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LETTER TO POLITICIAN ON NATIONAL CARBON CREDIT SYSTEM

AND THE CREATION OF A CARBON PRICING INSTRUMENT THAT IS COMPETITIVE GLOBALLY

* Summarize the problem, policy, and history associated with the topic
  + Employing economic thought and reasoning to problem identification
* Recommend a policy approach to correct the issue(s)
  + Describing the rationale in support of your recommendation that conforms to accepted environmental economic theory
* Acknowledge, and speak to, issues of efficiency and equity associated with policy impacts

National Carbon Credit System

Arayana Janson

**National Carbon Pricing Instrument**

Dear Members of the US Climate Alliance[[1]](#endnote-1):

Of the 195 countries in the world[[2]](#endnote-2), 189 of these have some sort of emissions reductions agendas fashioned towards meeting Paris Agreement goals. In other words, 97% of the world’s nations have become party to the Paris Agreement[[3]](#endnote-3). The US is the second biggest single-nation contributor to CO2 emissions (after China).[[4]](#endnote-4) The US has pulled out of the Paris Agreement while citing the heavy economic burden (said to be lopsided in favor of China[[5]](#endnote-5)) as well as the general reduction in national emissions.[[6]](#endnote-6) The US leaving the Paris Agreement could give China the global boost it seeks as the world’s largest producer of wind and solar and as the world’s largest investor in green energy.[[7]](#endnote-7)

This is prime time for jumping on the carbon pricing initiative—and doing so could incentivize innovation while also addressing the climate change market failure and corresponding (pollution damage) externalities.[[8]](#endnote-8),[[9]](#endnote-9) We already know from environmental economic theory that putting a price on carbon is a better idea than doing nothing[[10]](#endnote-10), in that it is more likely to bring us towards a sustainable outcome and increase net social benefit towards the social optimal[[11]](#endnote-11). If we as a nation abstain from monetizing or quantifying the act of sequestering carbon, we’ll be making policy decisions based on peoples’ norms or opinions while implicitly giving a value of zero to sequestering carbon.[[12]](#endnote-12) Emissions trading systems function efficiently because firms can work together to optimize their costs since firms respond ‘equimarginally’. Using a market-based instrument like a cap-and-trade model—which allows Coasean bargaining and allows firms to reach their caps optimally—is more cost-effective and requires that we as policymakers hunt down less information from the firms (in order to derive what is needed legislatively, as in, a permit quantity). The price (or, in this case, quantity permitted) of a carbon credit needs to reflect the damages that are occurring in the environment and to human health, because, otherwise, we will be subsidizing (as we are now and have been) the price of pollution and paying for pollution through higher healthcare costs, for example. If we grandfather permits, or limit certain areas of competition in the market, parties are more likely to participate in the carbon market.[[13]](#endnote-13)

If we assign a value to carbon credit emissions, we are ascribing to the idea of weak sustainability wherein we can substitute natural capital for other forms of capital. By giving a value to carbon emissions, we are assigning (a value to) the right to pollute and will create policy accordingly. Such policy assumes the commonly accepted definition of sustainability in environmental economics, or, upholds the premise that utility should not be decreased (or, that production that uses inputs from the environment or that represents sacrificing the environment and that uses inputs from households or consumption of goods should continue to increase into the future) in order to achieve or maintain sustainability.[[14]](#endnote-14)

Meanwhile, coronavirus has accelerated innovation gains and threated traditional manufacturing[[15]](#endnote-15), while global demand for oil has been slashed. The pandemic has dramatized the already impending decline[[16]](#endnote-16) of the US fracking boom[[17]](#endnote-17),[[18]](#endnote-18) and has given rise to questions of whether we’ve reached peak oil demand or supply.[[19]](#endnote-19) The oil and gas industry has been underperforming for a while[[20]](#endnote-20), and the pandemic has lowered US demand by 5-10%[[21]](#endnote-21), with a predicted international drop in demand of 50%[[22]](#endnote-22). Autonomous taxis have already hit the road,[[23]](#endnote-23) while gas-powered car makers are paying out the nose[[24]](#endnote-24),[[25]](#endnote-25) for carbon credits from electric vehicle producers and striving to get on the EV wave.[[26]](#endnote-26),[[27]](#endnote-27) Tesla received $428M in carbon credits in the second quarter of this year, almost as much as it earned from selling cars in the same quarter ($418M).[[28]](#endnote-28) Carbon credits are currently a big part of the reason electric vehicle producers are in the black.[[29]](#endnote-29) California’s deal with 5 automakers will hold automakers accountable to emissions reductions standards that are more stringent than current federal limits.[[30]](#endnote-30)

