



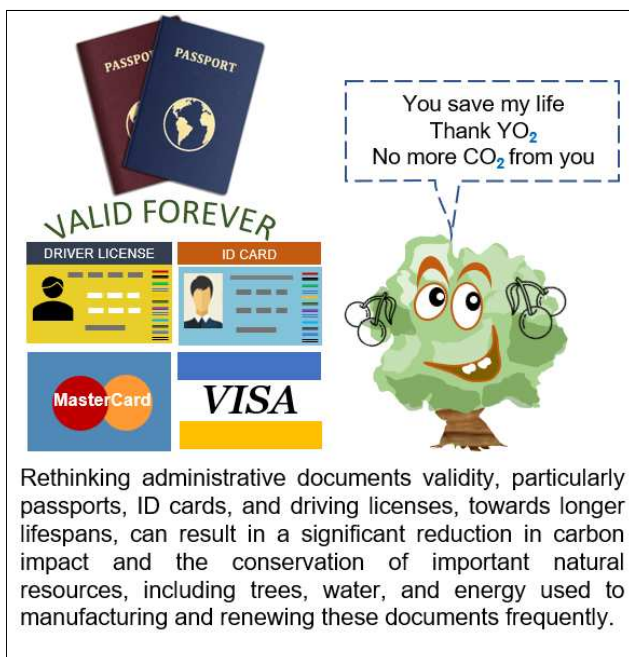
## COMMUNICATIONS

# Rethinking administrative documents' validity to cutoff greenhouse gas emissions by million tons

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**OBJECTIVES** Climate change is a multi-hazard challenge for life on earth in all its aspects. Wildfires, pollution, drought and heatwaves are just a few examples of exacerbated environmental crises propelled by climate change effects. To mitigate such effects, urgent actions are required to cutoff greenhouse gas emissions by all the means across all the sectors. Every additional kilogram of greenhouse gases produced unnecessarily should be avoided. **METHODS** One source of greenhouse gas emissions that may not be top of mind for the public and policymakers - and which can be taken into account in preventive environmental policies - is the industry of administrative and identification documents (papers) with short validity dates that involves intensive production (mass printing) and frequent renewals (mass reprinting) while the carbon footprint is too high. The validity of, for example, identity cards, passports, banking cards, driving licenses, etc., is often short ranging from 3 to 10 years, depending on each type of document and issuing country. Short validity dates, however, should raise critical questions regarding the environmental sustainability, societal and carbon impact, and depletion of natural resources used in their production and frequent renewals. Identification documents are not food prod-

ucts that spoil over time or medications that lose their functional activities, so their validity should be unlimited by time in order to avoid the high environmental costs of mass printing/reprinting and high rates of greenhouse gas emissions associated with their production. **RESULTS** The production of plasticized ID-type cards can emit up to 100 grams of carbon dioxide equivalent per card. Manufacturing one administrative document per person and renewing it five times could produce up to 4 million tons of carbon dioxide globally. If individuals have five administrative documents that need renewing five times, which is often the case, gas emissions would be five times higher, or approximately 20 million tons of CO<sub>2</sub> equivalent. To save such important amounts of gas emissions, a modernization and flexibilization of administrative documents industry is required toward removing validity by date. This simple change could save substantial amounts of energy and natural resources, such as trees and water, while also reducing greenhouse gas emissions by million tons, especially in the pressing context of climate change. **CONCLUSIONS** Eliminating validity periods is a straightforward yet effective solution that would significantly reduce greenhouse gas emissions and promote sustainable environmental practices.

**KEYWORDS** administrative document validity; administrative papers; carbon dioxide emission; carbon dioxide footprint; carbon neutrality; climate change actions; environmental governance; environmental policy; greenhouse gas emission; identification documents; sustainable governance.

