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Tax incentives as a strategic lever for supporting startups and advancing the transition toward a green economy in Algeria

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***Abstract*---**This paper examines the role of tax incentives as a strategic policy lever for supporting startup ecosystems and advancing Algeria's transition toward a green economy. Drawing on international experiences from emerging and developed economies, the study analyzes the theoretical foundations, design considerations, and implementation mechanisms of fiscal instruments targeting green entrepreneurship. The analysis reveals that while Algeria has established a nascent startup legal framework and identified green economy priorities, significant gaps persist in the coherence, targeting, and effectiveness of tax incentives. The paper proposes a sequenced reform agenda comprising short-term administrative simplifications and medium-term structural frameworks aligned with sectoral green priorities. Comparative case studies from Egypt, Jordan, Kenya, and Tunisia illustrate design choices relevant to the Algerian context. The findings emphasize that tax incentives alone are

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insufficient without complementary institutional coordination, monitoring frameworks, and integration with financial ecosystem actors. The study contributes to policy debates on fiscal innovation for sustainable development in resource-dependent economies transitioning toward economic diversification.

***Keywords*---**Green economy, Tax incentives, Startup ecosystem, Fiscal policy, Economic diversification.

1. Introduction

The global imperative to decouple economic growth from environmental degradation has positioned green entrepreneurship as a central mechanism for sustainable development. Startups, characterized by their capacity for rapid innovation and technological disruption, offer particular promise for advancing green transitions in developing economies where established industrial structures often impede environmental adaptation. Tax incentives have emerged internationally as a favored policy instrument for stimulating such entrepreneurial activity, offering governments a mechanism to correct market failures, reduce investment risks, and accelerate the diffusion of clean technologies without direct fiscal expenditure equivalent to grant-based programs. Algeria presents a compelling case for examining this policy nexus. As a hydrocarbon-dependent economy confronting volatile commodity revenues and pressing diversification imperatives, the country has formally committed to green economy objectives through its Vision 2030 and subsequent strategic frameworks. Concurrently, authorities have sought to cultivate a domestic startup ecosystem, registering over 580 startups since 2020 and establishing dedicated legal and institutional structures. Yet the intersection of these policy streams—fiscal support for green entrepreneurship—remains underdeveloped and analytically underexplored.

This paper addresses this gap by systematically examining how tax incentives can function as strategic levers for simultaneously supporting startup formation and advancing green economy transition in Algeria. The analysis proceeds through four interconnected dimensions: theoretical foundations linking fiscal instruments to innovation and environmental outcomes; mapping of Algeria's current institutional and incentive landscape; comparative assessment of international practices from peer emerging economies; and policy proposals for sequenced reforms. The central argument advanced is that effective tax incentives for green startups require moving beyond generic exemption frameworks toward targeted, monitored, and coordinated instruments embedded within broader ecosystem support structures.

2. Green Economy and Startup Ecosystem in Algeria

Green Economy and Startup Ecosystem in Algeria
The term “green economy” encompasses a range of mutually supportive concepts, including environmentally sustainable development, low-carbon economy, and circular economy. A green economy is defined as one that results in “improved

human well-being and social equity, while significantly reducing the risks to the environment" (Chaouachi & Balsalobre-Lorente, 2022). This goal is pursued via three key objectives: (i) reducing greenhouse gas emissions, (ii) improving energy and material efficiency, and (iii) preventing loss of biodiversity and ecosystem services. The transition to a green economy can help protect the environment while promoting sustainable economic growth. Despite notable positive trends at the aggregate level, Algeria's economy remains an oil-dependent economy characterized by a high carbon intensity. The country is therefore exposed to significant economic, environmental, and social vulnerabilities caused by climate change.

Investments in green sectors are often viewed as excessively risky, and most Algerian investors in these sectors still rely primarily on funding from informal sources, thus further hampering innovation. An informal survey of startup companies in Algeria reported that 64% cited access to finance as the most important barrier to entrepreneurship (Chaff, 2023). On the other hand, innovation in a wide range of green areas—particularly in renewable energy, energy efficiency, and waste management—represents Algeria's best opportunity for economic diversification and technological leapfrogging. A growing number of startup companies in Algeria focus on these green topics, as evidenced by initiatives such as the Green Startup Challenge and Green Pitching Challenge. These firms are therefore attracting substantial donor support and growing interest from private investors.

Algeria's startup ecosystem is currently emerging. More than 580 startups have been registered as of mid-2023, a number that has more than tripled within one year and continues to grow rapidly. The sectors of activity presented in these recent registrations highlight the importance of green economy and environmentally friendly entrepreneurship. Most startups that address green issues focus on renewable energy, energy efficiency, waste management, and ecological or organic agriculture. Furthermore, simply avoiding violations of existing regulations generates substantial demand for compliance technology, particular in legal and tax matters. Similarly to online commerce, the Covid-19 pandemic and its associated lockdowns have accelerated the growth of related services. The transition toward a green economy simultaneously constitutes an important driver of innovation and opens up significant opportunities for startup companies.

2.1. Conceptual Framework of a Green Economy

Achieving a 'green economy' means promoting economic activities or production systems that are not only environmentally sustainable but also socially equitable and enable mainstream livelihoods. The term encompasses concepts such as sustainable development, the circular economy and low-carbon development. A shift to a green economy in Algeria is justified by the predicted rise of non-oil sectors in the economy. Investments in a low-carbon, green economy stimulate and diversify overall investment whilst enabling the social transition associated with mainstreaming unemployed youth.

