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**Working Paper**

## Defining green bonds the danger of neglecting the issuer side: Looking at problems and solutions

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# **IW-Policy Paper 2/19**

## **Defining Green Bonds: The Danger of Neglecting the Issuer Side**

Looking at Problems and Solutions  
Markus Demary / Adriana Neligan

Köln, 13.02.2019

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**JEL-Classification:**

O16 - Financial Markets: Saving and Capital Investment, Corporate Finance and Governance

Q01 - Sustainable Development

Q54 - Climate, Natural Disasters and Their Management, Global Warming

Q56 - Environment and Development: Environment and Trade, Sustainability, Environmental Accounts and Accounting, Environmental Equity, Population Growth

## Management Summary

The European Union is currently making significant strides to lead on green finance and align its financial system with its climate, sustainability and clean energy ambitions. To this end, the European Commission presented three legislative proposals on sustainable finance in May 2018.

One of the EU's main efforts here is to establish a market for green bonds by introducing a common taxonomy. A technical expert group on sustainable finance is currently developing this taxonomy for sustainable finance. However, most experts are from the investor side, while the issuer side is underrepresented in the group. By defining which economic activities are green, the expert group also determines, which economic activities are non-green. Through the taxonomy, the green bond framework will thereby alter the financing conditions for green investments as well as for traditional investments. In our view, the framework on sustainable finance is unbalanced; it emphasizes mostly the investors' view and less the issuers' view. Two problems might arise from this: First, it does not adequately address the contribution of intermediate goods producers to green final products, and second, the contribution of non-green investments to CO<sub>2</sub>-reduction with the consequence that their financing costs might rise through a green bond framework.

Our first recommendation is, that the expert group should shift its focus away from single green products towards the green value chain. This approach would allow intermediate good producers of non-green products to issue green bonds if they contribute to green final products. If the issuer of an intermediate product could prove that, for example, 20 percent of its sales contribute to a green final product, the issuer should be allowed to structure the issuance by distributing 20 percent of the issuance volume as green bonds and the remaining 80 percent as conventional bonds. Considering the green value chain is important, since the financing costs of intermediate products will contribute to the production costs of green final products.

Our second recommendation is that businesses should at least in part be allowed to issue green bonds if they invest in technologies that reduce their CO<sub>2</sub>-emissions significantly. Their production does not fall under the definition of green products, but these firms could also contribute to greening the economy by investing in emission-reducing and energy-saving technologies. Embracing these issuers into the sustainable finance framework would set them incentives to invest into lowering their CO<sub>2</sub>-emissions.

## 1 The EU's Policy on Sustainable Finance

The European Union wants to embrace investors for reaching its three climate and energy targets by 2030. This involves not only cutting greenhouse gas emissions by at least 40 percent compared to 1990 levels, but also a minimum share of 32 percent of renewables in final energy consumption, and a minimum of 32.5 percent energy savings compared to a business-as-usual scenario according to the recently adopted 'Energy for all' package (European Parliament, 2018a). To this end, capital flows should be redirected in such a way that investments reflect environmental, social and governance considerations.

The European Commission presented three legislative proposals on sustainable finance in May 2018. The first proposal tackles the establishment of an EU classification system of sustainable economic activities, the so-called taxonomy (COM, 2018a). The second one intends the improvement of disclosure requirements on how institutional investors integrate environmental, social and governance (ESG) factors in their risk processes (COM, 2018b), while the third proposal aims at the creation of low carbon benchmarks and positive carbon impact benchmarks for investors, which allows them to compare the carbon footprint of their investments (COM, 2018c).

A key part of the legislative proposal is the establishment of a market for green bonds. A green bond is a security whose proceeds can only be invested into projects that contribute positively to either: (1) climate change mitigation, (2) climate change adaption, (3) sustainable use and protection of water and marine resources, (4) transition to a circular economy, waste prevention and recycling, (5) pollution prevention and control, and (6) protection of healthy ecosystems (COM, 2018a). In November 2018, a draft report by the European Parliament's Committee on the European Parliament's Committee on Economic and Monetary Affairs (ECON) was published adding a definition of economic activities with a negative environmental impact. This proposed amendment would introduce a division into positive and negative economic activities. Yet, the original proposal already requires that ecologically sustainable economic activities do not have a significant negative impact on the environmental objectives. It remains unclear if this would lead to a classification of CO<sub>2</sub>-intensive production processes such as steel or cement production as unsustainable, although the industry can demonstrate world-leading high energy and process efficiency and despite their essential importance for the economy as well as for the transformation of energy systems (e.g. wind turbines). Furthermore, it remains open if such activities are considered positively if most efficient in their sector, even if they are considered unsustainable according to the amended definition (European Parliament, 2018b).

