

Dr. Matthias Kroll

UNLOCKING THE TRILLIONS TO FINANCE THE 1.5°C LIMIT

How MDBs and the GCF can mobilize large scale private sector finance by selling standardized Green Climate Bonds to the Central Banks

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Abstract

In order to meet the +1.5 ° C limit specified in the Paris Agreement, a shift of the global energy supply to 100% renewable energy is necessary at the latest by 2050. Such a process requires annual investments in the order of \$1.5 to \$2 trillion. Although the costs of renewable energies (RE) have recently declined sharply and further downturns can be expected, current investments are stagnating at approximately \$250 billion. Therefore, additional monetary support must be provided, in order to bring the global expansion of RE to the necessary scale, i.e. guarantees to make the risks predictable to private (Green Bond) investors and repayment-free grants for RE investments which are not yet financially viable / competitive. However, funding from public budgets, including instruments such as emissions trading or CO₂ taxes, is not a realistic option to cover the gap of around \$1.25 to 1.75 trillion. An additional innovative financing mechanism is required and can be established through cooperation between the non-industrialized countries, the Multilateral Development Banks (MDBs), the Green Climate Fund (GCF), or other financial institutions, and the Central Banks of the industrialized countries. The MDBs, together with non-industrialized countries, should develop national roadmaps for a sustainable 100% RE strategy, identifying the financing requirements (guarantees and grants) required for each country. Subsequently, the MDBs should issue the corresponding amount of Green Climate Bonds. Central Banks should be ready to guarantee these and also to purchase and hold such bonds. Thus, the income of the MDBs from the sale of such Green Climate Bonds will be virtually repayment free and the MDBs will receive new funding to facilitate new RE investments. The resulting planning and income security would open additional investment opportunities for private finance at low yet sustainable interest rates.

Central Banks played a key role in managing the banking crisis by adding unprecedented amounts of new bonds to their balance sheets, without losing their independence or endangering monetary stability. The annual margin available to Central Banks for purchases of new MDB Green Bonds lies within "normal" growth in their balance sheets and can be estimated at least to a global total value of approximately \$300 billion. Central Banks from a few industrialized countries could already initiate such a new Green Climate Bond system. The Bank of England and the ECB have recently stressed that Central Banks' need to expand their mandate to include global climate protection. The purchase of new MDB/GCF Green Climate Bonds by the ECB is permissible under existing EU Treaties.

1. Framing the Problem

With the landmark Paris Agreement adopted in December 2015, governments committed to keep global warming below 1.5 °C and set a deadline for net zero greenhouse gas emissions in the second half of this century. This historic agreement signals what lies ahead: the unprecedented and complete decarbonisation of the energy supply, moving to 100% renewable energy within the next few decades. In non-industrialized countries with yet low energy consumption this requires new renewable energy supply technologies to meet SDG 7 (Affordable and clean energy access for all).

How are we going to finance the radical transformation needed to reach this goal? The International Energy Agency has concluded that \$1tn per year in renewable energy investments would be needed to stay below the 2C limit.¹ To achieve the 1.5C limit agreed in Paris, substantially higher investments will be required. The WFC has estimated this figure at between \$1.5tn and \$2tn (WFC, 2015). This total is much larger than \$100bn per year promised to the new Green Climate Fund of the UNFCCC. Even this sum (in form of grants) from 2020 seems unlikely to be met.² Private capital will only participate if there is sufficient financial return. But, under current conditions, many of the required RE-Investments are not attractive for private investors. One way to accelerate RE-Investments would be grants from public money (e.g. for debt guarantees or feed-in tariffs in developing countries). However, this would require annual grants considerably larger than the 100bn p.a. promised so far from national budgets, which are unlikely to materialize. Previous experiences with financial commitments from taxes or emissions trading show that the sums provided regularly fall short of what was promised. Thus, it seems appropriate to look for alternative ways of generating large scale climate finance.

Fortunately the costs of renewable energies have decreased substantially in recent years and a further decline can be assumed. So it can be expected that the number of bankable renewable energy projects will increase. Global new investments in renewable energy totaled 242 billion US-Dollars in 2016.³ However, to unleash the full potential of renewable energy and boost investments to the necessary scale at the necessary speed, the following challenges need to be overcome:

- The economic conditions differ from country to country and lead to manifold risks in cost accounting. Especially in non-industrialized countries, the experiences with RE-Projects are few and therefore examples as a basis for any risk calculation are limited. These uncertainties hinder investments or lead to demands for high interest rates, in conflicting with the requirement of SDG 7 for 'Affordable and clean energy for all' and with the long term sustainability of the investment. This conflict of aims could be solved by loan guarantees from MDBs and Central Banks.

