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Carbon taxation and market financial instruments for mobilizing climate finance

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Carbon taxation and market financial instruments for mobilizing climate finance

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Abstract. The aim of this paper is to conduct an evaluation of the financial instruments and their role in mobilizing climate finance, provide a set of recommendations aimed at easing the process of climate finance mobilization for both developed and developing countries (especially, for Ukraine). It is also important to show the shift from voluntary corporate social responsibility (CSR) to the new principles of investing (ESG) and business models in the climate change area and how it affects mobilization of climate finance. Another important goal of this paper is to show the importance of transaction costs, and ways how the accounting, reporting and evaluation of the results of emission reduction projects could reduce existing costs and improve access to the financial market, i.e. to the relatively “cheap” financial resources. We also highlights ways for establishing the necessary infrastructure on the financial market needed to minimize the transaction costs while getting financial resources for the purpose of greenhouse gases reduction (GHG reduction).

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The authors are responsible for the information in the chapters.
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<td>AAU</td>
<td>Assigned Amount Units</td>
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<td>BMUB</td>
<td>Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety</td>
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<td>CAA</td>
<td>Clean Air Act</td>
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<td>CDP</td>
<td>Climate Disclosure Protocol</td>
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<td>CER</td>
<td>Certified Emission Reductions</td>
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<td>COP</td>
<td>Conference of the parties</td>
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<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<td>CSV</td>
<td>Creating Shared Value</td>
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<td>DFI</td>
<td>Development Financial Institution</td>
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<td>EEX</td>
<td>European Energy Exchange</td>
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<td>EIB</td>
<td>European Investment Bank</td>
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<td>ERU</td>
<td>Emission Reduction Units</td>
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<td>ESG</td>
<td>Environmental, Social and Governance</td>
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<td>EU ETS</td>
<td>European Union Emission Trading System</td>
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<td>EUA</td>
<td>European Emission Allowances</td>
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<td>EUAA</td>
<td>European Union Aviation Allowances</td>
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<td>GFC</td>
<td>Green Climate Fund</td>
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<td>GHG</td>
<td>greenhouse gas</td>
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<td>GO</td>
<td>Guaranty of Origin</td>
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<td>GRI</td>
<td>Global Reporting Initiative</td>
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<td>IAS</td>
<td>International Accounting Standards</td>
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<td>ICI</td>
<td>International Climate Initiative</td>
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<td>INDC</td>
<td>Intended Nationally Determined Contribution</td>
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<td>KPI</td>
<td>Key Performance Indicator</td>
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<td>LRC</td>
<td>Carbon, climate resilient economy</td>
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<td>MiFID II</td>
<td>Markets in Financial Instruments Directive</td>
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<td>MRV</td>
<td>Monitoring, reporting, verification</td>
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<td>NCI</td>
<td>National Climate Initiative</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<td>PRI</td>
<td>Principles for Responsible Investment</td>
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<td>R&amp;D</td>
<td>Research and development</td>
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<td>RDS</td>
<td>Royal Dutch Shell</td>
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<tr>
<td>REC</td>
<td>Renewable Energy Certificate</td>
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<td>SASB</td>
<td>Sustainability Accounting Standards Board</td>
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<td>SSE</td>
<td>Sustainable Stock Exchange Initiative</td>
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<td>UNCTAD</td>
<td>UN Conference on Trade and Development</td>
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<tr>
<td>UNEP FI</td>
<td>UN Environment Program Finance Initiative</td>
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<td>WFE</td>
<td>World Federation of Exchanges</td>
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INTRODUCTION

Our common goals to combat climate change, limit the global warming to substantially below by 2 degrees of Celsius and protect the environment is economically justified (see e.g. Burke, Hsiang, and Miguel, 2015) but at the same time require trillions of USDs of low carbon investments in the near future. This means that we have to engage businesses, municipalities, governments, NGO’s and even ordinary citizens to make it possible. It is obvious that only government revenues will not be sufficient to conduct all the projects in order to catch the opportunity and to limit global warming. Nevertheless, the role of the government is crucial in providing public goods – finance R&D, support capacity building, shape the framework and set up the rules, needed to ensure competition on the market. This leads to the need to examine and build up (if it is necessary) a mix of fiscal and market financial instruments to get climate finance\(^1\) mobilized to combat climate change.

There is a classical way to raise the revenues and combat these risks – to impose a carbon tax or use other forms of environmental taxation. Emission trading markets can also offer effective instruments for mobilizing the climate finance and combating the climate change. In both cases we will face some transaction costs associated with monitoring, reporting and verification of the emissions as a tax base or the results of emission reduction projects as base of crediting and creating tradeable emission allowances.

Involving companies and financial institutions into the process is crucial to ensure sustainable development of the world economy and improve the quality of environment. To make it possible it is necessary to introduce a new type of economic relations, implementing new business models and approaches to environmental management, for example the creation of the emission trading schemes or carbon taxes with the appropriate infrastructures. Only in case when the companies and financial institutions will consider climate change as a risk for business and opportunity to increase their value after reducing GHG emissions we could shift from corporate responsibility to corporate sustainability – to a completely new way of doing business and investing according to ESG Principles (Environmental, Social, and Governance).

This research will help Ukraine to learn international experience in implementing different financial instruments – prepare Ukrainian policy makers and companies for the new challenges and show them how to get an access to climate finance in both macro and microeconomic levels.

Results of this paper will be presented and discussed at the Second International Summer School “Economic aspects of climate change”, involving professors, students and experts from Germany and Ukraine (Kiev, August 2016).

\(^1\) Climate finance – economic relations connected with distribution and redistribution of limited financial resources with the aim of combating climate change.
1. THE PARIS UN CLIMATE CONFERENCE (COP 21): A LONG WAY TO POLITICAL CONSENSUS AND PRIVATE CAPACITY BUILDING

In New York, on April 22, 2016 an extraordinary event took place the importance of which, in terms of combating the climate change and further development of the global finance, was crucial. Representatives from 175 countries, including Ukraine, participated in the signing ceremony of the Paris Agreement which after 2020 will replace the Kyoto Protocol and create new long-term conditions to limit global warming by attracting and involving resources of the international financial community in a joint state and non-state actor approach to accelerate climate action (see Figure 1).

