

Managing Carbon Emissions: a refundable excise duty on carbon *extraction* rather than on its emissions.

A concrete alternative system incorporating stronger inherent incentives.



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"A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

Max Planck

Despite the diplomatic optimism regarding the outcome of CoP 21, it is important to recognize that the conference may equally be considered as a failure or, equally disastrous, of settling for compromises that failed to fully grapple with the issues at hand. Indeed, such is the case with the climate change compromises currently in place, their façade of efficacy notwithstanding. Therefore, is it not critical that we pause to reevaluate our current strategies and recognize that the moment has come for a true paradigm shift?

We continue to confront the challenge of implementing a reliable system for evaluating, overseeing, and taxing emissions of carbon dioxide (CO₂) and other greenhouse gases (GHGs). The discourse surrounding these issues clearly reveals a disconcerting lack of appreciation for their gravity: we seem to be debating treatments for hypertension when, in reality, our patient is on the verge of a heart attack. If CoP 21 runs the risk of failure, it is not so much the fault of a crippling and pervasive dearth of enthusiasm as it is the fault of the current system for calculating and measuring emissions, which at present only underscores our disagreements. The situation is paradoxical: global differentiated solidarity, which ought to be at the heart of these negotiations, demands complete, shared trust in this measurement system. Is it not therefore urgent that we reevaluate current strategies and seek a paradigm shift?

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Illustration: Pukara. Aboriginal artwork by Iyawik Wikilyiri of the Tjungu Palya Center for Art. Work exhibited at the Aboriginal Signature Gallery, Brussels. Dimensions of the original work: 200x120 cm.

Context



1.1 Two decades of stymied negotiations .

One of the critical issues facing the 21st Conference of the Parties at the United Nations Framework Convention on Climate Change (CoP 21) involves the many and disparate methods for controlling greenhouse gas emissions: how can we embrace and – most importantly – promote compliance with these various strategies? Our concern is only with emissions sources that the scientific community has deemed responsible for current (and future) global warming.³ We dismiss here the small minority of scientists who continue to question the existence of global warming or the extent to which human activity contributes to it.

The climate of a period – in our case, the period defined by the rise of human civilization, the so-called “Anthropocene period” – hangs in a delicate state of equilibrium. Due to this fragility, it is surely wisest to avoid the proverbial “straw that breaks the camel’s back.” Where climate change is concerned, that straw is the 2°C mark: should average global temperatures rise by more than 2°C, we run the risk of consequences that are no longer gradual and subtle, but devastating and abrupt, similar to the aftermath of an avalanche or earthquake. Such cataclysmic events could swiftly shatter the planet’s overall climate balance.

We now confront a critical challenge: how to define, implement, and ensure broad adoption of a reliable system for evaluating, overseeing, and taxing GHG emissions? Of particular concern are CO₂ emissions derived from use of carbon-based fuels, including (but not limited to) fossil fuels: e.g., petroleum; coal; gas; peat; bitumen; and industrial biomass (wood or pellet form), especially when used to generate heat. However, the discourse surrounding these issues reveals a disconcerting lack of appreciation for their gravity: we seem to be quibbling over treatments for hypertension instead of recognizing that a heart attack is imminent. In addition, the fossil fuel industry continues

³ For short animated teaching videos that explain key factors affecting climate, see <https://www.youtube.com/watch?v=f3a90Ct6d-U>.

to receive enormous subsidies totaling billions of dollars, particularly in developing countries; the price of such fuels thus remains artificially low.⁴

It is important to recognize that, whatever its immediate outcome, the CoP21 conference does run the risk of failure. Among the potential causes of such a defeat is the lack of political will on the part of some stakeholders (states, industrial/economic sectors, etc.). However, just as serious are the constraints inherent in the current strategies for emissions regulation. For instance, taxes are levied on GHG emissions themselves, despite the fact that such emissions are difficult to measure and monitor. These taxes are inconsistently enforced, which only compounds the current system's dearth of incentives to promote compliance.

These problems are a matter of great concern: after all, as we grapple with climate change, global solidarity is essential. Such solidarity demands that all stakeholders take part in this movement to the extent that their circumstances allow (e.g., different contributions would be expected from developed versus developing countries). Such participation hinges in turn on shared, complete trust in the current strategies for emissions reduction and measurement.

