World Future Council

VOICE OF FUTURE GENERATIONS

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Financing the Green Climate Fund

How central banks can contribute to staying below the 2°C benchmark by purchasing Green Climate Bonds

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Abstract:
A sustainable future is only possible if we can limit global warming to 2°C. To still achieve this goal, an estimated $1,000 billion need to be invested annually in developing climate-friendly renewable energy production. Due to the subsidies provided for fossil fuels, targeted support measures are needed to make renewable energy investments attractive to investors.

Financing such support measures is one of the main responsibilities of the Green Climate Fund (GCF) within the framework of the UNFCCC. The Copenhagen Accord at the COP15 designated the GCF to obtain the "significant" amount of the promised "new and additional" $100 billion p.a. committed by developed countries by 2020. However, assuming that the GCF manages to obtain a sum close to the promised $100bn, two questions remain: Firstly, what is the likelihood of receiving $100 billion each year in form of non-repayable grants (and not largely in form of loans as a recent OECD report assumed[1]). And secondly, will $100 billion be sufficient to make annual investments of $1,000 billion dollars profitable or will funding of at least 300 billion dollars be required?

Previous experience with financing commitments from tax or semi-public funds - such as revenues from emissions trading - indicate that the sums which will actually be disbursed will regularly fall short of the ones promised. For example, the current amount of grants provided to the GCF stand at $10 billion in total, not per year.

An alternative way of financing and providing sums larger than 100 billion dollars to the GCF could be the involvement of central banks. These can never become insolvent in their own currency due to their monopoly of issuing the legal tender – even if they purchase non-performing assets. The economic potential of central banks was witnessed during the bank bailout, leaving no apparent reason why they should not contribute to saving the climate with a fraction of the funds previously used. In order to do this, central banks would continue doing what most of them are currently doing to combat the effects of the financial crisis: Buying bonds to create new liquidity. To finance the Green Climate Fund, central banks would need to buy "Green Climate Bonds" issued by the GCF and finance concrete investment projects, rather than investing in government or corporate bonds. The monetary policies of the central banks would benefit from this new liquidity to finance real production instead of simply purchasing existing financial assets. So, instead of talking about "QE for the banks" we should focus on "QE for the climate".

Green Climate Bonds should have a duration of at least 100 years and would ideally only bear small, if any, interest rates. Due to their very long term, 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 is at the receiving end of new and virtually non-repayable money, with which it can increase the profitability of many existing climate protection investments. Likewise, it is now possible to finance adaptation and mitigation measures that result in no immediate economically exploitable yield. In this case, the participation of private investors would have to be excluded.

[1] Oxfam America: Behind the numbers: Getting to $100 billion in climate finance, October 7, 2015
http://politicsofpoverty.oxfamamerica.org/2015/10/behind-the-numbers-getting-to-100-billion-in-climate-finance/

To raise $100 billion per year, the Fed and ECB - in proportion to GDP - would each need to purchase Climate Bonds worth approximately 20 billion dollars annually. Remaining Climate Bonds worth 60 billion dollars would then need to be purchased by the central banks of other countries. For the euro zone, these annual 20 billion correspond to a monthly sum of approximately 1.5 billion euro per month – a small amount compared to the 60 billion euros the ECB is currently planning on investing in monthly bonds.

It is therefore easy to imagine a threefold increase of funding to $300 billion. But even if the central banks stop their large-scale purchases of a diverse range of bonds, $100 or 300 billion could easily be found within the regular money creation process.

Ideally, all UNFCCC member states and their central banks should be involved in this new Green Climate system. The financing via Green Climate Bonds could also be initiated through the participation of a relevant number of members.

The advantage for states participating in the bond purchases would be that Climate Bonds purchased by their central banks would count towards their promised share of the $100 billion, without having to invest their own budget funds.

For the real economy, such additional demand would not lead to inflation since it will be globally distributed. Even if new money creation succeeds in stimulating total investment and thus an additional demand of $1,000 billion, this would be a small stimulus package rather than an inflationary risk when seen in relation to the global economic output of around $78,000 billion dollars.

The proposed study would demonstrate how the new money flows between the GCF and the central banks can finance the global transition to a renewable energy economy while supporting monetary policy objectives.

1. The challenge

Since the beginning of the financial crisis, central banks have first bailed out private sector banks and, then, states by buying up private and public bonds to the tune of billions. This was possible because central banks can never become insolvent in their own currency due to their monopoly of issuing the legal tender – even if they purchase non-performing assets. An important side effect of these bailouts was the growing realisation that central banks can play a more active role with their monetary policies. If money creation by central banks does not automatically lead to inflation, newly created money can be used to finance urgent global tasks that would otherwise not be undertaken, e.g. underfunded global climate protection measures. It is still unclear how conventional financing sources can provide the minimum $100bn per year which we are told are needed for the Green Climate Fund, in order to attract further investment from the private sector.

To still achieve the 2°C target, approximately $1 trillion needs to be invested per year for climate protection- in economically sensible ways.[2] For a successful leveraging to a grand total of $1tn per year, a basis of at least $300bn is more realistic than the hitherto agreed up to $100bn. But even $300bn is not such a huge amount when compared to the world output (the appropriate comparison) of approximately $78tn (2014). Compared to the sums that are now being injected into the financial system by central banks, $300bn per year would cause neither excess demand nor inflation.

2. The possible role of central banks in climate financing

Central banks have the task of providing their currency area with sufficient legal tender. This means that in ordinary times (with a real growth rate of 2% and an inflation rate of 2%, i.e. nominal growth of 4%) they can meet demands for additional money of up to 4%, without this money creation leading to imbalances or speculative bubbles. An expansion of the money supply analogous to the real financing needs of a growing economy is naturally sustainable.[3]

To meet additional demand for money and 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 into the money creation process without it requiring a fundamental change of central bank policy. The current independency of central banks would not be affected by such a new “QE for climate” programme.