**Figure 1: A long way from the Kyoto Protocol to the Paris Agreement**

Consequently the Paris Agreement provoked a great interest by the representatives from banks, stock exchanges and investment funds. In particular, the Bank of America Merrill Lynch estimated that by 2040 worldwide we should spend at least USD 75 trillion
to stop the climate change (for instance, this amount is comparable to today’s volumes of the global GDP in nominal terms).

Why actually did the problem of climate change earned so much interest by the key players on the financial market only in 2014, while the first steps to improve the quality of environment were already made in the early 60s of the last century (such as the Clean Air Act, CAA in the US) and the need to reduce GHG emissions was included in the Agenda for the XXI century at UN Conference on Environment and Development, Rio de Janeiro, Brazil, in 1992? Manly because the capacity to respond for both, state and non-state actors had to be developed in a decadal effort. The only fact of signing the Kyoto Protocol in 1997 provided a first impulse for the significant capacity building efforts. In particular, in 1997, the first reporting initiatives GRI was created (Global Reporting Initiative), which aims to help companies, government agencies and other organizations to establish communication regarding business participation in addressing such important issues as climate change, human rights, corruption, etc. (according to the ESG Principles). It was, actually, the first step towards reforming the system of corporate reporting.

All of these strategies share one goal – disclosure, which shows the state of the company and how much they are successful in reducing environmental, social and governance risks.

After the entry into force of the Kyoto Protocol it became clear that countries should use not only public funds but also attract resources from the financial market in order to meet their obligations (especially, developing countries). That is why the World Bank, as a special institution in the United Nations system, along with several other international financial institutions, started developing new financial instruments aimed at attracting investors and creditors and to provide finance to the emission reduction projects.

The Kyoto Protocol came into force (after fierce resistance by Russia in particular) in 2005. In response, the Principles for Responsible Investment were introduced at the New York Stock Exchange in 2006. In 2007 the European Investment Bank (EIB) issued the first "green bond" (fixed-income debt securities issued by governments, banks, MDBs, corporations and projects in order to raise the necessary capital for an asset which contributes to a low carbon, climate resilient (LCR) economy)², the proceeds went to the projects in the area of renewable energy and energy efficiency³. However, the lack of guarantees that the global carbon market will be established made it impossible to develop new financial instruments and attract resources on the financial market. Despite all these obstacles in 2009 a new strong initiative was created – the Climate Bonds Initiative, whose members in 2016 were already representing the assets for 32 trillion USD. The primary objective of this initiative is to track the market of "green bonds" and the trigger of accumulation of over 100 trillion USD for the projects aimed at combating the climate change.

Also in this year during the COP 15 in Copenhagen the idea of the “Copenhagen Green Climate Fund” was firstly introduced. This decision of the Copenhagen Accord led to the establishment of the “Green Climate Fund” (GCF) at the UN Climate Change Conference in Cancun (2010). The main purpose of this Fund is to collect each year 100 billion USD and to invest these resources in emission reduction projects. All the

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necessary governing bodies were created at the COP 17 in Durban, South Africa in 2011.

In a paralleling effort of private business capacity building – the CDP (Carbon Disclosure Protocol) initiative was launched in 2010, which aim is not only to display an information regarding the company's engagement in solving environmental problems but also to help 822 institutional investors, who have almost 95 trillion USD assets under management, to disclose the risks hidden in their investment portfolios. An important advantage of this initiative is the fact that it works not only together with representatives of the corporate sector but is also engaged in projects at the municipal level and the level of central government.

In the same year, at the initiative of UNCTAD (UN Conference on Trade and Development), the UN Global Compact, UNEP FI (UN Environment Program Finance Initiative) and PRI (Principles of Responsible Investment) Sustainable Stock Exchange Initiative (SSE Initiative) were established. The aim of these initiatives is to create a platform that would help clarify how the stock exchanges, investors, regulators and companies can improve the transparency and performance of the corporate sector. First of all, it's about compliance with the ESG Principles (Environmental, Social and Governance).

The importance of all these capacity building initiatives within the private sector of finance cannot be overstated, since the first initiative (UNEP FI) contributed to the development of the new financial market instruments, which helped to accumulate funds for the purpose of combating the climate change. The second initiative (SSE) forced absolutely all the key players on the financial market to restructure their business activities, take into account environmental and social risks – reflect them in their reports in order to get better rating and access organized markets (stock exchanges).

Even more significant changes took place after the milestone meeting of signatories to the Kyoto Protocol under the COP 19 (November 2013, Warsaw, Poland), where the member countries of the UN agreed to start work and intensify cooperation between the state and non-state actors in order to prepare the so-called Intended Nationally Determined Contribution (INDC) (see the Paris Agreement, Article 4). All this was supposed to be made before the Conference in the city of Paris (COP 21) in 2015. Another important decision made by the UN member-states was to create the Warsaw International Mechanism for Loss and Damage, aimed not only at knowledge enhancement but also at facilitation of support in the financial sphere.

This signal served as a powerful impulse for the development of the "green bonds" because immediately after the conference in the city of Warsaw there were numerous issuances of the corporate "green bonds" – in fact, the first corporate bonds of this kind. In particular, the issuers were EDF (1.5 billion EUR, energy sector), Bank of America (500 million USD, banking) and Vasakronan (1.3 billion SEK, real estate), which gave a powerful boost for the market development. In general, we can say that starting from this point of time the growth rate of the market has skyrocketed – in 2013-2015 the market grew by almost 500% (see Figure 2).

An interesting point in the Paris Agreement is that the countries agreed to create conditions for sharing the results of emission reduction projects at the international level (Article 6 of the Paris Agreement). In fact, it is all about a global market, which together with commitments to cut emissions creates the necessary conditions for the big capital to step in. Not only emission allowances will be of particular interest for the bankers, but also the opportunity to lend and invest in the related emission reduction projects.
In order to support projects aimed at the reduction of the GHG the Paris Agreement foresees a mechanism to contribute to the mitigation of GHG and to support the sustainable development. The activities of the mechanism will be supervised by a body designed by the Conference of the Parties and focused on the promotion and participation of private companies in the emission reduction projects worldwide (Article 6).