## 1. INTRODUCTION

Climate change is a major challenge that affects various aspects of life on Earth, including the environment, industry, agriculture, economy, society, and health. The effects of climate change are becoming increasingly visible worldwide, with a rise in environmental disasters such as flooding, drought, heatwaves, wildfires, pollution, deforestation, and desertification. These consequences have a direct and indirect impact on everything on Earth, including human infrastructure, the atmosphere, plants, animals, and humans. Coastal cities and towns are particularly vulnerable to pollution and salinization of freshwater sources. Predictions and

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data from past and recent years suggest that the long-term effects of climate change would worsen, affecting ecosystems, biodiversity, natural resource management, and food availability (Moustafa 2016). Climate change has also serious health impacts and can contribute to the spread of diseases (Microbe 2021; Urrutia-Pereira et al. 2022; Ishaque et al. 2022). So far, however, most countries have failed to use evidence-based information to plan and adapt their environmental policies to protect their populations from climate change consequences (The Lancet 2022).

Sustainable development is a complex issue involving various legal, economic, environmental and societal impacts and practices. These have contributed to the current unsustainable and unjust state of the world, where industrialized countries are responsible for most greenhouse gas emissions, yet the global south is disproportionately affected by climate change and its consequences. The limited availability of natural resources on a global scale is a significant restriction for contemporary societies, as evidenced by the yearly trend of Earth Overshoot Day occurring earlier each year (Morone and Reibstein 2023). This emphasizes the significance of taking actions to preserve natural resources and to minimize societal impact, greenhouse gas emissions at the sources, and environmental wastes through all available means, including regular industrial breaks (Moustafa 2017).

## 2. GREENHOUSE GAS SOURCES

Greenhouse gas emissions have been increasing since the Industrial Revolution in the mid-18th century. The primary sources of these emissions include human activities related to economic development, industry, agriculture, construction, urbanization, communication, and transportation. Energy consumption, which includes transportation, construction, lighting, heating, and manufacturing, accounts for approximately 73% of global human-caused greenhouse gas emissions, followed by agriculture at 10 – 12%, and residential and commercial sectors at 10 – 12% (United States Environmental Protection Agency 2023). The paper industry is responsible for up to 190 million metric tons of CO<sub>2</sub> emissions, which represents about 2% of all emissions from industry. Although some countries have implemented national policies to reduce emissions at the local level, greenhouse gases are still being emitted at an alarming rate globally. In 2021, the International Energy Agency estimated that the average amount of carbon dioxide equivalent emitted was approximately 40.8 gigatons worldwide (The International Energy Agency 2021). China, the United States, the European Union (EU27), India, Russia, and Japan are the largest CO<sub>2</sub> emitters, accounting for around 70% of total emissions.

## 3. HISTORY OF IDENTIFICATION DOCUMENTS (ID)

Identity documents have become a ubiquitous part of modern life, but their invention is relatively recent. In the past, people did not require formal identification documents to live their daily lives. Before World War II, there were no standardized identification documents. People were identifying themselves orally using their names and places of origin. In some cultures, oral heritage is a strong binding engagement, and oral promises, agreements or commitments were considered as binding as written engagements, if not more. How-

ever, in modern societies, the complexity of life has led to distrust, suspicion, and fraud. People must now prove their identity using one or more identification documents, or else they may be considered imposters or suspects. The lack of trust and the prevalence of fraudulent behavior necessitate the use of different forms of identification, which in turn require heavy bureaucracy and carry significant environmental costs. In some countries, paperwork holds more value than their holders, where papers are paradoxically valued more than humans themselves.

## 4. ADMINISTRATIVE DOCUMENTS AND GREENHOUSE GAS EMISSIONS

Billions of people around the world have various types of administrative documents, including identity cards, passports, bank cards, driving licenses, insurance cards, membership cards, student cards, employee cards, etc. These documents are usually issued and renewed every few years, with validity periods ranging from 1 to 10 years depending on the type of document and the issuing country. However, the short validity periods of these documents result in frequent production and renewal, which incurs significant environmental costs. Mass printing and reprinting of these documents require significant amounts of natural resources such as trees, paper, plastic, water, ink, and energy while also emitting large amounts of greenhouse gases in the atmosphere. According to the International Card Manufacturers Association (ICMA), the production of plasticized cards such as identity document and banking cards emits about 50 – 100 g CO<sub>2</sub> equivalent per card (Trüggelmann 2012). Modern and biometric passports, which look like as booklets of up to 30 pages, are more energy-intensive. Although all the human populations (8 billion) might not have multiple identification documents at the same time, but let's assume that, at a given time, they all would have at least one type of document that should be renewed 5 times per an individual's life. In such a case, the predictable amount of CO<sub>2</sub> emitted worldwide would be:

$$8,000,000,000(\text{people}) \times 100(\text{gram CO}_2 \text{ equivalent per card}) \times 5(\text{renewals}) = 4,000,000,000,000 \text{ g}(4 \text{ million tons})$$

