Targeting a sustainable recovery with Green TLTROs

Jens van 't Klooster
Rens van Tilburg

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PositiveMoney Europe

SUSTAINABLE FINANCE LAB

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About the authors

Jens van 't Klooster is an FWO Postdoctoral Fellow at the KU Leuven and a member of the research group "A New Normative Framework for Financial Debt" at the University of Amsterdam. Email: Jens.vantklooster@kuleuven.be

Rens van Tilburg is Director of the Sustainable Finance Lab at Utrecht University. Email: r.vantilburg@uu.nl

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Positive Money Europe & Sustainable Finance Lab

Jens van ‘t Klooster (KU Leuven and University of Amsterdam)[1]
Rens van Tilburg (Sustainable Finance Lab and Utrecht University)

Since their introduction in 2014, the European Central Bank’s Targeted Longer-Term Refinancing Operations (TLTROs) have become ever larger and ever more attractive for banks. As they increasingly drive bank lending, TLTROs often enable unsustainable investments. This report proposes Green TLTROs, which are refinancing operations that provide banks with cheap funding if they lend in accordance with the EU’s taxonomy of green activities. We discuss the legality of such a market-based programme and show that it is compatible with a level playing field between banks and the singleness of monetary policy. We outline several possible technical designs of the Green TLTROs and suggest a pilot programme for energy efficient housing that can quickly be implemented.

[1] Email: jens.vantklooster@kuleuven.be

FOREWORD

The core task of the European Central Bank, as any central bank, is to support the economy. Its primary responsibility is defined as achieving price stability to keep the economy on a stable path. Without prejudice to price stability, the ECB should also support the general economic policies of the European Union.

A focal point in the EU's general economic policies is the European Green Deal, which is endorsed by the European Council and the European Parliament. In her recent State of the Union speech, the European Commission President Ursula von der Leyen proposed to tighten the green policies further with ambitious carbon emissions reductions by 2030. Interestingly, the European Union has combined its COVID-recovery policies and green policies into a green recovery programme. As governments can only spend their money once (assuming there are limits to their borrowing), it makes sense to aim for a green recovery instead of general economic stimulus today and green stimulus in a few years time. Why finance a business-as-usual approach first and only later phase out the climate negative part of this business out, while stimulating the green part? You may as well start by stimulating the green part first.

The same logic applies to the ECB. The ECB's targeted and longer-term refinancing operations (TLTROs), provide cheap funding for banks in order to incentivize them to keep lending to the real economy. This paper by Jens van 't Klooster and Rens van Tilburg argues for a green TLTRO. The cheap funding is then targeted to green bank loans, which stimulates a green recovery. Luckily, the European Commission has developed a Green Taxonomy that can be used to determine what a green loan is. The ECB should stay away from the political choices of what is green and what is not.

The main barrier to green TLTROs is orthodox thinking – the ECB should only stimulate the recovery. The European Union has made the smart choice to work on a green recovery. This paper shows how the ECB could support a green recovery,without getting into politics. Green TLTROs are an interesting application of integrated thinking, which is at the core of efforts by governments, central banks and companies to transition our current unsustainable economy into an eco-friendly financial system.

Dirk Schoenmaker, Professor of Banking and Finance at the Rotterdam School of Management, Erasmus University, and member of the Sustainable Finance Lab

Stanislas Jourdan, Executive Director of Positive Money Europe

1. Introduction

The EU today faces two dramatic challenges, which it can only successfully master by relying on its banking system: the COVID-19 pandemic and the climate transition. The pandemic provides an opportunity to restart the EU economy in line with the EU's environmental objectives. A restart without adequate green provisions would put the objective of staying well below 2°C at immense risk.

Monetary policy will have to play its part in the recovery. Even before COVID-19, the monetary policy stance in the euro area was highly expansionary with the deposit facility interest rate negative and the Asset Purchase Programme still running. Despite this, since 2009 the ECB has struggled to get inflation to the required level, to achieve its primary objective of price stability.

The question therefore is what instruments the ECB still has at its disposal to stimulate the Eurozone economy. One instrument that has not received much attention in the public discussion, is the Targeted Longer-Term Refinancing Operations (TLTRO). This is an extension of the regular or main refinancing operations (MRO), targeted on lending to the real economy and with an increasingly favourable interest rate and longer term maturity. In the first months of the pandemic, the ECB has resorted to this instrument in an unprecedented way.

At the same time, an increasingly public debate has started about whether ECB interventions go against the general economic policies of the European Union or not. This debate has focused on the EU's climate objectives in particular. This discussion is even more pertinent now that the EU has agreed on an inclusive energy transition, a European Green Deal, as the core of its recovery planning. The ECB has not proposed any similarly ambitious proposals. This raises the question -is the current design of its monetary policy operations sufficiently sensitive to their environmental impact?

In this report, we argue that within its current mandate the ECB can and should do more to accomodate a green and social recovery. To achieve this, we focus on the greening of the TLTRO instrument. Because most banks do too little to incorporate environmental criteria into their lending decisions, they may lend in ways that conflict with the ECB's monetary and financial stability objectives, as well as the EU's environmental objectives. We will argue that a green TLTRO can counteract such market practices, and thereby contribute to the ECB's primary objective of price stability, its secondary objective for supporting the economic policy objectives of the EU and its financial stability objective.

This report is structured as follows. Section 2 explains the role of the TLTRO in the ECB's operational framework. Section 3 discusses whether the ECB's current monetary policy operations conflict with the broader environmental objectives of the EU. Section 4 formulates the normative and legal case in favour of Green TLTROs. Section 5 outlines the proposal itself and important design features.