A large regulatory body and legislative effort for a country the size of the US aimed towards carbon emissions reductions would require a whole lot of investment (although hypothetically less-so than what would be required for tax regulation); therefore, our approach should be (cost-effective) and should stick. If the system and mechanism is established correctly, our investment would pay off not only in terms of increased social benefit but also potentially in terms of participation in an (impending) international market. The international market, however, will most likely not effectively reduce pollution well unless all countries are participating (even developing ones)—as seen by the 2012 EU-CER carbon credit trading system collapse that was established under the UN’s CDM (Clean Development Mechanism).[[31]](#endnote-31) The onus of producing dirty energy is pushed onto developing countries if not every country participates.

We’ve seen the failure of Kyoto (and the impending lack of compliance regarding Paris) with regards to carbon leakage; while Kyoto-participant countries’ self-reported carbon emissions levels decreased, their overall carbon footprints were not, given dirty energy imports.[[32]](#endnote-32),[[33]](#endnote-33) A dirty energy import tax is the clearest way to go for such scenarios, a likely case anyway for non-Paris-participants like the US in the near future.[[34]](#endnote-34) However, Kyoto wasn’t and Paris isn’t an enforced agreement—and, although the concepts of “transparency” and “accountability” are written into the Paris Agreement[[35]](#endnote-35),[[36]](#endnote-36)—and the current likelihood of nations arriving at an effective market mechanism under Article 6 (which is about international cooperation around cutting emissions and adapting to climate impacts)[[37]](#endnote-37) of the Paris Agreement is choked (now through both COP25 in 2019 and COP26 in 2020) by overall complexity and the nature of being unenforceable or unrealistic (or some combination of all of the above)[[38]](#endnote-38). That is, establishing a consistent international carbon (mitigation) price is only half of the overall solution; we also need an efficient system of trading the value of carbon mitigation.

Because an international price and market mechanism could be achieved far into the future, the best-case scenario for mitigating climate change globally for now may be if nations—particularly the leading nations in the economy—invest in their own systems, establish good practices and thereby lead by example for other countries (most likely countries in regional trade agreements) via the expansion of said systems.

When it comes to choosing a pricing instrument for carbon (as in, tax versus cap and trade) for our country, perhaps the most ideal approach would be one that is comprehensive, applicable to many markets, varied according to those markets, and scalable by the amount of member markets and (eventual) member countries. An initial comprehensive approach could, therefore, involve: 1., dirty energy import taxes;[[39]](#endnote-39) 2., a revenue neutral tax on consumers’ use of oil and gas;[[40]](#endnote-40),[[41]](#endnote-41) and, 3., a network for carbon credit trading amongst industries via application of blockchain (and other adaptive) technology to increase transparency and accountability.[[42]](#endnote-42) Eventually, various international and national legislative endeavors that as yet have no market mechanism for carbon credits (Paris[[43]](#endnote-43), USMCA[[44]](#endnote-44), GCSA[[45]](#endnote-45)) could benefit from aligning with such a model.

Companies are already developing blockchain tokenization of carbon credits[[46]](#endnote-46), Russia has had an established carbon credit blockchain ecosystem since 2017[[47]](#endnote-47) and various blockchain carbon credit ecosystem proposals for Paris compliance and/or international trading have arisen.[[48]](#endnote-48),[[49]](#endnote-49) Cities[[50]](#endnote-50),[[51]](#endnote-51), states and businesses that have pressed ahead with their efforts to cut pollution despite the US having left Paris[[52]](#endnote-52) could be the proving ground for carbon credit blockchain applications. (Assessing the value in segmented areas that are relevant to carbon emissions makes sense because it is difficult if not impossible to valuate capital stock, benefit flow and utility on a large scale with relation to ecosystem services. The lessons from valuing ecosystem services tell us that values are better calculated on smaller special scale and with an interdisciplinary approach[[53]](#endnote-53).) Individuals could later participate in such markets.[[54]](#endnote-54),[[55]](#endnote-55)

A blockchain carbon credit trading system would minimize government administrations costs involved with billing, tracing and trading[[56]](#endnote-56). This needs to be done in the US to keep our country competitive with (at the least) China. As of 2018, the government of China was already creating national standards for blockchain technology, according to an Applied Energy Hong Kong conference proceedings paper that also says that the application of blockchain to the carbon market [in China] is probably inevitable, where the “cochain of carbon asset” has become a quiet hotspot. This same paper illustrates how the carbon trading market is characteristically built for blockchain in that its features are similar to the blockchain mechanism.[[57]](#endnote-57)