1.2 Limitations in the strategies currently under consideration.

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As previously mentioned, the current strategies for reducing emissions face three major limitations.

The first major limitation lies in the difficulty of determining the cost of “emissions permits.” Without first knowing this cost, it is impossible to fix a price for these permits on the carbon market. Two major systems of emissions quotas and/or carbon taxes have been delineated. These systems should, in theory, make it possible to integrate and monitor the vast array of small, disparate emissions sources. In addition, they should create incentives to promote a transition toward products or activities with a reduced (or wholly eliminated) climate impact. Thus, as originally envisioned, the emissions quotas program ought to resemble a young family seeking to rent an apartment or a house before having the resources to purchase it.

These systems ought to draw a distinction – at least a temporary one – between the price of the carbon emitted by existing facilities (via the notorious “licenses to pollute”) and the price of the carbon associated with new ventures/start-ups investments and products/facilities generating lower levels of emissions.⁵ Unfortunately, the various efforts to implement such a system for regulating carbon emissions, particularly in Europe, have proven to have serious limitations. Carbon emissions quotas are set in a

⁴ Estimates of the global subsidies granted to fossil fuels and nuclear energy range from 550 to 5600 billion USD per annum; estimates differ based on the definitions adopted and methods of calculation employed. See http://www.ren21.net/wp-content/uploads/2015/07/REN12-GSR2015_Onlinebook_low1.pdf.

⁵ A similar strategy was successfully employed in the 1980s, during a campaign to reduce emissions responsible for acid rain. In the EU, targets for reducing these emissions were reached five years ahead of schedule.

relatively arbitrary manner and cannot readily be scaled up to a global level or applied to a wide range of activities (e.g., heating buildings). These limitations are especially pronounced in times of economic crisis. Emilie Alberola, director of the Carbon and Energy Market research unit at CDC Climat, has stressed that due to these weaknesses in the quota system, economic agents lack incentives to make the long-term investments (30 to 50 years) necessary for reduction of CO₂ and other GHG emissions. As a result, true “decarbonization” of the world’s energy will likely be stalled for decades to come.

In sum, the existing carbon emissions market fails to create a coherent, effective, and reliable system for controlling emissions. Above all, it does not offer incentives powerful enough to trigger a dramatic reduction in the scale of emissions, nor does it supply the financial means for a genuine energy transition.

A second major limitation involves “externalities.” This term refers to the social and environmental (particularly in relation to climate change) impacts of fuels and other GHGs or activities involving them⁶. Since final sales prices do not typically reflect the significant downstream costs stemming from these externalities, the fuels are perpetually sold at a loss. This cycle is unacceptable and clashes with the values of a liberal economy. It is important to recognize, too, that these losses are absorbed by states, not by businesses; in order to cope, states must take on additional debt or raise taxes/increase their citizens’ social security contributions. As might be expected, the public bitterly resents such efforts to raise revenues. Yet when efforts are made under the current system to roll the cost of externalities (especially climate externalities) into product prices, the results are problematic: such products are invariably too expensive to be competitive and thus fail to find purchasers outside a few “niche” markets.

A third major limitation lies in the financial burden that the energy transition places on states. Many developing countries lack the necessary resources for such a transition, others are (deeply) mired in debt, and still others remain extremely hesitant to fund such complex endeavors. While many countries have promised financial support, only a few have followed up on their pledges: as the saying goes, *a promise only binds believers*. Consequently, contributions have fallen far short of expectations and there remains a pressing need for funds.

⁶ A prime example of the cost of these externalities: in France, the external cost of removing excess nitrogen (derived from fertilizer use) from water can reach 100000 €/tonne, even as the sales price of the fertilizer fluctuates between 500 € and 1000 €/tonne. This vast difference is due to the fact that the plants only remove 50% of the fertilizer

2. An alternative, incentive-based proposal for controlling GHG emissions.



In light of these issues, it is therefore right – indeed, urgent – that we recognize that the moment has come for a true paradigm shift, a shift toward a more holistic and integrative solution. We envision a dynamic system wherein the longstanding coercive measures meant to promote compliance are paired with equally powerful inherent incentives. Only through such an approach can we hope to realize our ambitious goals for reducing GHG emissions, goals that challenge us to act swiftly and dramatically.