Entrepreneurship is positively correlated with national growth. Entrepreneurship enhancement and creation in a green economy can be catalysed by government

financial and non-financial incentives such as the allocation of large-scale special grants adaptable to specific public policy objectives, national priorities and developmental economic phases. The rise of green startups in Algeria can accelerate the green transition by stimulating overall verification and validation-based technology and competence advancement diffusion to other sectors. The startup ecosystem revolves around small, young and technology-based firms with asymmetric information about risk and growth prospect evaluation. Other responses to asymmetric information include direct funding from public or quasi-public specialised institutions that French research indicates would not suffocate private-market-led venture finance development. (Amira et al., 2026)

2.2. Current Startup Landscape in Algeria

The startup ecosystem in Algeria is slowly emerging, albeit remaining concentrated in urban areas, especially within the capital. The lack of a common definition leaves the startup phenomenon to be perceived in various shades, either referring to small and medium-sized enterprises (SMEs) or to newly created innovative firms. Overall, startups are recognised as businesses that carry a high risk due to both uncertainty and the lack of predictable revenue, pursued by entrepreneurs drawn by the prospect of high returns and by the opportunity to build the bigger company of tomorrow. Historical and current insights reveal that economic planning in Algeria has since independence always sought to reduce over-dependence on oil and that in the aftermath of the 1986 oil shock a state-led strategy to create and foster SMEs relied on the hope that they would generate jobs, exports and economic diversification. Despite the importance attached to entrepreneurship in the National Economic Recovery Plan of April 2020 to escape the post-2014 oil shock and promote the green economy, the current startup ecosystem remains still underdeveloped. About 1 200 non-oil SMEs were created in 2021, only 15 % of which qualified as startups. Rate of GSM subscription and broadband Internet usage is relatively low. The informal economy reaches 50 % of the GDP. Startups are often plagued by a lack of market knowledge, confidence and financial resources to deploy their innovations. Innovative or export-intent SMEs still have difficulties to access finance, despite several public initiatives and plans designed to address the issue and support project holders.

More generally, the startup phenomenon is at a embryonic stage. Perceptions and understanding differ widely. A tendency persists to associate the term startup with SMEs. A narrow approach construes startups as innovative projects with high growth potential. Some decrease their indicative 1.5-hour or 2-hour video presentation to balance adherence in the launch pad. Yet no specific definition has been adopted within national programming documents or priorities. These different views coexist although an algorithmic classification system permits to identify a subset of innovation-driven businesses within the overall SME population. (Soumeia et al.2024)

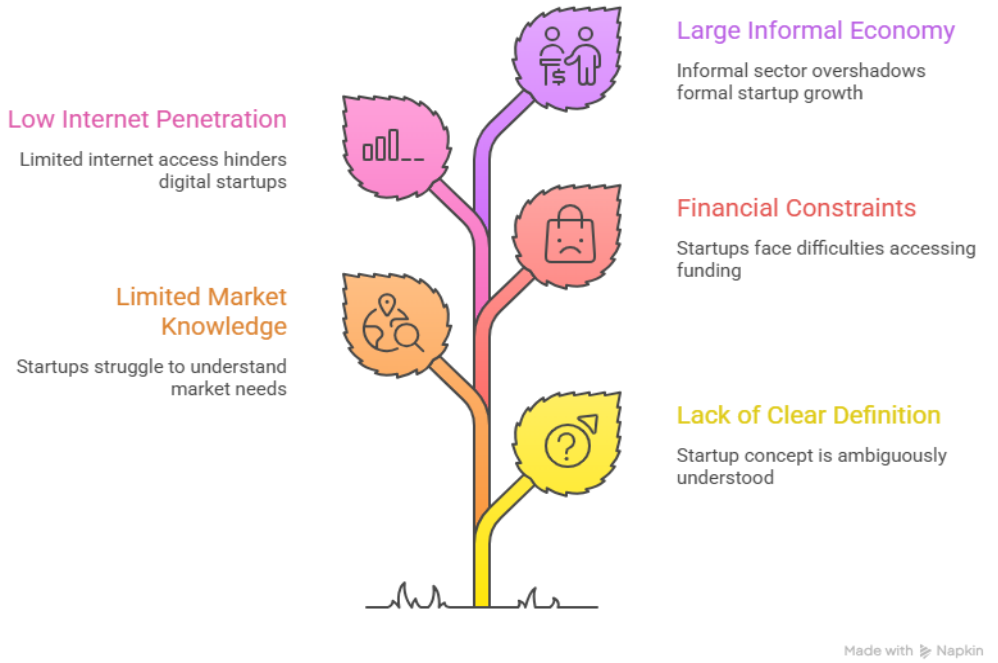

Figure 1. Underdeveloped Startup Ecosystem in Algeria
Source: Authors' elaboration based on institutional analysis and field observations, 2026

2.3. Policy Context and Regulatory Environment

In recent years, Algeria has made significant strides in promoting green entrepreneurship. The mandate is formally framed at the highest levels of government, emphasizing the vital role of startups in mobilizing technological innovation and green investment for advancing the transition toward a green economy. Concurrently, an active entrepreneurial ecosystem has matured in Algeria, with startups emerging as a key vehicle for entrepreneurial development across various industries. In this context, tax incentives represent an effective tool for promoting the creation and growth of green startups. They play a critical role in encouraging technological innovation, enhancing access to funding, and promoting the commercialization and diffusion of green te chnologies and climate-smart solutions. (Olisaeva et al.2024)