**Figure 2: Green bond issuance, 2007-2015, billion USD.**

![Green bond issuance, 2007-2015, billion USD.](source)

Source: The Climate Bond Initiative. Available at: https://www.climatebonds.net/market/history

The Signatory Parties of the Paris Agreement unanimously agreed to use all the available financial instruments, first of all, public funds (Article 9) to support the set up of capacity for emission reductions but equally for monitoring, reporting and verification, which is quintessential for take into account the environmental and social risks of private investments. Despite the fact that the Paris Agreement foresees the functioning of the Green Climate Fund (GCF) and other financial mechanisms, these funds obviously are unable to provide the necessary amount of financial resources needed to combat climate change. The greatest hope of developing countries lies in the access to resources of the Green Climate Fund, which is going to provide approximately 100 billion USD for the emission reduction projects. However, even this amount is not yet collected and the capacity of the Songdo head quarter of GCF not fully established – in February 2016 the amount of resources collected was only 10.2 billion USD. At the same time, financing the projects by the GCF foresees the involvement of private funds and the "green bonds" are playing an important role as well. In particular, GCF approved a funding program for the region of Latin America and the Caribbean using

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the "green, energy efficient bonds" in the amount of 217 million USD\textsuperscript{5}. But in fact, this mechanism could be a very important tool for minimizing the risks while investing in the projects in countries with a high level of political risks.

The Paris Conference COP 21 lasted almost two weeks, during which numerous meetings took place and almost nobody noticed a gathering of representatives of the financial market on December 7 as a part of the COP 21 program. This event brought together representatives of the world's biggest stock exchanges (Euronext, Nasdaq, Luxembourg Stock Exchange), companies dealing with collection and processing of the business information, evaluation of the performance of corporations and financial institutions.

Eloquent words belong to the Head of the Bank of England – Macro Carney (the head of Financial Stability Board, created by the G20 with the aim to promote international financial stability), which are included into the final statements of the above mentioned meeting: "carbon budget – like the one produced by the IPCC – is hugely valuable, but can only really be brought to life by disclosure, giving policymakers the context they need to make choices, and firms and investors the ability to anticipate and respond to those choices"\textsuperscript{6}.

Therefore, two of the most important achievements of the Paris Conference are the plans prepared by the representatives from 175 countries to reduce GHG emissions, and their ratting over the next decades and the mechanism to transfer mitigation outcomes globally, the so-called ITMOs, to achieve nationally determined contributions under the Agreement. In fact, ITMOs will be the global carbon market unit of the future market where companies and financial institutions will be able to forecast supply and demand, conduct their projects and attract necessary financial resources for the projects. In fact, the institutional foundations in the financial market have been already created and financial institutions expect only the launch of the global carbon market.

In Ukraine the preparation work is still on the way and the main efforts are concentrated on the implementation of Directive 2003/87/EC – establishment of the national carbon market (Emission Trading System, ETS). But it is already clear that it is unrealistic to fit into the existing timetable (according to the Association Agreement with the EU market should be launched in 2017). This is due to the fact that the system should be launched after six months of the already functioning pilot projects needed to verify the system and identify "bottlenecks". But the bill is not yet introduced to the Ukrainian Parliament.

Even much more to do remains in the creation of the new financial market infrastructure needed for the use of derivatives – one of the instruments which have been used to trade emission allowances. Moreover, companies will have to use the mechanism of MRV (monitoring, reporting, verification), required for the reporting to the authorities. It is also important to show to the companies that along with the costs required for the use of this mechanism, received results/information can be used to report on the corporate sustainability – bring many benefits for them.

In particular, such information can be used to prepare reports according to the ESG Principles and provide an access for the companies, cities and regions to relatively cheap financial resources for the "green" projects.

\begin{footnotesize}
\textsuperscript{5}Green Climate Funds approves first 8 investments. Green Climate Fund. Available at: http://www.greenclimate.fund/-/green-climate-fund-approves-first-8-investments-1

\end{footnotesize}
In fact, public and private agents all around the worlds are using different instruments to accumulate financial resources for emission reduction projects – climate finance. And the main discussion is about to find the best way how to connect the interests of the companies and financial institutions. In light of this process, it’s important to conduct the capacity building projects for creating in society the necessary conditions while creating an effective mechanism for combating the climate change.
2. CARBON TAXATION AS ONE OF THE FISCAL INSTRUMENTS TO ACCUMULATE CLIMATE FINANCE

Nowadays, economic agents can use different financial instruments to collect financial resources and conduct emission reduction projects. According to the estimations of the Climate Policy Initiative, in 2014 more than 390 billion USD of climate finance were collected and spent by worldwide (see Figure 3).

Figure 3: Global landscape of climate finance in 2011-2014, billion USD.

Source: built by the authors, data from The Climate Policy Initiative.

We can distinguish two major groups of such resources and instruments:

- public resources based on fiscal instruments (taxation, auctioning of emission allowances, grants etc.);
- private money from market financial instruments (loans, bonds, emission allowances etc.).

Carbon taxation and various fees are the examples of fiscal instruments from public area, market financial instruments encompass instruments, which provide investment (for example, CER or ERU) and credit opportunities (loans and debt securities) not only for private but also for public sector.

Governments, government agencies, development financial institutions (national, bilateral, multinational), climate funds can use various sources to accumulate the necessary financial resources. Classical source is national taxation, which is limited to the facilities of a specific country. The main question that arises in the area of carbon pricing is “how to put the price on carbon – by using the carbon tax or by introducing the ETS (Emission Trading Scheme)?"
According to the World Bank, 39 countries and 23 supranational jurisdictions are already using a variety of tools for setting the price on carbon (greenhouse gas emissions). Direct taxes on greenhouse gas emissions can be found in 15 countries. In fact, among the existing financial instruments carbon tax (a tax on greenhouse gas emissions) can be considered as one of the most effective, despite the fact that the maximum emission reduction level cannot be guaranteed. In addition, companies consider the taxes only as the costs that do not give any positive consequences for them.

There are series of papers and reports dedicated to this issue where positive and negative features of both instruments can be found. Finally, we can sum up the positive features of the carbon tax cited in some of them:

- gives an opportunity to compensate the negative impact of the given company (installation) on the environment\(^7\);
- provides certainty in marginal costs faced by emitters of the GHG\(^8\);
- insures the best cost-effective emission reduction\(^9\)\(^10\);
- provides incentives for R&D in pollution abatement and energy efficient technologies\(^11\).

