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Issue 1 | May 2025

Politics & Policy Program

Policy Briefs

About

The Politics and Policy Program (PPP) is a co-curricular experience for first-year students enrolled in the Joseph H. Lauder Institute for Management & International Studies. It emerged from our recognition that global business leaders must understand how to navigate complex regulatory environments to rise into and thrive at the C-suite level.

Toward that end, this new program supports students interested in conducting independent field research on topics at the intersection of business and policy. This research is completed in the summer between their first and second year of study.

In advance, PPP students undergo rigorous skills training on campus to prepare them for on-the-ground interviews, source identification, and networking abroad. Our students also engage in small-group discussions with professionals central to policy-making processes, including government representatives, think tanks, lobbying firms, and others in Washington, D.C. In addition, we host on-campus speakers with government or public affairs functions in major corporations. Those who complete all PPP requirements are distinguished as "Lauder Institute Politics and Policy Fellows" at graduation.

Our first cohort benefited from up to 10 days of field research on their topic. They traveled to 17 countries, including Egypt, Singapore, Burkina Faso, South Korea, Argentina, Bolivia, Saudi Arabia, and Germany, among other locations. After their return to campus, they were tasked with synthesizing their findings into a policy brief to support decision-making at the highest levels. As we hope the following pages demonstrate, the policy briefs in this collection offer insight into some of the most challenging decisions confronting policymakers and business leaders worldwide.

None of this would have been possible without the generous support of Pavel Oliva (G'00 WG'00) and Kimberly Y. Oliva (GED'99), whose gift allowed us to launch this new initiative. On behalf of the Lauder Institute, I would like to acknowledge and thank them for their support.

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Policy Briefs

May 2025

The Peso Puzzle: Unraveling Argentina's Exchange Rate Volatility and Policy Solutions

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Lauder Track: Latin America, Portuguese

Executive Summary

Argentina's economic instability, driven by exchange rate volatility, unsustainable debt, and rising inflation, requires urgent reforms. Argentina must expedite the unification of its exchange rates to eliminate market distortions and attract foreign investment; restructure its debt transparently by engaging with international lenders to secure favorable terms and restore credibility in global markets; and avoid dollarization due to long-term risks, including the loss of monetary sovereignty and reduced export competitiveness. By implementing carefully managed transitions, Argentina can establish a more stable economic environment, rebuild investor trust, and promote sustainable long-term growth.

The Economic Repercussions of Exchange Rate Volatility

Argentine peso fluctuations are significant due to their profound impact on the nation's economic and social landscape. Argentina's volatile economic history underscores the crucial role of exchange rate policies in shaping the overall economic environment and influencing business operations, government fiscal management, and the everyday lives of Argentine citizens (Vercesi 2018). These policies explain the factors driving inflation, influencing foreign investment, and affecting economic stability — knowledge that is indispensable for policymakers in designing effective strategies to stabilize the economy.

This policy brief examines Argentina's historical and current exchange rate policies, focusing on their impact on economic stability and financial markets. It sets the stage for analyzing potential reforms under President Javier Milei, whose policies could significantly alter the trajectory of the Argentine peso.

Tracing Argentina's Economic Turbulence

Argentina's economic volatility is rooted in decades of policy missteps and external shocks. Once one of the world's wealthiest nations in the early 20th century, Argentina's dependence on agricultural exports left it vulnerable to global commodity price fluctuations, triggering boom-and-bust cycles. Mid-20th-century

populist policies under leaders like Juan Perón introduced expansive welfare programs and nationalized industries, financed through extensive borrowing and money printing, which laid the groundwork for inflationary pressures (Sturzenegger and Zettelmeyer 2006).

The 1980s brought hyperinflation, peaking at over 3,000% annually, ultimately culminating in the 2001 economic crisis marked by a debt default and the abandonment of the peso-dollar peg. Attempts at stabilization, such as the Convertibility Plan in the 1990s, temporarily reduced inflation but created overvaluation and trade imbalances (Galiani, Heymann, and Tommasi 2003). Recent administrations have struggled with inconsistent policies, including heavy state intervention under Cristina Fernández de Kirchner and gradual market reforms under Mauricio Macri, leading to persistent inflation and fiscal instability (Cibils and Lo Vuolo 2014).

President Milei's proposed economic reform package is a dramatic break from Argentina's historical record of interventionist policies and gradual adjustments to manage inflation and debt. Embracing libertarian principles, his agenda seeks to align exchange rates with market values, restructure external debt to restore global credibility, curb inflation through fiscal austerity and strict monetary control, and dollarize the Argentine economy (Reuters 2022). While Milei views dollarization as a solution to inflation and a means of restoring credibility, critics argue it sacrifices monetary sovereignty and leaves the country vulnerable to U.S. Federal Reserve policies.

His proposals are particularly controversial due to their potential for exacerbating inequality and social unrest, particularly during the transition to a dollarized system. The plan's radical nature has polarized public opinion, with some lauding it as a necessary shock to the system and others warning of severe economic and social consequences (Reuters 2022).

Diagnosing Argentina's Economic Crisis

Argentina's persistent economic instability stems from exchange rate volatility, unsustainable debt management, and rising inflation. The current dual exchange rate system, which allows for official and parallel exchange rates, drives these issues because it creates a significant gap between the official rate and the parallel or "blue-chip" rate, leading to severe distortions in how businesses and investors operate. As one chief economist said, "The system inflates costs for businesses and creates opportunities for those with access to the official rate to exploit the gap." The gap creates inefficiencies while fostering corruption, as those with privileged access to cheaper foreign currency through the official rate can use it to their advantage, further distorting the market (Reuters 2022).

The distortions are particularly severe in Argentina's export sector, which is a critical source of foreign currency for the country. Exporters receive payment at the lower official exchange rate while incurring costs closer to the higher parallel rate. This reduces competitiveness, as Argentine goods become more expensive than those from other countries with unified and more favorable exchange rate policies. Furthermore, the gap between the two rates fuels inflation by driving up import costs, as businesses navigate the disparities between official and parallel rates to source materials and goods. Over time, the erosion of competitiveness harms export volumes and reduces the country's foreign currency reserves, further destabilizing the peso. According to a financial analyst, "The exchange rate system has become a self-fulfilling cycle of inflation and currency depletion." In this context, and as pointed out by a chief economist, aligning exchange rates with market values will be critical to achieving competitiveness in foreign markets.

The issue of debt management is equally pressing. Argentina's debt burden has grown substantially in recent years, with its debt-to-GDP ratio exceeding 80% on average. This is far higher than in neighboring countries, such as Chile and Peru, which maintain ratios of around 30% to 40% (International Monetary Fund 2022). These healthier ratios allow those countries to maintain greater fiscal flexibility, attract investment, and lower borrowing costs. In contrast, Argentina's excessive debt burden constrains its ability to finance growth and social programs. Years of mismanagement, including multiple defaults, have undermined the country's credibility in global financial markets, making it difficult to access affordable capital (Pastor 1989). "Milei should approach debt restructuring with transparency to avoid further damaging Argentina's credibility," a former ministry of finance official commented. Without such an approach, Argentina's international standing will continue to deteriorate, exacerbating its economic challenges by increasing borrowing costs and isolating the country from global financial markets. The

plan is feasible but challenging because it depends heavily on negotiations, favorable terms, and sustained fiscal discipline to rebuild trust with international lenders.