We thus face a unique challenge: how to internalize these collective expenses, particularly those costs incurred in the effort to control GHG emissions? As a corollary, we must also ask: how do we incorporate externalities, including their associated costs and the collective constraints they impose, into the options available to, and the decisions made by, economic agents? Jean Tirole, Nobel laureate in Economics, has urged that a carbon tax be levied in conjunction with a system of “green funds.” These would in turn be linked to a trading market wherein a multilateral governing organization would assign or auction off redeemable permits to participating countries. States choosing not to participate would be penalized by excise duties imposed at the borders by the WTO, the ECB, or an institution specifically created to fill this role. The system would establish an adjustable “corridor” for the price of carbon. However, country participation would be purely voluntary in the interest of ensuring adequate follow-through.

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2.1. The two components of the excise duty/refund strategy .

Toward this end, we propose replacing taxes on emissions of carbon and other GHGs with a new system consisting of two interlocking components:

- a) The first component consists of an Excise Duty on Extraction of Fossil Fuels and Primary Production of Greenhouse Gases (GHGs). The duty would apply particularly to carbon derived from fossil fuels but also to GHGs derived from other sources, both synthetic and non-synthetic, including timber, fluorocarbons, methane, and incinerated waste;
- b) The second component involves a scalable refund that would make it possible to reclaim (via COCs) the excise duty levied upstream, in whole or in part.

Refunds would be granted in exchange for a reduction in, or complete elimination of, the emissions linked to the use of substances with a global-warming potential. Examples of activities eligible for refunds include: cogeneration of energy, including cogeneration involving renewable energy sources; production of polymers and other long-lasting and/or non-emissive products; and demonstrated development of more energy-efficient processes or installations, as well as recycling, fixation, or long-term storage of GHGs.

At the global level, the excise duty would be intrinsic and therefore more readily implemented: there are, after all, innumerable immediate sources of GHG emissions, versus relatively few sources of *extraction/production* of GHG-emitting materials.

The great advantage of this combination – i.e., excise duties coupled with refunds – is that it provides inherent incentives to promote compliance: could there be a more effective strategy?

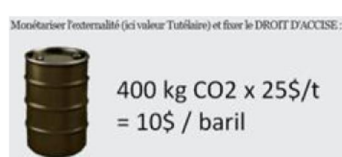
2.2. Effective implementation of the excise duty/refund strategy.

2.2.1 Levying the excise duty.

Some 30 gigabarrels of petroleum are extracted each year. Let us now suppose that the excise duty on petroleum is fixed at 10 USD/barrel (25 USD/tonne) – not an insurmountable financial barrier for immediate users and consumers – and that the price of the barrel ranges from \$40 to \$110. As such, the excise duty on petroleum alone would generate at least 300 billion USD. These revenues would then be used to distribute refunds as determined at the Copenhagen Summit. Refunds would be granted in exchange for a reduction in, or complete elimination of, the emissions linked to the use of or extraction/production of substances with a global-warming potential.



Determine a reference value



Monetize the externality
(reference value used here)
and set the excise duty rate.



Calculate total revenues associated
with the excise duty.

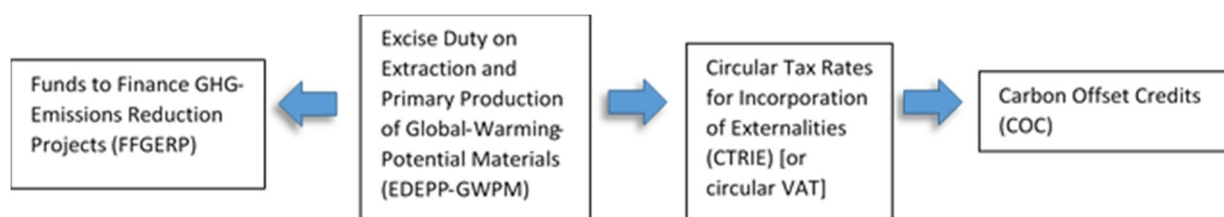
These calculations do not take into account potential revenues from excise duties on coal; traditional natural gas sources or shale gas; or industrial biomass (wood and pellet form). The excise duty would be levied on the basis of the quantity of material extracted, and thus would be impervious to the fluctuations of markets that are, after all, inherently speculative (consider the case of trading markets for CO₂ emissions permits). In addition, after signing a treaty pledging its participation, each country would be obliged to levy the duty regardless of whether the GHGs (or other products associated with climate externalities) were extracted within the country or were imported from

elsewhere. The process would resemble the system proposed by Jean Tirole, though in this case, the duty would be levied not on GHG emissions, but on extraction of GHG-producing materials.