By labelling a bond as 'green', the issuer commits to investing the proceeds of the bond in climate-related or environmental-friendly projects in a transparent manner. It is an attractive instrument to finance large environmental investment projects such as wind farms, photovoltaic plants, but also low-emission transport concepts or sustainable waste management. Private standards predominantly brought forward by the Climate Bond Initiative and the Green Bond Principles of the International Capital Market Association, have kick-started the market leading to a currently broad spectrum of voluntary standards and guidelines for green bonds. Now the proposed EU package will introduce a taxonomy for ecologically sustainable economic activities.

With a single EU standard investors shall gain better information and transparency on green bonds. To this end, the European Commission has established a technical expert group on sustainable finance which will analyse stakeholders' views until June 2019. However, problems could arise from the composition of the group that is skewed towards the investor side and places little emphasis on the issuer side. The following sections will discuss potential difficulties in more detail.

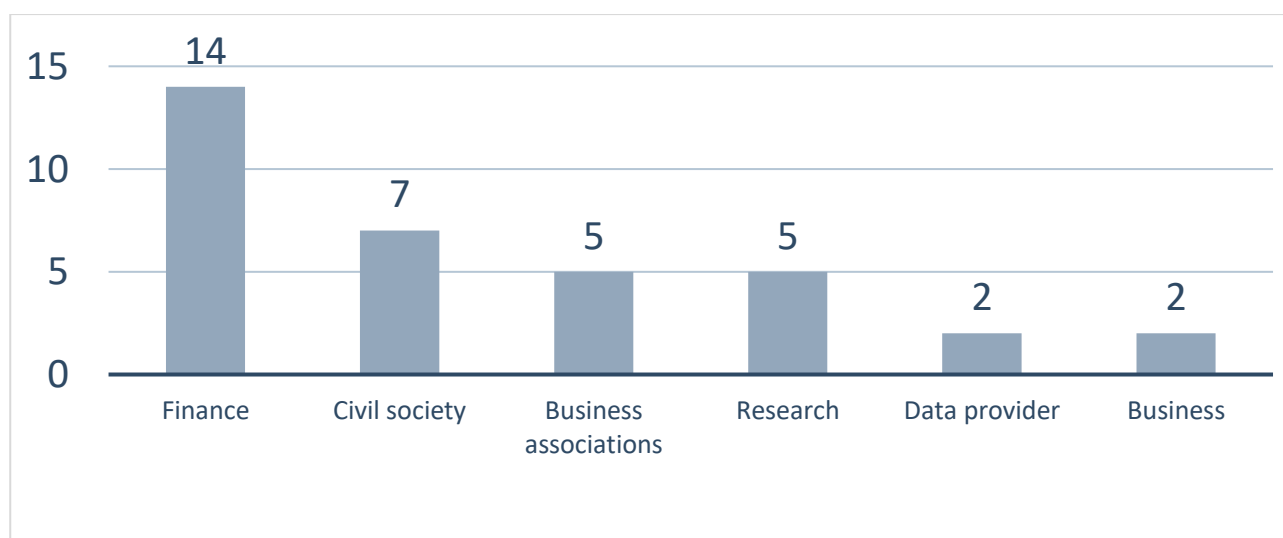
## 2 The Technical Expert Group's Composition

A technical expert group is currently developing a taxonomy for sustainable finance to determine whether an economic activity is environmentally sustainable. Moreover, it develops an EU Green Bond Standard, benchmarks for low-carbon investment strategies as well as guidance on corporate disclosure of climate-related information (COM, 2018d).

