

Financing Green Transition in Time of Economic Crisis

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Abstract

This year's surge in energy prices highlights the short-term impact of our dependence on fuels on both our lives and economic growth. It emphasizes the imperative of transitioning to a green economy in the medium and long term.

Converting financial commitments into investment opportunities aims to bridge financing gaps to strengthen climate resilience. In this paper, we will examine the extent to which our current financial system, and in particular the Banque Centrale du Liban in the face of the current crisis, encourages the transition to a sustainable economy.

The soaring energy-prices this year has shown how our reliance on fuels can undermine our lives & economic growth in the short term. It made us think that the transition to a green economy in the medium & long term is a must. However, would that transition be achieved through carbon pricing and regulation alone?

Converting financial commitments to investment opportunities is critical to strengthening climate resilience to preserve the planet & our future prosperity. Addressing funding gaps to leapfrog the need for carbon-intensive technologies to achieve Sustainable Development Goals (SDGs) and avert climate catastrophe, is of great importance.

We will try in this paper to see how efficient is our financial system of today in fostering the shift to a sustainable economy, & at what cost? Would the Central banks in general, which “*are in both a stagflation trap and a debt trap & “Amid negative aggregate supply shocks that reduce growth and increase inflation”*” as Nouriel Roubini said, be able to do so? Would the Central Bank of Lebanon in the midst of the current economic crush be able to do so?

Would the war in Ukraine trigger the transition to renewables?

On the 24th of February, 2022, the Russian army invaded Ukraine. The invasion resulted in deaths, casualties & destruction. It brought about the biggest refugee crisis since World War two. Nye, Jr. (2022)¹ described it as “*the most disruptive conflict that Europe has seen since 1945*”. It aggravated the “*uncertainty and price volatility*”. Russia² “*reduced gas supply to the EU and created risks for future supply*”. The amount of gas delivered from Russia to the EU fell to historically low levels at the end of 2022, reaching around 20% of pre-war levels. However, the fall in Russian gas exports to the EU started even before the war, resulting in low gas storage levels already at the beginning of 2022. EU responded by implementing gas saving measures and sourcing alternative gas supplies – particularly by tapping LNG markets. Following the war in Ukraine³ Josep Borrell, & Werner Hoyer wrote:” *Although a rapid reduction in global greenhouse-gas emissions was already needed to address climate change, the task has become doubly urgent in response to Russia's territorial*

¹ J.S. NYE, JR., “What Caused the Ukraine War?”, *Project Syndicate*, 2022.

² J. F. ADOLFSEN, M. S. LAPPE & A. S. MANU, “Global risks to the EU natural gas market”, *Economic Bulletin Boxes*, 1, 2023.

³ J. BORRELL & W. HOYER, “Decarbonization Is Now a Strategic Imperative”, *Project Syndicate*, 2022.

aggression and weaponization of energy supplies. Achieving net-zero emissions must now be a central objective of defense and security policy". They considered that president Putin's aggression strengthened the motives to decrease the dependence on imported fuel and invest more in renewables. Moreover, the war made Joseph Stiglitz⁴ (2022) say: "*Gone are the days when everyone seemed to be working for a world without borders; suddenly, everyone recognizes that at least some national borders are key to economic development and security*".

In the wake of the Russian invasion, the west announced plans to terminate their energy dependence on the Russian market. EU allocated a good amount of the needed public funds to ensure the green transition. It announced its 300-billion-euro investment plan in green transition. Major EU countries have made pledges to provide more funds for the green transition projects. In fact, EU affirmed & intensified their decarbonization plans following the invasion. The invasion of Ukraine fosters the transition to green energy to ensure energy security & independence, along with decreasing emissions to combat climate change. The introduction of the security and independence factors to the production equation has put energy transition at the forefront of the agenda of decisionmakers. Price volatility & supply chain disruption became a challenge for the industry. Following the gas shortage & the sanctions imposed on the Russian fuel, renewable became attractive, reliable & affordable to many businesses. Energy security became a top priority on the political agenda. The war in Ukraine drove decision makers to build resilient economies to conflicts & price volatility & to shift their focus from lower prices & comparative advantage to developing, sustaining & supporting local supply chains. This is to help meet the sustainable development goals. The current crises highlighted the growing need to build an energy system for tomorrow. However, the transition to a new system "*could leave some medium and large fossil exporters unprepared while giving early investors in batteries and other clean technologies new levers of influence*".

In brief, EU countries adopted a new energy strategy, which is focused on increasing efficiency & fuel saving; shifting to other sources of gas; investing more in the transition to renewables; & changing "*the gas market model, with possible effects for an emerging green hydrogen market*".

⁴ J. E. STIGLITZ, "Getting Deglobalization Right", *Project Syndicate*, 2022.

The Drawbacks of the World Economic Crisis on Transition

“The war in Ukraine is derailing the energy transition plans in the short term”. It came after “years of ultra-loose fiscal, monetary, and credit policies and the onset of major negative supply shocks, stagflationary pressures”, which lead to a colossal amount of public- and private-sector bills. It has made the transition difficult because it eroded any potential short-term recovery chances of the ailing world economy, following covid pandemic. There is a negative shock on the supply chain. The prices of materials produced in the war zone (gas, wheat, fertilizers, metals) increased tremendously. The rise in food and energy prices resulted in an increase in the poverty levels, lead to food insecurity, and intensified the inflation burden, which influences the financial markets, amidst the ambiguity and geopolitical pressure. As a result, borrowing costs increased. Central Banks began to tighten their monetary policies. Confidence in the international system eroded, Global growth shrank, the financing costs increased, & food insecurity is at stake. It resulted in a series of interrelated risks that are amplifying a tough landing for the world economy⁵. Thus, transition to green economy, became costly at both the corporate & governmental levels. A transition that requires trillions of unavailable investments annually for years. Raising taxes with the current high ratios of taxes to GDP to fund the transition is difficult in many parts of the world. Funding it without additional taxes, therefore increase spendings and lead to additional structural budget deficits with an increase in borrowing cash charges, which will increase the intensity of the global economic crisis. Roubini (2022)⁶ considered that the “geopolitical depression” & spending on “conventional and unconventional weapons” have tremendous effects on public budgets. Kristalina Georgieva, the managing director of the IMF, spoke of “confluence of calamities”. She said that our economy, is witnessing “perhaps its biggest test since the Second World War” with “repeated aggregate supply shocks”, unprecedented high debts & a depression.