Additionally, Argentina's inflation crisis compounds the debt problem. The country maintains the second-highest inflation rate in Latin America and one of the highest in the world, with annual inflation regularly exceeding 100% (La República CO 2022). This extreme inflation erodes the purchasing power of consumers, increases borrowing costs, and complicates the implementation of effective economic policies. A chief economist at Puente's said, "As inflation rises, the Central Bank is forced to raise interest rates to curb it, which in turn increases the cost of servicing debt, making the debt burden even more unsustainable." The inflationary environment further reduces the effectiveness of fiscal and monetary policies, creating a vicious cycle that is difficult to break. As a senior banker noted, "Inflation undermines any policy reform efforts, as it weakens the very tools needed to implement those reforms." Given these circumstances, controlling inflation through austerity and monetary control requires careful implementation to avoid stifling growth and exacerbating social unrest.

The consideration of dollarization as a solution to Argentina's inflation problem is highly debated. Proponents argue that adopting the U.S. dollar would bring immediate price stability by eliminating the peso's volatility. However, this approach carries significant long-term risks. By dollarizing, Argentina would relinquish control over its monetary policy, effectively outsourcing it to the U.S. Federal Reserve. "Tying Argentina's fate to the U.S. Federal Reserve would leave the country vulnerable to external shocks that it cannot control," a portfolio manager explained. The U.S. Federal Reserve's monetary policies are designed to meet the needs of the U.S. economy, meaning Argentina could not tailor its monetary policy to its own economic needs. This would leave Argentina powerless to respond to future economic crises, recessions, and inflationary shocks.

"The transition to dollarization could itself trigger inflationary pressures," the chief economist at Puente said." As the peso devalues in the lead-up to its replacement by the dollar, the prices of imports would rise, disproportionately affecting lower-income populations." This could exacerbate income inequality and increase social unrest, particularly as inflation erodes the purchasing power of consumers (Frenkel 2006). Furthermore, exporters would suffer as Argentine goods become more expensive on the global market, reducing the country's export competitiveness. Without the ability to adjust its exchange rate, Argentina would struggle to compete internationally, further shrinking its foreign currency reserves and deepening its economic crisis.

A Path Forward: Strategic Policy Interventions

In response to Argentina's economic challenges, the government must implement strategic reforms that address the root causes of instability.

Unifying the exchange rate system is essential to eliminating the severe market distortions caused by the current dual-rate system. A unified exchange rate would reduce inefficiencies, foster a more transparent market, and attract foreign direct investment by creating a predictable business environment (Colacelli and Manasse 2018). While the process of unification may cause short-term inflationary pressures due to the peso's adjustment to market rates, these risks can be mitigated by strengthening Central Bank reserves through international support, such as credit lines from the IMF (IMF 2002). Transparent communication with domestic and international stakeholders will also ensure investor confidence throughout the transition.

Argentina must prioritize debt restructuring with transparent and realistic terms. Engaging with multilateral institutions, such as the IMF and World Bank, to negotiate favorable restructuring agreements would provide Argentina with the fiscal space to stabilize the economy without resorting to harsh austerity measures that could damage long-term growth prospects. A successful restructuring plan would reduce borrowing costs and improve Argentina's standing in global financial markets (Edwards 2007). Additionally, the government should introduce targeted tax incentives in strategic sectors such as renewable energy, technology, and infrastructure development to attract foreign direct investment, drive innovation, and diversify the economy.

Avoiding dollarization is critical. While dollarization might offer short-term price stability, it would come at the cost of Argentina's monetary sovereignty, leaving the country unable to tailor monetary policy to its specific needs. By maintaining control over its currency, Argentina can

retain the flexibility to respond to domestic and external shocks with independent policies that address inflation and support growth in ways that best suit its economic environment.

By implementing these reforms, Argentina can break free from its cycle of economic instability and create the conditions necessary for sustainable, long-term growth. Through prudent management of its currency, debt, and inflation, the country can rebuild investor confidence, attract foreign capital, and lay the groundwork for a more resilient and diversified economy in the upcoming decades.

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May 2025

How Public-Private Partnerships Propel Rwanda's Growth

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Lauder Track: Africa - General

Executive Summary

Public-private partnerships (PPPs) are instrumental to Rwanda's post-genocide development, particularly in technology, infrastructure, and finance. Despite successes in fostering economic growth and innovation, challenges in financial sustainability and stakeholder coordination persist. To optimize the impact of PPPs, it is necessary to enhance capacity building for public officials, promote inclusivity, and expand digital infrastructure. These actions will ensure that PPPs continue to support Rwanda's Vision 2050 and serve as a model for sustainable development in Africa.

For over 20 years, Rwanda has relied on public-private partnerships (PPPs) as a cornerstone for socioeconomic development, using these collaborations to drive growth in key sectors such as infrastructure, technology, and finance. The results are clear: PPPs propelled Rwanda's transformation into one of Africa's fastest-growing economies, demonstrating how well-structured partnerships can fuel sustainable progress. However, Rwanda faces key challenges in unlocking this model's full potential and ensuring its scalability. Specifically, enhancing capacity building for public officials and expanding digital infrastructure is essential to strengthening governance, improving service delivery, and expanding citizen engagement. Rwanda's experience with PPPs offers valuable insights into the possibilities and limitations of this approach, providing a model for other nations seeking sustainable development through public-private collaboration.

Using PPPs for Development

Following the 1994 genocide, the Rwandan government, led by President Paul Kagame, embarked on a series of ambitious reforms to stabilize the economy, attract foreign investment, and reduce poverty. A major component of these reforms was establishing a favorable environment for public-private partnerships, which was fundamental for accelerating economic recovery and sustainable development. In 2006, the government created the Rwanda Development Board (RDB) to streamline business processes and promote private investment. Since then, the RDB has established a framework[1] to guide ministries,

1 Rwanda Development Board. "Public-Private Partnership Guidelines." 2018.

departments, state-owned enterprises, districts, and public officials in developing and administering PPP projects. Initiatives, such as the Kigali Innovation City[2] and the Kigali Special Economic Zone[3], are key examples of successful PPP projects that catalyzed economic growth by attracting foreign direct investment and spurring innovation and entrepreneurship within the country. PPPs have significantly contributed to Rwanda's impressive economic growth rates since the early 2000s and can contribute to closing major gaps within sectors such as infrastructure.[4]

Despite their overarching successes, Rwanda's PPPs face challenges, including concerns over sustainable funding, addressing urban-rural and gender divides, and the overall equitable distribution of benefits. Lessons learned from these experiences are crucial for refining PPP policies and practices, ensuring that such partnerships continue to serve the broader interests of Rwanda's sustainable and inclusive development. As Rwanda pursues its Vision 2050[5] objectives, PPPs are expected to play a crucial role in achieving the ambitious targets to turn the country into a high-income, knowledge-based economy.