¹cf. Figueres, Christina in The Guardian of 14.1.2014, <http://www.theguardian.com/environment/2014/jan/14/un-climate-chief-tripling-clean-energy-investment-christina-figueres>

²cf. The new 'Roadmap to US\$100 Billion' from the industrialized countries from October 2016. <http://dfat.gov.au/international-relations/themes/climate-change/Documents/climate-finance-roadmap-to-us100-billion.pdf>.

³cf. REN21: <http://www.ren21.net/status-of-renewables/global-status-report/>

- Despite decreasing prices of renewable technologies, RE-projects have high upfront investment costs, which often lead to investors in developing and emerging markets demanding (partial) grants and / or guarantees.
- Some climate investments, especially adaptation measures, do not bring direct financial returns and must be financed by grants.

All these challenges can be solved by guarantees or repayment-free grants.

An alternative tool for large scale climate finance

We need a new tool which can speedily provide large scale sums for the diverse climate finance measures without burdening the public budget or the taxpayer. This tool can be created by a co-operation between non-industrialized countries, Multilateral Development Banks (MDBs) respectively the Green Climate Fund (GCF), the Global Environment Facility (GEF) or other financial institutions which are involved in climate finance, and the Central Banks of industrialized countries.

These Central Banks can support climate finance by agreeing to:

- guarantee climate related credits from the MDBs.
- purchase standardized 'Green Climate Bonds' issued by the MDBs, the GCF or other designated financial institutions.

2. The Roadmap to unlock trillions: Expanding bankable RE-Investment opportunities

The finance tools to create the necessary monetary resources for the implementation of climate protection measures are as follows:

- **The roadmap for the implementation of a 100% renewable energy strategy**

Countries that want to implement a 100% renewables strategy should prepare a roadmap that outlines the necessary investments in terms of concrete projects, infrastructure and technology requirements. A MDB (or another designated institution) analyses the roadmap together with the relevant country to assure that the new investments fulfill the required criteria. If the roadmap is approved, the necessary guarantees for credits, the required grants and currencies are identified.

- **The role of the guarantees**

As outlined above, risk calculations lead to the neglecting of many RE –investments, despite their potential profitability. The approved roadmap identifies which RE-investments can be implemented, if credit guarantees from the MDBs lower the level risk and thus the interest rate demanded. Because the MDBs can only cover a part of the risk, Central Banks must cover the bulk of the risk of the guarantees. The MDBs would bundle different credits for RE-investments to generate a bond with a homogeneous risk category. Thus, the MDBs create a new standardized and low risk asset category which could be issued to private investors: The Central Bank backed Climate Bonds (CBBCBs). The guaranties of the Central Banks justify interest rates at the level of AAA government bonds (e.g.: 1.5% or 2.5%). This low interest level would unlock a huge amount of additional RE-Investments. The low interest level leads to lower investment costs

and thus can be used to sell the newly produced renewable electricity at a price which makes it 'affordable for all' (in line with the SDG 7). The CBBCBs would transform the RE-Investment into a low risk, long term and sustainable investment. Central Banks would only become involved in the case of a default. The impact for their balance sheets would be small.

- **The issuing of standardized Green Climate Bonds**

If a RE-investment needs not only a guarantee to gain profitability, but a onetime or permanent grant, the involvement of Central Banks increases. In this case the MDBs, the GCF or the other designated financial institutions issue standardized and virtually perpetual Green Climate Bonds to the Central Banks of an industrialized country. The standardized Green Climate Bonds establish a new asset class, for Central Banks, as only Central Banks have the ability to purchase virtually perpetual bonds with very low (if any) interest rates. The new capability of the MDBs to receive new and virtually repayment-free money by issuing Green Climate Bonds to the Central Banks opens new possibilities to fund many additional RE-Investments.