3. Tax Incentives: Theory and Mechanisms

Tax incentives can stimulate innovation through indirect mechanisms by addressing market failures and mitigating obstacles that discourage investment in new ideas. One set of challenges pertains to the environment: externalities, the

lack of prices for ecosystem services, and uneven information contribute to the inadequate emphasis on the green economy. A second category of impediments to innovation is related to risk: uncertainties about demand, costs, technology, and commercialisation discourage expenditure on R&D and other activities. Not surprisingly, in the absence of government intervention prices for a variety of energy-related goods and services fail to reflect their true value, thereby creating the so-called Green Paradox—the notion that in a world of finite resources, effort may shift from securing a sustainable energy supply to securing non-finite energy sources. Although certain technologies may yield better performance in terms of development and implementation, optimising these technologies still requires investment in parallel systems (i.e., the accumulation of additional capacities without ensuring that the current set is being fully exploited). The diffusing of new information about alternative business models lowers the returns to investment on innovations that focus on the technological aspects alone. Eventually, a small number of firms typically draw sufficient revenues from energy technology innovation for the option to experiment with new, profoundly different concepts to, and even ability to fully exploit existing one to, remain attractive. (Shahmoradi & Bagheri, 2025)

3.1. Tax Incentives as a Policy Tool for Innovation and Green Transition

Tax incentives stimulate innovation and facilitate the transition to a green economy by mitigating market failures and reducing the uncertainty associated with the adoption of new technologies. Startups often face excessive risk and other obstacles in the early stages of development. Supporting them through fiscal measures allows governments to spur entrepreneurship, unleash creativity, and promote job creation. Tax incentives encourage the development and dissemination of innovations that reduce energy consumption, limit pollutant emissions, and mitigate climate change. Such innovation is vital to the transition toward a green economy.

Various tax instruments can direct resources toward entrepreneurship and green innovation: deductions, credits, exemptions, accelerated depreciation, and the carry-forward of losses. Tax incentives are expected to stimulate the creation of productive firms, enable the existence of firms and ideas that would otherwise die with the absence of tax incentives, and increase the number of viable new startups launched. Such measures reduce the cost of capital for firms, making it easier to cover the high costs of producing new green technologies. (Suwanda, 2023)

3.2. Types of Tax Incentives and Their Economic Rationale

Tax incentives allow companies to reduce their tax liabilities by lowering taxable income, increasing allowable deductions and credits or applying taxes at rates lower than those applicable to other firms in the same jurisdiction. This initiative is expected to alleviate the financial strain on firms, especially when returns on investment are low, which will encourage additional investments and consequently the transformation of businesses in order to adapt to the transition to a green economy. Moreover, companies that fall under the category of start-ups or other small companies that have been registered and have achieved the criteria

set by the authority are significantly fewer when compared to other undeveloped or newly-established countries with similar backgrounds. Hence, the tax incentives strategy enables the system to satisfy such demands. (Kusumaningtyas & Kalimanzila, 2023)

3.3. Design Considerations: Targeting, Eligibility, and Duration

Effectiveness depends on appropriate design choices. Instruments should target activities where market failures and spillover effects inhibit private investment for a given level of risk; other constraints, such as access to finance and skills, require separate instruments. Eligibility requirements shape risk profiles and should reflect sector-specific capital-intensiveness and reliance on foreign technology, especially where commercial technology is available. Sunset clauses, built into law or included in issuing orders from tax administrations, ensure that incentives do not compromise the fiscal budget unduly, and periodic reviews improve and recalibrate incentives. The cost of compliance for the taxpayer and for the tax administration, which may have to audit a very high number of transactions that are individually small, should also be kept in mind.

Ideally, the duration of incentives should not exceed the time when a technology is expected to be a candidate for massive market deployment. If such a time horizon cannot be established very clearly, broad-based incentives, with direct budgetary costs, whose nature allows an easy adjustment when these costs become excessive, may be preferred to narrow-based incentives, the strict observance of which is likely to become difficult. (Filho et al.2023).

4. Alignment of Tax Policy with Green Growth Objectives

The green economy is defined by the United Nations Environment Program (UNEP, 2011) as “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.” The economy reduces carbon emissions and creates decoupling economically resources and energy. These economic activities are focused on the production process improvement through clean, innovative technologies. The measures associated with sustainable development directs Algeria’s transition into a green economy. Due increasingly limited access to finance, startups represent innovative companies looking for alternative sources of funding. Algeria’s startup ecosystem is rapidly evolving, and initiatives have been developed recently to facilitate its emergence. (Yuyang, 2024).

4.1. Sectors and Activities Eligible for Green Tax Benefits

Exploratory analysis of links between tax policy and green growth objectives indicates that innovation-fostering tax expenditures can play a role. Instruments designed to stimulate investments in renewable energy, energy efficiency, clean transport, and circular economy initiatives should be considered; opportunities for more efficient implementation exist. Potential eligibility criteria include: qualification of activity by public agencies, alignment of environmental benefits with national and regional priorities, contribution to local capacities, and partnership with financial or technical institutions. Directing resources toward

development banks and other financial institutions with a mandate for the green transition enhances impact. Financial support for technical expertise further develops the nascent ecosystem for financing and structuring projects with an environmental impact.

