Fossil Tokens: A Systemic Solution to Climate Change

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It is often said that there is no one solution to climate change. The problem is too complex, too global, too intertwined.

In the following pages, I hope to challenge this notion. Climate change is primarily caused by our addiction to fossil fuels. How confident are you that there is not one way to reorganize our system and disentangle ourselves from this deadly pollutant?

Although I reject the claim that there is no solution to climate change, I recognize that any solution must fit within our nations' social and political realities. I try to cover these important considerations in this text.

Still, you might conclude that I am naive. In that case, I hope I at least brought you to wonder about what could be.

In the other case, I am grateful you took my ideas seriously—ideas I am excited to share.

This story is entirely fictional.

We start on the set of a televised show in 2033 in Canada, my beloved home country.

Host: Welcome! Tonight we celebrate this week's fantastic news. You've heard it already. Yes, the rumours were true. Scientists have confirmed that, for the first time, global greenhouse gas emissions are declining *and*, as things stand, we should expect no more than 1.9°C of warming!

To discuss this historic event, on our set tonight we have Elizabeth Nash, professor, writer, and renowned historian at the University of British Columbia. Welcome!

Elizabeth: Thank you.

Host: We have Jamal Pavlov, recently retired head of Fossil Token Canada, welcome.

Jamal: Pleasure to be here!

Host: Elizabeth, I was very excited when you accepted my invitation to the show because I feel that we often forget how things were back in, say, 2025. As a historian, tell us: what were things like before Fossil Tokens?

Elizabeth: Well, they weren’t great. Most people had lost hope on climate change. COVID and its ensuing wave of inflation exacerbated growing inequalities. People were unhappy and elected a wave of mostly right-wing anti-climate-action governments. In a way, it’s no surprise that gym bros were the first movers on this issue.

Host: Gym bros?

Elizabeth: Yes! I learnt this story from Jamal. He should tell it.

Jamal: Well, two gym bros in Calgary launched this startup in 2025. An existing app called NutriFact let people scan nutritional labels on groceries to track their intake of calories, proteins and other macronutrients but these two entrepreneurs got tired of having to scan all their groceries.

They partnered with a few local grocery stores and launched their own credit card. Every time you paid for groceries with this card, the grocery store sent your card an electronic receipt with all the nutritional labels included. This startup would then automatically calculate your nutritional intake and display it through their app. It was simple and incredibly popular!

Elizabeth: Indeed, so popular that the big banks got jealous. Groceries make up a big chunk of people's credit card spending so the banks were losing revenue fast.

Canada's five largest banks formed a coalition and developed a new transaction standard called Transac+ to allow for transmitting metadata during transactions. At first, this metadata was only nutritional labels, but the standard was designed to support any form of data.

The banks invited not only grocery stores to transmit nutritional information but also restaurants and fast foods as these businesses were already using their payment system. In the end, they drove the Calgary startup out of business but the Transac+ standard endured.

Host: Wow. I didn't know Transac+ existed before Fossil Tokens were adopted.

Elizabeth: Yes. Part of the reason Transac+ didn't come about earlier is that many banking systems ran on COBOL code — a programming language from the 60s that nearly nobody still knew. ChatGPT, which came out in 2022, enabled younger developers to understand the COBOL code and upgrade it to support Transac+.

Host: Fascinating. Jamal, my understanding is that it was at this point that you did something brilliant.

Jamal: It was a whole team of us, but yes. In 2026, we were working within a newly elected government that had promised to

repeal Canada’s carbon tax and replace it with a less costly policy. We developed a proposal for a “Fossil Token” system.

Host: Before going any further, we’ve uploaded this proposal to our show’s website if anyone is curious.

Elizabeth: If I can add, I truly believe reading the original proposal is worth our audience's time. Today, we all somewhat know how Fossil Tokens work, but I found it fascinating to see what Jamal and his team were envisioning back in 2026.

CONFIDENTIAL: Proposal for Internal Circulation Only
Environment and Climate Change Canada
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Proposal for a Token-Based System to Track Fossil Fuel Pollution and Empower Climate Friendly Decision-Making

Over 80% of Canada's climate change inducing emissions come from the production and use of fossil fuel products such as gasoline, diesel, and natural gas. To mitigate climate change, Canada must reduce its reliance on fossil fuels.

Although fossil fuels are produced by only a handful of companies, directly restricting the sale of fossil fuels would be irresponsible given that fossil fuels power thousands of businesses, homes, and vehicles daily. Taxing these products is equally infeasible; former Prime Minister Trudeau's attempted carbon tax is largely responsible for his forced resignation. Still, our ministry has been charged with reducing our country's reliance on fossil fuels. In light of Canadian banks recently adopting the Transac+ system—a financial transaction standard that allows for the transmission of data alongside monetary transfers—we believe a solution exists.

Importantly, unlike past solutions, our proposal does not directly penalize businesses that use fossil fuel products nor does it add any significant administrative overhead for the hardworking businesses of our country.