Ukraine & Geopolitics of the Energy

However, the energy crisis obliged Europe to address urgently its “short-term energy supply needs rather than long-term needs to reduce emissions”⁷. The soaring prices of gas & the

⁵ J. D. GUENETTE, P. G. KENWORTHY, & C. M. WHEELER, *Implications of the War in Ukraine for the Global Economy*, 2022.

⁶ N. ROUBINI, “More War Means More Inflation”, *Project Syndicate*, 2022.

⁷ A. PICCIARIELLO *et al.*, “The War in Ukraine and the Geopolitics of Energy Transitions”, In *Navigating Energy Transitions: Mapping the road to 1.5°C* (pp. 30–56), International Institute for Sustainable Development (IISD), 2022. <<http://www.jstor.org/stable/resrep47303>>.

high need for made investment in fuel appealing. EU renewed its dependance on coal to meet the demands in its market in the short run to ensure its energy security. António Guterres proposed taxing sinful industries to fund energy transition last August.

Delays & the increase in the prices of shipping, the disruption in the fuel and mineral market following the war led to the increase in the costs of installing the renewables. So, by the first quarter of 2022 aluminum prices in the market increased by two folds, copper by 70%, steel by 50%, polysilicon was at 40 \$/kg. “*The overall investment costs of new utility-scale PV and onshore wind plants increase in the range of 15% and to 25% in 2022 compared with 2020*” (IEA, 2022g).

The trade war between US & China had delayed some solar projects, increased the costs of others, & even drove few to cancellation. In addition, the Zero bid auctions or negative bidding projects, which started few years ago is passing the additional costs to the consumers. It is increasing the electricity bills & putting more pressures on consumers.

Moreover, the tendency of central banks to increase the interest rates would deenergize financing for green projects, decrease fiscal incentives, green bonds, sustainable bonds, & so on. The cost of borrowing money is increasing in response to the surging inflation. The current of high uncertainty will affect certainly the struggle to limit GHGs into the air. Furthermore, applying the theory of⁸ optimal economic policy of Jan Tinbergen to neutralize the market failure by internalizing the negative externalities, would be difficult. Financing the transition by the right carbon tax would be impossible. Thus, the only way to foster the transition would be to incentivize the technologically innovative solutions to the crisis by modest investments. The prices of wind and solar energy are already decreasing. Technology could be the solution to man-made problems at least in the short to medium term.

Climate Change as an Existential Threat⁹

Global warming leads to devastating effects. It would cause food insecurity. Extreme weather conditions such as rising temperatures & droughts are becoming a real threat to the world

⁸ D. ACEMOGLU, “What Climate Change Requires of Economics”, *Project Syndicate*, 2021.

⁹ T. DIMSDALE, C. CECILIO & I. BENOMAR, “Geopolitical Drivers for Tipping Point Risk”, in *Living On The Edge: How Climate Tipping Points Will Reshape Geopolitics*, 2022, p. 22–31. E3G. <<http://www.jstor.org/stable/resrep43047.11>>.

stability. They are leading to desertification, less food production, loss of agricultural jobs. They are pushing people to migrate, and political systems to break down.

IPCC (United Nations' Intergovernmental Panel on Climate Change) considers that global warming poses a mid-to-long term food security risk if the earth temperature increases by 2 °C or higher. The “*Crop production patterns*” will change in a warmer planet. The production of certain crops will decrease, while other production of other crops would increase. This is going to affect agrarian communities; farmers would lose their jobs & move to other places, which would result in tensions with locals. The war in Ukraine lead to the increase in the price of food & its shortage. The war in Ukraine had colossal effects on food security, & geopolitical tension; it is reminder that the world is interconnected. The melting of Arctic glaciers is affecting productive agricultural areas drastically, forcing therefore certain countries to look for new agricultural lands in Africa. Moreover, the degradation in the marine ecology is affecting the fish availability, and as a result putting whole communities at risk.

Decarbonization would affect those fossil fuel producers who are not prepared for the transition. Energy security is going to draw new alliances & alter old ones; countries with fuel will have a different position in the geopolitical game. Alliances among consumers is strengthened. The supply chains for green energy will face new challenges arising from climate change. Global warming will affect power grids & basic infrastructure.

Moreover, Global warming leads to the displacement of people throughout the globe. The large & sudden movement of people is correlated with political instability & conflicts. The number of displaced has increased between 2008 & 2017 to reach a level of 30 million people per Anum.

Global Warming & Financial Crises¹⁰

In 2015 the world leaders met in Paris & they agreed on “*holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels*”. The absence of political will, difficulties of coordinating among the 195 heterogeneous states to reduce CO2 emissions, the scramble over the resources, the cultural differences, the varying stages of development among member states,

¹⁰ S. SAHA & B. VINEY, “How Climate Change Could Spark The Next Financial Crisis”, *Journal of International Affairs*, 73(1), 2019, p. 205–216. <<https://www.jstor.org/stable/26872790>>.

& the differences in economic & political systems adopted are making the struggle to reduce GHGs into the air difficult. Global warming leads to costs but poses opportunities as well¹¹. 2008 crisis reminds us of the effects of corporate & risk management on asset values.

The UN estimated the funding needs of the third world countries to adapt to the climate change by \$300 billion/annum by 2030. The developing world introduced the concept of “*Loss and damage*” which refers to “climate impacts that cannot be avoided through mitigation and exceed current adaptation capacity” to the climate negotiation. However, the developed world did not adopt it since it raises concerns about its legal liability. IMF considers “*climate change adaptation a macro-critical risk*”, with implications on financial stability and balance of payment issues.

According to the High-Level Expert Group on Sustainable Finance (2017) there are two major climate-risks, the first is derived from the transition to greener economy, the second is related from the physical risks. Climate change offer also a number of opportunities to businesses through efficiency & reducing costs. The climate risks pose challenges on investors & the financial system as a whole. The asymmetry of information raises concerns and results in mispricing of the assets. Disclosure of information is a key to assess the applicability of Global Warming risks. It provides the different stakeholders with the necessary data & tools to make the proper analysis.