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2. TLTROs in the ECB's policy framework

The primary objective of the Eurosystem is to maintain price stability (TFEU, Article 127). In order to achieve this objective, the Eurosystem has defined its conventional instruments in its operational framework: open market operations, standing facilities and minimum reserve requirements for credit institutions.

The interest rate that the ECB charges for its refinancing credit has been its most important tool for achieving price stability. Consumer prices are not controlled by the ECB directly. Instead, they are determined by forces of demand and supply in the economy. Lacking direct control over prices, banks are crucial to the transmission of monetary policy. By raising their interest rate, central banks seek to contract bank lending, thereby reducing the volume of economic activity. Low interest rates, conversely, serve to stimulate bank lending.

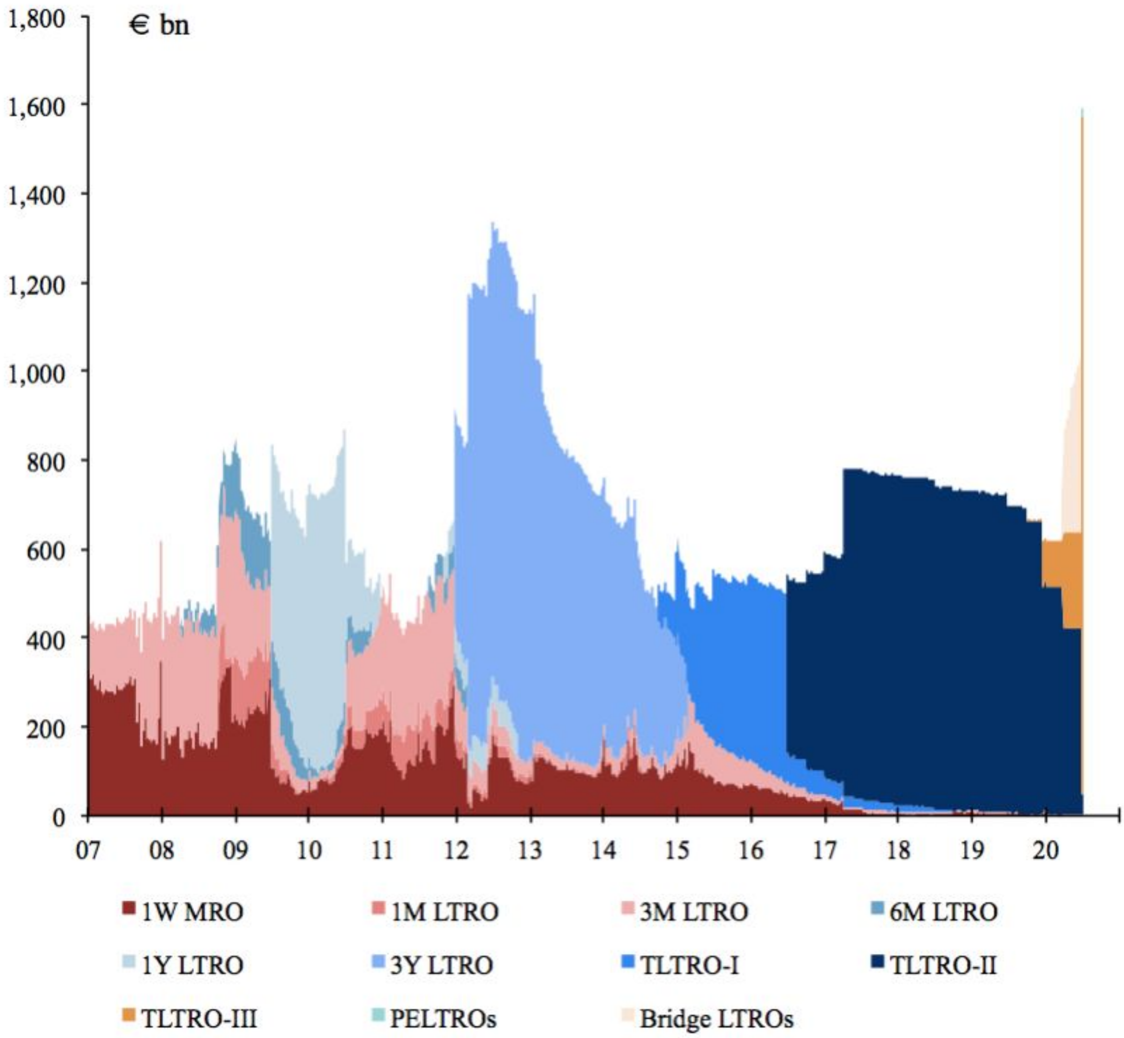
The ECB's Main Refinancing Operations (MROs) and Longer Term Refinancing Operations (LTROs) are at the very heart of the Eurozone's financial system (ECB 2011; Bindseil 2014). Banks normally fund their loan portfolio by issuing deposits, borrowing in money markets and in other ways taking on debt. However, when banks fail to find funding at a rate below the ECB's policy rate, they can access central bank refinancing credit (ECB 2011, 94). Through its refinancing operations, the ECB thus provides an important public service to banks. Its liquidity insurance allows banks to engage in liquidity transformation; they can fund a portfolio of illiquid assets by accepting customer's bank deposits. Long-term illiquid investments made by banks are, accordingly, supported by the central bank's willingness to step in and help banks fund their portfolios (Goodhart 1988; Ricks 2016).

Since 2009, the ECB has implemented several 'unconventional' measures. The most prominent of these is its Asset Purchase Programme (APP). Through the APP, the ECB has become an important investor in government bonds and other financial assets. The APP has received a lot of attention. Much less discussion has gone to the ECB's refinancing operations, where the ECB has done a lot to provide the banking system with cheap funding.

