consumed in the EU would face the same carbon price, irrespective of globally diverging climate policies.



Explainers: VOX EU CEPR – Pricing carbon within and at the border of Europe





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Carbon border adjustment measure on import and export

- Limiting the BCA to applying only to imports would not address the distortion caused by less stringent climate policies outside the EU
- EU companies could remain less competitive on external markets and, accordingly, not remove the risk of carbon leakage.



Explainers: VOX EU CEPR – Pricing carbon within and at the border of Europe



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Carbon leakage

What does an EU CBAM mean for the UK?



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Economic impacts on sectors and industries

- Two scenarios: 'narrow' CBAM covers only raw material products 'broad' CBAM covers both raw material and semi-finished products
- UK's raw-material steel, aluminium and plastic sectors would face £663.55m, £192.74m and £172.75m tax liabilities, respectively.
- Broadening the scope to include semi-finished products, tax liabilities across steel, aluminium and plastic are higher but remain the same for paper and cement.
- A narrow CBAM captures almost all materials at risk of leakage in cement and paper.



Figure S3. Annual potential tax liabilities on UK exports to EU

Source: Burke et al (2021)



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High-level recommendations for UK and take-aways for Belarus

- A **robust carbon pricing framework** is needed to support UK deep decarbonization and to be consistent with carbon policies of commercial/trade partners (EU)
- High convergence and **collaboration**, characterised by carbon market linkage, remain high priority:
- 1. Bring additional effort- and risk-sharing benefits (Doda and Taschini, 2017; Doda Quemin and Taschini, 2019).
- 2. linking provides a common platform on which to collaborate with the EU on anti-carbon leakage measures, which would also serve to mitigate the economic impacts to the UK of the EU CBAM.
- Alignment with the EU CBAM:
 - broader context of engaging with and forging close **multilateral cooperation** and a common approach to the design and implementation of the EU CBAM.
 - Failure to make this engagement risks the UK being forced into adopting a policy without having a say over the design and governance in other words, it would be a **'rule taker'**.





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Thank you!

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