Global Warming, which is a manmade crisis could spark a new financial crisis. It could lead to a big & unpredicted collapse in asset values. United Nations’ Intergovernmental Panel on Climate Change (IPCC) predicted more floods, more powerful in the short to medium term. These catastrophes would have a devastating effect on physical infrastructures, such as roads, public facilities & houses, with financial losses that exceed the ones forecasted by econometric models. As a result, the insurance companies will be exposed to more systemic risks, which could drive them to go bankrupt if they pay out much more than what they earn. When their losses increase, the value of their stocks in the financial market would go down. In 2019, AIG announced that catastrophe losses prevented it from achieving profit. Climate-related losses increased tremendously over the last decades. Global Warming is causing extreme weather events, which would have great implications on financial products such as mortgages, insurance, & pensions. It poses systemic risks to the financial market. The collapse of the insurance companies could trigger

¹¹ (*High-Level Expert Group on Sustainable Finance, 2017*). Board F. S. (2017). *Recommendations of the task force on climate-related financial disclosures*.

more shockwaves in the world economy. The Insurance companies would turn to reinsurance to cover their losses. Moreover, the destruction of homes would lead to mortgage default crisis, & as a result to the collapse of the mortgage-backed security (MBS).

Rising sea levels, desertification, fires & floods from climate change would result cumulatively in trillion of dollars of losses in property homes, infrastructure, production and displace people. The economic losses and social disruption are going to be far greater than any of the crises that the world had witnessed so far. Taxpayers are the ones to pay the bill of potential bailouts.

Thus, the different Market stakeholders should amend their risk modeling techniques to include the potential global warming risks. Regulators & central bankers should sound the alarm about the climate related risks which could affect the economy and lead to a financial crisis. Rating agencies considered that insurance companies are undervaluing possible costs from weather by 50%. Increasing the price of insurance due to climate-related risks lead to its non-affordability to low- & medium-income people, which would make people in high-risk regions exposed to the climate change risks, and to house mortgage default contagion.

Aligning the Financial System with Global Warming

In order to tackle the climate-related risks, finance should align with sustainability in the time horizon & in the appropriate interpretation of the risk concept. A financial system is to balance the supply of money with demand in order to build an added sustainable value in the economy¹². Our financial system is oriented towards the short term with a limited perception of the conception of financial risks. Whereas strategic objectives such as Lower GHG emissions, protecting the planet, transition to green economy are long term objectives with broad perspectives. The time horizon in finance is much shorter than the time required to meet the challenges of sustainable development; and the perception of risk in business is much less than one that takes into account the economic, social and environmental perspectives. Governments should therefore extend the

¹² High-Level Expert Group on Sustainable Finance, “Sustainability and the processes, incentives and culture of the financial system”, in *Financing A Sustainable European Economy*, 2017, p. 18–30. E3G. <<http://www.jstor.org/stable/resrep17906.7>>.

time horizon and the perception of risk. The sustainability challenges (economic, social and environmental) are long-term, with impacts and financial drawbacks stretching over years & decades. Sustainability information is increasingly pertinent in the decision of managers, lenders, & investors. They should be integrated into the accounting standards to take sustainability risks into consideration. However, there would always be difficulties in designing an accounting system that is used for yearly or even seasonal reporting which seizes the long-term category of certain business activities.

Mitigating & Adapting to the Crisis

Politicians should move in parallel in three different directions: first, mitigate emissions, second, amend the infrastructure to make urban areas resilient to Global warming induced damages, and compel businesses to disclose information about their exposures to the risks of climate change.

The most important tool of mitigating the Global Warming-induced risk in the financial system is to simply confront climate change challenges by reducing greenhouse gas emissions. The planet is insurable with a temperature increase of four degrees Celsius. Mitigating Global warming is necessary not only to reduce financial risks but also to safeguard our economic growth & save life on the planet.

Abiding by the Paris Agreement will reduce Global Warming -induced economic degradation to 1% of the GDP compared to more than 10% forecasted. It is of utmost importance to limit the damages that Global Warming can cause to infrastructure, dams, buildings, businesses, power & communication grids.

Governments should take adaptation measures as well as mitigation solutions to combat Global Warming. Legislators should work on changing the institutional framework to correct market failures to mitigate and make the people more resilient to the Global Warming effects. In addition, international institutions such as the World Bank, & International Monetary Fund (IMF) should invest more in making companies mitigate their exposure to the risks of global warming. They should empower local communities to adapt & fund projects in that regard. Economist should upgrade their discounting techniques.

Greening Economics & the financial system is needed to adjust the market to the systemic risks of Global Warming. For that governments should combine actions at the international level to mitigate global warming with national mitigation & adaptation strategies, transparency, and better disclosure of information about risks. However, these measures that are necessary to prevent a global catastrophe would not come without a high cost on the economy in time of crisis.

Adjusting the Economic System

Moreover, it is not only about greening our financial system but upgrading our economic system as a whole. Daron Acemoglu (2021) considered¹³ that economics is not yet up to the challenge of climate change. He suggested a fundamental reconsideration “*of some of the field's most deeply held assumptions*”. He said that long-term risks imply the revision of many of “*long-held assumptions*” & “*the economics discipline is no exception*”. It is a must to “*adapt mainstream economics to new climate realities*”. For him, William D. Nordhaus did not introduce the concept of “*indigenous technology*” into his framework. As a result, he underestimated the real future costs of Global Warming which, did not mirror fully the intensity of the problem. Furthermore, he considered that the incorporation of the tipping point probability changes the methods of tackling the crisis. Acemoglu went further to suggest amending the utility function, which embodies the trade-off between present & future expenditure. For him to restore economics to nature we have to determine well how much we are willing to discount today to achieve more value tomorrow. It is a question of dealing with discounting and the time frame of prevalence of our decision-making processes, “*would the decision consequences show in the next decade or would they be felt in the coming 100 years?*”. This is so important to make the economics take into account the sustainability of the natural capital, which provides the necessary natural resources & services for growth & production. The natural capital is an asset with economic value.

Markandya, A., & Galinato, S. P. (2021) estimated the costs of emitted CO₂ using the social cost method between \$20-\$94/ton CO₂ in 2030 depending on the discount rate adopted in the social cost of carbon approach. The projected GHG emissions in 2030 are estimated at around 59 GtCO₂e in 2030. So, in order to get to the 2°C target in 2030, we need to lower the emissions for the year 2030 by 34.9 Gt or 18.9 Gt for the 1.5°C target. The economic crisis will do its own

¹³ D. ACEMOGLU, “What Climate Change Requires of Economics”.

part of the game but policy makers have to do their homework as well & take the necessary painful measures to curb further the emissions of GHGs in the midst of the “*mother of crises*”.