Since the crisis of 2008, the ECB has increasingly provided banks with generous low interest rates and long maturities for refinancing. The cheapest funding today is available for the part of bank lending that goes to Targeted Longer-Term Refinancing Operations (TLTROs). Unlike MROs and LTROs, this funding is only available for banks when they lend to firms and provide consumer credit, but not when they only give out mortgages. In this regard, the TLTRO programme is 'targeted'.

For the TLTRO, over the last years, the ECB has steadily increased the fraction of eligible loans, the capacity of the instrument, and has offered ever more attractive interest rates. The fraction of eligible loans for which TLTRO were available was raised from 7% (TLTRO I, 2014) to 30% (TLTRO II 2016) and 50% (TLTRO III 2019). During the COVID pandemic the interest rate on TLTRO III was lowered to minus 1%, which means that the ECB pays banks 1% of the value of their loan every year. This generous support has continued until the corona virus hit and then strongly increased (see Figure 1).

Figure 1. Outstanding MRO, LTRO and TLTRO 2007-2020[2]



The COVID-19 pandemic has had a devastating impact on the lives of citizens and the economies of member states. It is likely that monetary policy will have to remain expansive for quite some time. With the interest rate negative and the asset purchase programmes reaching their limits, it is to be expected that TLTRO will play an important role in stimulating the bank based economies of the Eurozone in the years to come.

[2] Source: Ducrozet/Pictet

3. The green dimension of the ECB's monetary policies

As monetary policy is now key to the EU recovery, the question of its environmental impact becomes more pertinent. Arguably, TLTROs are the ECB instrument with the most direct real economic impact. Where other instruments focus on the price of short-term credit or the quantity in the financial system, as with asset purchase programmes, TLTROs seek to incentivize non-mortgage lending to the real economy.

To date, discussion on the environmental impact of monetary policy has focussed almost exclusively on the APP (Matikainen, Campiglio, and Zenghelis 2017; Jourdan and Kalinowski 2019). Consequently, whereas a lot of attention has been paid to the question of how to green the ECB's quantitative easing and its banking supervision, there are few proposals for greening the ECB's refinancing operations (Monnin 2018; Schoenmaker 2019; Dikau, Robins, and Volz 2020). In discussions on greening the monetary policy of the ECB (see Box 3), little attention has gone to TLTROs.

Currently, the ECB's refinancing operations provide banks with funding irrespective of whether their lending is green (i.e. contribute to the EU's environmental objectives), red (harm the EU's environmental objectives) or grey (neither contribute nor harm).[3] This also holds for existing TLTRO programmes, which are targeted in terms of sectors, but ignore the environmental impact of loans.

The question is whether the ECB is playing its part as a European institution in the Green Recovery. Without a dramatic change to human consumption and production, continued greenhouse gas emissions will lead to "severe, pervasive and irreversible impacts for people and ecosystems" (Pachauri et al. 2014, 8). Therefore, the EU has decided to aim for a Green Recovery, linking 30% of all expenditures for the Recovery to this specific aim. The ECB so far has not greened its policies in any way, and has made the question of 'where and how' climate change can have an impact on its policies part of a review of its monetary policy strategy, which will not be finalized before the summer of 2021.

[3] The TEG acknowledges that the use of "brown" to designate pollution is not "appropriate to different cultural contexts" (TEG 2020a, 51). Because green and pink are opposed on the colour spectrum, their combination is grey-brownish.

With its current crisis-fighting operations, the ECB is leaving an important tool to promote green lending unused. Banks are uniquely well-placed to finance the energy transition, since many of the investments that are needed are relatively small, such as the case for retrofitting houses and capital investments of SMEs. Banks are also particularly important for the energy-intensive sector of construction and real estate, which accounts for 40% of EU energy consumption and 36% of carbon emissions (TEG 2020b, 367). European banks' credit screening capacities could drive forward the greening of housing, manufacturing and other energy-intensive sectors.

For now, environmental risk is low on the agenda of banks, and internal screening facilities for environmental impacts remain underdeveloped (ECB 2020b, 13). Because most banks do too little to incorporate environmental criteria into their business decisions, they may manage environmental risks in ways which conflict with the ECB's monetary and financial stability objectives, as well as the EU's environmental objectives. Today, as the ECB recently explained, most European banks:

> "do not have the tools to assess the impact of climate-related and environmental risks on their balance sheet. More specifically, only a small number of institutions have fully incorporated climate-related and environmental risks into their risk management framework, through for instance a risk measurement approach, by defining their risk appetite, performing stress tests and scenario analyses and/or assessing the impact on their capital adequacy." (ECB 2020b, 13)

As a consequence, to this day overall bank lending is not sustainable. Billions still flow from European banks to coal and gas plants (RAN 2020). Mortgage funding can be used to refurbish houses and to make them more energy efficient, but also to lock in the carbon emissions of an outdated housing stock decades into the future. As the European Commission's Technical Expert Group (TEG) notes "About three-quarters of European buildings are considered inefficient, while only 0.4-1.2% (depending on the country) of the building stock is renovated each year to improve its efficiency" (TEG 2020b, 367). Meanwhile, despite serving the same households with similar volumes of credit, research suggests that banks often remain hesitant to fund energy efficient home retrofitting, while eager to provide credit for car purchases – most of which will continue to have combustion engines (Giraudet, Petronevich, and Faucheux 2019).