While PPPs have driven significant development, they are the subject of academic debate. Proponents argue that PPPs leverage private sector strengths – efficiency, capital, and innovation – to close public sector gaps, with the World Bank[6] noting improvements in Rwanda's infrastructure, health care, and IT. They contend that PPPs enhance service delivery, reduce costs, and boost competitiveness.[7]

However, critics warn that PPPs can prioritize profitability over public welfare, risking inequalities if benefits are concentrated among elites.[8] The International Monetary Fund highlights potential financial liabilities,[9] while Transparency International underscores corruption risks in environments with weak institutional checks.[10] This tension underscores the importance of balancing private incentives with public needs to maximize PPP impact on inclusive growth.

Evaluating Rwanda's PPP Model

Rwanda's strategic use of PPPs is integral to its Vision 2050, aiming to transition the country into a high-income, knowledge-based economy. One of the standout examples of a successful PPP is the Centre for the Fourth Industrial Revolution (C4IR), which focuses on developing the country's artificial intelligence (AI) capabilities and digital governance. As explained by Joris Cyizere, strategy lead at C4IR, the center was established as a not-for-profit private entity, primarily funded by the government but governed by a board of public and private sector representatives. This hybrid governance structure allows C4IR to act as a bridge between the government and private enterprises, facilitating the creation of policies and projects that align with national development goals.

C4IR's success lies in its ability to leverage international partnerships, such as those with the German government and the MasterCard Foundation, to bring global expertise into Rwanda. This has enabled the country to develop a national AI policy and data protection and privacy laws, which are foundational to fostering a robust digital economy. By aligning these initiatives with the priorities of the Ministry of ICT and Innovation (MINICT), C4IR has positioned Rwanda as a leader in digital governance within Africa. The center's work underscores the strategic advantage of PPPs in harnessing private sector innovation and resources to build local capacity and advance national development objectives.

Irembo is another example of a successful PPP that transformed public service delivery in Rwanda. Established in 2014, Irembo, meaning "gateway" in Kinyarwanda, has digitized the interaction between citizens and the government, streamlining processes such as applying for passports. According to Neolla Dushime, director of business development and partnerships at Irembo, the IremboGov platform was created to address the

2 "The Republic of Rwanda and Africa50 Unveil the Kigali Innovation City Urban Masterplan." Rwanda Development Board, last modified July 22, 2021.
3 Rwanda Development Board. "Special Economic Zone and Accelerated Registration Catalogue." 2020.
4 World Bank. "Partnership with Private Sector is Key in Closing Rwanda's Infrastructure Gap." Press release.
5 Ministry of Local Government. Rwanda Vision 2050 (Kigali: Ministry of Local Government, 2020)
6 World Bank. "PPPs in Infrastructure." World Bank Report.
7 United Nations Economic Commission for Africa. "Enhancing Public Private Partnership for Development." UNECA Policy Brief.
8 James A. Robinson and Daron Acemoglu. Why Nations Fail: The Origins of Power, Prosperity, and Poverty. (New York: Crown Publishers, 2012).
9 International Monetary Fund, Public-Private Partnerships, IMF Policy Paper (Washington, D.C.: International Monetary Fund, 2019), https://www.imf.org/en/Publications/Policy-Papers/Issues/2019/02/25/Public-Private-Partnerships-46668.
10 Transparency International. "Corruption in Public-Private Partnerships." TI Report, 2021.

inefficiencies and complexities citizens face in accessing government services. Through a Build-Operate-Transfer (BOT) model spanning 25 years, Irembo digitized over 128 government services, with plans to reach 200 services in the future. The platform's revenue-sharing model, where the government pays commissions for each transaction, ensures the burden is not placed on citizens, making public services more accessible and efficient.

The government's strategic use of PPPs has also been instrumental in developing key infrastructure projects. The Kigali Innovation City and the Kigali Special Economic Zone are prime examples of how PPPs can drive economic growth by attracting foreign direct investment and promoting entrepreneurship. The Rwanda Development Board (RDB), which oversees these projects, serves as a one-stop shop for investors to simplify the process of engaging with the government. This streamlined approach has been crucial in attracting high-profile international partners and ensuring that projects align with national development priorities. According to Innocent Bajiji, the PPP lead at RDB, the clarity and efficiency of the PPP framework have been critical in managing complex projects and navigating the bureaucratic landscape.

Challenges and Limitations of PPPs

Despite their significant contributions, PPPs in Rwanda are not without challenges. One of the primary issues is the bureaucratic complexity and the need for coordination among multiple stakeholders. This challenge is particularly pronounced in projects that involve ministries or agencies with limited technical expertise. For example, while the MINICT has supported digital transformation initiatives, other ministries may lack the technical knowledge or motivation to fully engage with these projects. Cyizere highlighted that making value propositions to non-tech ministries can be a hurdle, as these entities may not see the immediate benefits of adopting new technologies. This misalignment can slow down the implementation of projects and limit their impact.

Financial sustainability is another critical concern. While PPPs are sometimes mistakenly seen as a means to bridge funding gaps, they can also create long-term liabilities for the government. Bajiji said some PPPs require the government to provide guarantees to attract private investment, which can lead to significant financial exposure if the expected revenues do not materialize. This has been the case in several energy sector projects, where fluctuating demand and complex contractual terms have led to costly renegotiations. The misconception that PPPs are a cure-all for funding challenges can lead to inadequate risk assessment and oversight, potentially resulting in more expensive and less effective projects than traditional public sector initiatives.

Resistance to change within the government and public sector poses another significant challenge. Dushime explained that while there is institutional support for digital transformation, there is also a tendency for complacency and a reluctance to embrace new technologies. This inertia can be detrimental to the success of PPP projects, particularly those that require ongoing innovation and adaptability. Moreover, the fear of disrupting established processes and the perceived risks associated with change can delay project implementation and limit the potential benefits of PPPs.

Another challenge is data availability and quality, which is crucial for informed decision-making and effective project management. Delphine Uwase, head of strategy & competitiveness at the RDB, said the lack of reliable and updated data in some sectors hampers the ability to monitor and evaluate the impact of PPPs. This is particularly problematic in the health care and education sectors, where accurate data is essential for assessing the effectiveness of services and identifying areas for improvement. The limited capacity for data collection and analysis within government agencies further exacerbates this issue, making it difficult to establish a robust evidence base for policy decisions.