GREEN FINANCING AND ESG CERTIFICATION

The financial tools are the most efficient tools to leapfrog the carbon intensive economy to a sustainable economic system. Green financing and ESG certification have emerged as important tools to promote sustainable development. Green financing refers to financial instruments and services that are specifically designed to support environmentally friendly projects, while ESG certification evaluates the environmental, social, and governance performance of companies and projects. In this paper, we will explore the different aspects of green financing and ESG certification, including their overview, fiscal and monetary policies needed to support them, the involvement of central banks, international support, valuation of different financing methods, and the positive externality that arises from these initiatives. We will use Lebanon as a case study to demonstrate how green financing and ESG certification can be applied in under-developed countries.

Overview of Green Financing

Green financing is a type of financing that promotes sustainable development by supporting environmentally friendly projects. The most common types of green financing include green bonds, green loans, green insurance and green investment funds. Green bonds are debt securities issued by companies, municipalities, or governments to finance environmentally friendly projects. Green loans are loans provided by banks or other financial institutions to finance environmentally friendly projects. Green insurance refers to insurance products that support environmental protection, such as coverage for renewable energy projects. Green investment funds are investment funds that invest in environmentally friendly projects or companies.

Forms and Characteristics of Green Financing

Green bonds: can be issued by governments, corporations, and other organizations, and are typically structured as debt securities with a fixed interest rate and a set maturity date. The proceeds from the sale of green bonds are used to finance projects such as renewable energy, energy

efficiency, clean transportation, sustainable agriculture, and climate adaptation. The market for green bonds has grown rapidly in recent years, as investors increasingly seek out opportunities to support environmentally sustainable initiatives. The issuance of green bonds has been driven by a range of factors, including increased awareness of climate change and the need to transition to a low-carbon economy, as well as regulatory and policy support from governments and international organizations.

One of the key features of green bonds is their transparency and accountability. Issuers of green bonds are typically required to provide detailed information about the projects that are being financed, and investors can track the environmental impact of their investments. This transparency and accountability help to build investor confidence and ensure that the funds raised from green bonds are being used to promote sustainability and combat climate change.

Green loans are a type of loan that is specifically designed to finance environmentally sustainable projects. These loans are similar to traditional loans, but they are earmarked for projects that have a positive impact on the environment and promote sustainable development. Green loans can be offered by banks, financial institutions, and other lenders, and are typically structured as fixed or variable rate loans with a set repayment period. The proceeds from green loans are used to finance projects such as renewable energy, energy efficiency, green buildings, sustainable transportation, and climate adaptation.

Green loans can be used by individuals, businesses, and organizations to finance projects that help reduce carbon emissions and promote environmental sustainability. For example, an individual may use a green loan to install solar panels on their home, while a company may use a green loan to upgrade their facilities to improve energy efficiency. One of the key benefits of green loans is that they can help to reduce the cost of financing environmentally sustainable projects. Green loans may offer lower interest rates or longer repayment periods compared to traditional loans, which can make it easier for borrowers to finance their projects. Green loans can also help to promote transparency and accountability in the lending industry. Lenders may require borrowers to provide detailed information about the environmental impact of their projects and may track the progress of the project over time to ensure that it is meeting sustainability goals.

Overall, green loans are an important tool for promoting environmental sustainability and combating climate change. They provide borrowers with access to financing for environmentally sustainable projects, while also promoting transparency and accountability in the lending industry.

Green insurance is a type of insurance that is specifically designed to promote environmental sustainability and reduce environmental risks. Green insurance products can be offered to individuals, businesses, and organizations, and can cover a wide range of environmental risks, such as pollution, climate change, and natural disasters.

Green insurance can take many forms, including property and casualty insurance, liability insurance, and environmental risk insurance. For example, a business may purchase liability insurance that includes coverage for environmental damage caused by their operations, or a homeowner may purchase property insurance that includes coverage for damage caused by natural disasters. Green insurance products may also include features that promote sustainability and encourage environmentally responsible behavior. For example, a car insurance policy may offer discounts for drivers of electric or hybrid vehicles, or a home insurance policy may offer discounts for homeowners who install energy-efficient appliances.

Green insurance can also help to promote sustainability in the insurance industry. Insurers may require policyholders to meet certain environmental standards in order to qualify for coverage or may offer incentives for policyholders to reduce their carbon footprint.

Green investment funds are investment vehicles that are specifically designed to invest in environmentally sustainable and socially responsible projects. These funds may invest in a variety of assets, including equities, bonds, and other financial instruments that meet certain environmental, social, and governance (ESG) criteria. Green investment funds can be offered by a variety of financial institutions, including asset managers, mutual fund companies, and exchange-traded fund (ETF) providers. These funds can be structured in different ways, such as actively managed or passively managed funds, and may focus on a specific sector, such as renewable energy or sustainable agriculture.

One of the key features of green investment funds is their focus on sustainability and social responsibility. These funds typically invest in companies that have strong ESG practices and are committed to promoting environmental sustainability, social responsibility, and good governance. Green investment funds can offer a range of benefits for investors. They provide an opportunity to invest in environmentally sustainable projects and promote sustainability and social responsibility, while also offering the potential for financial returns. Green investment funds can also help to diversify an investor's portfolio and may offer tax benefits in some cases.

Green investment funds have become increasingly popular in recent years, as more investors seek out opportunities to support environmentally sustainable initiatives. The growth of these funds has been driven by a range of factors, including increased awareness of climate change and the need to transition to a low-carbon economy, as well as regulatory and policy support from governments and international organizations.

ESG Certification and Green Financing:

ESG certification is a set of standards and criteria used to evaluate a company's environmental, social, and governance performance. The certification process is based on the company's ability to meet specific sustainability standards, such as reducing carbon emissions, promoting social responsibility, and adhering to good governance practices. Green financing, on the other hand, is a financing mechanism that channels capital towards environmentally sustainable projects. This includes projects related to renewable energy, energy efficiency, sustainable agriculture, and other green initiatives.