2.2.2. Reclaiming the excise duty in whole or in part: the refund component.

In order to provide full or partial refunds of the excise duty levied upstream, we propose the implementation of a tax recovery rate scheme. Certificates would be issued indicating monetizable “climate externalities” associated with a good, service, or activity. This system would make it possible to identify products or processes that generate lower GHG levels or avoid generation of GHGs altogether. Like the European VAT, this Circular Tax Rate for the Incorporation of Externalities (CTRIE) could be incorporated into traditional tax schemes. However, taxes should not rise for those consumers who adopt strategies to selectively reduce their own climate externalities. This plan is closely linked to the Carbon Added Tax (CAT) proposed by Laurent and Cacheux.⁷ However, while the CAT would seek to control emissions linked to the process of GHG importation, it would not address the significant issue of the cost of climate externalities associated with the production of imported goods.⁸ The CTRIE would take such considerations into account.

If deemed appropriate, the CTRIE could incorporate additional externalities, direct and indirect – including effects upon the environment, public health, and society at large. Examples include the issues discussed in the UN’s list of Millennium Development Goals.⁹ The tax would be calculated using methods (e.g., Life Cycle Analysis [LCA]) already in place for monetizing these externalities. Other tools for monetization of various externalities, both positive and negative, are also available or are in development; Fondation 2019¹⁰ has been particularly active in this field.



In order to implement the Excise Duty on Extraction and Primary Production of GHGs, we must develop strategies to make the duty broadly applicable and to monitor its collection. To ensure compliance, a source-tracing system (similar to those adopted in

⁷ See <http://www.ofce.sciences-po.fr/pdf/revue/5-122.pdf>.

⁸ In France, for instance, the carbon footprint has increased by 15% since 1990, even as direct emissions declined by 7%!

⁹ See <http://www.un.org/fr/millenniumgoals/>.

¹⁰ For more information about Fondation 2019’s endeavors, see content/uploads/2013/03/MISSION-TVA-CIRCULAIRE-V20110216.pdf.

some food industry sectors) must be instituted. This is particularly true in the case of imports.

As a tentative conclusion...



Ultimately, this alternative proposal would resolve three of the major difficulties that policymakers have encountered in the current paradigm:

- 1- Emissions are so numerous and so varied that it has become nearly impossible to comprehensively measure and control them at the worldwide level. The current paradigm ignores the carbon footprint linked to indirect, extraterritorial emissions (those linked to imports/exports of finished products).
- 2- Much of the responsibility for Green Funds promoting the energy transition has long devolved upon states (i.e., those responsible for “the commons” or “common goods”). This is a significant burden, particularly in light of heavy national debts. Would it not be more equitable for economic interests to assume a major role in supporting these funds? After all, these same interests have reaped nearly 200 years’ worth of direct benefits from the cycle (described above) of selling these fuels at a loss.
- 3- not taking into account the carbon footprint related to indirect emissions outside the territory related to imports / exports of finished products.

The challenge of paradigm shifts: contending with mental inertia.

Despite its potential benefits, this proposal must first confront the “resistance to change” that characterizes political stakeholders – and, indeed, even economic stakeholders – in our “advanced” societies. All those seeking solutions to climate change will have to cope with this powerful inertia, along with a widespread refusal to accept lucid reasoning (people are instead determined to “stay optimistic”). Thus, a paradigm shift will demand the engagement and support of a concerned public, a public that realizes the urgent need for ambitious goals and powerful strategies aimed at reducing carbon emissions. Though such public support and ambitious goals/strategies are not as yet in place, this ought not to deter us. In the spirit of Romain Rolland, we must « **combine the pessimism of the intelligence with the optimism of the will !** » ##