With TLTROs, banks are enticed to ramp up their unsustainable lending practices. By providing cheap funding without applying any environmental criteria, the ECB accelerates a set of market practices that may be unsustainable; fund carbon lock-in and keep funding rates too low for unsustainable business models. Another approach is possible, that gives preferential interest rates for green lending, hence the Green TLTRO.

The ECB's refinancing operations could be a key lever in greening the banking sector. What counts as contribution has recently been codified through the development of the EU's Green Taxonomy (TEG 2020a; 2020b), a regulatory framework for determining which economic activities contribute to the EU's environmental objectives. Green TLTROs are refinancing operations where the interest rate that banks pay depends on their volume of lending that complies with the EU's Green Taxonomy. Although the development of EU ESG taxonomies is still in its early stages, Green TLTROs can be implemented today – enabling what the ECB's recommends the EU to do, namely "frontloading use of the Taxonomy in the context of the recovery from the COVID-19 pandemic" (ECB 2020a).

4. How do green refinancing operations contribute to the ECB mandate?

Green TLTROs are like all LTROs in that they contribute to the ECB's price stability objective by incentivizing more lending. They are also like existing TLTROs in that they are targeted; they do not just provide banks with one refinancing rate, but rather incentivize a specific allocation of capital towards green investment.

There are broadly three kinds of arguments for implementing Green TLTROs within the ECB mandate:

- Green TLTROs will contribute to achieving the ECB's primary mandate by addressing market failures that undermine the broader economic preconditions of monetary stability;
- Green TLTROs will support the ECB's efforts to reduce environmental and climate-related financial risk built up in banks' balance sheets and thereby contribute to financial stability;
- Green TLTROs will help to align monetary policy with the ECB's secondary mandate, which requires it to support the EU's environmental objectives where this is possible without prejudice to price stability.

Climate-related economic shocks matter to monetary policy first and foremost because they can undermine the broader economic preconditions of monetary and financial stability (NGFS 2019; ECB 2020a). Both threats to instability result from the pricing and changing perception of value in relation to the environment. It is now widely recognized that climate change is itself a source of monetary and financial instability. These risks fall into two distinct categories. First, transition risk associated with economic policy measures taken to reduce greenhouse gas emissions. Physical risks, on the other hand, result from extreme weather events, rising sea levels and other consequences of rising temperatures. Beyond climate change, however, environmental degradation and loss of biodiversity comes with an equally disruptive impact on the economy.

To achieve its inflation target, the ECB may lower the interest rates on its refinancing operations to stimulate additional lending. If this goes to unsustainable economic activities, however, the stability that it provides is short-lived (Batten et al. 2016; Batten 2018; Bolton et al. 2020). This may fit the ECB's current interpretation of the price stability mandate, which focuses on year-on-year consumer prices over the medium-term. However, this short-term focus is not itself in the Treaty, but an interpretation which has not been updated since 2003. For the ECB's current review of the monetary policy strategy, this definition should be revised.

The absence of adequate private-sector green investment leads to an allocation of capital that hinders long-term price stability. Credit to fund carbon-intensive energy production and energy-inefficient capital investments may boost the economy in the short-term, but will only contribute to future shocks to the economy when these investments lose their value. Extreme weather events can damage the economy's productive capacity, which left unchecked creates inflationary pressure. As Isabel Schnabel recently explained, "the longer the risks of global warming are ignored and policy action delayed, the higher the risks of very large and persistent shocks to output and inflation" (Schnabel 2020). Green lending, in contrast, will itself contribute to long-term stability, and will therefore outperform existing programmes in achieving the price stability objective of the ECB.

Green TLTROs will also contribute to a second task of the ECB, namely the financial stability role that is part of its banking supervision mandate (ECB 2020a)**.** Through Green TLTROs, the ECB can help ensure that financial institutions adequately price the climate and environmental risks that they are exposed to. Markets currently fail to adequately price financial risk resulting from climate change and other environmental dimensions of economic policy (Mercure et al. 2018; Bolton et al. 2020). It is true that these supervisory objectives would benefit most from a "red" list of activities that impose significant harm on the EU's environmental objectives. However, until such a taxonomy is available, Green TLTROs will promote those investments that are most sustainable and hence (all else equal) in the long-run most secure. As we argue below, Green TLTROs will also incentivise the development of better environmental and climate-related risk screening – again complementing the ECB's supervisory efforts.

Thirdly, the Treaty explicitly requires the ECB to support the general economic policies in the European Union, without prejudice to the objective of price stability. With regard to the functioning of the internal market, these objectives include a:

> "sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment." (TEU, Article 3)

Article 11 TFEU also assigns to EU institutions a more general requirement to integrate environmental protection requirements into the definition and implementation of policies and activities (Solana 2019).

The past years the EU and its member states have also made a clear democratic choice for the pursuit of a climate-neutral economy. The EU Green Taxonomy provides a set of criteria to determine activities that contribute to protecting the European economy against physical and transitional risk. These criteria also provide an important reference point for understanding what financial market practices support the economic objectives of the EU. Green TLTROs are not just aiming for any set of future prices, but specifically for those prices already democratically decided as the ones that the EU pursues.

Rather than going against the ECB mandate, Green TLTROs should be seens as a new step in the interpretation of that mandate, which reflects the lessons learned since 1992. Central banks have over the centuries used a wide range of tools to ensure that private credit was allocated in line with the state's economic policy objectives (Bezemer et al. 2018; Monnet 2018). The past decade again saw the ECB experiment with a wide range of new tools to pursue price stability. Green TLTROs are in this regard a logical next step in the broadening of the monetary policy toolbox (Braun and Downey 2020).

Box 1: Do green TLTROs go against the ECB's legal mandate?