Green certificates are often used by corporations and other organizations to demonstrate their commitment to renewable energy and to meet their sustainability goals. They are also used by governments to meet renewable energy targets and to incentivize the development of renewable energy projects. Green certificates can help to support the development of the green financing market by providing an additional revenue stream for renewable energy projects, increasing demand for renewable energy, reducing risk, and improving transparency, also Green Certificates can have a positive effect on green financing in several ways:

1. **Revenue Stream:** Green certificates can provide an additional revenue stream for renewable energy generators, making it easier for them to secure financing for new projects. This can help to reduce the overall cost of financing for renewable energy projects, making them more attractive to investors.
2. **Demand for Renewable Energy:** The availability of green certificates can help to increase demand for renewable energy, as buyers can purchase certificates to support the development of renewable energy projects. This can help to create a more favorable market environment for green financing, as investors are more likely to invest in projects that have a proven demand for their output.

3. **Reduced Risk:** Green certificates can help to reduce the risk associated with investing in renewable energy projects, as they provide a mechanism for ensuring that the project is actually generating renewable energy. This can help to reduce the risk premium that investors require to compensate for the perceived risks associated with renewable energy projects.
4. **Improved Transparency:** The use of green certificates can improve transparency in the renewable energy market, as they provide a standardized way to track and verify the generation of renewable energy. This can help to improve confidence in the market and make it easier for investors to assess the potential risks and returns associated with green financing.

Positive externality and green financing

Positive externalities can play a significant role in green financing by providing a broader societal benefit that is not captured by the individual or organization investing in the green project. In the context of green financing, positive externalities refer to the benefits that are generated by a green project that extend beyond the investors and directly contribute to the greater good of the community or environment.

For example, a green energy project such as a wind farm may provide local communities with improved air quality, reduced carbon emissions, and a source of clean energy. These benefits are not directly captured by the investors in the project but contribute to the greater good of society.

Green financing can help to support projects that generate positive externalities by providing the necessary funding to undertake such projects. In turn, the positive externalities generated by these projects can help to attract additional investors, create a more favorable market environment for green financing, and contribute to the overall sustainability of the environment.

Furthermore, green financing can also help to mitigate negative externalities that are generated by traditional industries by financing projects that have a lower environmental impact. For example, financing a green energy project can help to reduce the negative externalities of traditional fossil fuel industries, such as air pollution and carbon emissions, thereby contributing to a healthier environment and a more sustainable future.

Overall, the positive externalities generated by green projects provide a strong rationale for green financing and can contribute to a more sustainable and resilient economy.

Several international organizations support ESG and green financing initiatives specifically in third world countries. Here are some examples:

1. International Finance Corporation (IFC): IFC is a member of the World Bank Group that focuses on private sector development in developing countries. IFC provides financing and advisory services to support sustainable development projects, including renewable energy projects and sustainable infrastructure in third world countries.
2. Green Climate Fund (GCF): GCF is a multilateral fund established under the United Nations Framework Convention on Climate Change (UNFCCC) to support climate change mitigation and adaptation projects in developing countries. GCF supports projects in areas such as renewable energy, energy efficiency, and sustainable transport.
3. United Nations Development Programme (UNDP): UNDP works to support sustainable development in developing countries by providing technical assistance, policy advice, and financing for sustainable development projects. UNDP works on projects related to renewable energy, sustainable agriculture, and sustainable urban development.
4. Global Environment Facility (GEF): GEF is a multilateral fund that provides financing for environmental projects in developing countries. GEF supports projects related to biodiversity, climate change, and land degradation.
5. Agence Française de Développement (AFD) : AFD is a French development agency that provides financing and technical assistance to support sustainable development projects in developing countries. AFD works on projects related to renewable energy, sustainable agriculture, and sustainable urban development.

Overall, these organizations play a critical role in supporting ESG and green financing initiatives in third world countries. By providing financing, technical assistance, and policy guidance, these organizations help to promote sustainable development and create a more equitable and sustainable future for all.

Fiscal and Monetary Policies to support Green Financing and ESG certifications.

Fiscal and monetary policies should be initiated to support green financing and ESG financing

To support green financing and ESG financing, governments and central banks can implement a range of fiscal and monetary policies.

Measures of Fiscal Policies

Governments can:

1. **Tax incentives:** Governments can offer tax incentives to companies that invest in green projects or adopt environmentally friendly practices. For example, tax credits can be provided for renewable energy projects, energy-efficient buildings, or investments in electric vehicles.
2. **Green bonds:** Governments can issue green bonds to finance green projects. These bonds are specifically earmarked for environmentally friendly projects and can be attractive to investors who are interested in socially responsible investing.
3. **Green subsidies:** Governments can offer subsidies to companies that invest in green technologies or products. These subsidies can be in the form of direct payments, grants, or low-interest loans.
4. **Carbon pricing:** Carbon pricing mechanisms such as a carbon tax or cap-and-trade system can help to reduce carbon emissions and incentivize companies to invest in low-carbon technologies.
5. **ESG disclosure requirements:** Governments can require companies to disclose their ESG performance and impact. This can be done through mandatory reporting requirements or stock exchange listing rules.
6. **Green procurement policies:** Governments can implement green procurement policies to promote the use of environmentally friendly products and services. This can create a market for green products and services and provide a boost to companies that produce them.

7. **Green infrastructure investment:** Governments can invest in green infrastructure such as public transportation systems, renewable energy projects, and energy-efficient buildings. This can create jobs and stimulate economic growth while also promoting sustainable development.

Measures of Monetary Policies

Central banks can also play a role in promoting green financing and ESG financing:

1. **Provide favorable financing conditions for green projects:** Central banks can offer low-interest loans or provide liquidity to financial institutions that lend to green projects.
2. **Incorporate climate risk into financial stability assessments:** Central banks can analyze the financial risks associated with climate change and incorporate this analysis into their financial stability assessments.
3. **Support the development of green financial products:** Central banks can work with financial institutions to develop new financial products that promote sustainable development.
4. **Provide research and data on climate risks:** Central banks can provide research and data on climate risks to help financial institutions better understand and manage these risks.

Overall, a combination of fiscal and monetary policies is needed to support green financing and ESG financing. By creating a supportive policy environment, governments and central banks can help to mobilize private sector investment and accelerate the transition to a low-carbon, sustainable economy.