The expert group's focus is on the investors-side since 14 out of 35 members are from the financial industry (Figure 2-1). The issuer-side is heavily underrepresented with only two experts from the corporate sector and five experts from business associations. From the consultation plans can be inferred, that the group focusses more on consulting asset managers and less on issuers. Although the expert group is going to consult green bond issuers (COM 2018d), there is no hint that it does address non-green bond issuers, which could also contribute to reducing CO<sub>2</sub> emissions in the future. In addition to the risk that the expert group does not embrace non-green intermediate inputs to green final products, there is the risk that the expert group misses to include the contribution of the energy-intensive firms' investments into energy-saving and CO<sub>2</sub>-reducing technologies on greening the economy.

**Figure 2-1: Composition of the Technical Expert Group**

Number of experts



Source: European Commission (2018e)

### 3 The Role of Bonds for the German Non-Financial Sector

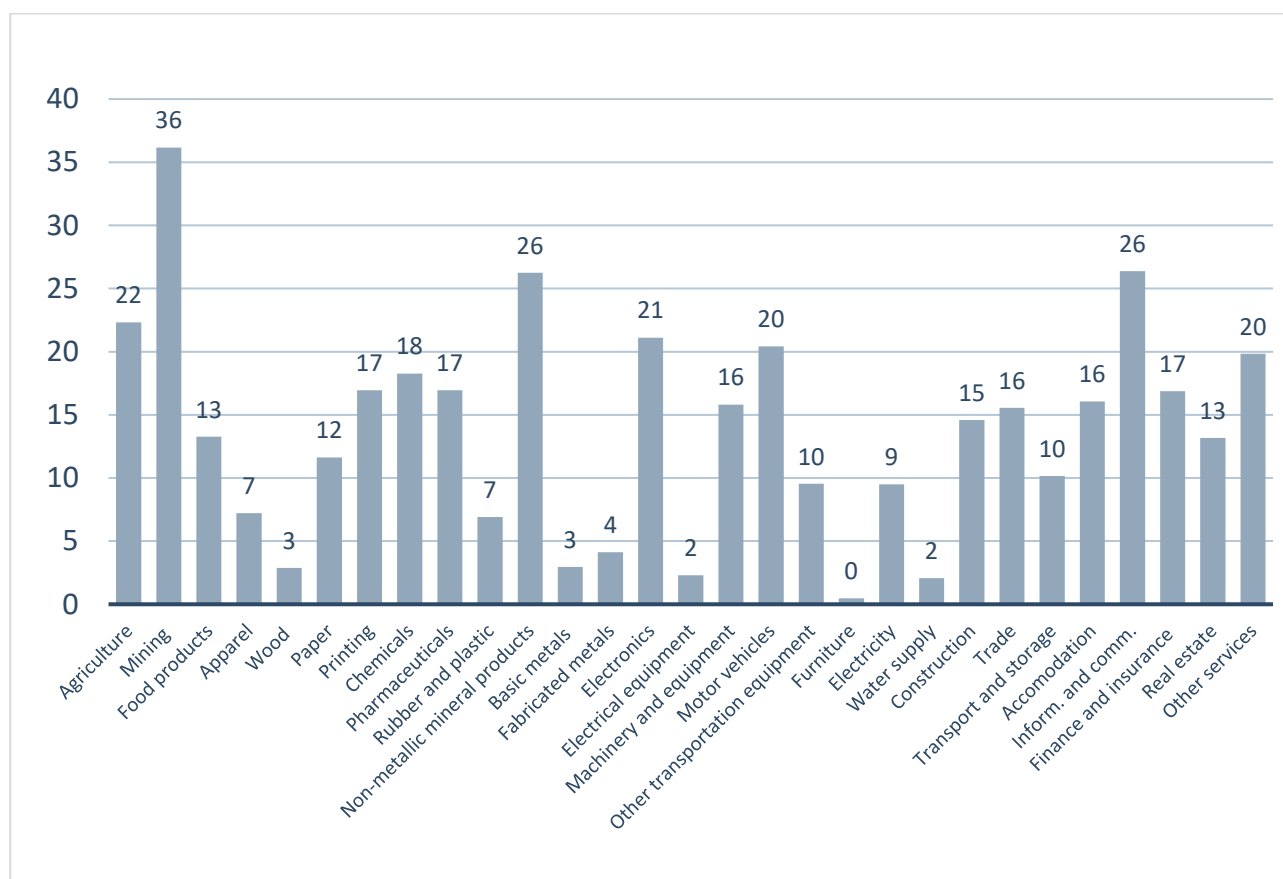
With the international community pushing sustainability, adequate ‘sustainable’ investments are needed to achieve the set goals. For example, to enable economic development in line with CO<sub>2</sub> reduction and climate resilience, investments in appropriate technologies and infrastructure are necessary. It involves a transformation of the conventional economy towards efficient, low-carbon products, technologies and services via technical and social innovations and investments. The process of greening, however, takes not only place in the environmental sectors, but extends to all other sectors of an economy (Demary / Neligan, 2018).