If each person has five administrative documents that need to be renewed five times in their lifetime, which is the case for many people in developed and industrialized countries, greenhouse gas emissions would be five times higher, or about 20 million tons of CO<sub>2</sub> equivalent. Although this amount may seem small compared to other sources, such as fossil fuels, it is still a significant contributor to climate change when combined with other sources. Policymakers and climate decision-makers can take this into account as an easily applicable and environmentally beneficial action to reduce emissions by up to 20 million tons. Furthermore, as the global population continues to grow, millions of new people will need administrative documents, which will result in an increase in associated gas emissions. The predicted amount of CO<sub>2</sub> emitted from administrative document manufacturing is comparable to the amount of emissions produced in Norway by oil and manufacturing industries combined or approximately half of the total emissions estimated at 49 mil-

**TABLE 1.** Emissions of CO<sub>2</sub> equivalent in Norway in 2021.

	Million tons CO <sub>2</sub> equivalent in 2021
Oil and gas extraction	12.2
Manufacturing industries and mining	11.8
Road traffic	8.7
Aviation, navigation, motor equip. etc.	7.5
Agriculture	4.6
Other sources	2.2
Energy supply	1.7
Heating in industries and households	0.5
<b>Total Emissions in Norway (million tons)</b>	<b>49.1</b>

Statistics Norway: <https://www.ssb.no/en/natur-og-miljo/forurensning-og-klima/statistikk/utslipp-til-luft>, Accessed 16 September 2023

lion tons (table 1).

## 5. TOWARD LIFELONG-VALID IDENTIFICATION DOCUMENTS

ID cards and passports are manufactured to withstand various conditions, such as temperature changes, stress, and exposure to chemicals (Liersch 2017). With proper care, these documents can last longer than a human lifetime. It seems illogical, then, that administrative documents are designed to “expire” after a relatively short period, while the physical document itself may remain intact and readable for decades or even centuries. The expiration dates on these documents are subjective and arbitrary. There is no clear rationale for determining the validity period of an ID card or passport. Otherwise, why should a document expire after three years, for example, rather than two or four? Why should it expire after five years instead of six, or seven? Why should a document expire after ten years, rather than nine, eleven, fifteen, or fifty years? The concept of expiration dates on printed administrative documents does not make much sense, especially considering that personal information such as names, birthdays, and fingerprints do not change or change very slightly over time. The only piece of information that might change is the address, but is it really necessary to renew entire documents just to update this one piece of information? The environmental risks and resource allocation involved in renewing a simple date or address line are not justified by a minimal required change. While photographs can be useful for identifying people and can be changed over time, they are not the most reliable method. Fingerprinting and iris recognition are more reliable methods of identification (Ravin 2016; Pillai et al. 2011; Li and Savvides 2009; Marinović et al. 2011). Fingerprinting is a well-established method of identification that has been used for over a century. Fingerprints are unique to each individual and do not change over time, making them a reliable way to identify someone. Iris recognition is a newer technology that has become increasingly popular in recent years. The iris is the colored part of the eye that surrounds the pupil, and like fingerprints, it is unique to each individual. Iris recognition works by capturing an image of the iris using a specialized camera, and then using software to analyze the unique patterns and features of the iris to identify the person. Both fingerprinting and iris recognition are widely used in a variety of applications, including law enforcement, border control, and secure access control systems. So, the