The main negative feature of the carbon taxes is obviously associated with the **loss of international competitiveness**\(^12\), because if the tax would be introduced the domestic companies will face additional costs. All this could make their products and services less attractive (price increase and *inflation* as a consequence) and cause a decline in revenues and profits. Moreover, many scientists argue that the implementation of carbon taxes leads to negative effects not only on productivity and economic growth, but also on equity and income distribution.

Another important negative feature of the carbon taxation is that a **possible high level of corruption** cannot guarantee that the revenues will be spent on the emission reduction projects and gain an appropriate amount of certified reductions\(^13\). It is important to consider the level of corruption in the country and the likelihood of intended use of funds accumulated via carbon tax. Otherwise, it will create only additional costs of emission reduction projects.

Another problem regarding taxation of greenhouse gas emissions (direct and indirect) is their **relatively low share of the revenues from carbon taxation**, both in nominal value and as a share of the total tax revenues and GDP (see Figure 4).

Because the amounts of accumulated resources are small, this tool has a limited impact and opportunities of funding the projects in the area of GHG reduction (financing needs of some countries amount to hundreds of billions of dollars). Moreover, in most cases the carbon tax was introduced as the tax applied to the purchase or use of fuels with the


main aim to cover sectors and installations exempted from the EU ETS (European Union Emission Trading System).

**Figure 4: Energy taxes (including CO2 taxes) as a share of the GDP, %.

![Energy taxes chart](image)


It is also important to underline that in some countries the introduction of the carbon tax has been postponed to 2017. So, the overall amount of the energy tax revenues, collected in 15 above-mentioned countries, was about 113 billion EUR in 2014 (calculated by the authors). But in fact, only 10 billion USD was raised through carbon taxes. Actually, it is almost equal to the amount of expenditures dedicated to the projects in the area of emission reduction and prevention of climate change in the same year. So, according to the report published by Climate Policy Initiative in 2014 roughly 148 billion USD was spent by the public sector for the purpose of combating the climate change (see Figure 3).

Additional financial sources could be acquired through the **auctioning of the emission allowances** (for instance, in accordance with Directive 2009/29/EC (Article 10), member states of the EU ETS can sell via auction some defined amount of EUA –

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European Emission Allowances). Around 88% of these receives should be used for the purpose of emission reduction projects directly or by establishing special programs/agencies. For instance, on the EEX (European Energy Exchange) by the end of 2015 roughly 1 billion EUR have been accumulated by Germany as a result of auctioning of EUA and EUAA (European Union Aviation Allowances). These financial resources were the main source for the various programs, established by the German government – ICI (International Climate Initiative), NCI (National Climate Initiative). About USD 5 billion were accumulated through ETS sales worldwide.

Traditionally, there are also opportunities to receive loans from other countries, private or international financial institutions (for instance, cities and municipalities can issue the so-called green bonds in order to finance emission reduction or energy efficiency projects), green investments as a part of internationally agreed and approved economic mechanisms. So, according to the Kyoto Protocol countries could buy or sell AAU (Assigned Amount Units).

**Figure 5: Total public finance by actor in 2012-2014, billion USD.**


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Another possible instrument, which allows the government to receive financial resources for the purpose of emission reduction, is to get grants (14 billion USD in 2014 worldwide). This way the government can not only receive money but also get the experience, which can be helpful for conducting the projects in the area of emission reductions. For instance, Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supports experience and knowledge exchange between Chinese, European and German experts related to emission trading, helps in establishing the pilot projects in China\(^\text{21}\).

The structure of public expenditure in the area of climate change shows us that only 15 billion USD from overall 148 billion USD was spent by the governments and government agencies in 2014. The leading role in this case belongs to the national and multilateral DFIs (Development Financial Institutions) such as European Bank for Reconstruction and Development, European Investment Bank, etc. (see Figure 5).

DFI’s are the most important providers of public climate finance with 131 billion USD in 2014. Among the DFI’s the role of National Financial Institutions is crucial, because they represent almost 50% of the total DFI’s commitments.

As we know, total financial resources, provided by public and private institutions for the emission reduction projects in 2014, was about 390 billion USD. The private sector was responsible for the biggest part of such expenditures – 243 billion USD in 2014.

But in fact, the amount of financial resources needed to limit global warming to 2 degrees of Celsius is much more bigger. So, according to the report published by the World Economic Forum in 2013, up to 114 trillion USD will be needed to invest till 2030 in order to limit the speed of global warming within 2 degrees Celsius. It means that in next years, starting from 2017, we should spend around 8 trillion USD each year. It is obvious that the capacities of the public sector are limited (more than 10% of the world’s GDP should be redistributed each year through the central and local budgets) and we cannot introduce new carbon taxes or increase the tax rate of the existing environmental taxes all over the world (some countries are poor and moreover are trying to reduce the existing tax burden).

3. MARKET FINANCIAL INSTRUMENTS FOR THE GHG REDUCTION

As we have already mentioned above, carbon tax is not a tool that can allow us to accumulate the necessary amount of financial resources for emission reduction projects. And even in those countries where they are used together with a system of trading greenhouse gas emissions (ETS - Emission Trading System), are related emitters of greenhouse gases, which are not included in the ETS. Therefore, to ensure the achievement of the objectives in the fight against global warming and climate change, it is necessary to attract additional resources through financial market.

On the financial market the following methods are being used to mobilize climate finance:

- balance-sheet financing (projects are financed internally), 173 billion USD – private climate finance, 3 billion USD – public climate finance in 2014;
- low-cost debt (low-cost loans, which are provided by the public actors) – almost 46% of the public finance;
- project level market rate debt;
- project level equity.

The main source of private climate finance stays the same in recent years and accounts for about 70% of the total private climate finance (see Figure 6). The main reasons why the companies are investing internally are associated with problems in securing debt or high costs of capital.

Figure 6: The role of market mechanisms in mobilizing climate finance by public and private agents in 2014, billion USD.

Private finance is being mobilized through **equity, debt securities, and derivatives**. As we have already mentioned in the first chapter, the entry into force of the Kyoto Protocol and especially the preparation of the INDs after COP 19 (Warsaw, Poland) in 2013 were not only important impulses for the development of new instruments and mechanisms to attract private climate finance, but also gave investors a signal to invest more actively in projects and assets which can prevent the global warming.