3. Standardized Green Climate Bonds

Standardized Green Climate Bonds should be virtually perpetual (e.g. 100 years or longer) and practically interest free. Due to their perpetual duration, Green Climate Bonds would become permanent assets of the Central Banks and thus form the foundation of regular money creation. This would ensure that the GCF or the MDBs are at the receiving end of new and non-repayable money with which they can co-fund and thus increase the attraction of many climate protection investments. Likewise, they could finance adaptation and mitigation measures that generate in no immediate financial returns. Considering the current actions of Central Banks, up to \$300 billion p.a. could easily be generated within the regular money creation process (WFC, 2015). Central Banks can never become insolvent in their own currency due to their monopoly of issuing the legal tender – even if they purchase perpetual non-performing assets. The economic potential of Central Banks was seen during the bank bailouts. There is no reason why they should not contribute to stabilizing the global climate with a fraction of the funds thus used.

Ideally, all UNFCCC member states and their Central Banks should participate in this new Green Climate Bond system. But such Bonds could be initiated by a smaller number of countries. The advantage for participating states would be that Climate Bonds purchased by their Central Banks could count towards their governments' promised contribution to the \$100 billion p.a. climate fund (agreed at COP16 in Cancun), without having to invest tax-generated funds.

In the real economy, such additional money for RE-investments and the resulting consumption would not lead to inflation, since it will be globally distributed. The IEA has estimated that approximately \$1 trillion p.a. in additional investments would be required to limit global warming to 2°C. Even if new money creation to achieve the Paris 1.5°C goal succeeds in stimulating total investments and thus an additional demand of up to \$2 trillion p.a. (including participating private capital), this would be a small stimulus package rather than an inflationary risk when seen in relation to the global economic output of around \$80 trillion dollars. Of course, the total required would be less if RE prices continue to fall.

4. Why Central Banks should and can buy perpetual Green Climate Bonds from the MDB?

Central banks are public institutions in charge of providing legal tender and maintaining financial stability. In most cases they are also mandated to support the public good (including a healthy environment), provided that this does not prevent their operating an independent monetary policy. The purchase of standardized Green Climate Bonds by Central Banks would not lead to their losing the ability to operate an independent monetary policy.

4.1. Why should a Central Bank buy perpetual Green Climate Bonds?

The traditional task of Central Banks was quite narrowly defined before the 2008 financial crisis. Besides providing the economy with legal tender, managing inflation was key. Since the financial crisis, and due to growing deflation, Central Banks have been compelled to use other economic tools and been given more responsibility for the overall stability of the financial system. The Bank of England has now stated explicitly that the risk to the stability of the financial system from climate change is a new responsibility of Central Banks.⁴ The purchase of standardized Green Climate Bonds would therefore be a consistent next step for a Central Bank policy in fulfilling its mandate.

In the case of Europe, protecting the environment is part of the mandate of the ECB. Based on article 127 (TFEU), one of the aims of the ECB is to support the objectives of the EU in article 3 (TEU):

TFEU, article 127: “Without prejudice to the objective of price stability, the ESCB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union.”

TEU, article 3, para 3: “...a high level of protection and improvement of the quality of the environment.” There is no reason to assume that purchasing Green Climate Bonds in the proposed amounts by the ECB would seriously harm price stability. Also, buying bonds from MDBs or other designated financial institutions by the ECB is not forbidden by article 123 (TFEU). Only the direct purchase of government bonds is forbidden.

Central Banks are the most powerful financial institutions in our current economic system. Climate breakdown would seriously harm not only the environment but also economic and financial stability. Therefore they have the duty to do what they can to prevent climate breakdown.

4.2. Why can Central Banks purchase perpetual Green Climate Bonds?

Central Banks are mandated to provide their currency area with sufficient legal tender. In ordinary times (e.g. with a real growth rate of 3% and an inflation rate of 2%, i.e. nominal growth of 5%) they can meet demands for additional money of up to 5%, without this money creation leading to imbalances or

⁴ cf. Bank of England, One Bank Research Agenda, Discussion Paper, 25. February, 2015, p. 30 ff.

speculative bubbles. An expansion of the money supply analogous to the real financing needs of a growing economy is naturally sustainable.⁵

To meet additional demand for money and to inject it into the economy, Central Banks give- usually very short term-credit to banks or buy government or private bonds of differing maturities from them. During ordinary economic times there is likely to be nominal monetary expansion and growth in Central Bank assets. Central Banks can afford to additionally include very long-term bonds in their balance sheets without it constraining their (monetary) room for manoeuvre. This means that it is possible to integrate the purchase of long-term Green Climate Bonds (issued by the GCF or dedicated MDBs) into the money creation process without it requiring a fundamental change of Central Bank policy. The current independence of Central Banks would not be affected by such a new “QE for climate” programme.