Green growth is recognized in domestic and international discourse; tax policy can be aligned with strategic priorities. Emphasis is on environmentally sustainable public finances and investment that supports a sustainable and inclusive recovery, in light of pandemic- and conflict-related pressures. Fiscal policy, too, can support emission reductions and scientific and technological innovation in Algeria. Tax instruments are directed toward lending activities in support of the green transition and are designed to direct resources toward sectors and activities needed for the reconversion of economies. These include investments in renewable energy, energy efficiency, clean transport, and the circular economy. (Tatiana et al.2025)

4.2. Measuring Environmental and Economic Impact

Startups represent a means of responding to important structural, social, economic, and organizational challenges facing the Algerian economy, some of which carry potential consequences for degradations and scarcity on the world market. In this context, green startups are particularly significant, as they contribute to the establishment of a green economy that guarantees a sustainable socio-economic future. To facilitate the emergence of new green startups, fiscal measures have been adopted since the emergence of the national startup ecosystem in 2020. Nevertheless, the Grand Plan National de Développement (2022-2026) underscores the need to consider the transition towards a green economy. A more targeted articulation of the measures provided and the development of a specific fiscal incentive regime for green startups can play an important role in advancing the diversification of the economy through the establishment of an effective green economy. A system for mapping and measuring their impact is necessary in order to provide visibility on these measures and ensure that fiscal incentives are suitably calibrated. Direct delivery of the measures through the institutions of the banking system, the operating arrangements of public agencies responsible for managing the instruments, and the financial partners involved in the financing becomes therefore crucial for the mobilisation of private funding. (Gorowara et al.2024)

The measurement of the impact of these incentives must cover both the environmental and economic aspects, as feedback loops can exist between the two components. This involves specifying the effects sought on the environment, determining the specific mechanisms through which these effects are expected to materialise, and identifying the economic impacts associated with the anticipated environmental ripple effects. Furthermore, Spain in particular illustrates the relevance of the approach, paving the way for an appropriate national scheme on the basis of comparable criteria.

4.3. Cooperation with Financial and Institutional Actors

Tax incentives can effectively facilitate innovation and the transition to a green economy only when coordinated with financial support for companies, entrepreneurial individuals, and project developers to provide the necessary resources and expertise. Government development banks play a critical role as financial intermediaries, supplying risk capital to prepare projects and cover the early stages of development for high-risk activities that are strategically important but beyond the financing capabilities of individual governments.

International project developers—particularly from developed countries, the Gulf states, and other African countries—face risk and financing constraints when structuring and investing in new projects in Algeria. Soft loans from international development banks and financing institutions can cover the additional risk premium required to finance investments below commercial viability. Such capital can mobilize additional investments from multilateral development institutions, such as the World Bank, African Development Bank, and Islamic Development Bank, and international and regional investors through the creation of commercial co-financed funds.

The government can also tap public agencies to secure either individual financing at low cost for priority investments or to establish concessionary multi-projects funding sources in cooperation with Arab financial institutions for the financing of renewable energy and energy efficiency projects. The pool of funds at the level of a decade can support several projects, and experience has shown that it can generate a multiplier factor of, for example, two. (Mungai et al.2022)

5. Comparative Perspectives: International Experiences

The expansion of tax policies to support green startups in emerging economies is not a novel approach. Many developing countries have already implemented substantive, targeted tax incentives that support the growth of green startups. For example, several countries throughout Africa, Latin America, and Asia have adopted such measures. These jurisdictions include Egypt, Ghana, Kenya, Madagascar, Mexico, Morocco, Nigeria, Pakistan, Peru, Senegal, and Vietnam . Although the particular design of tax incentives varies from one location to another, each jurisdiction tailors its incentives to stimulate private investment in areas such as renewable energy, energy efficiency, waste management, and disaster and climate resilience. In each case, the incentives address obsolescence and technology risk concerns arising from the innovative nature of these sectors, as well as access-to-finance obstacles. Policy environments are similar because regulation in non-environment sectors is often obsolete. Consequently, these examples represent a pertinent peer group for Algeria when examining tax instruments to support green startups. (Olisaeva et al.2024)

5.1. Case Studies from Similar Emerging Economies

Tax incentives represent a strategic lever for boosting green business creation and innovation-led economic diversification in Algeria. To calibrate an effective scheme for startups, lessons can be drawn from international experiences, especially in

countries sharing similar development challenges. This section presents case studies from Egypt, Jordan, Kenya, and Tunisia, illustrating design choices and performance outcomes relevant to the Algerian context.

In Egypt, a wide-ranging 2020 tax holiday established an attractive framework for green startups. The regime targets companies operating in the renewable energy, energy efficiency, waste recycling, and sustainable agriculture sectors during their first five years of operations. Startups must subsequently renew their operating license, which allows for a five-year extension of tax line exemptions. Widespread eligibility and generous durations have spurred business creation, yet fiscal implications remain limited. To promote “green business,” the government recently reemphasized the importation of “green technologies”—products, machinery, and services able to enhance energy performance and environmental protection.