Governments and Central Banks Support from International organizations

ESG and green financing support is important for central banks and governments that may not have the financial means to support such initiatives. There are several ways in which support can be provided:

1. **Technical assistance:** International organizations such as the United Nations Environment Programme Finance Initiative (UNEP FI) and the Principles for Responsible Investment (PRI) provide technical assistance and guidance to central banks and governments to help them develop and implement ESG and green financing policies.
2. **Capacity building:** International organizations can provide training and capacity building programs to central banks and governments to help them build the necessary skills and knowledge to implement ESG and green financing initiatives.
3. **Grant funding:** International organizations such as the Green Climate Fund and the Global Environment Facility provide grant funding to support ESG and green financing initiatives in developing countries.
4. **Financing facilities:** International organizations such as the International Finance Corporation and the European Investment Bank provide financing facilities to support sustainable development projects in developing countries.
5. **Policy support:** International organizations can provide policy support and advocacy to help central banks and governments implement ESG and green financing policies. This can include providing research and analysis to support policy development, as well as advocacy and communication activities to promote ESG and green financing initiatives.

Overall, these support mechanisms can help central banks and governments that may not have the financial means to support ESG and green financing initiatives to build capacity, access funding, and implement policies that promote sustainable development.

Technology as the Potential Solution¹⁴

Combatting global warming requires innovation to phase out of the fuel era to a “*post-petroleum economy*”. Finance is supposed to fund the development & dissemination of technological innovation, to make the transition. Scientists for example, should develop cheaper

¹⁴ R. A. MANNING, “Emerging Technologies: New Challenges to Global Stability”, *Atlantic Council*, 2020, <<http://www.jstor.org/stable/resrep26000>>.

& efficient ways to store energy to scale up energy production from wind & sun. In fact, technology is providing us with the means to build smart cities, smart buildings, & smart grids with more efficiency and less energy consumption.

CAN TECHNOLOGY INNOVATION SAVE US FROM CLIMATE CHANGE?

Freeman, M. (2019) considers that climate-risks are pressing, and there is place for failure. “*The technologies that may be able to prevent catastrophe are at different points along the spectrum of viability, and it is necessary that leaders take actions to develop & make them a reality in the political and economic system of the world in the global economic and political reality of today to save the world*¹⁵”. It is a must that policymakers act swiftly to foster legally and financially the transition from the internal combustion engine, which lead to the existential crisis of global warming to the electric engine.

Solutions to climate change are available in labs but not deployed fast enough to meet the decarbonization challenge. For that, policymakers should understand how they could “*galvanize the flow of capital*” to foster creativity, encourage innovation tools of decarbonization & other mitigation techniques. Technology began to provide us with a solution in the energy sector. For that, we need to increase the rate of penetration of solar & wind to get out of the fuel era. Improving battery storage capacities, lowering its manufacturing costs, & increasing its longevity, therefore are the main challenges of the sector. We should invest more in “*non-battery storage options*” such as “*pumped hydro*”, encourage its development & its deployment.

In addition, technology has provided the transportation sector with “*electric vehicles*”, which became commercialized & available in the market.

However, the transition in the industrial sector is much harder. Its emissions are increasing despite its decreasing contribution share as a part of the growth indicators. Steel & cement need high temperature. However, new innovations are underway “*to lower the level of heat necessary*”. We count on Nanotechnology to revolutionize the industrial sector and make it more eco-friendly. Carbon sequestration could be an option to reduce CO₂ level in the atmosphere. Thus, carbon can

¹⁵ M. FREEMAN, “Can Technology Innovation Save Us From Climate Change?”, *Journal of International Affairs*, 73(1), 2019, p. 171–182. <<https://www.jstor.org/stable/26872787>>.

be captured, & stored in the underground in the solid form; then used to make paints & other chemical products.

Technologies to lower emissions in agriculture are still underdeveloped. It is worth mentioning that agriculture is a main contributor to CO₂, Methane, & nitrous oxide emission into the air. The continuously increasing demand for red meat is a challenge for reducing GHGs into the air in the coming years. The demand for red meat is “*expected to double over the next 40 years*” with the increase in population & its consumption. Moreover, the bacteria of the rice paddies, & the fertilizers are other sources of emission & pollution. Nanotechnology could provide us with tools to produce food intensively in the laboratories & could be in the future an alternative to agriculture. However, it is still in its infancy.

Eichhorn, S. J., Rahatekar, S. S., Vignolini, S., & Windle, A. H. (2018) acknowledged the fact that Nanotechnology¹⁶ is providing us with Cellulose Nano-fibers, which could replace real cellulose in industrial production. Forest absorbs approximately 9.3 gigatons of CO₂ per annum & retain it. The development of that new sustainable high value product would collaborate in maintaining the status quo of the forestry industry & help in reducing the cutting of trees and the use of real wood pulp.

Dixon-Fowler, H. R., Slater, D. J., Johnson, J. L., Ellstrand, A. E., & Romi, A. M. (2013)¹⁷ considers that geoengineering could provide the solution to our civilization, “*no matter of other environmental drawbacks*”. Solar radiation management (SRM), which could include aerosol particle injection to increase reflectivity of the Earth through mirrors put in space, or alteration of the amount and elements of clouds. As a matter of fact, China & India are investing in R&D in geoengineering to lower their emissions of GHGs. However, the main challenge to the field, is the absence of legal & ethical framework. Unilateral actions may result in potential climate disasters that result into geopolitical tensions. Carbon dioxide removal (CDR) is another option of geoengineering to keep warming below 2 °C. It involves the use of negative emission technologies with direct air carbon capture and storage (DACCS) and bioenergy with carbon capture and storage

¹⁶ S. J. EICHHORN, S. S. RAHATEKAR, S. VIGNOLINI & A. H. WINDLE, *Introduction: New horizons for cellulose nanotechnology*, *Philosophical Transactions: Mathematical, Physical and Engineering Sciences*, 376 (2112), 2018, p. 1–5. <<http://www.jstor.org/stable/44678862>>.

¹⁷ H. R. DIXON-FOWLER *et al.*, “Beyond “Does it Pay to be Green?” A Meta-Analysis of Moderators of the CEP—CFP Relationship”, *Journal of Business Ethics*, 112(2), 2013, p. 353–366. <<http://www.jstor.org/stable/23327210>>.

(BECCS). Acemoglu¹⁸ as well believe that Geoengineering might present a solution to climate change. He talked about reversing the solar radiation back into space, which might be an option, & Carbon capture, which might be another. However, he considered that these techniques are either untested or still very expensive. Thus, I believe that there is a need to evaluate the effects of geoengineering in fighting global warming & of spraying sulfates or calcium carbonate dust to stop sunrays for example. It would be necessary to know if it would be good to trade off one hazard with another as wrote (2021).