The legal mandate of the ECB is broad and contains only a few provisions that provide targeted guidance on how to implement monetary policy (Smits 1997; Gortsos 2020; de Boer and Van 't Klooster forthcoming). Instead, Article 127 (2) TFEU leaves it to the ECB itself to "define and implement the monetary policy of the Union". It is, hence, left to the ECB to decide how it pursues its primary and secondary objective. In particular, at least until other EU political actors decide to weigh in, the interpretation of what constitutes price stability is up to the ECB. The CJEU has confirmed the wide discretion granted to the ECB in its *Gauweiler* and *Weiss*-rulings. Article 18 of the ECB and ESCB statutes provide the ECB and NCBs (National Central Banks) with a very general power to trade in financial assets by "buying and selling outright (spot and forward) or under repurchase agreement and by lending or borrowing claims and marketable instruments, whether in euro or other currencies". It also permits the ECB and NCBs to "conduct credit operations with credit institutions and other market participants, with lending being based on adequate collateral", though it is left to the ECB to decide what adequate means. The clearest restrictive provisions are Article 123 TFEU, which prohibits lending to governments and Article 124 TFEU that prohibits providing public borrowers with privileged access to its lending facilities. Green TLTROs, however, do not target governments.

The ECB has recently invoked a principle of market neutrality to justify the absence of environmental criteria from the design of its Corporate Sector Purchase Programme operations. It should be noted that this principle is not in the ECB mandate and is in fact relatively new; ECB officials denied that ECB operations were subject to a demand of market neutrality as late as 2009 (Cheun, von Köppen-Mertes, and Weller 2009, 18–19; cf. van 't Klooster and Fontan 2020). The principle also has no clear basis in the ECB mandate. Instead, Article 127 of the ECB mandate contains a generic provision that requires the ECB to operate in accordance with the principles of a market economy. The provision was

historically included in the ECB Statutes to prohibit coercive credit guidance instruments used before the creation of the EMU. It does not prohibit a market-based programme such as Green TLTROs. It is, moreover, not immediately clear what market neutrality means in the context of refinancing operations. All interest rate setting is ultimately a form of administered, rather than market-based pricing. The application of differentiated interest rates relative to the bank's portfolio is not a priori more or less market-based than using one undifferentiated interest rate. The Green TLTRO programme is market-based and hence in accordance with the principles of a market economy. A widely accepted principle of a market economy is that market failures justify regulation. It is thus in accordance with Article 127 TFEU to implement Green TLTROs to the extent that it contributes to the ECB's monetary policy objectives and counteracts market failures that enable the current carbon-intensive and unsustainable trajectory of the financial system.

5. The proposal for Green TLTROs

So how would the Green TLTRO programme work in practice? Green TLTROs are distinct from existing refinancing operations with regard to how their interest rates are determined. Instead of providing credit at a unitary refinancing rate, the interest rate on Green TLTRO credit is determined by the volume of bank lending that complies with the EU's Green Taxonomy.[4]

The programme is market-based in the sense that it is designed to secure a level playing field between banks and a single monetary policy stance for the Eurozone. The programme involves administered prices, namely the TLTRO interest rates. This is the case for all monetary policy operations, which by their nature involve setting prices in accordance with the central bank's monetary policy stance. Like the existing TLTRO programme, Green TLTROs are selective, with an eye to what types of lending contribute most to the ECB's monetary policy objectives. The programmes, however, leave it to private initiative to find profitable investments and rely on private price discovery to determine the cost of credit for the customers of banks. The Green TLTRO programme is more targeted than existing refinancing programmes by encouraging loans that fit the broad criteria set out in the EU's Green Taxonomy. To ensure that the programme respects the ECB's principles of equal treatment and harmonisation, it is possible to introduce various benchmarks and procedural safeguards that we will discuss here.

5.1 The EU Green Taxonomy

The key input into the design of the Green TLTRO programme is the European Commission's EU Green Taxonomy Regulation, which is a comprehensive set of guidelines that allows investors and companies to report on the environmental impact of their activities (TEG 2020a; 2020b). To comply with the Green Taxonomy, an activity must contribute to one of six objectives: (i) climate change mitigation, (ii) climate change adaptation, (iii) sustainable use and protection of water and marine resources, (iv) transition to a circular economy, (v) pollution prevention and control; protection and (vi) restoration of biodiversity and ecosystems. In addition, they must do no significant harm to the other five and meet minimum safeguards such as the OECD Guidelines on Multinational Enterprises and the UN Guiding Principles on Business and Human Rights. Technical screening criteria spell out in detail what these requirements mean in practice.

[4] The use of monetary policy operations to pursue a specific industrial strategy has a long history (Bezemer et al. 2018; Monnet 2018; Braun and Downey 2020). More recently, the People's Bank of China has committed to using its refinancing operations to guide private investment and promote the Chinese green agenda (PBOC 2016).

Although the development of EU ESG Taxonomies is still in its early stages, it can already be used for implementing Green TLTROs today. Currently, the EU's broader efforts to create ESG taxonomies are incomplete in four regards. First, technical screening criteria are available for objectives (i) and (ii), while other objectives should be ready by the end of 2021 (TEG 2020a). Second, the revised Non-Financial Reporting Directive (NFRD) will only apply from 2022 onwards to oblige publicly listed companies, banks and insurance companies with over 500 employees to report on Taxonomy-compliance of their activities at the company level (TEG 2020a). Third, the Green Taxonomy is expected to be complemented with a red list of activities that impose significant harm on the EU's environmental objectives. Finally, efforts to create taxonomies for social aspects of investment are only in their early stages (TEG 2020a, 51). Green TLTROs provide banks with cheap funding to the extent that they can document Taxonomy-compliance. As such their successful implementation requires neither mandatory NFRD disclosures, completion of technical screening criteria, red lists or other taxonomies. Indeed, the ECB itself recommends frontloading its use to make sure that the unprecedented spending efforts in the service of a post-pandemic recovery also support the EU's environmental objectives (ECB 2020a, 9).