In Germany environmental protection investments in the producing sector (excluding construction) have been slowly increasing in absolute and relative terms since 2009 after a crisis-driven slump. In 2016, the German producing sector (excluding construction) invested around 10 percent of its total investments in environmental protection. However, the bulk of these investments (70 percent) were made in the supply and waste management industry alone. In the manufacturing sector environmental protection investments made up around 4 percent of total investments. These increasing investments also need to be financed by the firms (Federal Statistical Office, 2018a).

The Proposal on Sustainable Finance is highly relevant for the financing of businesses, although only a small fraction of companies issues bonds. From the financial accounts, which are part of a country’s national accounts, can be inferred that the volume of bonds issued by non-financial corporations in Germany corresponds to only 3 percent of the non-financial corporations’ total assets, while bank loans sum to 27 percent of the non-financial sector’s total assets. By interpreting this numbers, one must keep in mind that issuers are only a subset of the German companies, but which are mostly the largest ones, since small and medium-sized companies often do not issue bonds. The Dafne-Database of the data provider Bureau Van Dijk lists 861 non-financial business groups, which issue bonds in Germany, with 99 978 subsidiaries. These issuers are mostly the largest companies of the country and their total assets represent 63 percent of the total assets of the German non-financial business sector. By the exclusion of the non-issuing companies from the calculations, one gets information on the relevance of bonds for issuers (figure 3-1).

**Figure 3-1: The Relevance of Bonds for Issuers in Germany**

Volume of bonds in percent of total assets of issuing companies, 2016. Companies, which do not issue bonds, are not included in the calculations.



Source: Bureau Van Dijk (2018), own calculations

From the figure can be inferred, that bonds are a very important financial instrument for the issuers of the sectors mining, non-metallic mineral products, information and communication. While the volume of bonds sums to 36 percent of the mining sectors' issuers' total assets, it sums to 26 percent for both other two sectors. Bonds make up a large part of the balance sheets of issuers from electronics (21 percent), automotive (20 percent), chemicals (18 percent), pharmaceuticals (17 percent), printing (17 percent) as well as machinery and equipment (16 percent).

A larger emphasis on green bonds among investors would favour some industrial sectors but could lead to higher financing costs for other sectors, if investors prefer green bonds over conventional bonds. Given investors' preference for green bonds, the degree by which investors will favour bonds from a specific industrial sector will depend on the possibilities of the sectors' companies to issue green bonds. Thereby, the definition of a green financial product, i.e. the taxonomy, plays a crucial role for directing capital flows.

**Table 3-1: Turnover with Environmental Goods and Services in Germany**

Turnover in Billions of Euro, 2016

Sector (NACE Classification)	Turnover in Billions of Euro	
	Environmental goods / services	of which: for climate protection
Total	70,0	46,2
Machinery and equipment (28)	26,7	20,4
Electrical equipment (27)	4,8	4,6
Rubber and plastic products (22)	4,5	2,3
Motor vehicles and (semi-)trailers (29)	4,2	0,9
Repair/installation of machinery/equipment (33)	4,0	3,8
Fabricated metal products (25)	3,7	1,9
Architectural/engineering activities; technical testing/analysis (71)	3,5	1,8
Other non-metallic mineral products (23)	3,1	1,9
Specialised construction activities (43)	2,6	1,9
Civil engineering (42)	2,5	0,2
Chemicals/chemical products (20)	2,3	1,1
Computer, electronic, optical products (26)	2,2	1,4
Basic metals (24)	1,0	0,8
Construction of buildings (41)	1,0	0,6