Fossil Tokens to Track Fossil Fuel Usage

What fossil fuels go into producing a cup of coffee at your local cafe? Although your cafe might not use fossil fuels themselves, your coffee still relies on fossil fuels in several ways. Your cafe buys electricity that is often produced with fossil fuels. Your cafe also buys coffee beans and coffee cups that are most likely shipped on a fossil fuel powered vehicle. These are just two of the numerous ways that fossil fuels contribute to your morning coffee. Our proposal would empower Canadians to know exactly how much fossil fuels are used to produce the products they buy.

Our proposed system relies on the transmission of virtual "Fossil Tokens" across supply chains where the quantity of tokens transmitted represents the extent to which a purchase relied on fossil fuels. Unlike money which travels up the supply chain (from individual people to companies), Fossil Tokens travel down the supply chain (from fossil fuel producers to individual people). The proposed system works as follows.

1. **Token Generation.** The Government of Canada generates tokens and sends them to the handful of companies that produce fossil fuel products in proportion to the amount of fossil fuels produced. For example, if a company produces fossil fuels that will emit the equivalent of 1,000 kilograms of CO_2, that company would receive 1,000 tokens.

2. **Full Token Transfer.** As Canadian businesses receive tokens, they must transfer these tokens to their buyers in such a way that businesses themselves are left with no tokens. This ensures that all tokens flow down the supply chain and eventually reach an end consumer.

3. **Token Display.** Banks are required to display to individual people (end consumers) how many tokens they have accumulated through each purchase. Banking statements, banking websites, and banking mobile apps should display not only the financial cost of each purchase (dollar amount), but also the fossil fuel usage of each purchase (token amount).

Expected Benefits of Proposed System

While many or even most Canadians may not pay attention to their accumulation of tokens, we expect that the segment of Canadians that do care about their purchases' impact on climate change ("token-conscious consumers") will drive the following significant changes:

1. To attract token-conscious customers, stores will start advertising products that result in only a small number of tokens transferred ("low-token products") .

2. Token-conscious consumers will shift their purchases away from high-token products when affordable low-token alternatives exist. This shift will reduce Canada's fossil fuel usage.

3. Businesses and entrepreneurs will seize this opportunity by creating new low-token products, further shifting purchases away from high-token products and reducing Canada's dependence on fossil fuels.

In summary, by making it clear which products most contribute to climate change, we expect that businesses will find creative new ways to reduce their reliance on fossil fuels to attract the growing segment of climate-conscious customers.

Expected Harms of Proposed System when Leveraging Transac+

A priori, the primary concern with this system is that it would impose significant administrative overheads since business operators would now need to receive tokens from numerous sources and pass these tokens onto a multitude of customers. Yet, thanks to Transac+, this need not be the case.

Transac+ allows for the transfer of tokens to be completed at the transaction level—right alongside the established financial transaction process. Banks and financial payment services are the only businesses that would need to upgrade their systems. These upgrades would be moderate in scope as they would build upon the already existing Transac+ infrastructure.

Once these upgrades are performed, Canadian businesses would only need to input into their systems the number of tokens to transfer when a product is sold.

How many tokens should businesses transfer to each customer?

Under our proposal, businesses receive fossil tokens from the government (if they directly produce fossil fuels) and from other businesses (if they buy products that use fossil fuels). Businesses must pass on the entirety of these tokens to their customers.

Thus, a central question is how should businesses allocate their received tokens among their customers?

We propose only one rule: profitability cannot be used to justify the choice of allocation method. For example, businesses cannot transfer fewer tokens to customer A than customer B solely because customer A is more token conscious.

The simplest allocation method that follows this rule is a spend-based method[1]. Businesses divide the number of tokens they receive by their revenue to determine how much each dollar of revenue contributes to their fossil fuel usage. Customers then receive a fixed number of tokens for each dollar spent on the business's products. Tokens received for long-term investments can be amortized and corrections should be made regularly to ensure the inflow of tokens equals the outflow of tokens. This method is simple enough to be automated in business software.

How should fossil fuel usage outside of Canada be accounted for?

How would your morning coffee tokens account for the fossil fuels used in transporting the coffee beans from South America?

We propose assigning tokens to importers at the border using the same mechanisms that are used to apply border tariffs. The European Union is already implementing a similar system to apply border tariffs in proportion to a product's greenhouse gas emissions[2]. Importers would then pass on those tokens to buyers (e.g., your local cafe) as previously described.

How are Fossil Tokens enforced?

In the same way that businesses can't create money by magically adding an extra "0" to their bank balance, businesses wouldn't be able to make their tokens disappear. Banks hold these tokens and banks have strong incentives not to commit fraud.

We additionally propose that banks monitor token balances and report businesses who have accumulated an excess of tokens—an indicator that a business may not be passing *the entirety* of its tokens to its customers.

Finally, for larger businesses, financial audits could include checks on allocation methods to ensure businesses aren't allocating strategically (e.g., by shifting tokens away from products on the sole basis that the product's market is mostly token-conscious buyers).