The Jordanian experience, in turn, focused on an array of technology employed to support green practices and energy-saving solutions. Green startups benefiting from an economic exemption on corporate tax covering the first five years of operations. Qualifying activities concern renewable energy “production” and “supply,” energy-saving technology, bioremediation of solid or liquid waste, products sourced from “recycled waste,” and efficient water-utilization technology. These do not provide direct coverage for adaptation and resilience measures.

Kenya introduced a specific corporate tax incentive in 2019 targeting environmentally sustainable technology operating within the green economy. Eligible firms—new or existing—can apply for a 100 percent corporation tax exemption on qualifying investments. In 2022, over 3 300 firms were registered under the green economy initiative. Kenya’s physical and climate vulnerabilities call for further adaptation action across a range of sectors; national efforts aim to integrate climate-resilience criteria into national and county development plans and local budgets.

The wide range of tax benefits conferred on eligible businesses highlights the importance of effective single-window mechanisms to avoid excessive delays and compliance burdens. Tunisia adopted a medium-term package of major tax reforms in 2019, notably featuring an extremely competitive four-year complete exemption on corporate income tax for green startups, covering agricultural equipment, solar energy, biowaste management, energy and water-saving technologies, smart textiles, and telemedicine service. In similar vein, the 2017 code granting system process approval for such an exemption remains subject to payment (Ghaly, 2026)

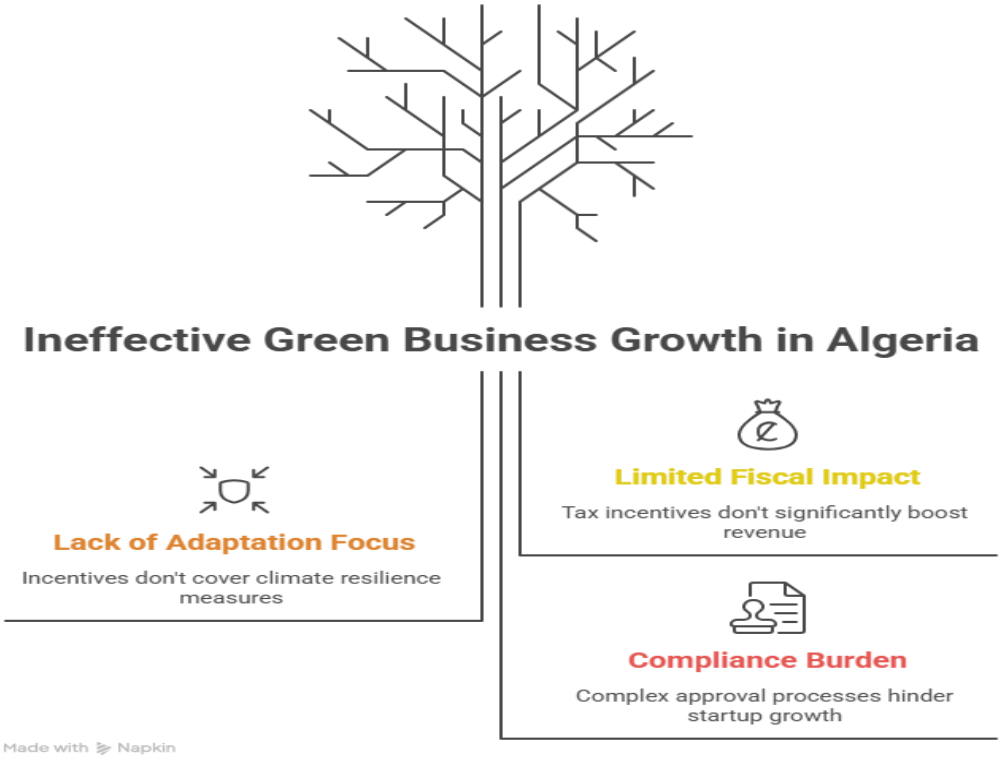

Figure 2. Key Challenges Facing Green Startup Growth in Algeria
Source: Authors' elaboration based on institutional analysis and field observations, 2026

5.2. Lessons Learned and Best Practices

Case studies from similar countries in the early stages of their transition to a green economy—which are therefore facing comparable requirements—show that the design of tax incentives must be suited to the different types of actors being targeted. For tax credits aimed primarily at corporate investment in innovation by large companies, an appropriate governance structure, with clearly defined responsibilities, communication across government realms, strict compliance standards, and implementation flexibility to adapt to economic growth, is vital. Empirical analysis using the relevant economic literature can underpin rationale and calibration of incentive schemes.

The specific nature of a country's financial system may also affect the design of instruments supporting corporate investment in innovation. In economies where bank credit is the principal source of external finance for corporations, public venture capital funds can be especially useful; they may enhance the equity base of investee companies, increase the likelihood of their receiving additional resources from banks, and improve the quality of risk assessment performed by the banking sector. Since the majority of supply in these capital market segments continues to come from banks, offering tax incentives for bank financing and/or

investment in venture capital funds may be a useful complement. In view of the limited size of domestic stock markets, tax incentives for financing through initial public offerings or the acquisition of shares in newly listed companies must be used with caution. (He et al., 2023)

6. Policy Proposals for Algeria (2026)

Startups are widely recognized as key drivers of innovation, job creation, and growth across diverse industries. Tax incentives specifically targeting startups have gained traction due to their potency, adaptability, and relatively lower costs compared to direct grants or loans. Such mechanisms lower the cost of innovation, thereby stimulating the development of new technologies, products, and business models. Startups have unique advantages in rapidly developing and commercializing innovations. Their projects are often characterized by substantial uncertainty and risk, limiting private investment and reducing overall economic returns. Tax incentives effectively address this market failure by enhancing innovation tax relief.