Source: Federal Statistical Office, 2018b

In addition, the transformation to a ‘green economy’ encompasses the entire industrial value chain. Traditional industries are indispensable as ‘green’ products also require basic and energy-intensive industries as supporting pillars of industrial production. In 2016 more than 80 percent of the turnover generated with environmental goods and services originated from the manufacturing industry, with the machinery and equipment industry being responsible for almost half of this according to the annual survey undertaken by the Federal Statistical Office (table 3-1). Most important are climate protection goods and services making up two thirds of the turnover in the environmental goods and services sector. Almost 40 of the 46 billion Euro turnover with climate protection products are generated in the manufacturing sector – again the machinery and equipment sector being responsible for almost half of the turnover (Neligan / Oberländer, 2018). Bond finance is highly relevant for this sector, why it can be expected that the financing conditions will improve for this sector from a larger emphasis on green bonds if the technical

expert group includes this sector's contribution to environmental goods into the taxonomy. Another sector that highly depends on bond financing is the automotive industry, which mainly produces environmental goods to abate noise, control air pollution and then to protect the climate. In particular manufacturers of parts and accessories for motor vehicles generate the majority of this turnover of 4 billion Euro within the automotive industry.

Bond finance is also highly important for German producers of chemicals. This sector contributed 3 percent to the turnover of the total environmental goods and services sector in Germany. This sector's financing conditions will improve, for example, if the technical expert group includes this sector's contribution to batteries for electrical cars into their proposal, but it will worsen if the experts focus the electrical cars as final products and disregard their chemical inputs.

## 4 Problems Arising from Neglecting the Issuer Side

The current European Commission's legislative proposal on sustainable finance has one major shortcoming. It focusses heavily on the political goals and investors' demand for green bonds. Politicians aim at fulfilling the environmental and climate goals by incorporating the financial sector. However, the political goal of financing the needed investments of up to 7 trillion US-dollar annually seems to be very ambitious (Demary/Neligan, 2018). Nonetheless, investors seem to have a high demand for green financial products. They value the higher transparency standard of green bonds over conventional bonds. The label 'green' is essential to them for signalling their engagement in greening the economy. The financial stability risks of climate change are also a long-term incentive for investors for focussing on financing green investments. As a result, there might be a market-driven paradigm shift from conventional bonds towards green bonds, which will be fostered through the proposal on sustainable finance by a politically driven harmonisation of the existing market-driven standards.

From the examples above can be seen, that the development of a taxonomy for green bonds is far from trivial, and it seems to be insufficient to focus on the investor view only. In our view, problems can arise from neglecting the issuer view in two dimensions:

- First, by neglecting that a green product is the sum of many non-green intermediate products, the green bond framework will neglect intermediate goods producers as possible green bond issuers.
- Second, by disregarding that green bonds can be used to finance non-green investments, that could contribute to climate change mitigation by being energy saving or by being less pollutant compared to the situation before, the framework will exclude these issuers. This might be relevant for embracing energy-intensive producers to contribute to climate change mitigation.

Through the taxonomy, issuers are either allowed to issue green bonds or they are excluded from supplying green bonds. Capital misallocations could then arise, if issuers are excluded from