Broader Economic and Social Implications

By facilitating private sector involvement in areas traditionally dominated by the public sector, PPPs have helped to promote a more dynamic and competitive business environment. For example, the Kigali International Financial Centre (KIFC) is a key initiative to transform Rwanda into a regional financial hub. KIFC aims to position the country as a gateway for regional investment by attracting international financial actors and fostering a conducive environment for capital. This initiative, which aligns with Rwanda's Vision 2050, demonstrates how PPPs can be leveraged to achieve broader economic goals and enhance the country's global competitiveness.

Moreover, PPPs have played a crucial role in improving public service delivery and enhancing the quality of life for Rwandan citizens. The IremboGov platform significantly reduced the time and cost of accessing government services, thereby increasing public trust and confidence in the government. This, in turn, supports social cohesion and strengthens the relationship between the state and its citizens. The success of Irembo also highlights the potential of PPPs to drive digital transformation and innovation in public service delivery, setting a precedent for other sectors and countries to follow.

While PPPs have driven Rwanda's development, their success is contingent on effective coordination, financial sustainability, and the ability to adapt to changing circumstances. By addressing these challenges and building on the successes, Rwanda can continue to leverage PPPs as a powerful tool for achieving its Vision 2050 objectives and set an example for other nations to harness public-private collaboration for sustainable development.

Key Steps for Sustainable Growth

Rwanda's strategic use of PPPs has been instrumental in its rapid socioeconomic transformation. The success of these partnerships underscores their potential to drive sustainable development and foster a dynamic business environment. However, challenges related to coordination, financial sustainability, and institutional capacity pose significant risks to their continued effectiveness. The following policy recommendations are necessary to maximize the benefits of PPPs and align them with national development goals.

Enhance capacity-building for public sector officials. By doing so, Rwanda can ensure that its PPPs are managed more effectively, with improved alignment between the government's strategic objectives and the operational realities of these partnerships:

- Develop specialized training programs that focus on financial, technical, and legal aspects of PPP management. This will equip public officials with the necessary expertise to effectively negotiate, manage, and evaluate complex PPP agreements.
- Establish dedicated PPP units within key ministries to streamline processes and ensure these partnerships are managed by experts familiar with the intricacies of public-private collaboration.
- Facilitate ongoing knowledge exchange between public officials and private sector partners through regular workshops and conferences, promoting best practices, and staying updated on emerging trends in PPP management.

Promote inclusive and equitable PPPs. This will ensure that the benefits of these partnerships extend beyond economic growth to include social and developmental outcomes:

- Prioritize PPP projects in social sectors such as health care, education, and affordable housing. These areas are critical for addressing underserved communities and ensuring that development benefits all segments of the population, especially in rural areas.
- Incorporate gender and social inclusion metrics into PPP project evaluations to ensure that these partnerships promote equitable growth and reduce social inequalities.
- Strengthen community engagement processes by ensuring that local stakeholders are consulted in the planning and execution of PPP projects, ensuring the projects meet their needs and foster long-term social equity.

Expand digital infrastructure and data capabilities. Strengthening digital infrastructure and data capabilities will not only support the effective management of PPPs, but position Rwanda as a leader in digital governance and innovation in Africa:

- Accelerate investment in digital infrastructure nationwide, focusing on expanding connectivity in rural and underserved areas.
- Develop a national data strategy to improve data collection, management, and sharing, enhancing transparency, and enabling data-driven decision-making in PPP projects.
- Encourage public-private data collaborations to build shared platforms for monitoring and evaluating the impact of PPPs, improving accountability, and fostering more informed policymaking.

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May 2025

The Green Promise: How to Unlock India's Hydrogen Potential

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Lauder Track: Southeast Asia, the Middle East and North Africa (Hindi)

Executive Summary

India's National Green Hydrogen Mission (NGHM), a landmark initiative introduced by the Ministry of New and Renewable Energy (MNRE) in 2023, is poised to position the country as a leader in green hydrogen by addressing hard-to-abate sectors. However, it faces implementation challenges: high production costs, limited infrastructure, and financing gaps. Overcoming challenges to NGHM requires streamlining regulations and industrial mandates, developing a robust infrastructure and innovative project financing models, and continued international cooperation.

India's Mission for Green Hydrogen

The National Green Hydrogen Mission (NGHM) chalks out an ambitious plan for India to become a global hub for the production, use, and export of green hydrogen while meeting its energy requirements sustainably.[1] Green hydrogen, a clean energy source produced through water electrolysis, generates zero carbon emissions, distinguishing it from conventional ("grey") hydrogen derived from fossil fuels. The mission aims to achieve annual production of 5 million metric tonnes of green hydrogen by 2030, en route to net zero by 2070.[2] This mission is crucial for India's transition towards renewable energy, decarbonization of various industrial sectors, and achieving energy self-reliance. India relies on imported fossil fuels for more than 80% of its energy needs, making it vulnerable to international price volatility and geopolitics.[3] Green hydrogen is uniquely suited to India's energy security and decarbonization goals due to its ability to decarbonize hard-to-abate industrial sectors and its potential to reduce dependence on imported fossil fuels. Unlike other renewable energy sources, green hydrogen can serve as both a clean fuel and a feedstock for industries such as steel, cement, and fertilizers, where direct electrification is challenging.[4] Additionally, by producing green hydrogen domestically using abundant renewable resources, India can enhance its energy independence and mitigate

1 "India's Green Hydrogen Revolution, An Ambitious Approach." May 2024.

2 "Government Declares Plan to Add 50 GW of Renewable Energy Capacity Annually for next 5 Years to Achieve the Target of 500 GW by 2030." www.pib.gov.in, 5 April 2023, www.pib.gov.in/PressReleasePage.aspx?PRID=1913789.

3 "National Green Hydrogen Mission (NGHM)." Pib.gov.in, 2024, pib.gov.in/PressReleasePage.aspx?PRID=2039091.

4 Sheth, Shalin. "The Impact of Green Hydrogen on India's Energy Security and Sustainability." *Times of India Voices, Times of India*, March 2, 2023. timesofindia.indiatimes.com/blogs/voices/the-impact-of-green-hydrogen-on-indias-energy-security-and-sustainability/.

vulnerabilities associated with international fossil fuel markets.

However, factors such as high production costs, limited infrastructure, and a shifting regulatory framework are major limitations to the rapid implementation of NGHM. To assuage this, NGHM is expected to attract investments, stimulate economic growth, and create employment opportunities in emerging green technologies. The government has also introduced the Strategic Interventions for Green Hydrogen Transition (SIGHT) program to incentivize the implementation of the NGHM.[5] Two important incentives that SIGHT covers are the manufacturing of electrolyzers and the production of green hydrogen, thus broadening the scope of NGHM as an environmental imperative and robust economic opportunity.