[2] The sum of 1 tn $ is required to achieve the 2 degree target. Cf. 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

[3] 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.

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 biggest central banks, the US Federal Reserve and the ECB, could (with $5tn as their total monetarily effective balance sheet total[4] and a long-term money creation requirement of 5%) potentially create $250bn per year without causing inflation and use this to finance (i.e. buy) long-term bonds of the Green Climate Fund. As the dollar and euro currency zones together account for only 36% of global GDP, the total sustainable money creation potential of all central banks can be estimated at $700bn.[5] 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 the massive interventions by central banks 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.

Green Climate Bonds as a new monetary tool of central banks

When central banks buy new Green Climate Bonds, and record this 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 disbursal by the GCF 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 credit creation, and thereby reduce the money supply, because of the endogeneity of the money supply. The Bank of England has recently identified this as the correct description of monetary policy practice.[6] 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.

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[4] 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.

[5] For a preliminary estimate of the sum involved, it is assumed that the balance sheet of other central banks are structurally similar to those of the ECB and the Federal Reserve.

[6] 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

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 long term Green Climate Bond in its books to use as collateral for money creation, it meets the requirement of James Tobin[7] and Richard Musgrave[8], that government bonds should be the bedrock of central bank assets. As the Green Climate Bonds 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.

The traditional task of central banks was seen as quite narrow before the financial crisis. Besides providing the economy with legal tender, managing inflation was emphasised. With the financial crisis, and the phenomenon of deflation, this has changed radically. Central banks have been compelled to use all their economic tools to stem the crisis. They have been given a larger area of responsibility for the overall stabilization 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.[9] The purchase of Green Climate Bonds would therefore be the consistent next step for a central bank policy fulfilling its mandate.

3. 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.[10] When a central bank purchases bonds, it does not do that to earn interest[11], 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.

[7] 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.
[8] 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
[9] cf. Bank of England, One Bank Research Agenda, Discussion Paper, 25. February, 2015, p. 30 ff.
[10] 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
[11] 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.

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.

4. The Green Climate Finance System: How do the new financial streams flow?

To involve the central banks in the financing of the required $100bn – or better yet: 300bn, a new Green Climate Finance System is needed. This entails the participating member states of the UNFCCC allowing their central banks to invest in bonds of the GCF on a long-term basis. It is unnecessary that all member states of the UNFCCC take part. To ensure the fundamental functioning of the system, it would suffice if Annex 1 nations and well-performing Annex 2 nations (that have an internationally recognised currency and/or a positive current account) take part. That might not immediately enable the issuing of the full required amounts. But it would provide tens of billions annually to fund climate protection investments. The more states take part in the Green Climate Finance System, the larger the sum available. An important incentive for UNFCCC members taking part would be that the bonds (purchased by their central banks) would be recorded as funding for the GCF. A government taking part in this system could therefore fund the GCF without using its own budget.

It would also be sensible to have an agreement (between central banks taking part in the system) to recognise 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.

The Green Climate Finance System at work

Before the GCF sells these new Green Climate Bonds to central banks, it needs to determine which climate protection projects are to be funded - and to what extent. Only then can it be known which currencies will be needed. When this is established, the GCF sells new Green Climate Bonds of this amount to the respective central banks. The central banks record the new bonds in their balance sheets and issue the new currency to the GCF. The funding of projects will normally be distributed among several central banks.

Most Green Climate Bonds are likely to be bought by central banks of Annex 1 countries. But central banks of Annex 2 countries (that have a surplus in their current account and/or large currency reserves) could also buy new Green Climate Bonds. Where a direct purchase of Green Climate Bonds is legally tenuous because of the central bank's mandate - as probably with the ECB - an investment bank can be used as intermediary. For the ECB, the European Investment Bank (EIB) could be used. The GCF would then sell the new Green Climate Bonds to the EIB, which would sell them on to the ECB.

Who profits (and how) from the new financial flows from Annex 1 to Annex 2 countries?

The new funding, which the GCF obtains from Green Climate Bonds, can be channelled in various ways to fund climate protection measures. For example, an industrial consortium of international and local project operators wants to generate CO_2-free energy in an Annex 2 country with a combined solar and wind power infrastructure. In this example it is assumed that the investment project would need – based on projected electricity prices - a 30% start up funding to be economically feasible. That means that a total investment of $1bn would need funding of $300m from the GCF. Because the project is then profitable, the balance of $700m can be obtained from investors. To obtain the funds, the project operators would need to lay out to the GCF exactly which currencies they would need to obtain the investment goods (probably mostly from Annex 1 countries). The cost of construction in Annex 2 countries would be covered by way of the GCF selling the necessary bonds to a pool of Annex 1 countries' central banks. Thus, central banks would finance, with the new money and via the Green Climate Finance System, additional exports from Annex 1 states. The newly created money would have a positive effect in the issuing country while also providing foreign exchange in the recipient country.

This is a simplified example to illustrate the fundamental financial flows. Other funding models are possible. The overriding principle would still be "money only for performance". Other funding models, where investment projects in RE plants would involve a guaranteed payment for supplying electricity, are thinkable. Regardless of the funding model chosen, the Green Climate Finance System will give Annex 2 countries a currency influx from Annex 1 states, while Annex 1 states get export financing. In the system described, the GCF will acquire additional responsibility for the distribution of considerably increased funds.

Summary

With the new Green Climate Finance System, sums of $100bn to $300bn p.a. can be channelled to the GCF 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 dollars 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 CO_2 is saved.

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