Box 2: Green Taxonomy Technical Specification for Construction and Real Estate Activities (TEG 2020b, 369–70)

To illustrate the nature of the Taxonomy's technical specifications, consider the standards for construction and real estate, which we point to below as a suitable starting point for a Green TLTRO pilot programme. The main requirement that a project makes a substantial contribution to the EU's objective of climate change mitigation is specified as follows:

1. **Construction of new buildings:** To be eligible, the design and construction of new buildings needs to ensure a net primary energy demand that is at least 20% lower than the level mandated by national regulations.

2. **Building renovations:** Renovations need to be designed to meet the local, national or regional requirements for 'major renovation', as defined in the Energy Performance of Buildings Directive (EPBD). This will stimulate the market and encourage building owners undertaking a 'conventional' renovation to include energy-efficiency measures established by EU Member States in national and regional regulations which implement the EPBD. Alternatively, renovations are eligible if undertaken to ensure at least 30% savings in net primary energy demand, in comparison to the baseline energy performance of the building before the renovation, assessed through the calculated energy performance of the building.

3. **Individual measures and professional services:** Measures and services aimed at reducing energy and/or carbon emissions in buildings. This is assessed through technical requirements for each measure and service.

The body of the report sets out detailed criteria for how to apply these standards (e.g. measurement of energy use) and how to specify baselines, as well as further specifying the compliance criteria.

5.2 Main features of the proposal

The Green TLTRO proposal has four main features:

(i) **Green TLTROs are refinancing operations where the interest rate that banks pay is determined by the volume of Taxonomy-compliant loans issued by the bank.**[5] Just like other ECB refinancing operations, Green TLTROs can take the form of collateralized loans or repo transactions. Banks access Green TLTRO credit via their national central bank. Banks will also continue to borrow at the regular LTRO rate, so that the Green TLTRO programme in practice provides banks with a discount on their overall volume of interest payments to the central bank.

(ii) **To enable an early implementation of Green TLTROs, the onus should be on banks to provide proper documentation for the Taxonomy-compliance of individual loans.**[6] As we saw, the extent to which adequate reporting modalities are available for bank loans is expected to increase gradually over time. For now, technical screening criteria are available for climate change mitigation and adaptation, which can be used to determine whether any given loan is Taxonomy compliant. As the Taxonomy develops over time, banks will be increasingly able to provide documentation to prove that loans issued are Taxonomy compliant. For this, they may use information from private providers (MSCI, green certificates, greenhouse gas emissions data), accounting statements, and other relevant inputs. Early implementation will incentivize banks to document from an increasingly large share of their portfolio that it is Taxonomy-compliant, until the point is reached where good documentation mechanisms are in place for all sectors. One example of such frontrunning efforts is the Hungarian central bank's programme for issuing loans for building or renovating a property with at least a B rating (MNB 2019). This scheme is aligned with the Taxonomy requirement for the purchase and renovation of real estate (TEG 2020b, 367–91). An important benefit from asking for such documentation is that it incentivizes banks to put in place reporting and lending procedures for green lending, prior to the Green Taxonomy being fully implemented, which will contribute directly to the ECB's supervisory efforts. Once adequate reporting mechanisms are in place to cover the whole of a bank's balance sheet, the Green TLTRO interest rates will mainly incentivize green lending directly.

[5] In this regard, the proposal is entirely compatible with a dual interest rates approach to the problem of the lower zero bound (Lonergan and Greene 2020).

[6] For simplicity of exposition the focus in the following will be on loans, although the programme could be developed to also accept other Taxonomy-compliant assets.

(iii) The volume of Green TLTRO credit will be determined by the percentage of new loans for which the bank can document that they are Taxonomy compliant. The Green TLTRO rate is lower than the regular LTRO rate, so that banks which have no Green Taxonomy-compliant loans can only refinance at the LTRO rate. To ensure that Green TLTRO credit is sufficiently scarce, a benchmark should be developed based on both the total volume of Taxonomy-compliant lending and the volume of new loans. To incentivise green lending, it is important that borrowers cannot cherry-pick their most green projects for funding, while the majority of their operations continue to harm the EU's environmental objectives.[7] From the start of 2022 onwards, large companies and financial institutions are required to report what percentage of their activities and portfolios are Taxonomy-compliant. What counts as a green loan to a corporation should be determined on this basis, rather than providing credit for individual activities. Loans to households and project finance do not raise the same issue, so that we suggest below that this may be a good starting point. Once the Green TLTRO programme is implemented to accept a broad range of green assets, rules need to be developed that determine the volume of available Green TLTRO funding as a function of Taxonomy compliant loans. This benchmark can be adjusted over time as more efficient reporting modalities become available and increase pressure on banks to green their portfolio.