Furthermore, to compete in the green hydrogen market, India must continue developing its renewable energy via a three-pronged path of technologies, policies, and public-private partnerships (PPPs) streamlined into a single, workable approach. The move to renewable energy is also driven by India's commitment to clean energy. As of October 2024, India has a total installed capacity of 203.18GW renewable energy, which accounts for over 46.3% of the country's total installed capacity.[6] At this pivotal moment in the energy transition, the NGHM is a key step towards achieving net-zero emissions by 2070.[7]

International Benchmarks and India's Position

Green hydrogen is taking a central role in the global energy transition strategies of countries such as Germany, Chile, and Australia, which are heavily investing in technological advancement to expedite this growing need. Taking the lead, Germany presented its National Hydrogen Strategy in 2020, which focused on a €9 billion[8] plan to decarbonize hard-to-abate industries and develop hydrogen-powered transportation. Chile, like India, plans to use its abundant solar resources and manufacture green hydrogen at a reduced cost of $1.50[9] per kilogram by 2030, with hopes to become a key global green hydrogen exporter. These initiatives underscore the global momentum for green hydrogen as a sustainable energy solution.

India, also globally competitive in solar and wind energies, is positioned to be a market leader, especially by taking comparative advantage of producing low-cost green hydrogen. However, India must understand and overcome crucial challenges in developing global standards, establishing hydrogen certification mechanisms, and promoting export capacity with vigorous storage and transportation infrastructure.

With the help of escalating capacity of solar and wind energy, India has set an ambitious goal to reach 500GW[10] of non-fossil fuel-based electricity capacity by 2030, with projections indicating 280 GW from solar energy, 140 GW from wind energy, and 80 GW from other renewables, including hydro and bioenergy.[11] Green hydrogen relies on renewable electricity to produce clean energy through electrolysis. This integration creates a synergistic cycle: Expanding renewable energy capacity facilitates increased green hydrogen production, which in turn can be used to store excess renewable energy and provide clean fuel for sectors that are challenging to electrify directly. Relying heavily on India's abundant solar energy potential, India has the opportunity to become a leader in green hydrogen production. Policies, such as renewable energy auctions, additional tax incentives, and resilient frameworks to encourage foreign direct investment in the renewable energy sector, align with India's commitment under the Paris Agreement to increase its share of renewable energy capacity to 50% by 2030.

The NGHM positions green hydrogen as instrumental in building India's renewable energy foundation, decarbonizing industries, and enhancing India's energy

5 "National Green Hydrogen Mission | Ministry Of New and Renewable Energy | India." Mnre.gov.in, 2023, mnre.gov.in/en/national-green-hydrogen-mission/.

6 "India's Renewable Energy Capacity Hits New Milestone." pib.gov.in, 2024, pib.gov.in/PressReleasePage.aspx?PRID=2073038.

7 "Government Declares Plan to Add 50 GW of Renewable Energy Capacity Annually for Next 5 Years to Achieve the Target of 500 GW by 2030." www.pib.gov.in, 5 Apr. 2023, www.pib.gov.in/PressReleasePage.aspx?PRID=1913789.

8 Welle (www.dw.com), Deutsche. "Germany and Hydrogen — €9 Billion to Spend as Strategy Is Revealed | DW | 10.06.2020." DW.COM, www.dw.com/en/germany-and-hydrogen-9-billion-to-spend-as-strategy-is-revealed/a-53719746.

9 "Chile Green Hydrogen Action Plan Overview - AX | LEGAL." AX | LEGAL, 14 May 2024, ax.legal/2024/05/14/chile-green-hydrogen-action-plan-overview.

10 "500GW Nonfossil Fuel Target | Government of India | Ministry of Power." powermin.gov.in, powermin.gov.in/en/content/500gw-nonfossil-fuel-target.

11 *India's Renewable Energy Capacity Hits 200 GW Milestone*. Ministry of New and Renewable Energy, Oct. 14, 2024, static.pib.gov.in/WriteReadData/specificdocs/documents/2024/oct/doc20241014416401.pdf.

security and stability. NGHM also aims to reduce green hydrogen production costs — a major barrier to $1.5 per kilogram by 2030 — through a mix of domestic electrolyzer manufacturing, integrating renewable energy, and research and development (R&D) incentives.[12]

Supporting this mission, institutions, such as the Council on Energy, Environment, and Water (CEEW), and The Energy and Resources Institute (TERI), emphasize three additional socioeconomic benefits: the creation of more than 600,000 jobs; a cumulative reduction in fossil fuel imports; and the abatement of nearly 50 MMT of annual greenhouse gas emissions by 2030.[13] Moreover, the World Bank reiterated that India can enhance its economic resilience with this robust foundation of renewable energy to support its long-term sustainability goals.

Strategic Pillars for Leadership

To reach India's ambitious goal of becoming a global leader in the green hydrogen economy, the Ministry of New and Renewable Energy designed NGHM to address three critical pillars: cost reduction, domestic demand, and infrastructure development. Yet, this journey poses significant challenges alongside opportunities.

A core objective is to reduce production costs to $1.5/kg by 2030 to achieve price parity with grey hydrogen derived from fossil fuels.[14, 15] This cost reduction relies on scaling up production, improving electrolyzer efficiency, and integrating abundant renewable energy resources like solar and wind into the production process.[16] The mission leverages India's solar and wind potential, especially in regions like Rajasthan and Gujarat, to achieve this target while addressing the high capital costs of electrolyzers, which currently account for a substantial portion of production expenses.[17]

To support the NGHM mission, the ministry introduced the Strategic Interventions for Green Hydrogen Transition (SIGHT) program with ₹17,490 (approximately $2.1 billion) allocated for green hydrogen production and electrolyzer manufacturing.[18] This program aims to de-risk early adopters by offering financial incentives for domestic manufacturing and providing viability gap funding.[19]

Another central goal is to create a robust domestic market by targeting hard-to-abate sectors, such as steel, cement, chemicals, and fertilizers, which collectively contribute to nearly 21% of India's industrial emissions.[20] Mandates to blend hydrogen fertilizers and gradually include steel production under the green hydrogen umbrella is part of the road map to foster demand. Additionally, a senior MNRE official emphasized that pilot projects in transportation, particularly for heavy-duty vehicles and railways, will exponentially catalyze the use of hydrogen in mobility.

With increased demand, infrastructure development is another key focus. Policy experts at CEEW stressed the challenges to storing, transporting, and distributing green hydrogen due to its low density and high flammability, which requires the development of specialized infrastructure to ensure safety. At the moment, India's lack of a national hydrogen grid and export-ready ports are among the biggest barriers.[21] To mitigate these barriers, the NGHM also emphasizes investments in pipelines, storage solutions, and renewable energy microgrids near hydrogen production hubs to optimize costs, reduce transmission losses, and ensure safety.

Leveraging Strengths to Drive Progress

India has inherent advantages in the green hydrogen space. The country's abundant renewable energy potential

12 "India." *Green Hydrogen Organisation*, gh2.org/countries/india.

13 "Cabinet Approves National Green Hydrogen Mission." pib.gov.in, pib.gov.in/PressReleasePage.aspx?PRID=1888547.

14 "PLI Schemes for Green Hydrogen Production and Electrolyser Manufacturing." EY, 2023, www.ey.com/en_in/media/webcasts/2023/06/pli-schemes-for-green-hydrogen-production-and-electrolyser-manufacturing.