A series of measures, planned for implementation from 2026 onwards, aim to stimulate growth in green startups through aligned tax incentives. In the short to medium term, Algeria's innovation support strategy—focusing on five priority sectors—is expected to include tax frameworks to enhance the availability of such incentives. Additional adjustments, such as the introduction of cash refunds for unused credits and mechanisms for progressive white-label financing, would facilitate access to finance and promote the reinvestment of returns in further innovative projects. Further simplifications and administrative reforms are necessary to accelerate the deployment of these provisions and reduce compliance costs.

6.1. Short-Term Measures and Administrative Reforms

The 2019 Startup Policy (SP) introduced coordination mechanisms to connect and leverage national and sector-based start-up policies. In this context, the establishment of a Green Start-up Policy supports a green technological start-up ecosystem, investments in the green sector, and the decoupling of economic growth from pollution. These efforts align with Algeria's international climate change commitments (Kamysbayev et al.2025)

An analysis of legal texts concerning green economy and start-ups highlighted a proliferation of relevant regulations, hampering innovation. Bureaucratic steps were excessive, redundant, or contradictory. The Start-up Law created favourable conditions for establishing start-ups and introduced tax incentives. Nevertheless, the Government's Strategy Agenda) called for a more flexible taxation system, fine-tuning of the start-up eligibility list, and the application of further exemptions.

6.2. Medium- to Long-Term Tax Frameworks for Green Startups

A medium- to long-term framework targeting green startup development should be established for the period beyond 2026, ideally aligned with the launching of

full automotive manufacturing in Algeria. Expanding eligibility to include at least the global green industry sectors—renewable energy, energy efficiency, pollution and waste management, sustainable transport, and sustainable agriculture—and those identified in the 2022–36 National Green Economy Strategy would provide maximum benefits. Qualification criteria would also need to be extended, with duration and supervision aligned and coordinated with the financial institutions, development banks, and public agencies expected to mobilize applied technology and early-stage capital.

The task should involve also undertaking a broader evaluation of the performance and costs of tax incentives. The current focus appears to be on compliance costs and revenue foregone—but an exploration of economic-environmental trade-offs and the potential for sunset clauses in low-impact activities would provide an opportunity to rationalize and optimize the incentive rules over time. Quality assessments and a sensible control framework could also reduce the burden of misallocation; prioritization of bilateral and interaregional administrative cooperation could help mitigate the challenge of avoidance and enable appropriate examination and verification. (Olatinsu, 2024)

6.3. Implementation Roadmap and Governance

An implementation roadmap specifies the sequence of actions, the players involved at each step, and the time frame for delivery. Roadmaps are useful because the transition is complex and creates many moving parts that require calibration and interaction. Critically, a roadmap anticipates how each decision will be reviewed during the transition phase. Regular reviews keep the policy relevant and responsive to emerging developments.

The underlying principle is that definitions and allocations should first be made for the transition phase (i.e., until 2030). For the short term (2023–25), the focus is on activating the innovation ecosystem and the funds needed to drive technology development and demonstration. A broader set of incentives should then open up to a wider range of startups, subject to quality controls. All allocations need to be prepared in consultation with the relevant actors in the targeted sectors and activity areas. Such open discussions clarify expectations and help in understanding and addressing potential stress points before they develop into serious problems.

The key steps in the proposed roadmap are (i) defining the sectors and activities eligible for faster resource mobilisation; (ii) activating the start-up fund negotiated with the civil service; (iii) creating and capitalising a target fund to support the development and demonstration of breakthrough technologies and technologies of particular relevance for Africa; (iv) activating support for a limited number of start-up companies and setting the selection criteria; (v) advancing preparatory work for support to additional companies in the short- to medium-term; and (vi) putting in place monitoring and adjustment mechanisms. (Corvello et al.2023)

7. Economic and Environmental Impact Assessment

Tax incentives are a promising policy mean for stimulating investment and innovation, and for addressing market failures, such as those related to green technologies and start-ups, that constrain the emergence of the new green economy in Algeria.

Algeria has lost its gold rush status as a destination for FDI. Policy recommendations suggest accompanying the forthcoming oil & gas investment reform initiative with a set of mutually reinforcing green incentives designed to mobilize and attract investments, whether domestic or foreign, that introduce or expand green, clean, sustainable, and high-performance activities in Algeria.

Tax incentives constitute a credible policy lever to support green efforts in line with national priorities. In order to measure the impact of the initiatives on the economy and the environment, specific indicators are proposed that relate directly to the national economic growth, the subsidiary diversification objective, and the national climate agenda. (Ljubičić, 2025)

7.1. Direct Fiscal Implications

Algeria's overall tax burden is not anticipated to see any substantial alterations as a result of these adjustments, according to straightforward calculations drawn from the legal framework that oversees the flat-rate payroll tax exemption specifically designed for small enterprises. Regardless of this, any modifications made in this regard could potentially improve the cash flow situation of a number of eligible businesses within the burgeoning startup ecosystem. This enhancement in cash flow could also play a crucial role in influencing the future assessment and determination of the various growth stages these enterprises might enter as they evolve and develop. (Hassiba & Nassira, 2023)

7.2. Spillover Effects on Investment, Employment, and Innovation

According to the OACD, Algeria's innovation and entrepreneurship ecosystem is concentrated in Tizi Ouzou and Algiers, with startups concentrated in the digital sector—the cleantech sector has been neglected although it represents an opportunity for Algeria to develop its economy in a sustainable way.