Technology without financing would not prosper, funding needs to address mitigation measures as well adaptation solutions to the crisis. Funding needs to address the losses & damages from Global Warming. However, the cost of money is high in the midst of the current financial crisis but not as high as its implications. The Global Warming is an existential crisis that is becoming hard to manage without too many sacrifices. Avoiding such dangerous outcomes necessitate sponsoring technological mitigation & adaptation measures. It needs an innovation process, which is fostered by an institutional framework (good legal, judicial & financial systems), and key players (excellent universities, public research centers, financing institutions, good infrastructure). Funding nowadays is the main limitation to innovation. Overcoming the financing gap requires both public & private funding.

Finally, Policymakers should create the proper medium for innovation to bolster & provide affordable & feasible solutions to the market. What is lacking is the political will to avert a catastrophe that would swipe away our quality of life & maybe our civilization.

Climate Change & Lebanon

Climate Change as a Game Changer in Lebanon

The Intergovernmental Panel on Climate Change¹⁹ (IPCC,2022) warned that the temperature in the Mediterranean basin will increase by 20% in the decades to come. With

¹⁸ D. ACEMOGLU, "What Climate Change Requires of Economics".

¹⁹ IPCC, *Climate Change 2022: Impacts, Adaptation, and Vulnerability, Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (ed. H.-O. PÖRTNER, D.-C. ROBERTS, M. TIGNOR, E.-S. POLOCZANSKA, K. MINTENBECK, A. ALGERIA, M. CRAIG, S. LANGSDORF, S. LÖSCHKE, V. MÖLLER, A. OKEM, B. RAMA), Cambridge University Press, Cambridge, UK and New York, NY, USA, p. 3056, doi:10.1017/9781009325844.

heatwaves, water shortages, loss of biodiversity and lower food production, Lebanon of tomorrow would be different than ours & more exposed to the risks to climate change.

“*One of the most relevant consequences of climate change*²⁰” on Lebanon & the region, is water scarcity resulting from the “*reduction of surface runoff and groundwater levels*” (Noto, L. V., Cipolla, G., Pumo, D., & Francipane, A., 2023). The Lebanese Ministry of Environment published on its website the different forecasted climate change scenarios. It indicated that an increase in the temperature of 2°C to 4°C simultaneously, will lead to a decrease in rainfall in the range of 10 to 20% by 2040 & by 45% in 2090; an expansion of the drought periods by 9-18 days by 2090; & the contraction of the snow cover in the range of 40 to 70%, its shift upward from 1500m to 1900m altitude, & its melting down faster (110 days to 45 days). Global warming is going to decrease the availability of fresh water in Lebanon, which will lead to decrease in agricultural productivity, and intensify our dependance on energy resources. Lebanese farmers are going to suffer the most.

Moreover, Lebanon as a part of the Mediterranean Basin is going to face “*highly interconnected climate risks*” (IPCC report, 2022), which include “*sea-level rise related risks, land and marine biodiversity losses, risks related to drought, wildfire, alterations of water cycle, endangered food production, health risks in both urban and rural settlements from heat, and altered disease vectors*”. It is expected that heatwaves during summer time will lead to more the loss of our green cover. The Mediterranean basin is becoming a “*climate change hotspot*”. Global Warming is a silent game changer in Lebanon. it is changing our economy & altering our comparative advantages in tourism. Our landscaping is burning gradually & the number of hot & dry days of extreme weather conditions had doubled since the “1980s”. Climate change is imposing high costs on the Lebanese economy due to the loss of green cover, water shortage, biodiversity loss, lower land productivity, increase expenditure on health (hot weather leads to disease outbreak), increase in the consumption of electricity (higher number of hot days in summer), rising sea level, extreme weather conditions (floods in winter) & less comparative attractiveness in tourism due to the loss sceneries and lower air quality. This is going to slow the economic growth. It is estimated that the accumulation of GHG into the air since 2015, would reduce Lebanon’s GDP by 3% by 2040, & 32% by 2080.

²⁰ L. V. NOTO *et al.*, “Climate Change in the Mediterranean Basin (Part II): A Review of Challenges and Uncertainties”, in *Climate Change Modeling and Impact Analyses, Water Resources Management*, 1-17, 2023.

Global Warming is one of the main factors²¹, which drove the internal revolt against the regime in Syria (Valensi, C., Efron, S., & Noach, K., 2021). The drought, which preceded the war decreased the productivity of the agricultural lands, made many farmers lose their jobs in the villages, & migrate to the cities to look for new opportunities that they could not find. The failure of the Syrian government to respond to global warming threats & meet the needs of the angry farmers for jobs, encouraged them to go to the streets.

The Syrian war created 12 million refugees & displaced²². “As of the end of the year 2017, Lebanon hosted 1.5 million refugees from Syria, in addition to the pre-existing 277,985 Palestinian who already were living there. The Syrian war put a tremendous economic, social & political pressure on an already fragile system, which was about to collapse. It resulted in tensions & undermined further the political & economic stability of the country”.

The Transition to Green Economy Amidst the Lebanese Decay Period

The World Bank considers that our economic crisis is one of “*the worst economic crises in the world since the 19th century and that such a dramatic deterioration of the economic situation is usually observed in conditions of war and conflict*”. The crisis²³ is still aggravating due to the paralysis of the system & the unwillingness of the decision makers to take the necessary measures to stop the degradation. The financial crisis stems from the accumulated fiscal deficit throughout the post war years. The collapse of the exchange rate led to continuously soaring inflation rate. The Lebanese government is confronted with an increasingly steep decrease in revenues. The bad management of the electricity sector resulted in the loss of billions of dollars without providing it to the people. Poverty levels sky rocketed; unemployment reached high levels.

²¹ C. VALENSI, S. EFRON & K. NOACH, “A Decade of War in Syria: Between Climate Change and Political Stability”, *Institute for National Security Studies*, 2021. <<http://www.jstor.org/stable/resrep33848>>.

²² “World Health Organization, LEBANON”, in *Practices in addressing the health needs of refugees and migrants: WHO Eastern Mediterranean Region*, 2018, p. 14–19. World Health Organization. <<http://www.jstor.org/stable/resrep27960.9>>.

²³ A. BOURHROUS et al., “Socio-economic challenges and the state of public services”, in *Reform Within The System: Governance In Iraq And Lebanon*, 2021, p. 12–28. Stockholm International Peace Research Institute. <<http://www.jstor.org/stable/resrep39756.9>>.