15 "Green Hydrogen - Path to Decarbonization." Teriin.org, TERI, Nov. 2024, www.teriin.org/policy-brief/green-hydrogen-path-decarbonization.

16 Mallya, Hemant, et al. "Unlocking India's RE and Green Hydrogen Potential an Assessment of Land, Water, and Climate Nexus." *CEEW*, Sept. 2024.

17 KE Seetha Ram, and Haoran Zhang. "Hydrogen in Decarbonization Strategies in Asia and the Pacific." *Asian Development Bank Institute Ebooks*, ADB Institute , 2 Oct. 2023.

18 "National Green Hydrogen Mission Portal of India." mnre.gov.in, 2023, nghm.mnre.gov.in/supply-incentives.

19 "A Roadmap for Green and Transition Finance in India - CPI." *CPI*, 2 Dec. 2024, www.climatepolicyinitiative.org/publication/a-roadmap-for-green-and-transition-finance-in-india/.

20 "Green Hydrogen - Path to Decarbonization." Teriin.org, TERI, Nov. 2024, www.teriin.org/policy-brief/green-hydrogen-path-decarbonization.

21 "Financing Green Hydrogen in India." *CEEW*, 10 June 2024, www.ceew.in/publications/how-can-indian-policymakers-boost-investments-for-domestic-green-hydrogen-financing

offers a cost-effective foundation for green hydrogen production. Furthermore, advancing technology and expanding market opportunities can be done by instilling an environment conducive to successful PPPs, a direction India is moving towards. According to analysts at CPI, leaning into international collaborations with countries including Germany, Japan, and Australia can also progress technology, transfer knowledge, and bolster expertise.

India's added advantage of emerging energy-intensive markets in the Global South, such as Japan and South Korea, can strengthen its export potential. MNRE officials emphasized the government's strong infrastructural development approach in building hydrogen-ready ports, securing trade agreements, establishing policy frameworks like the SIGHT program, and enhancing trade by implementing waivers on interstate transmission charges for renewable energy.

Overcoming Barriers to Adoption

Nonetheless, India faces several challenges in scaling green hydrogen adoption. One of the most significant is cost competitiveness. Green hydrogen production in India, currently at $3-4/kg, is considerably more expensive than grey hydrogen[22] production ($1-1.5/kg). The Energy and Resources Institute's hydrogen policy roadmap outlines effective tools for cost reduction to achieve the $1.5/kg target, including advanced electrolyzers, enhanced energy efficiency, and scaling production. According to senior officials at the Asian Development Bank, private investment is essential in this mission. Mobilizing private capital will demand innovative financing solutions such as green bonds, concessional loans, and viability gap funding. Furthermore, one of the concerns expressed by policy experts at CEEW is the high financing costs in emerging markets like India that deter private investments. Financial gaps further hinder development, with the sector requiring over $100 billion in investments by 2030.[23]

Regulatory uncertainties add to these challenges. India lacks comprehensive safety standards, certification mechanisms for green hydrogen, and robust policies aligned with global trade standards. Without these, market confidence and international trade prospects for green hydrogen remain limited.[24]

Strategic Pathways for Leadership

To position itself as a global leader in green hydrogen production and export, India must implement strategic actions across five key areas: (1) policy and regulation, (2) market development, (3) financing, (4) infrastructure development, and (5) international collaboration. These recommendations are designed to align with the objectives of the NGHM and the SIGHT program, providing a targeted framework for action.

Policy and Regulation

Establishing a streamlined regulatory environment is crucial for swiftly deploying green hydrogen initiatives. The government should implement a single-window clearance system,[25] which it is discussing, to expedite approvals for hydrogen projects, thereby enhancing investor confidence and reducing project delays. This approach will also be bolstered through a comprehensive safety and quality standard for green hydrogen-related production, storage, transportation, and distribution. Moreover, policies that promote technological development and R&D are also necessary to ensure credibility and market confidence in India as a green hydrogen producer and exporter.

Market Creation

India is a complex country with traditional large and established enterprises, as well as bustling micro, small, and medium enterprises (MSMEs) operating across industries and state lines. Stimulating domestic demand is pivotal for the success of the green hydrogen sector. Introducing blending mandates for green hydrogen in sectors, such as steel, cement, and fertilizers, is critical to stimulating demand. Expanding hydrogen's role in transportation by promoting pilot projects for hydrogen-powered buses, railways, and heavy-duty vehicles will demonstrate feasibility and encourage adoption. Another important — and often overlooked — approach to market development is awareness campaigns highlighting the

22 Grey hydrogen: hydrogen produced from fossil fuels like natural gas

23 "A Roadmap for Green and Transition Finance in India - CPI." CPI, 2 Dec. 2024, www.climatepolicyinitiative.org/publication/a-roadmap-for-green-and-transition-finance-in-india/.

24 KE Seetha Ram, and Haoran Zhang. "Hydrogen in Decarbonization Strategies in Asia and the Pacific." Asian Development Bank Institute EBooks, ADB Institute , 2 Oct. 2023.

25 National Green Hydrogen Mission Ministry Of New And Renewable Energy. 2023.

economic and environmental benefits of green hydrogen to encourage industries and MSMEs to adopt it in their enterprises.

Financing Mechanisms

The transition to a green hydrogen economy will require substantial capital investment, and innovative financing mechanisms are key to mobilizing resources. Green bonds, viability gap funding, and concessional loans are ways the government can reduce capital costs and attract private investors. Another innovative approach will be PPPs that combine government support with private sector expertise, a relationship that can effectively execute large-scale projects. Furthermore, collaboration with multilateral organizations such as the World Bank and the Asian Development Bank can offer risk mitigation tools, including guarantees and insurance products, to de-risk investments in green hydrogen.[26] Establishing a dedicated Green Hydrogen Investment Fund[27] that combines domestic and international resources can support infrastructure development, technology innovation, and market creation.

Infrastructure Development

India must also prioritize the creation of a robust national hydrogen grid to connect production hubs with industrial consumers and export terminals. This can be done through a dual approach of developing specialized storage facilities, pipelines, and hydrogen-ready ports to scale adoption and access global markets; and investing in renewable energy microgrids near hydrogen production hubs to optimize costs and ensure a reliable energy supply for electrolysis.

International Collaboration

Lastly, the renewable energy revolution is a global movement that requires dedicated international cooperation for success. Collaborating with leading hydrogen economies such as Germany, Australia, and Japan to facilitate technology transfer, joint R&D initiatives, and market access is fundamental for India. Engaging with multilateral organizations such as the International Renewable Energy Agency (IRENA) is imperative to access resources, expertise, and funding for large-scale hydrogen projects. Developing international certification frameworks and trade agreements will ensure that India's green hydrogen products meet global standards, enhancing export potential.