The breakdown of the different stages of startup financing shows a significant deficiency in the pre-seed stage, which is the stage where startups are often the most fragile. Funding issues remain the primary challenge limiting the growth of startup companies in Algeria, and the restrictive financial regulations and severe obstacles in securing a bank loan have discouraged entrepreneurs from establishing a startup. (Singh2024)

The overall regulatory framework has a key impact on entrepreneurship activities in Algeria. The burden of regulations has become a significant barrier for entrepreneurship in Algeria, preventing the emergence and growth of start-ups. Besides, fiscal policy is still supportive and has no disincentive effect for the establishment of startups despite the lack of a special fiscal incentive regime.

7.3. Environmental Outcomes and Green Competitiveness

Transitioning to a green economy, defined as the decoupling of economic growth from resource depletion and pollution through the adoption of technologies that minimize environmental harm while creating economic opportunities, corresponds with Algeria's priorities to establish a regulatory framework for green entrepreneurship and the priority given to implementing the role of startups in innovation and digitalization. Consequently, green growth mechanisms that stimulate green innovation become a strategic lever for restoring and accelerating the recovery of the national startup ecosystem after the health crisis (Chaouachi & Balsalobre-Lorente, 2022).

While Algeria benefits from still unexplored competitive advantages in the areas of solar, wind, and bioresources, the promotion of green entrepreneurship requires placing green innovation at the heart of the strategy of the Algerian startup ecosystem and accompanying the deployment of new green technologies. Tax incentives appear to be suitable, to launch and sustain a recovery plan of the startup ecosystem. Facilitating the establishment of startups, funding them through venture capital, developing clusters, and stimulating scientific research represent other possible levers to complement such incentives. Starting from fiscal consolidation capability, the tax incentive framework is designed to accompany the phase-closing, safeguarding, and rebound of the existing ecosystem and to ensure the emergence and development of a next-generation cluster that catalyzes the uptake of technologies, long-term urban competitiveness, and provision of green technologies to Algeria and other African economies.

8. Risks, Mitigation, and Evaluation

Tax incentives for green startups in Algeria entail macroeconomic and fiscal revenue risks, stemming from high vulnerability to external shocks and the volatility of hydrocarbons revenues. Such risks may translate into cuts to public funding for critical infrastructure, R&D and innovation, vocational and technical training, and provision of, or access to, public services, such as electricity, water and sanitation, which are necessary for enabling clean-energy entrepreneurship and reducing the cost of doing business.

Mitigation measures should include precise evaluations of the direct and indirect cost of tax expenditures associated with tax incentives for green startups prior to their implementation. These evaluations should also estimate the potential impact of such incentives on the Public Finance Management (PFM) framework and macroeconomic destabilisation. Regulatory impact assessments (RIAs) examining the impact of green startup incentives on startup formation and post-period viability should also be conducted before the introduction of such incentives. Estimates of the fiscal cost of tax incentives to support green startups should be revised periodically to ensure that this expenditure remains classified as an upfront investment accordingly. Such reform would also ensure the preexistence of complementary regulations targeted at green startups, as well as a clear sunset period or exhaustive post-program evaluation prior to the withdrawal of either this type of incentive or the two other complementary incentives. This analysis

should include estimates of the economic, environmental and regulatory costs associated with multiple green growth incentive instruments, as well as modelling of the least-cost technology mix to achieve a defined environmental objective.

Concerns about excessive market valuation, avoidance strategies, compliance challenges, or the interest of undertaking market creation projects through tax incentives and other means rather than through start-ups, could also arise. Avoidance strategies and excessive market valuation could nevertheless still pose risks. The assignment of qualified contracts for service provision—whereby public institutions directly provide services to private contracting firms, hence avoiding the supposition of high market-value firms—represents one potential means of introducing public services without pursuing strict start-up stipulations. The reduced scope of technology diffusion services and assistance to entrepreneurs could be compensated, however, through the provision of high-capacity, heterogeneous technological, engineering or consulting services concerning, for instance, common business-model design, in order to obtain intellectual property on re-engineering or process technologies that remain considered high value. Only the non-facilitation of public-service acquisition could thus warrant start-up stipulations, and the funding of capital grants or equity investments in direct exchange for subsequent provisions of such services could also be permitted. (Fiet, 2022)

Finally, monitoring, evaluation and adaptation frameworks, including the relevant indicators, data sources, and expected timeframes for the first evaluation of the impacts of green-start-ups incentives, should also be outlined. Distortive taxation of advertising, and clear consideration of public regulations requiring prior market-creation projects should be especially emphasised. Public regulations requiring prior market-creation projects should also appear in a light formalised in any undertaking of the relevant analysis. (Dippenaar, 2018)