issue at hand is whether it is justifiable to expend natural resources and generate large amounts of carbon dioxide to make minor changes to administrative documents, such as altering a photo, address, or part of a number. For example, consider the change from 2020/01/12 to 2030/01/12, where only the number 2 in 2020 is modified to make it valid until 2030. Is it reasonable to use resources and emit greenhouse gases for such small modifications? What precisely expires when a document reaches its expiration date? Is it the name, birthdate, or what exactly? The administrative papers of Albert Einstein, if he had any, would have expired long ago. So, should we stop using his name and citing his work since his identification papers are no longer valid? If we follow this line of reasoning, it implies that we should no longer mention or reference people and scientists who have died, and whose documents have expired. The truth is that expiration dates on administrative documents are absurd and illogical from a rational and scientific perspective. Administrative and official documents are not perishable cheese or meat products, nor medications to lose their effectiveness over time. Therefore, their validity should not be limited by time or at least extended until they naturally degrade or become unreadable. This would save the greenhouse gases emitted by their manufacturing and renewal processes. The purpose of identification documents is to provide basic information about individuals such as their name, gender, citizenship, and date of birth. For most citizens, this information remains unchanged over time, rendering expiration dates unnecessary and unsound. Even if some information does change occasionally, it does not justify the significant use of natural resources or the emission of large amounts of greenhouse gases.

## 6. ADVANTAGES OF LIFELONG IDENTIFICATION DOCUMENTS

Reconsidering the time limit on the validity of administrative documents could achieve a range of positive environmental, financial and administrative outcomes. These include reducing waste, pollution, and greenhouse gas emissions caused by their mass printing and reprinting. Public civil administrations could also be freed from significant administrative burdens and bureaucracy, while significant amounts of time, financial, and energy resources used to produce such documents could be saved. Eliminating the need to use paper, plastic, energy, transport, water, and trees could signif-

icantly reduce the environmental impact of administrative documentation.

The act of reissuing administrative documents periodically, while they are still physically valid and readable, is akin to tearing down perfectly habitable houses just to rebuilding them with a new house number on the door. This process is environmentally costly and can be avoided by making administrative documents valid indefinitely, rather than for only a few years, as is often the case. Diplomas, school certificates, and banknotes do not have expiration dates. Similarly, administrative documents can also remain valid indefinitely, except when it is necessary to renew them, such as when there are no more blank pages in passports or are lost.

The introduction of a validity date on administrative documents is somewhat bizarre and puzzling. While taxation may explain why validity dates are implemented to renew and gather taxes from the production and renewal of identification documents, the financial incentive of repetitive renewals cannot justify the environmental risks involved. The environmental cost of frequent production and renewal of administrative documents is higher than the financial benefits generated by the taxes collected. A small amount of greenhouse gases or a simple spark caused by extreme heatwaves can cause more environmental and health damages than the benefits of the taxes collected from the production and renewal of administrative documents that may have caused the environmental damages. Therefore, it is essential to consider longer validity periods to reduce environmental impact, and taxes should not be the primary factor in determining the validity of administrative documents. Eliminating time-based validity on administrative documents and other print documents can significantly reduce the need for frequent and unnecessary reprinting, thus reducing associated greenhouse gas emissions. This policy is a simple and achievable step towards building a clean and sustainable future. Its implementation can result in a measurable outcome, cutting global greenhouse gas emissions by at least millions of tons, which is particularly crucial under current energy crisis, where every kilowatt should be conserved. Implementing policies like removing time-based validity on administrative documents is a practical solution that can have a positive impact on the environment without significant negative consequences.

## 7. TRADEOFFS OF LIFETIME-VALID IDENTIFICATION DOCUMENTS

Short validity dates on documents may be perceived as a means of protection against potential fraud and identity theft, but in reality, it has the opposite effect. By having documents with perpetual validity, the need for stealing others' identities will be reduced, if not eliminated completely. The implementation of a perpetual validity system for administrative documents can help to reduce the incidents of identity theft and fraud by eliminating the need to obtain new documents frequently. This would also result in a more efficient system and a reduction in the environmental impact of the frequent printing of new documents. Second, the short validity periods of credit cards are often thought of as a means to validate the authenticity of cardholders and prevent fraud. However, this is not entirely accurate. Short validity periods