If we assume that future, nominal, global growth will average 5%, the yearly global growth of the money supply must also be around 5% to avoid restrictive effects on the real economy. The two largest Central Banks, the US Federal Reserve and the ECB, could (with \$5tn as their total monetarily effective balance sheet total⁶ and a long-term money creation requirement of 5%) potentially create \$250bn per year without causing inflation and could use this to purchase perpetual Green Climate Bonds. As the dollar and euro currency zones together account for 36% of global GDP, the total sustainable money creation potential of all Central Banks can be estimated at \$700bn.⁷ The purchase of Green Climate Bonds for the assumed total of \$300bn would still give Central Banks enough scope to continue their normal monetary operations with the policy measures already in use. A buffer of approximately \$400bn dollars could be created to offset possible shortfalls on the part of other Central Banks.

As shown by their massive intervention during the financial crisis, Central Banks can expand their balance sheets with once-off purchases of assets of all types - without relevant negative consequences. This means that a once-off purchase of Green Climate Bonds, exceeding the usual extent of monetary expansion, would be possible. This money could be used as start-up financing for many climate protection projects.

Standardized ‘Green Climate Bonds’ as a new monetary tool of Central Banks

When Central Banks buy new Green Climate Bonds and record these in their balance sheets they also gain a new monetary policy tool. The advantage of this new tool is that it leads directly to the purchase of new goods and services. The real economy is thus stimulated without a need for the usual detour of credit creation by private banks. This means that no new debtors and creditors need be found. The new money is created, debt-free. The disbursement by the GCF and the MDGs would be directly into the system of the nation's banks, and their reserves at the Central Bank would rise. Should excess reserves result, the banks could reduce these reserves by lowering their refinancing at the Central Bank. The money supply would thus fall again. Banks would reduce their reserves at the Central Bank, which they do not need to refinance

⁵ It was unsustainable to provide for the financial sector's enormous demand for money for speculative purposes since the deregulation of the financial sector. But Central Banks could not stem excess demand for credit without simultaneously throttling growth- given that they only had the setting of lending rates as their sole policy tool.

⁶ Thanks to the various measures used by Central Banks to manage the financial crisis, their balance sheets became volatile. The figure of 5 tn \$ is to be seen as a rough average. Cf. the current amounts in the ECB's monthly review and the Federal Reserve's Statistical Release, H6.

⁷ For a preliminary estimate of the sum involved, it is assumed that the balance sheets of other Central Banks are structurally similar to those of the ECB and the Federal Reserve.

credit creation, and thereby reduce the money supply, because of the endogeneity of the money supply.⁸ The Bank of England has recently identified this as the correct description of monetary policy practice.⁹ The effect of the endogeneity of the money supply is especially important when Central Banks buy more Green Climate Bonds (for a short period of time as start up financing) than needed for actual money creation. This process contributes to the money creation and the resultant money supply reduction offsetting each other, so that the money supply grows as much as the economy requires to expand to full potential.

When a Central Bank puts a perpetual Green Climate Bond on its books to use as collateral for money creation, it meets the classical requirement of James Tobin¹⁰ and Richard Musgrave¹¹, that government bonds should be the bedrock of Central Bank assets. As the Green Climate Bonds are issued by a supranational public institution, they have a comparable function to national government bonds. The purchase of Green Climate Bonds could thus not only be integrated into the currently practised monetary policy measures of Central Banks, but also into classical financial theory.

It would also be sensible to have an agreement (between Central Banks taking part in the system) to recognise standardized Green Climate Bonds as tender between them. In that way, exchange rate fluctuations could be reduced whenever demand for specific currencies and corresponding buying Central Banks do not coincide.

What distinguishes the new Green Climate Bonds from ordinary bonds?

An ordinary bank or an institutional investor who buys a bond wants to earn interest and be repaid the capital in full at maturity. The business model using ordinary bonds can work in a market economy only if the issuer of bonds can generate that interest and the repayments due in the real economy. Because Green Climate Bonds are not actually repaid and do not yield interest, the only feasible buyers are Central Banks. Due to their right to issue legal tender (in their own currency), Central Banks cannot become insolvent and remain capable of acting even if they have negative capital.¹² When a Central Bank purchases bonds, it does

⁸ cf. World Future Council (2016): The meaning of the endogeneity of money for 'conventional QE' and the different kinds of 'helicopter money', Future Finance – Discussion Paper 11/2016.