(iv) The ECB should develop or promote facilities to evaluate and verify Green Taxonomy-compliance as documented by banks. Even if the onus is on banks to document Taxonomy compliance, the question of what constitutes adequate documentation will inevitably arise, for which there is currently no agreed auditing or verification process (ECB 2020a, 10). Third-party providers could play a role within the frameworks developed by the NCBs and the Eurosystem. However, like credit ratings agencies, private providers have business incentives for being too permissive, so the procedure cannot rely entirely on these providers (White 2013). Hence, any independent providers need to be properly screened. Alternatively, evaluation and verification can be done at the level of the NCBs, since they implement the ECB's refinancing operations. Evaluation and verification can follow the EU taxonomy where it is sufficiently fine-grained, but the ECB will also need to develop criteria to evaluate the documentation provided by banks and verify whether loans are actually Taxonomy-compliant. A positive side-effect of involving both the ECB and the NCBs in the development of Green TLTRO frameworks is to foster expertise on the evaluation of the environmental impact of investment portfolios.

[7] European banks hold roughly €30 trillion in assets, of which €12 trillion are loans to EU citizens and firms (€4.5 trillion of these are mortgages). If banks succeed to document that 10% of their loans are Taxonomy-compliant, that would amount to up to €1.2 trillion in Green TLTRO credit, which is almost twice the total volume of current refinancing operations (See Figure 1). Hence, providing Green TLTRO volume for all Taxonomy-compliant loans would be too generous.

5.3 Technical designs of the Green TLTROs.

The essential feature of the Green TLTRO programme is to set interest rates based on the volume of Taxonomy-compliant loans that they can document, but we see many different ways to spell out the technical features of the programme. The most basic programme uses one simple interest rate, calculated as a function of the volume of new Taxonomy-compliant loans issued by the bank. The major advantage of such an approach is its simplicity, easy communicability and modest administrative efforts on the side of the ECB and its counterparts. Although some banks may have more Taxonomy-compliant customers than others, we see no need to offset every competitive advantage that results from the heterogeneity of Eurozone banking systems. The extent to which individual banks are able to engage in lending that complies with regular TLTRO standards differs between banks; this is not a distortion of competition, but simply reflects the importance of non-mortgage lending for the ECB's monetary policy objectives. The same is true for green lending.

There are clear advantages to the simple version of the Green TLTRO programme, but it is also clear that the specification of the programme will need to meet two principles that currently apply to ECB monetary policy operations. First, within the existing monetary policy strategy, any new programme must be compatible with the singleness of monetary policy. The ECB seeks to control the increase of consumer prices in the Euro-area as a whole, by steering the average money market rate.[8] The Green TLTRO programme should, therefore, not lead to a differentiation of money market rates within specific geographical sectors. Second, access to Green TLTROs should not undermine fair competition between European banks by unduly favouring some banks over others. How these principles can be fulfilled will need to be explored in more detail in subsequent research, but the options are plenty. The ECB could address operational challenges by developing benchmarks that recognize (i) the geographical location of the bank, (ii) the sectors in which the bank is active, and (iii) the size of the bank.

(i) Benchmarking Green TLTROs for member states

One worry that one may have about an undifferentiated Green TLTRO rate is that it allows NCBs to support their domestic banking sector through a lenient application of Taxonomy-standards.[9] Because monetary policy is implemented by the NCBs and often no EU-wide standard-setting body is available, choices may go to NCBs concerning what counts as Taxonomy-compliance. Moreover, to enable a swift implementation of

[8] The growing economic divergence between individual member states puts this objective under increasing pressure, which raises the question of whether some regional differentiation of rates may not in fact be conducive to the objective of price stability. That differentiation, however, would be very unlikely to map onto the differentiation of interest rates that would result in the absence of member state benchmarks for Green TLTROs.

[9] This happened in member state banking supervision before 2008 (Larosiere Report 2009; Bayoumi 2017) and in the design of ECB Tier-II collateral lists until the creation of the Single List in 2006 (ECB 2005, 76).

Green TLTROs, central banks should accommodate a wide variety of methodologies to document Taxonomy-compliance. This also means that there are likely to be considerable grey areas so that in an adverse scenario a race to the bottom could develop for Green TLTRO standard setting. By setting a quota for Green TLTRO funding relative to specific member states, the programme can remove incentives for NCBs to be lenient with criteria for domestic banks. The task of the NCBs would then be limited to determining which banks are entitled to what share of the overall NCB volume of Green TLTRO discount on refinancing cost. Banks can directly weigh-in on the criteria used by their NCB and propose improved standards.

(ii) Benchmarking Green TLTROs for the size of the bank

A second worry that one may have with an undifferentiated lending rate concerns the considerable differences in size between banks within the Eurozone, ranging from the large SSM banks to small local banks. These differences in size also translate into a different relative capacity to document Taxonomy-alignment. To prevent the Green TLTRO programme from unduly disadvantaging smaller banks, the Green TLTRO rate could be made comparatively low for such lenders. The size of this small-bank bonus can be determined in a market-based way, taking into account the overall volume of Green TLTRO lending that goes to smaller banks relative to larger banks.

(iii) Benchmarking Green TLTROs for sectors in which banks operate

Sectoral variation in the difficulty and costs involved in documenting Taxonomy-compliance could turn out to undermine fair competition between banks and reduce the singleness of monetary policy. Consider one example. It is easy for banks that invest in solar energy to document Taxonomy-compliance, since solar energy production is by definition Taxonomy-compliant. Banks active in such sectors may, therefore, benefit disproportionately from Green TLTROs even if their lending does not contribute more to the EU's environmental objectives than others. Conversely, banks active in agriculture, where it now appears Taxonomy-compliance comes with a considerable bureaucratic burden, potentially face a competitive disadvantage. This, in turn, may have further ramifications for the singleness of monetary policy since sectors are also unevenly distributed over the Eurozone economy. To recognize the high level of heterogeneity of the EU banking system, the interest rates for Green TLTROs can be further differentiated to reflect how difficult it is for a given bank to make Taxonomy-compliant loans. To this end, Green TLTRO interest rates should be benchmarked for the sectoral composition of a bank's investments.