So, after the balance sheet financing project level equity is the second significant mechanism for the climate finance mobilization. In this case equity securities are important instrument to facilitate the flow of financial resources between investors and companies. For example, financial resources for one of the biggest projects (400 MW offshore wind farm Merkur located off the coast of Germany) in 2016 have been accumulated through equity (500 million EUR) and debt securities (1.2 billion EUR)\(^22\).

If the investment market experienced a rapid recovery after the above-mentioned events, the market of debt financing was a subject for significant transformation processes. At the centre of such transformations are the so-called climate-aligned bonds in general and green bonds in particular. Those instruments are important to attract climate finance to the GHG reduction projects (see Figure 7).

**Figure 7: Climate-aligned bonds universe in 2014, billion USD.**

![Figure 7: Climate-aligned bonds universe in 2014, billion USD.](source)

As noted above, the use of market financial instruments is accompanied by the transaction costs – that is the reason why in recent years there was a gradual increase in volumes and share of certified green bonds (in 2015 the volume of the issue green bonds reached 41.8 billion USD). Meanwhile, there was a gradual reduction of the so-called "grey" uncertified climate-aligned bonds (see Figure 8).

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One of the important roles in the structure of issued green bonds along with corporate green bonds has been played by municipal green bonds (muni green bonds). Accumulated via municipal green bond, financial resources could be used to finance projects aimed at the development of renewable energy, energy efficiency improvement, water and waste, "clean transport" at the local level.

Table 1: Types of the green bonds.

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<th>Type</th>
<th>Characteristic</th>
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<tr>
<td>Green Use of Proceeds Bond</td>
<td>standard recourse-to-the-issuer debt obligation for which the proceeds shall be credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer and attested to by a formal internal process that will be linked to the issuer's lending and investment operations for eligible projects.</td>
</tr>
<tr>
<td>Green Use of Proceeds Revenue Bond</td>
<td>non-recourse-to-the-issuer debt obligation in which the credit exposure in the bond is to the pledged cash flows of the revenue streams, fees, taxes etc., and the use of proceeds of the bond goes to related or unrelated Green Project(s).</td>
</tr>
<tr>
<td>Green Project Bond</td>
<td>project bond for a single or multiple Green Project(s) for which the investor has direct exposure to the risk of the project(s) with or without potential recourse to the issuer.</td>
</tr>
<tr>
<td>Green Securitized Bond</td>
<td>bond collateralized by one or more specific projects, including but not limited to covered bonds, ABS, and other structures.</td>
</tr>
</tbody>
</table>

The main advantage of this instrument is the fact that the risk is much lower than in case of conventional municipal bonds. This is due to the fact that there is a collateral in form of possible saved resources, which could occur as a result of the improved energy efficiency, future payments for the use of renewable energy generation or certified GHG reductions (see Table 1). That is why their ratings are usually close to the rating "A", and the cost of such resources are lower than usually (see Figure 9).

Figure 9: Annual issuance of the Muni green bonds, billion USD.

Issuers of the muni "green bond" are not only the cities but also the entire regions. In particular, among the largest issuers of such bonds may be mentioned region Ile-de-France (1.8 billion USD), Johannesburg (0.1 billion USD), City of Stockholm (0.4 billion USD) and others.

In fact, investors can get additional benefits (receive additional financial resource) using certified results of their green investments. For this purpose on the financial market they can use another type of financial instruments – derivatives. Derivatives were at the forefront of the climate finance, because they are responsible for the operations with emission allowances. In fact, the waste majority of transactions are in the form of derivatives: futures, forward, options.23

The total value of the global carbon market in 2014 reached 45 billion USD.24 On different levels 17 subnational, national or regional emission trading schemes (ETS) were responsible for around 7.7 billion metric tons of trading volumes.25 Nowadays, we


can witness a sharp decline in prices and trading volumes as a result of the oversupply on the markets. Consequently, low prices are responsible for insufficient amount of climate finance, which can be accumulated by selling emission allowances in different mandatory and voluntary markets.

Voluntary carbon markets grew by 87 MtCO2 in 2014 comparing to the previous year. This represents 395 million USD of purchased carbon offsets. The analysts of the World Bank are saying that a diminishing number of new corporate offsetting programs were responsible for that.26

The biggest mandatory market EU ETS delivered the vast majority of the trading volumes in 2014. The trading volumes of the European Emission Allowances (EUA), European Aviation Allowances (EUAA) on the primary market were around 400 million ton, while the average price was about 5 Euro per tone.27 This allowed to mobilize roughly 2 billion EUR for the purpose of GHG reduction.

So, according to the Kyoto Protocol, companies can conduct two types of green projects – CDM (Clean Development Mechanisms) and JI (Joint Implementation), with the aim to receive Emission Reduction Units (ERU) and Certified Emission Reductions (CER). But, unfortunately, these instruments are not playing such an important role in attracting financial resources for the emission reduction projects. So, according to the data, published by the World Bank, the amount CER traded in the primary market in 2014 was 60 million CERs and the average price – 0.17 Euro (about 104 MtCO2 of CERs were issued). The amount of primary ERU contracts traded in the same year was only 17.8 MtCO2 (0.03 EUR per one tonne).28 This means, that these two instruments allowed us to mobilize almost 11 million EUR in 2014 (10.2 million EUR and 0.5 million EUR respectively).

Except emission allowances, there are also an opportunity to use Guarantees of Origin (GOs) to attract climate finance in renewable energy production and reduce GHG emissions. According to the data provided by Association of Issuing Bodies (AIB), trading volumes in European Energy Certificate System (EECS), around 300 TWh in GO were traded in 2014 with average price about 0.27 EUR for MWh.29 The prices for Renewable Energy Certificates (RECs) on the territory of USA (voluntary market) are almost equal to those mentioned above in the EU – roughly 1 USD for MWh. On the compliance market the price range for RECs varies from 1 USD to 60 USD for MWh.

But the main question stays the same: why the companies and financial institutions are so interested in spending their limited financial resources for the purpose of renewable energy generation, energy efficiency improvement or reduction of the GHG? In other words, why it has became so attractive to shift from the voluntary corporate social responsibility to the completely new way of dealing with environmental problems?