do not provide any real safeguard against fraud. If there is no money associated with credit cards, card issuers can simply prevent any attempt to withdraw money. Additionally, there are already methods of authentication, such as two-factor authentication and multi-factor authentication, that are in use to reduce the risk of fraud. Credit cards often have withdrawal thresholds per day, week, month, or transaction, beyond which card users are not allowed to withdraw more. Moreover, card issuers can prevent any attempt of money withdrawal if there is no money associated with the card in question. Therefore, the validity date of the credit card is not related to fraud, but rather to the principle of fraud itself. Fraudsters will always find ways to commit fraud, regardless of the validity date of the documents. Thus, the issue of fraud should be addressed legally and efficiently, rather than through the use of short validity dates on credit cards.

Third, short validity dates for credit cards may be seen as a way to comply with new or user-friendly technologies and emerging security issues. However, this approach is not the only solution, as card issuers can reissue cards with new technologies or security norms as needed, regardless of the validity period. While technology can help reduce fraud, fraudsters will continue to operate and exploit any weaknesses or imperfections in the system. To effectively fight fraud, the root causes and motivations behind it must be addressed, and deterrent punishments should be in place. Effective governance should focus on reducing fraud through dissuasive and punitive measures, rather than simply adapting to new fraud methods.

## 8. TOWARD AN ALL-IN-ONE LIFETIME VALID IDENTIFICATION DOCUMENT?

Identification documents such as ID cards, passports, and social insurance are similar in many ways. Therefore, it might be a good idea to merge them into one digital or printable document that is easy to carry and valid everywhere all the time, just like smartphones replaced several devices. With the new identification technologies, such as biometrics, DNA patterns, and retina or fingerprint, physical identification documents may soon become obsolete. However, a full digitization of public services and documents can lead to inequality and social injustice as not everyone uses or wants to use electronic devices. Combining all identification documents in one digital format may also increase cyber risks, compromising digital information security. Additionally, a digitalization policy may obligate people to own a mobile device, which may conflict with democratic values. Focusing solely on technology can reduce the effectiveness of sustainability measures. Furthermore, relying on a centralized database of identification documents is controversial, as it can compromise personal freedom and privacy. Therefore, efficient mitigation and adaptation measures should not infringe human rights in any way and should not neglect any small or local measure.

As such, to avoid the potential issues that come with a centralized digital database, it may be more practical and secure to simply remove the validity dates from printed identification documents. This would involve creating a single, permanent identification document that does not expire. Competent authorities would then be able to verify the authentic-

ity and identity of the document holder as needed, using civil registries. This approach would be easier, cheaper, faster, and safer than trying to create a single digital document or database that could compromise privacy and infringe on personal freedom.

## 9. CONCLUSION

Despite the benefits of identification documents, there should be a balance between their usefulness and the potential negative consequences of their uses on the environment and natural resources. This includes finding ways to reduce bureaucracy and their environmental impacts while maintaining their integrity and usefulness. Rethinking the validity of administrative documents is an easy and cost-effective measure that can significantly reduce gas emissions by millions of tons. The benefits of having lifetime valid documents outweigh the tradeoffs by far. Climate change, food and energy crises have brought into sharp focus the need to conserve energy, minimize greenhouse gas emissions and reduce water wastage by all means possible. Eliminating the short validity by date from identification documents to make them lifelong would be a substantial step towards preserving valuable natural resources that are currently being needlessly wasted. The planet Earth can be likened to a complex living “organism”, with interdependent relationships between living and nonliving components. This “organism” is now environmentally sick, suffering from the chronic accumulation of greenhouse gas emissions. To help the planet resist and recover from human-made climate change consequences, it is necessary to take preventive and effective measures. Preventive measures are always more efficient and less expensive than late therapeutic approaches. The cost and damages of inaction tomorrow will be much higher than the cost of prevention measures undertaken today. Reducing greenhouse gas emissions at production sources is an effective way to decrease the overall amount of greenhouse gases released in the atmosphere.

## 10. ETHICS STATEMENTS

No animal or human subjects used in this article.

## 11. DECLARATION OF INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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