Charting the Future

India's NGHM represents a transformative step towards the nation's commitment to net zero and redefining the global energy landscape. At the second International Conference on Green Hydrogen in September 2024, Prime Minister Narendra Modi emphasized, "The time for action is here and now," highlighting the urgency of addressing climate change through innovative energy solutions. Modi also remarked, "Green Hydrogen is emerging as a promising addition to the world's energy landscape," offering solutions for decarbonization and energy storage.[28]

With the goal of producing 5 MMT of green hydrogen annually by 2030, India is poised to become a global hub for green hydrogen production, use, and export. The NGHM builds on this momentum, aiming to decarbonize hard-to-abate sectors such as steel, fertilizers, and heavy-duty transport while fostering innovation, infrastructure, and investment. However, despite its promise, the mission faces hurdles, including high production costs, limited infrastructure, and financing challenges that require policies, regulations, infrastructure development, innovative financing models, and a coordinated, multi-stakeholder approach to accelerate scaling and minimize costs. A well-thought-out plan of action, NGHM is a cautiously optimistic mission that represents both an environmental necessity and an economic opportunity for India to lead in the global energy transition, paving the way for a sustainable and self-reliant future.

26 KE Seetha Ram, and Haoran Zhang. "Hydrogen in Decarbonization Strategies in Asia and the Pacific." *Asian Development Bank Institute EBooks*, ADB Institute , 2 Oct. 2023.

27 "CFLI India Announces Climate Finance Solutions with the Potential to Mobilize over US $6.5 Billion in India." *Bloomberg Philanthropies*, www.bloomberg.org/press/cfli-india-announces-climate-finance-solutions-with-potential-to-mobilize-over-us-6-5-billion-in-india/.

28 "PM Addresses Second International Conference on Green Hydrogen." Pmindia.gov.in, 2014, www.pmindia.gov.in/en/news_updates/pm-addresses-second-international-conference-on-green-hydrogen/.

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Policy Briefs

May 2025

From Stability to Sustainability: Unlocking the Green Potential of the Digital Euro

Joselyn Salazar
Lauder Track: Europe, French

Executive Summary

The European Central Bank is developing the digital euro, an electronic form of payment available to everyone in the 20 Eurozone countries. Beyond its immediate financial benefits, it aligns with the European Union's strategic goals of promoting sustainability and a low-carbon future. The digital euro could serve as a vital tool in this transition, supporting green finance while ensuring that Europe's financial system remains competitive and resilient in the digital age. However, greenwashing, financial stability, and energy efficiency must be addressed to ensure its success.

The ECB's Commitment to Innovation and Sustainability

The European Central Bank (ECB) has been very vocal about its commitment to sustainable banking. In early 2024, ECB president Christine Lagarde confirmed, "A hotter climate and the degradation of natural capital are forcing change in our economy and financial system. We must understand and keep up with this change to continue to fulfill our mandate."[1] Since then, the central bank has taken concrete action, setting up the Climate Change Center as the official coordinating body to consolidate, direct, and execute the climate agenda internally and externally. This group, reporting directly to Lagarde, works on several cross-functional projects relating to financial market operations, risk, and European Union (EU) policy and financial regulation.[2]

Furthermore, the ECB has set up the Digital Euro team in its Frankfurt headquarters, composed of experts who are tackling the strategic, regulatory, and operational challenges that come with such an endeavor.

In interviews, members of their strategy team provided additional context on three key deliverables that the public can expect. First, they are dedicated to providing a **privacy-first, online payment solution** that fully addresses the concerns of the general public. According to a recent survey by independent market research firm Kantar Group,

1 European Central Bank. "ECB Steps up Climate Work with Focus on Green Transition, Climate and Nature-Related Risks." European Central Bank, 30 Jan. 2024, www.ecb.europa.eu/press/pr/date/2024/html/ecb.pr240130~afa3d90e07.en.html#:~:text=%E2%80%9CA%20hotter%20climate%20and%20the. Accessed 21 Sept. 2024.

2 Olmem, Andrew, and J. Paul Forrester. "European Central Bank Establishes Climate Change Centre." Mayerbrown.com, 2 Feb. 2021, www.mayerbrown.com/en/insights/blogs/2021/02/european-central-bank-establishes-climate-change-centre. Accessed 21 Sept. 2024.

"The public consider privacy and data protection to be two of the most important design elements of a digital euro."[3] Second, the ECB will produce a **digital rulebook** – "a single set of rules, standards and procedures to standardize digital euro payments across the Euro area." [4] This body of work would set up the framework to deal with future disputes and ensure agreement across the multiple countries that accept this form of payment. Third, the digital euro will offer an **offline digital euro** that will allow users to transact with this payment method, regardless of internet connection.

To succeed, this ambitious project will need "two main tracks to advance in parallel. It needs to be timing optimal and technically feasible," a senior strategist said. The digital euro is a must-win and goes beyond "just an ECB project, but a European project."

A project of this scale has been attempted by other central banking institutions, with limited success. According to a recent thought piece by Boston Consulting Group, "One key factor that stands to make the digital euro a success is the strong level of political will and capital already in place." [5] The EU's bureaucratic infrastructure, often seen as a burden to overcome, may be the single most important aspect to ensuring permanent adoption and buy-in. The coordination effort required spans public and private sectors—from governments to civil institutions to individual consumers—which are already within the operating scope of the EU regulatory bodies.

Despite this work, it has been challenging to quantify the net impact of this nascent "green" monetary policy. A recent analysis of the ECB's corporate bond portfolio found that the existing portfolio was unknowingly favoring "firms with more tangible assets, as well as riskier firms, especially those more exposed to climate risk." Melina Papoutsi, a senior economist at ECB, explained that this effect was largely driven by the fact that "riskier" firms require significant upfront capital expenditure. By extension, these same firms can collateralize more loans, thus facing a lower cost of capital. These capital-intensive firms are typically in heavy "brown" sectors such as oil and gas, mining, and manufacturing. The outcome of these findings has led to a robust dialogue with ECB policymakers as they think about the second- and third-order implications of their policies.

A New Pathway to Climate Neutrality?

As Europe pushes towards its climate-neutral goals, the digital euro presents a unique opportunity to integrate sustainability into the financial ecosystem. Following the clear pledge to deliver a robust "roadmap to further incorporate climate change considerations into its monetary policy framework."[6] the ECB has committed to finding solutions to the climate crisis, which the digital euro is well-positioned to address. While initially conceived to modernize payments and ensure financial stability, the digital euro is also a potential tool for advancing green finance and supporting Europe's sustainability goals. By allowing for precise tracking of transactions, the digital euro could help ensure that funds designated for sustainable investments are used effectively, reducing risks of greenwashing—a growing problem whereby companies misrepresent their environmental practices to attract capital.