Foreign policy, domestic political instability as well as corruption led to moral hazards, which destabilized the monetary & financial system. The public sector expansion at the expense of the private sector accentuated further the deficit.

The soaring fuel prices & the electricity crisis are enhancing the transition to solar energy, & to hybrid cars. But at the same time the increase in poverty level is accelerating environmental degradation. People are becoming more dependent on trees for cooking & heating. Moreover, the failure of the banking system & the decay of government and the erosion of the judicial & security systems make the transition hard to achieve currently. However, any recovery plan should include the application of green financing & ESG certification in Lebanon.

Application of Green Financing and ESG Certification in Lebanon:

Green financing and green certification could be applied in Lebanon, as the country has a growing interest in sustainability and environmental conservation. Lebanon faces many environmental challenges, including air and water pollution, deforestation, and soil degradation. Therefore, green financing and certification could help to support and finance projects that address these challenges, such as renewable energy, waste management, and sustainable agriculture.

Green financing in Lebanon could be supported by international organizations, such as the World Bank or the United Nations, as well as private investors and local financial institutions. These institutions could provide funding and technical assistance to help finance and implement green projects in Lebanon. Additionally, green certification could help to create transparency and trust in green investments, as it would provide a standard set of criteria for evaluating the environmental impact of a project.

However, there are also challenges to implementing green financing and certification in Lebanon, including a lack of regulatory frameworks, limited awareness and understanding of sustainable finance, and a limited pool of experienced professionals in this field. Nevertheless, with the growing global interest in sustainable finance, there is potential for Lebanon to adopt green financing and certification as a means to address environmental challenges and contribute to a more sustainable future.

Various fiscal and monetary policies could be initiated to support green financing and ESG financing with the help of international organizations that provide technical assistance and funding in most cases.

Fiscal policies:

1. **Tax incentives:** The Lebanese government can provide tax incentives to companies and individuals that invest in green projects. This can include tax credits, rebates, and exemptions for renewable energy, energy-efficient buildings, and other sustainable investments.
2. **Subsidies:** The government can also provide subsidies to green projects to help offset the higher costs of renewable energy and other sustainable technologies. This can include direct subsidies, grants, and low-interest loans.
3. **Green procurement:** The government can encourage the use of green products and services in public procurement, which can create demand for sustainable technologies and help support green industries.
4. **Green bonds:** The government can issue green bonds to finance green projects and attract private investment in sustainable projects.

Monetary policies:

1. **Green lending:** The Central Bank of Lebanon can encourage banks to provide green loans by offering preferential treatment, such as lower interest rates.
2. **Sustainability criteria:** The Central Bank of Lebanon can develop sustainability criteria for banks to follow in their lending and investment practices.
3. **Reserve requirements:** The Central Bank of Lebanon can set lower reserve requirements for banks that lend to green projects or invest in sustainable industries.
4. **Carbon pricing:** Implementing a carbon pricing scheme, such as a carbon tax or cap-and-trade system, can incentivize companies to reduce their carbon emissions and invest in green projects.

Overall, these policies can help Lebanon transition to a more sustainable economy and address its environmental challenges. However, it is important to note that these policies should be implemented in a way that is tailored to the country's specific economic and political context.

Conclusion

Lebanon faces significant environmental challenges, including air pollution, water scarcity, deforestation, and waste management issues. These challenges have been exacerbated by the country's political and economic crisis, which has led to a decline in public services and infrastructure. The country has a growing demand for energy, but its reliance on fossil fuels has led to high levels of greenhouse gas emissions.

The Potential of ESG Certification and Green Financing in Lebanon can help Lebanon address its environmental challenges while promoting sustainable economic growth. The country has enormous potential for renewable energy, such as solar and wind power. The Lebanese government has recognized the importance of renewable energy and has set a target of 30% renewable energy by 2030. ESG Certification and Green Financing can help achieve this goal by providing the necessary capital to finance green projects.

ESG Certification can also promote social responsibility and good governance practices among Lebanese companies. This can enhance the country's reputation and attract foreign investment. By promoting sustainable practices, companies can reduce their operational costs, increase efficiency, and improve their bottom line.

Green financing can also create new jobs and boost economic growth in Lebanon. The renewable energy sector has the potential to create thousands of new jobs in the country, particularly in rural areas. By investing in green projects, Lebanon can also reduce its dependence on foreign oil, which can improve its energy security.

ESG certification and green financing offer a viable path towards sustainable growth in Lebanon. By promoting sustainable practices and investing in green projects, Lebanon can address its environmental challenges while creating new economic opportunities. To achieve this, the Lebanese government and Central Bank should work together to develop a supportive regulatory

framework that incentivizes ESG certification and green financing. Through collaboration, we can promote sustainable development in Lebanon and create a brighter future for generations to come.

Finally, Regulations & carbon pricing are not enough to make the transition in the midst of the “*Mother of Crisis*”. Developed countries should convert part of their commitments at least to investment activities to preserve the quality of life on the planet & ensure a sustainable peace. What is happening in Lebanon & Ukraine can foster the transition to green economy. We should align our current financial system with sustainability to move forward. The crisis might be a good opportunity to reshape our economy & make it more sustainable.

Global Warming is undermining our future in Lebanon. Climate Change is an existential crisis to deal with. Our country is at stake; we should therefore, take immediate steps to save it. It is important to change the way we think. We should begin to transform our economic systems & even our institutional framework to prioritize the future over the present. It is our duty to avert societal collapse & stay within the planetary boundaries of growth. The future of our country depends upon the ecosystem. Restoring economics to nature must be a top priority. Financial tools are the most efficient to ensure the transition to a more resilient eco- friendly economy.

We should learn from wars & crisis. It is important to leapfrog the fuel economy & the competition over resources to achieve Sustainable Development Goals (SDGs) and avert climate catastrophe. Governments should increase at least their expenditure on R&D. Technology could provide us with the most efficient tools to combat Global warming. It could be the solution with the proper policies.

We do believe in the human mind. Global Warming is a man-made crisis that man can solve. Our economies still reel from the toll of covid, resource scramble & geopolitical challenges. The transition to new economies is the way to end the economic crisis & move forward to a more prosperous future. It is the future of our children, our country & the continuity of our anthropogenic civilization globally that are at stake. That is why we should have the will to find the way...

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