[1] Similar to spend-based methods used in carbon accounting. See, e.g., the Greenhouse Gas Protcol's "Technical Guidance for Calculating Scope 3 Emissions"

[2] See the EU's Carbon Border Adjustment Mechanism

What about non-fossil fuel sources of climate change?

Although fossil fuels account for the vast majority of greenhouse gas emissions and hence climate change, other sources of emissions exist notably in the production of chemicals like cement and fertilizer, in agriculture, and in waste management. Our system could easily be expanded to these additional emission sources by simply generating and sending tokens to these emitters in the same way that tokens were generated and sent to fossil fuel producers.

Is Government Surveillance a Concern?

No. Thanks to Transac+, tokens are transferred along the same channels that money is transferred. Governments won't gain any visibility into business transactions beyond what they already have. The tokens that individuals accumulate are only visible to their bank in the same way that their bank account balance is private information.

Can businesses cancel out their tokens by purchasing carbon offsets?

Not quite. We propose that the government should send *negative* tokens to businesses that permanently remove greenhouse gas emissions from the atmosphere. These businesses could then sell their negative tokens to fund their operations. Buyers of negative tokens could use them to cancel out their fossil tokens and offer a lower-token product (or, in the extreme, a negative token product).

However, negative tokens should only be awarded for high quality, permanent offsets that do not "crowd out" offsetting initiatives. Investing in renewable power would rarely meet this criterion nor would planting trees. Direct carbon removal and sequestration would.

Host: Well, let me ask you, Elizabeth, what surprised you most about the 2026 proposal compared to how things played out in actuality?

Elizabeth: I think nobody expected so many other countries to adopt our proposal. We didn't realize that countries, especially European ones, would use the token system to make their products stand out on the Canadian market. It was a win-win because Canada was trying to move consumers away from American products given the trade war at the time.

Jamal: Personally, I was surprised to see how popular the token system was among Canadians. When we opened our proposal for public comment, we received hundreds of messages from Canadians explaining that they wanted to help fight climate change, but they didn't know how. They learnt to love the tokens because suddenly they were empowered to choose climate-friendly products without fear of falling prey to a greenwashed "eco-label."

Host: I have to say that I remember the proposal's initial years being... difficult.

Jamal: There was a lot of backlash at the start, especially from fossil fuel producers who were terrified that our proposal would cause the demand for their products to drop. Canadian tar sands are one of the most expensive ways to produce fossil fuels so these companies knew that the moment prices dropped they would go out of business.

They launched a massive media campaign against us. Fortunately, unlike the carbon tax, it was hard to criticize a proposal that didn't tax people. Instead, they tried to stoke people's fears around government surveillance. Thankfully, we had the foresight to launch our proposal with a strong pro-privacy campaign. "Just as private as your banking" was our tagline. Although industry created plenty of bad press, they failed in quashing our proposal.

Host: Before wrapping up I'd like us to listen to some voice messages our audience sent us.

First, here's Alex from Sturgeon Falls, Ontario.

> Hi. I'm Alex and I run the same orchard that my family started in 1954. I want to thank Jamal and everyone who fought to make Fossil Tokens a reality because, eight-ish years ago, I was about to sell our family farm. We just couldn't compete with the big Californian apple producers. When Fossil Tokens were launched, I could finally prove to my customers that our locally grown apples really were more sustainable. California even started shipping its apples on electric trucks to try to outcompete me, but I helped my shipper buy its own electric vehicles. Ultimately, California just couldn't beat our local Ontario Apples and our clean electrical grid.

Jamal: That's a beautiful story. I've heard many similar stories of entrepreneurial Canadians reimagining their businesses without fossil fuels and I never cease to be impressed.

Host: Next, Mckenna from Montreal.

> I have to say, for a long time I disliked these Fossil Tokens. Every year, my bank would tell me that I had accumulated more tokens and had used more fossil fuels than 95% of Canadians. I obviously didn't tell anyone. My friends would shame me. I was angry. I worked hard my whole life and the moment I had the money to travel, I was feeling guilty for taking the plane or treating myself to things I deserved. But, hearing the news this week that global emissions are decreasing

does make me wonder if it was all worth it. It's not like anyone's preventing me from travelling after all!

Elizabeth: Mckenna's right. Being forced to see exactly how much our lives contribute to climate change has been difficult. The goal was never to turn Fossil Tokens into a competition but that hasn't stopped some people from being particularly judgmental, especially on social media.

Host: Well said. Last one, Ahmed from Fort McMurray, Alberta.

I moved to Canada from Egypt with my family in 2024 to work in the tar sands. Three years in, because of Fossil Tokens, my company had to close our site and I lost my job. I'm not an angry man. Seeing the news this week, I understand why it was done. Still, my family has never quite been the same.

Jamal: You know, this is the thing I regret most. I wish we had foreseen how quickly Fossil Tokens would reshape our workforce. If we had, perhaps, we could've implemented better transition programs to prevent families like Ahmed's from being left behind.