While the digital euro holds promise, it also presents challenges. First, without robust oversight, there is a risk that the digital euro could inadvertently support unsustainable projects, undermining its purpose in promoting genuine green finance. Second, the ECB must find a way to balance its primary goal of financial stability with climate-related objectives. Prioritizing green investments while avoiding high-carbon sectors could disrupt market stability if managed too aggressively. Finally, the infrastructure required to support a digital currency could increase the ECB's carbon footprint unless carefully managed, as the energy demands of digital systems are significant.

A Roadmap for Sustainable Finance

The ECB's proposed digital euro aims to modernize the EU's financial infrastructure and expand digital payment options. Yet, beyond its transactional benefits, the digital euro could play a strategic role in advancing Europe's climate goals.

3 "Progress on the Preparation Phase of a Digital Euro - First Progress Report." European Central Bank, 24 June 2024, www.ecb.europa.eu/euro/digital_euro/progress/html/ecb.deprp202406.en.html, https://doi.org/10.2866/10580. Accessed 6 Aug. 2024.

4 European Central Bank - EuroSystem. The ECB Pledge on Climate Change Action. 2021.

5 Bauer, Patrick et al. "The Digital Euro Could Herald a New Era of Innovation." BCG, 2 July 2024, www.bcg.com/publications/2024/digital-euro-could-herald-new-era-of-innovation. Accessed 20 Sept. 2024.

6 European Central Bank - EuroSystem. The ECB Pledge on Climate Change Action. 2021.

Mitigate Greenwashing

One of the digital euro's most promising features is its capacity to **enhance transparency in green finance** by enabling more accurate tracking of funds and their environmental impact. Digitizing transactions within a central bank-controlled system could help ensure that funds earmarked for environmentally sustainable projects are properly allocated and used, preventing greenwashing. A recent study conducted by David Marques-Ibañez et al. illustrated that private banks that join voluntary green alliances, like the Net Zero Banking Alliance, "do not change their lending or loans pricing differentially compared to banks without climate commitments," and that "firm borrowers are no more likely to set climate targets after their lender sets a climate target."[7] Through the digital euro, regulators and investors could easily track the flow of funds related to green bonds or carbon credits, offering greater assurance that these financial products are genuinely contributing to environmental objectives. The digital euro could further enable central and commercial banks to develop specific financial instruments that promote green investments, such as lower interest rates for loans tied to environmentally sustainable projects. By ensuring transparency and accountability, the digital euro could drive capital toward projects that align with Europe's climate goals.

Foster Clean Energy and Digital Infrastructure

Another potential contribution of the digital euro is its ability to **reduce the carbon footprint** of financial transactions. Traditional systems that rely on physical cash incur environmental costs related to the production, transportation, and disposal of currency. Unlike energy-intensive cryptocurrencies such as bitcoin, which require vast computing resources for mining and transaction verification, the digital euro would be centrally managed, and therefore more energy-efficient. This efficiency could help mitigate the environmental impact of an increasingly digital economy, particularly as more consumers and businesses shift away from physical cash.

Support a Sustainable Financial Ecosystem

The digital euro could also promote **sustainable innovation** within Europe's financial ecosystem by providing a reliable digital platform for green fintech solutions. For example, green fintech applications could leverage the digital euro open-access API to develop innovative products that help consumers track the carbon footprint of their transactions, empowering individuals to make more sustainable financial decisions. Additionally, the digital euro could be the preferred partner for business models that prioritize resource efficiency and waste reduction, such as those in the circular economy. By simplifying peer-to-peer payments and supporting platforms for recycling, sharing, and reselling goods, the digital euro could enable a financial infrastructure that promotes sustainability on both the consumer and business levels.

Finally, considering ESG more broadly, the digital euro could promote financial inclusion by providing a secure, state-backed digital currency that ensures access to modern financial services, particularly for those in remote or underserved areas. Additionally, it enhances financial stability by mitigating risks like bank runs, offering individuals a safe digital alternative to private bank deposits, which can be crucial in times of crisis when confidence in commercial banks may wane. ECB economist Davide Porcellachia referenced his ongoing research in this area, explaining that the digital euro could be "a near-instantaneous method of controlling liquidity."

Policy Recommendations

While the digital euro offers significant opportunities for supporting green finance, several challenges must be addressed.

Greenwashing is the largest risk factor to consider. For the digital euro to be an effective tool in promoting sustainability, its **governance and regulatory frameworks must ensure that environmental claims tied to its use are backed by real outcomes.** This could be mitigated through explicit codification in the digital rulebook, ensuring that environmental key performance indicators (KPIs) are embedded into the oversight of financial instruments and transactions facilitated through the digital euro. To ensure the digital euro remains aligned with Europe's evolving sustainability priorities, the ECB should commit to ongoing monitoring and adaptation based on real-world impact. Regular assessments, informed by robust data analytics, will allow the ECB to adjust policies as needed and address emerging challenges in green

7 Sastry, Parinitha, et al. "Business as Usual: Bank Climate Commitments, Lending, and Engagement." SSRN Electronic Journal, 1 Jan. 2024, papers.ssrn.com/sol3/papers.cfm?abstract_id=4772562, https://doi.org/10.2139/ssrn.4772562. Accessed 21 Sept. 2024.

finance. This proactive approach, combined with open communication with stakeholders across the finance and environmental sectors, will be essential to maintaining the digital euro's relevance and effectiveness in Europe's journey towards sustainability.

Similarly, while the digital euro offers a lower-carbon alternative to physical cash, it introduces a new environmental challenge: the energy demand of a digital currency infrastructure. Maintaining the servers, data centers, and network systems needed to process digital euro transactions at scale could significantly increase energy consumption. To prevent the digital euro from contributing to the EU's carbon footprint, the **ECB must design this infrastructure to operate on renewable energy and implement efficiency standards for data processing.** Without proactive measures, the energy-intensive nature of digital systems may offset the digital euro's potential green benefits.

Balancing financial stability and sustainability is another significant challenge. The ECB's primary mandate is price stability, but as climate-related financial risks become more pronounced, the ECB must consider how to navigate the intersection of sustainability and financial policy. Discouraging investment in high-emission sectors, such as fossil fuels, could create instability in financial markets, particularly if these sectors represent a significant share of bank lending portfolios. **Financial institutions could be encouraged to slowly reduce their exposure to high-carbon industries, minimizing market disruptions while shifting capital towards greener sectors.** Additionally, the ECB could i**ncentivize banks to adopt sustainable finance practices** by offering benefits, such as lower collateral requirements for green financial instruments, allowing financial institutions to integrate sustainability in a way that aligns with broader stability objectives. This delicate equilibrium will require some thoughtful adjustment, as the ECB must avoid favoring specific sectors too overtly while still encouraging the shift toward a greener economy.

While the digital euro has the potential to reduce the environmental footprint of financial transactions, the infrastructure required to support a CBDC is not without its energy demands. The data centers, payment processors, and network systems necessary to support a digital currency are likely to consume significant amounts of energy if not carefully managed. Therefore, to align the digital euro with broader sustainability goals, the ECB must ensure that the infrastructure behind it is powered by renewable energy sources.

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