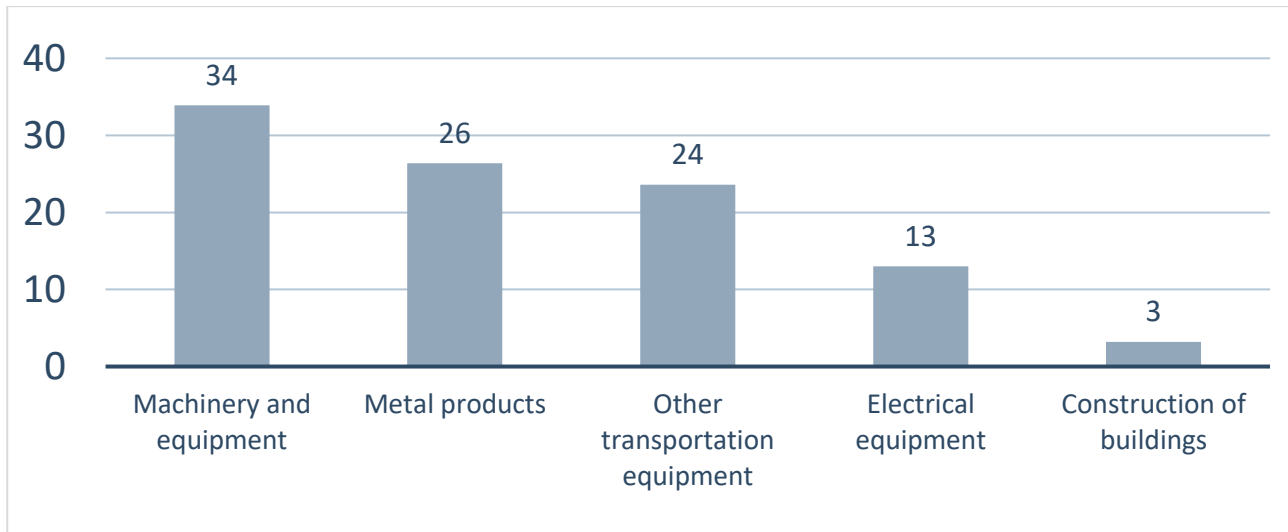
distributing green bonds, which could contribute to greening the economy in indirect ways by either producing intermediate goods as inputs for green final goods or which can invest a reduction of their CO<sub>2</sub>-emissions, which will be the focus of the next two subsections.

#### 4.1 Investments along the Green Value Chain Should Be Covered

A green final product is in many cases the sum of non-green intermediate goods. Primary industries and energy-intensive industries are important suppliers of components for producers of environmental goods. For example, an electric car can be classified as a green product to enable low emission mobility and its production could be financed via green bonds. Yet, its components do not automatically qualify as ‘green’ products such as the battery being its key enabling technology. For a lithium-ion battery cell it is common to use an electrochemical mix of cobalt, nickel and manganese oxides or iron phosphate together with the lithium as cathode. This is coupled with the anode, most commonly graphite (Romare/Dahlöf, 2017). For the suppliers of the relevant chemical products and materials it will be challenging to issue green bonds, if the taxonomy focusses too much on final products and neglects the contribution of intermediate products and raw materials to the final green products.

**Figure 4-1: Cost Components of a Wind Turbine**

In percent of the production costs



Source: Lehr/Flaute (2016), own calculations

The case is similar for the ‘green’ product wind energy (Figure 4-1). It consists of intermediate metal products such as the tower and bonnet, electrical equipment such as the generator and sensor technology or machinery such as transmissions, hubs and main shafts and last but not least rotor blades. Many of these components are being produced in the manufacturing industry. Around 34 percent of the production costs of a wind turbine are components made by the machinery and equipment industry, 26 percent are metal products, 24 percent are components manufactured by producers of other transport equipment, while 13 percent of its of its produc-

tion costs are related to electrical equipment. Furthermore, these sectors again obtain intermediate inputs from various other sectors. A similar calculation can be made for solar panels. Around 28 percent of its production costs are based on electrical equipment, additional 25 percent can be traced back to electrical components as well as to chemicals. Moreover, 10 percent of its production costs are based on intermediate goods from the metal industry, while only 4 percent are due to the construction work (Lehr/Flaute, 2016). Hence, looking at the intermediate inputs into this ‘green’ product shows how difficult it is to separate products into ‘green’ and ‘non-green’.

It would be misleading, if the current EU proposal focusses too much on the producers of final products as green bond issuers and misses to include the contribution of all relevant intermediate good producers to the green final products. In today’s complex value-added chains, there is a large fraction of value-added, which goes back to intermediate good producers. If we treat the intermediate goods producers like final goods producers, we would distort corporate finance with the proposal of a taxonomy for green bonds, because a green product is a combination of non-green intermediate goods. If we consider the intermediate goods producers contribution to the final green product, i.e. we regard the entire green value chain instead, we come to a different conclusion in treating them as the issuers of green bonds. For example, the Climate Bonds Taxonomy by the Climate Bonds Initiative already sees dedicated operational production, manufacturing or distribution facilities for key components, such as wind turbines, platforms etc. for wind energy as eligible assets. In certain cases the rules of the Climate Bond Initiative allows the producers of car batteries, for example, to issue green bonds (CBI, 2017a, CBI, 2017b). The challenge is now, to identify all relevant intermediate goods, which are relevant inputs for the greening of the economy.