8.1. Fiscal Revenue Considerations

Fiscal revenue considerations should not blind policymakers to the benefits that fiscal incentives can have on the economy and society. By stimulating investment, broadening the tax base, and supporting job creation, fiscal incentives for entrepreneurship can generate substantial fiscal revenue in the medium and long term. Over a time horizon of fifteen years, the modified Allen–Garcia model estimates fiscal revenue gains ranging from 247% for the least generous incentive scheme to 660% for the most generous. Nevertheless, even in the absence of fiscal revenue gains, and as long as short-run fiscal sustainability is assured, there remain compelling reasons for the use of fiscal measures to stimulate entrepreneurship for green start-ups. For example, despite substantial revenue losses, major G20 economies have committed to eliminating inefficient fossil-fuel subsidies, thereby demonstrating their broader commitment to the Paris Agreement. While loss of revenues from fiscal incentives can also arise in the short run, the investment supported is likely to generate further revenues in the medium and long term, thus justifying introduction of the systemic incentives described. Modelling simulations indicate that annual revenues will be greater than the fiscal cost incurred by year 7. (Sun et al., 2025)

8.2. Market Distortions and Compliance

Tax incentives foster innovation by reducing government costs via distortionless transfer of resources from non-innovative to innovative firms. One risk associated with incentives is that, depending on the design, they may create market distortions and encourage the emergence of "fiscal ingenuity": firms' involvement in tax avoidance or evasion. Such concerns may be particularly relevant for the proposed capital subsidies, which should receive careful design and monitoring. Conditions for allocating capital grants must be stringent enough to prevent "related party" transactions from inflating project costs and to eliminate projects with an adequacy of design and financial model, such as those aimed at saving taxes rather than creating jobs. With a sufficient budget allocated, priority should be given to rewarding additionality of investment or growth, such as the creation of new production facilities or new staff.

A tax exemption for all firms located in Algeria focusing on green investments would boost compliance and reduce avoidance efforts. However, this blind distortion cannot be sustained in the long run and should, at least, face a gradual sunset during which market forces would reduce the extent of demand. In the short run, the investment trend may require a higher incentive than what firms would undertake by themselves. Over time, intensified competition and related price decline will allow an adequate level of investment, which will continue without the stimulus of the exemption. In the medium term, policymakers must bear in mind the poor elasticity of investment for price changes and so start considering the entry of a sunset clause after two or three years. (Amal, 2026)

The demand for the incentive may decline also as other economic conditions improve. However, the poor business environment in Algeria is likely to remain for some time. Adjustment should be closely monitored and a set of indicators defined to signal a timely closure of the scheme or a shift to other support.

8.3. Monitoring, Evaluation, and Adaptation

Dedicated plans will validate projections, revealing unanticipated effects and confirming appropriate readjustments. Monitoring should quantitatively measure economic imperatives over time. A yearly review identifies deviations from engineered linkages through periodic evaluation channels. Principally facilitated by the Ministry of Finance, this task may mandate external support to present technical treatment of intricate topics.

Indicators, organized by concerned agencies, encompass considered dimensions. For FDI-volume and energy-consuming investment in green projects, annual reports aggregate data from all banks. Revenue, over or under projection, detection of sidestepped investments, inflation trends during the period, job creation in all suggested possible jobs created in supported projects, RAM material import difference on yearly export and domestic material supplies channels are to be delivered in periodic cycles. A revaluation of these examined indicators will appear as focal point in the report and reveal apparent differences made in considered directions. Further, adding new focal points through small-

time amendments will permit early identification of unpredicted tendencies, unconfirmed connections and their possible causes.

Green indicators for aligning with WTO and regional competitions include periodical shocks with neighbouring currencies, constant monitoring of product prices through time with major products in above-mentioned neighbouring countries, exporting by-products like RAM materials and also compact RAM assembly and shifting from low-value added to medium or high-value added screen for sum the three dimensions in specific period, maximum share requested on monitoring indicators by the green ministries and their separate measure of the business-friendly period. Periodical international and regional comparison with decref for international and regional openings are necessary for the continuous redesign of positioned incentives by authorities designing global and neutral net calculation for indicators and measures going above both, regional and international charges. (Trancoso & Gomes, 2024)

9. Conclusion

The urgent challenges posed by environmental degradation and climate change alongside the necessity to support innovation and economic diversification provide a compelling rationale for Algeria to harness tax instruments to stimulate green entrepreneurship. Tax measures can foster the innovation and diffusion of technologies critical to address these challenges. Streamlined and targeted incentives will facilitate the emergence of startups that can develop and deploy innovative solutions, while also contributing to job creation, social inclusion, and government revenue. Coordination with development banks and other financial institutions will enhance access to the equity and expertise needed for early-stage ventures to reach their growth potential.

To maximize effectiveness and minimize costs, instruments should be designed thoughtfully. The selection of sectors and activities eligible for support must reflect the potential environmental and economic impact of investments. Green innovation remains broadly defined to encompass a wide range of startups. Criteria to establish the environmental footprint of eligible projects should focus on measurable indicators linked to Algeria's national climate priorities. Simple and transparent metrics will promote uptake, while ensuring that a balance is struck between environmental concerns and sufficient coverage to stimulate entrepreneurship. Further policy integration should strengthen green finance for startups in Algeria.

International and regional experiences can guide the adoption of effective and efficient measures to promote green entrepreneurship. Insights from Brazil and Colombia illustrate how specific targeting of green priorities can stimulate the development of a broader environmental industry, while experiences from other jurisdictions indicate that Belgium's innovative and adaptable capital gains exemption has delivered positive results despite a less explicit policy orientation.

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