27EU must scrap carbon compensation scheme. EUobserver. Available at: https://euobserver.com/opinion/133058
29EEX Final Settlement Prices for Futures on Guarantees of Origin, December 2014. Available at: https://www.eex.com/blob/3040/12c8b73f25a64cae1efac0f66e987fd0/ci-20141204-customer-information-fsp-goo-dec14-pdf-data.pdf
4. FROM CSR TO ESG AS A WAY FROM CORPORATE RESPONSIBILITY TO CORPORATE SUSTAINABILITY

The answer the question mentioned in the previous paragraph we can find in the changing philosophy of doing business and making investment decisions.

The way of doing business is changing – new business models are coming, where the main goal is not only to make a profit, but also create the so-called “blended value”. In other words, companies want to meet financial, social, and environmental goals. The investors are tending to create and evaluate financial returns, social value creation and related returns\(^\text{30}\).

The notion of what we know today as the CSR was introduced in 1953 by H. Bowen in his book "Social responsibility businessman" and is about the "the obligation of businessman to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society"\(^\text{31}\). For the first time the idea of corporate social responsibility appeared in the paper of John Perkins "The Modern Corporation" (1908), where the author states that "the larger the corporation becomes, the greater become its responsibilities to the community"\(^\text{32}\). But the extent of such responsibility, unfortunately, is determined by businesses and results of related measures do not provide increase of the value of assets.

In the 50-s of the XX century international organizations, civil activists, NGO’s started to search for the ways how to stimulate employers to act more actively in creating more favorable work conditions, paying equally for work and freely joining the so-called trade unions.

But only in 80-s the concept of CSR (corporate social responsibility) began to gain awareness among all the key economic agents. The companies spent money on the charity and were rewarded for it only with improved image of the company in society. At the same time all those actions were separated from business and could not give any quantitative improvements for financial statements (or at least the interconnection was unclear and hard to evaluate).

However, in 2011, considering numerous disadvantages of this concept, M. Porter and M. Kramer offered its new version, called Creating Shared Value (CSV – creating shared value)\(^\text{33}\). According to the authors, this concept allows to move from the commitments to the process of creating a common (shared) value as a result of related activities. However, this concept left many questions, since neither the company nor the potential lenders or investors cannot "feel" such value on their balance sheet.

Nevertheless, the main problem still (continued its existence) existed – all the results of societal and environmental projects did not play significant role in terms of evaluating financial results of the company and “selling” it on financial market. In fact, financial institutions were unmotivated to finance charitable projects in large scale just in order to improve their image.

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That is why the biggest disadvantage of this concept is that responsibility assigned to the company is "voluntary" and it is completely a matter of ethics, decided by the management of the company, limited by the own financial facilities (except those cases when the company caused a damage to other businesses, citizens or government).

To compare these two concepts, we can use the figure prepared by I. Lapina, I. Borkus and O. Starineca in 2012 (see Figure 10).

**Figure 10: CSR transition to CSV.**

In fact, we can find a wide range of shortages in the new concept of CSV:

- high level of transaction costs (there is no widely used and accepted approach how to report, evaluate and verify the results of related projects);
- it is difficult to incorporate social and environmental results into the financial statements of the company;
- gives no initiative to investors to finance and creditors to lend the money for related projects and activities (it creates no assets and no additional products, which can be considered as a “hedge”).

In response to the numerous problems with the existing concepts a quite new was developed – the "triple bottom line", created by J. Elkington and presented in his book "Cannibals with forks: The Triple Bottom Line of 21st Century Business" (1997). He managed to fix two major disadvantages of the CSR concept and make the fight not only against climate change but also against the social problems attractive for

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First of all, there was a shift from the "voluntary responsibility" to the new business models, which are oriented on making profit while at the same time solving global environmental and social problems. Secondly, the results of the projects aimed at combating climate change and solving social problems are the real asset for the company and additional interesting product, which attracts lenders and investors.

Another important achievement of J. Elkington is introduction of the ESG Principles (Environmental, Social, and Governance) to assess the results of investment projects related to sustainable development issues in general and climate change in particular. These factors are the link between companies, investors and financial intermediaries, because they help companies to report on its activities, evaluate it (ratings) and get an access to the financial markets (stock exchanges). In fact, it is a large-scale reform of the entire financial infrastructure where the questions of accounting of the project results (as the assets) associated with combating the climate change (social and governance issues as well) are at the forefront — this is the starting point for the inclusion of these assets in the balance sheet and further preparation of relevant reports.

For the companies and other economic agents there are some definite challenges:

- additional costs (especially, transaction costs);
- new accounting and reporting approaches (reporting on nonfinancial results);
- more complex risk monitoring and evaluation systems;
- deeper information asymmetry between managers and owners of the company.

To make every additional "positive" (social or environment) project count it takes more time for the financial department to account and report on the related business activities. Moreover, to apply the principle of "materiality" new accounting standards need to be elaborated and enacted (recently, companies were using already existing standards with specific recommendations for the new operations). For instance, every reduced unit of greenhouse gas emissions could be incorporated into financial indicators according to the IAS 38, 20 and 37. At the same time, all the users of financial resources on the financial market are already preparing reports according to the existing reporting standards (for instance, GRI, Global Reporting Initiative), which are approved and accepted by the main stock exchanges and investors.

ESG Principles are forced the companies to take into account by the evaluation of the company’s performance not only financial but also social, environmental, and governance risks. It is very easy to find and evaluate the necessary information using the so-called KPI (Key Performance Indicators), elaborated for different sectors of the economy and with regard on the specific features of each business activity. The more complex and integrated reports are, the more sophisticated skills most owners of the company posses to understand the situation and make right decisions.

But on the other hand these changes can bring new opportunities:

- influence of all activities on overall company’s evaluation;
- link between the needs of companies and the interests of financial markets;
- "cheap" financial resources for the companies;
- more stimulus for the company to improve the "environment".

Using existing approaches to evaluate business activities of the company makes it easy to get an access to relative “cheap” financial resource on financial markets to finance social, environmental projects, improve governance structure or management methods of the company. Financial market has already elaborated and offered new financial instruments, which can provide huge amount of money for the projects in the above-
mentioned areas. For instance, the market for green bonds is the most rapidly growing segment of financial market where companies, municipalities, and even countries can find financial resources to improve their ESG ratings. Moreover, rating agencies (such as Moody’s and S&P) are already using ESG Principles to perform evaluation of different economic agents. The better are the results, the higher is the ESG rating and the lower are interest rates on the market for the economic agent.