Excluding the contribution of intermediate goods to final green goods could increase the production costs for green final goods, since higher financing costs for intermediate goods could be passed on to final green goods producers through higher input prices. This problem will get more severe under a classification that distinguished sharply between positive and negative economic activities.

## 4.2 Investments into CO<sub>2</sub>-Reduction Should Be Covered

Reducing overall CO<sub>2</sub> emission could also be achieved, when firms issue less CO<sub>2</sub> over time. To this end, they have to invest in new technologies. Although their investments are not CO<sub>2</sub> neutral, they could achieve less emissions. Excluding these firms’ investment decisions into CO<sub>2</sub> reduction from financing them by means of green bonds makes it harder for these companies to finance energy-saving investments in times in which investors are increasingly greening their balance sheets. It could even be counter-productive to exclude these firms from issuing green bonds, because investing into cost-saving technologies could become less profitable when financed by the issuance of conventional bonds rather than by green bonds. Under a taxonomy that differentiates sharply between positive and negative economic activities, it will become impossible for some economics sectors to finance investments for the reduction of their CO<sub>2</sub> emissions with green bonds.

One could argue here that the financing costs of green bonds and conventional bonds would be similar to the issuer. However, the Commission's proposal forces investors to integrate ESG risks and opportunities in their procedures. Moreover, the investors have to inform their customers about their compliance with the integration of ESG risks and opportunities. These regulations will thereby increase investors' demand for green bonds and decrease their demand for conventional bonds which determines the financing conditions of the issuers.

Excluding the issuers that invest in technologies, which improve their CO<sub>2</sub>-emissions significantly, would lead to a possible underinvestment if the financing costs for these issuers increase too much when investors focus more on investing in green bonds.

## 5 How to Overcome these Problems

There is the danger that the expert group underestimates the contribution on non-green intermediate goods to green products and the contribution of investments into the reduction of CO<sub>2</sub> emissions.

One option could be that the green bond proposal should focus more on the green value chain by allowing intermediate good producers to issue green bonds if they contribute to green final products. How could the green value chain approach be implemented? If the issuer of an intermediate product could prove that, for example, 20 percent of its sales contribute to a green final product, the issuer should be allowed to structure the issuance by issuing 20 percent of the issuance volume as green bonds and 80 percent of the issuance volume as conventional bonds.

The main problem is though that proving the contribution of an intermediate product to a green final product is harder to disclose to investors than disclosing the greenness of a final good. Demonstrating that 20 percent of the sales of the intermediate product to a green final product might be data-intensive because the issuer has to track the way of the intermediate products to the final good. The bureaucratic costs might be prohibitively high. A technical solution is needed to reduce potentially high bureaucratic costs. Otherwise, our idea of the green value chain would be irrelevant to intermediate goods producers. For signalling the investors their contribution to green products, a common data infrastructure for issuers and investors is needed through which they can track the intermediate goods way to the final green products. This could reduce bureaucratic costs. Maybe the blockchain technology could be useful here, because it can create trust in a decentralized anonymous network.

Taking into account of the green value chain is very complex. Nonetheless, besides a common green bond standard there is the need for a common infrastructure for disclosing information about the greenness of intermediate and final goods.

The same holds for business whose production does not necessarily fall in the definition of green products, but which could also contribute to reducing CO<sub>2</sub>-emissions by investing in emission-

reducing and energy-saving technologies. Energy-saving investments and investments that reduce CO<sub>2</sub>-emissions should therefore be allowed to at least in part be financed by green bonds. In addition, positive environmental aspects in subsequent states of the value chain in upstream activities should also be considered to strengthen the “enabler activities” of efficiency increases and savings in the further economic cycle.

An appropriate taxonomy should therefore include the issuers’ view. Important would be for this that intermediate goods producers and issuers from non-green industrial sectors which can invest in reducing CO<sub>2</sub>-emissions are closely involved in developing an appropriate taxonomy.

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