Box 3: The unique contribution of Green TLTROs

Monetary and financial policy have a decisive role to play in aligning the financial system with the EU's climate-related and environmental policy objectives. There are many ways in which the ECB could contribute to those objectives. Nonetheless, we think the use of Green TLTROs has a unique contribution to make that cannot be easily replaced by any other policy tool. Consider three frequently asked questions concerning the proposal:

(i) Why not focus on banking regulation and supervision, for example through a green supporting factor or a penalizing factor for capital requirements?

The use of banking regulation to pursue a green transition is in principle entirely compatible with doing Green TLTROs. However, this proposal concerns monetary policy, while the other focuses on banking supervision. Capital requirements are today based on historical default rates and therefore fail to protect banks against these risks (Bolton et al. 2020; NGFS 2020; Philipponnat 2020, Schoenmaker and van Tilburg 2016). Adequately reflecting those risks in bank capital requirements is important. Still, environmental and climate-related risks are one source of risk, but not the only one. Hence, banking regulation and supervision can only have a limited role in greening the financial system because, like monetary policy, it also has its own proper objectives. A green supporting factor may lower the capital buffer of banks, thereby undermining financial stability (Boot and Schoenmaker 2018). Capital requirements, moreover, would be particularly effective to ban red-listed lending, where often a more direct link exists between environmental damage and financial risk that individual banks are exposed to. The use of Green TLTROs does not have potentially undesirable side-effects for financial stability and is particularly effective for incentivizing banks to take a sustainable long-term business strategy.

(ii) Why not just green the collateral framework?

Greening the collateral framework is compatible with Green TLTROs and ideally the two should work in tandem (Monnin 2018; Schoenmaker 2019). The collateral framework, however, also has an important role in financial stability as it determines the conditions under which banks can access central bank credit. If banks lack sufficient collateral to access ECB refinancing operations, this can drive banks into insolvency. Green TLTROs serve to push the green transition through a more gradual increase of funding costs.

(iii) Why not Green Quantitative Easing?

In addition to the ECB's refinancing operations, we think that the ECB's quantitative easing (QE) Asset Purchase Programme and the more recent Pandemic Emergency Purchase Programme should also be modified to remove its carbon-intensive bias. QE programmes, however, are not an alternative to refinancing operations, but rather meant to work alongside each other. There is, accordingly, again no reason to oppose Green TLTROs in favour of Green QE. Europe has a bank-based system, while corporate debt markets are small and bond issuance remains available mostly to large companies (De Santis et al. 2018). Key elements of the green transition need to take place in individual households (i.e. energy-efficient housing) and SMEs. Green TLTROs facilitate a bank-based green lending channel alongside a market-based channel.

6. Conclusion: An ambitious programme and first steps

Given the state of the Eurozone economy, the TLTRO programme is destined to play an important role in the ECB's monetary policy operations in the near future. The current design of these operations risks exacerbating and accelerating unsustainable lending practices. Its terms fail to take the EU's environmental objectives into account. Green TLTROs will counteract the current carbon-intensive bias of bank lending. In this report, we have explained how such a programme will contribute to achieving the ECB's monetary policy objectives, proposed different technical options and discussed their pros and cons. There are no serious legal or technical objectives to a programme along the lines suggested.

We do not see one particular version of the Green TLTRO as clearly superior. There are important open questions regarding the technical specificities of such a programme and their impact on markets. The Green Taxonomy is currently also in its early stages. Even in 2022, a complete infrastructure is unlikely to be available to evaluate all loans for compliance with the Green Taxonomy. Moreover, there is currently no red list for activities that go against the EU's environmental objectives, nor are there taxonomies for social and governance criteria of ESG-lending.

Over time a Taxonomy-based approach to refinancing operations could be the road to making all bank lending subject to policy-based price incentives. Once red lists are available, the ECB can also penalize lenders for credit provision that conflict with broader EU economic policy objectives. The better the reporting modalities for various taxonomies, the larger the share of refinancing credit that can be provided based on the alignment of bank lending with the EU's objectives. The Green TLTRO programme is flexible so that its importance can grow organically with the development of ESG-taxonomy modalities.

The ECB can start a limited pilot programme today targeted on funding for building and renovations in accordance with the Taxonomy requirement for real estate (see Box 2). Such a programme will address a set of well-documented market failures in the provision of funding for energy efficient home retrofitting (Giraudet, Petronevich, and Faucheux 2019). It will also have a sizable impact on the post-pandemic recovery, since 36% of the EU's carbon emissions come from housing, while its housing stock is currently far behind on the EU's commitments under the Paris Agreement - three-quarters of European buildings are considered inefficient (TEG 2020b, 367). Hence, investments in energy-efficiency will need to take place on a massive scale throughout the Eurozone, which means that there is no a priori concern with regard to a level playing field and the singleness of monetary policy. This simple first step could be implemented in a matter of weeks.

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Positive Money Europe
Rue Ducale 67,
1000 Brussels,
Belgium
ASBL N° 0718.859.377

www.positivemoney.eu
info@positivemoney.eu
Phone: +32 2880449
@PositiveMoneyEU
facebook.com/PositiveMoneyEurope

Sustainable Finance Lab
Adam Smith Hall, Kriekenpitplein 21
3584 EX Utrecht
Netherlands
KvK N° 55983340

www.sustainablefinancelab.nl
sustainablefinancelab@uu.nl
Phone: +31(0)30 253 7926
@SFL_nl
facebook.com/SustainableFinanceLab

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