As a consequence, the transition from CSR to “triple bottom line” and ESG not only brought us the new way of doing business with regard to the nonfinancial results, but also changed the investment decision-making process. In this case investors will be able to evaluate financial and nonfinancial risks, associated with the selected project or company.
5. TRANSACTION COSTS ASSOCIATED WITH MOBILIZING CLIMATE FINANCE

Business activities have both positive and negative impact on the environment. We are talking in this case not only about the quality of air and water, but also about the welfare of economic agents affected by such activities. Economists are trying to find a solution – an instrument or a set of tools, which can help us to compensate this harmful effect.

As we have already seen in the previous chapters, carbon tax is a classic instrument for combating the climate change – introduced by A. Pigou (1877-1959) in “The Economics of Welfare” and implemented in some countries. Despite all the positive features, this instrument has some limitations and is unable to deliver an appropriate amount of climate finance needed to fulfil obligations to limit global warming to well below 2 degrees Celsius. And the main challenge was to make this process more attractive for the companies to step in. That’s why R. Coase (1910-2013) introduced the concept of property rights and this idea led to the implementation of emission allowances and Emission Trading Schemes (ETS) in different regions all around the world.

At the same time, implementation of the property rights and introduction of the market instruments (for instance, emission allowances) for combating the climate change caused transaction costs. So, according to the existing scientific findings, we can distinguish three categories of transaction costs: information and search costs (availability and price of a needed good), bargaining costs, policing and enforcement costs.

Bargaining costs represent the most evident additional expenses associated with functioning of the ETS. “The principal dimensions on which transaction cost economics presently relies for purposes of describing transactions are (1) the frequency with which they recur, (2) the degree and type of uncertainty to which they are subject, and (3) the condition of asset specificity.” These factors - to some extent - are interrelated with the implementation of the ETS. However, they depend mostly on the size and the type of the corporations participating in the system. Transaction costs are straining companies differently. It can be assumed that these transaction costs represent a burden to the enterprises according to the company size and the level of emissions. The costs for management and trading of emission allowances (carbon management) presumably do not originate proportionally to the amount of emissions but rather show overhead costs character. Hence, it can be assumed that the small and middle-sized enterprises with limited resources and ways of funding are disproportionally impacted by the costs of carbon management. As a consequence, they have less means to use the chances of emissions trading, e.g., by the sales of surplus emission rights. The same applies to companies with different emission quantities. For small emitters the

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35 This chapter was prepared together with the young scientists of the European University Viadrina. Special thanks to T.A. Beyer, E. Schultze, C. Stanek.
expenses for carbon management can be so high compared to the potential benefits that they refrain from participation in emission trading. Thus transaction costs and uncertainties can reduce the effectiveness of the emission trading significantly.\footnote{See Hertz R., Lo V. (2010)}

In general, we can distinguish the following types of transaction costs associated with mobilizing climate finance:

- application for free allocation;
- allowances trading;
- examining abatement costs.

For companies joining the free allocation process of the EU ETS the application procedure is time intensive and thereby costly. Regardless of their emissions-level, companies have to face overhead costs for submission. Those costs are caused by, for instance, quantification of historic emissions data, development of emission outlooks, fees or benchmark compilation. This process can be seen as an investment though, as the company will save money later on when they do not have to buy all their allowances at an auction.\footnote{See Heidl P. (2012), P. 6.} Furthermore, through careful inspection of the business partners as well as the internal consumptions, companies can also detect hidden risks and opportunities. These chances also contribute to the value created by sustainability reports.\footnote{Ioannou, I. & Serafeim, G., (2011). European Business Review. Available at: http://www.europeanbusinessreview.com/the-rise-and-consequences-of-corporate-sustainability-reporting/} Considering the currently very low price, companies may choose not to apply for free allocation, as this process, depending on the amount of emissions may be too costly. This will change with higher prices.

Companies have to pay additional transaction fees like exchange fees, broker fees and clearing. But compared with non-trade related cost, such as monitoring and reporting, this cost can be considered as small.\footnote{See Frasch, F. (2007)}

“When the assumption of full information of firms is relaxed and abatement occurs in a nontrivial technical way, firms might face costs for examining options for abatement and the related costs.”\footnote{See Heidl P. (2007), P. 3.} New technologies are associated with transaction costs, as it has to be assessed if it pays to invest into these technologies.

But the most part of transaction costs relates to the search and verification of information on the market, starting from the level of installations. As A. Lösche\l\l (Barometer 2010, 2011) reported one of the biggest significant causes of transaction costs in the EU ETS occurs from monitoring, reporting and verification (MRV).\footnote{Löschel, A. Et al., (2011). ftp.zew, KfW/ZEW CO2 Barometer 2011: Hoher Anpassungsbedarf im EU-Emissionshandel ab 2013 – deutliche Defizite bei der Vorbereitung in den Unternehmen, ZEW, KfW, p. 57.} Companies are committed to measure or compute their emissions. As P. Heindl says “this process is time demanding because data on emissions have to be collected on the installation level and have to be analyzed for emissions reporting each year.” The MRV process is required for compliance reasons in the EU ETS and might create costs for the participating companies. Costs for monitoring are e.g. costs for the planning of a monitoring concept, costs for application of an internal monitoring system and costs for

\begin{itemize}
  \item application for free allocation;
  \item allowances trading;
  \item examining abatement costs.
\end{itemize}
continuing monitoring. Costs for reporting are related to costs for quantification of yearly emissions, collocation of an emission report and verification of an emissions report and transfer of data for ex-post-control.

MRV costs come on top, inflowing the cost function in an additive way. Even if MRV costs are not related to transactions directly they are essential to delineate property rights and therefore to facilitate transactions.

Most of the costs associated with sustainability are already incurred, they are sunk costs. This is due to the fact that most policies that need to be accounted for are already in place (such as good governance and accountability structures and environmental, safety and health policies). The information regarding them is also already present in the company, but they are ‘hidden’ in the different departments of the company. So most of the costs are ‘hidden’ as well, they include, according to GRI, the following:

- time for senior management and other staff to discuss report contents;
- developing and implementing data gathering systems;
- time for gathering and inputting data;
- implementing new processes, including staff training, on data collection;
- time for checking information;
- preparing the report itself, involving internal resources (time, capacity building, etc.) and potentially external resources (consultancy, writing/editing, layout, printing, etc.);
- external verification and auditing, if applicable.