⁹ cf. Bank of England: "Money creation in the modern Economy", in: Quarterly Bulletin, Vol. 54, No. 1, 2014, Q1. <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q102.pdf>. The bulk of the theory on endogenous money supply was generated from the mid 1980's. Important contributions came from P. Howells and Thomas Palley. See also Moore, Basil J.: Horizontalists and Verticalists: The macroeconomics of credit money, Cambridge, 1988; Howells, Peter: The demand for endogenous money, in: Journal of Post-Keynesian Economics Vol. 18, No. 1, 1995, p. 89-196; Palley, Thomas: Post Keynesian Economics: debt distribution and the macroeconomy, 1996

¹⁰ cf. Tobin, James: An essay on principles of debt management, Fiscal and debt management policies; quoted from the German edition. Baden-Baden, 1978, p. 121.

¹¹ cf. Musgrave, Richard Abel: Theory of Public Finance; quoted from the German edition. Theorie der öffentlichen Schuld, in: Handbuch der Finanzwissenschaft, Dritter Band, Tübingen, 1958. p. 136

¹² Jordan, Thomas; Braucht die Schweizerische Nationalbank Eigenkapital; Rede vor der Statistisch Volkswirtschaftliche Gesellschaft, Basel, 28. September 2011 http://www.snb.ch/de/mmr/speeches/id/ref_20110928_tjn/source/ref_20110928_tjn.de.pdf

not do that to earn interest¹³, but to provide the seller of the bond with money and thus boost liquidity in the economy. Thereby, the Central Bank fulfils the function as issuer of legal tender. A Central Bank does not rely on interest payments nor on the bond being repaid at a certain date. It can absorb bonds with unlimited terms into its balance sheet. As long as it keeps enough stocks and bonds with short terms and/or those it can sell on the market, it can again reduce the newly created money at any time. From a monetary policy perspective, the Central Bank remains fully capable of acting.

Summary

With the new Green Climate Finance System, sums of \$100bn to \$300bn p.a. can be channelled to the GCF, the MDBs or other dedicated financial institutions which are involved in climate finance in the course of ordinary money creation by Central Banks. Already in the start-up phase, before the participation of all UNFCCC member states, funding of tens of billions of dollar worth of projects would be possible. A new Green Climate Finance System would benefit an array of groups:

- the countries in which the climate protection investments take place (mostly Annex 2 states) get new energy generation systems which give the poorer part of the population access to energy, and with which the country can substitute imported energy. Simultaneously, they obtain additional currency flows that would usually require additional exports.
- the commercial enterprises that carry out the projects
- institutional investors get a new, long-term investment option with solid and certain returns.
- the countries where the technical equipment for climate protection projects is manufactured boost their exports and increase employment. They can also contribute to the GCF without needing to burden their budgets.
- through the massive expansion of renewable energy generation, a considerable amount of CO₂ is saved.

¹³ When a central bank buys bonds from ordinary banks in order to inject liquidity, it naturally earns respective interest. That is also a large part of the contribution of profitably for Central Banks. It is, however, not the proper job of a central bank.

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About the Author

Dr. Matthias Kroll studied political economics, sociology and law at the Hamburg University for Economics and Politics and graduated as a certified political economist. In his PhD he dealt with the question on how public expenses can be financed through the money generation of the central bank without creating inflation. Matthias taught economic policy at the University of Hamburg. Since 2010 he supports the work of the Future Finance Commission of the WFC.

Contact

World Future Council
Head Office
Lilienstraße 5-9
20095 Hamburg, Germany
+49 (0) 40 3070914-0

UK Office, World Future Council
100 Pall Mall
London SW1Y 5NQ,
+44 (0) 20 7321 3810

Dr. Matthias Kroll
Chief Economist - Future Finance
+49 (0) 40 3070914-25
E: matthias.kroll@worldfuturecouncil.org

WORLD FUTURE COUNCIL

Lilienstr. 5-9 | 20095 Hamburg

T: 040 30 70 91420 www.worldfuturecouncil.org

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