Management of carbon emissions involves a distributed ledger that guarantees recording of transactions in a shared ledger; any changes anywhere in the chain are traceable and completely reflected in the shared ledger. [[58]](#endnote-58) Blockchain is abundantly considered as part of a complete response to the challenge of mitigating climate change because it is both decentralized and irreversible[[59]](#endnote-59), thereby increasing transparency and decreasing fraud[[60]](#endnote-60), both of which major problems in a current relevant national system, our national biodiesel credit system, RINs.[[61]](#endnote-61)

Related to the US Climate Alliance’s core principles and the fact that this alliance is bipartisan[[62]](#endnote-62), favor for putting a price on carbon does not necessarily indicate partisan sentiment.[[63]](#endnote-63) Now that we have become familiar with how to track and trace carbon sequestration[[64]](#endnote-64), and, now that more than 40 governments worldwide have adopted a carbon price in some format[[65]](#endnote-65), the US Climate Alliance would do well to issue a fourth challenge to citizens and/or smaller governmental bodies, this time as a kind of design competition for proffering a national blockchain carbon credit trading system which can be populated by B2B and (eventually) B2C transactions.[[66]](#endnote-66) There are still issues with climate change applications of blockchain, such as the double-spend problem (a tree can be sold 100 times)[[67]](#endnote-67), that could be more quickly solved (a consensus network is needed[[68]](#endnote-68)) if opened up to all citizen coders. Also, blockchain transactions could be made faster.[[69]](#endnote-69)

Blockchain could get us the data we need to better assess the appropriate carbon permit quantity. States, local governments, governmental bodies[[70]](#endnote-70) and schools[[71]](#endnote-71) could eventually become market participants. In a world that is suddenly and more sharply aware of its oil consumption, where working from home has been found to generally increase productivity[[72]](#endnote-72) and where citizens are ever more conscious of renewable energy, alternative vehicles and the health effects of pollution, we would do well as a nation to get ahead of the curve by initiating and hopefully leading in this blockchain-based infrastructure for carbon emissions.

As for carbon leakage and equity, previous considerations of leapfrogging solar energy efforts in developing countries have given rise to the trend of building an international carbon market from the “bottom-up” via enabling national self-determination of reduction targets and methods in both developed and developing counties.[[73]](#endnote-73) A block-chain based platform would entail participating country members trading emissions rights but jointly verifying, recording and storing them.[[74]](#endnote-74)

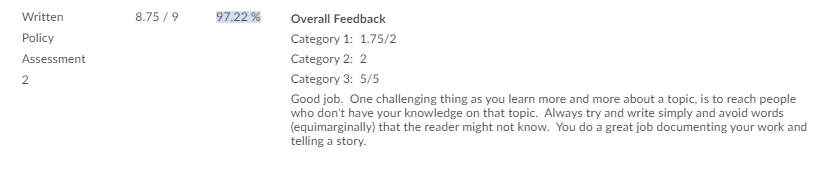
Global or national climate change mitigation requires an interdisciplinary and flexible approach that considers various models. Emissions trading is not the only method—it is simply the method that is the most widely acceptable and relevant. Blockchain technology does not circumvent the complexity, nor does it replace the need for a magnitude of policy-making participants. But it does offer us a tool that could jumpstart the process, especially since it is being considered or used for many other applications (particularly finance,[[75]](#endnote-75) accounting[[76]](#endnote-76) and supply chain management[[77]](#endnote-77)).

Economics and history tell us that a tax or credit system can increase innovation by incentivizing the investment in technologies that improve optimal outcomes/renewable energy/emissions reducing technology. [[78]](#endnote-78) Energy economics shows us how likely consumer switching to renewable energy is, at the point where continuously rising total marginal costs for nonrenewable energies meet a plateauing total marginal cost function of a renewable energy resource.[[79]](#endnote-79) The upfront investment costs into carbon market mechanisms that incentivize investment in and consumption of renewable energies and other emissions-mitigating technologies could pay off if the US became an international leader in policy and applications of policy (“leading by example”, as such). At the least, the US could potentially compete with China in green energy sectors. From Kyoto and elsewhere, we know that countries—when faced with international laws—act to maximize profits, as do businesses; why not embrace the impending changes in the world’s attitudes towards climate change and whether we will work to mitigate it while also become profitable by getting ahead of the game?

Thank you for your time,

Arayana Janson

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