Especially when starting reporting, companies are very nervous about doing it right. So in many cases they hire expensive external consultants to coach them through, visit seminars that explain the GRI guidelines and sometimes prepare internal ‘mock reports’ in order to get used to the procedure. These processes drive the costs. External assurance is provided by the “Big Four” accounting firms and a couple of niche providers, this is very costly. So many companies do not rely on external assurance, but rather consult independent experts while the preparation of the report is in progress and let them oversee the process. This strategy is also employed by Royal Dutch Shell (RDS), as will be seen below. All in all, the cost varies and can range from EUR 2,000 to over EUR 100,000. This seems like a lot at first, but is a considerably small amount when cost for the financial report, advertising and PR are taken into account.

Compared to Sustainability Reporting the cost associated with IR can be quite high. In order for the report to be meaningful, and thus useful, the process of issuing such a report requires the company to think deeply about who they impact and consult with stakeholders about what they expect. “It requires an ‘integrated thinking’ approach to your business before you can realistically report in an integrated way.” Especially challenging, and thus costly, is the reporting on connections and interdependencies of all the activities and the supply chain.

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50 See Nazari M. (2010)

51 See Nazari M. (2010)


At the same time the most crucial point for investors, lenders and stakeholders is the need to have all financial and nonfinancial information for their decision-making. That is why among the recommendations agreed by the participants of COP 21 meeting one deserves a special attention – a need to include the risk of climate change to the overall evaluation of the company (see Table 2).

Table 2: Strategic business model risk disclosure recommendations (following a meeting of representatives of the financial market at COP 21).

<table>
<thead>
<tr>
<th>Incorporating climate change into valuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Information should disclose any divergence between the company’s commodity market planning assumptions and demand levels implied by climate and energy policy targets</td>
</tr>
<tr>
<td>This seeks narrative disclosure of the extent to which company price scenarios may differ from current assumptions based upon demand volume implied climate and energy policy targets. Narrative would include identification and discussion of key supply and demand assumptions, including assumptions regarding renewables and energy substitutes development</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk management &amp; strategic planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Information should reflect how the board oversees climate risk management</td>
</tr>
<tr>
<td>This allows investors to understand the board’s role in assessing climate risk, including whether the board considers third party information and assessments.</td>
</tr>
<tr>
<td>3 Information should discuss how management would incorporate climate policy targets into investment decisions</td>
</tr>
<tr>
<td>Management should describe its long-term, forward production profile by fuel, allocating volumes and capex between base and growth projects and describe what changes, in any, it would make in response to demand implied by climate policy targets.</td>
</tr>
<tr>
<td>4 Forward-looking projections should evaluate potential project portfolios. Quantitative disclosure should align with data used by the company for investment decision-making and risk management</td>
</tr>
<tr>
<td>Future potential projects should be discussed. Project sanctions decisions typically consider internal rates of return (IRR) or breakeven prices (BEP). Discussion should provide a cost curve for full-cycle costs of a company’s future projects.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stress-testing</th>
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</thead>
<tbody>
<tr>
<td>5 Explanations should capture company vulnerability to price risk through stress-tests or sensitivity analysis</td>
</tr>
<tr>
<td>Analysis should go beyond single-scenario analysis based on historic prices and reflect downside cases on price and volume that would allow investors to better understand valuation impacts</td>
</tr>
<tr>
<td>6 Information should clarify assumptions underpinning financial reporting and impairment analysis</td>
</tr>
<tr>
<td>Management should, in the context above, outline its asset impairment policy and approach including providing price assumptions. Impairment analysis should be extended to analysis of all reserves and should include a sensitivity analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance</th>
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<tbody>
<tr>
<td>7 Explanation should be given in the absence of answers to the above</td>
</tr>
<tr>
<td>Management should provide credible explanations as to why they are unable to provide any of the above. Particular focus should be given to any view expressed on how global climate and energy policy targets impact industry structure.</td>
</tr>
</tbody>
</table>


Since the major part of transaction costs are associated with monitoring/accounting, reporting and verification/evaluation, the main task for all the players on financial market is to find the ways how to reduce them.
6. ACCOUNTING, REPORTING AND EVALUATION OF THE GHG REDUCTION ACTIVITIES AS A KEY TO CLIMATE FINANCE

As we have already mentioned before, the “triple bottom line” concept brought a completely new way of doing business and new investment philosophy not only for companies but also for different types of institutions on the financial market. While the companies are looking for additional financial resource, investors are taking into account social and environmental problems. However, the main challenge is to create a framework for a dialog between companies and financial market – ensure quality and credibility of information provided by the companies in order to reduce transaction costs.

The way from business activities to the financial market could be divided into several stages: accounting of the results, reporting on it, getting ratings and evaluating the results (changes in a share price, interest rates, etc.). And the major purpose is to reduce the transaction costs associated with getting climate finance. (see Figure 11).

**Figure 11: Major steps on the way to reduce/compensate the transaction costs while accumulating climate finance.**

First of all, it is about the way how to account the results of environmental and social projects. For this purpose, the IASB (International Accounting Standards Board) provided some explanations especially for emission allowances, which could influence financial statements of the company and also be sold or bought on the market (the so-called IFRIC 3, withdrawn in June 2005).

We can consider the way how EU ETS works just to see different ways of accounting emissions allowances. Since there are three major ways to obtain those allowances (free allocation, buying/selling on the market, auctioning) we could use previously recommendations how to apply three different IAS (International Accounting Standards) (IASB, 2010):

- IAS 38, Intangible Assets (emission allowances allocated by the government of purchased on the market);
- IAS 20, Government Grants and Disclosure of Government Assistance (if emission allowance were issued for less then the fair value);
- IAS 37, Provisions, Contingent Liabilities and Contingent Assets (companies need to meet the obligations and cover the existing emission volumes).
It means that in the absence of specific accounting standards the accountants will be considering and interpreting emission allowances differently – depending on the needs of information recipients (tax authority or investors).

**First step** would be to release a clear guidance (standards) on emission allowances accounting standards, which will bring more clarity to the accounting treatment of such instruments.

**Second step** for the purpose of transaction costs reduction in the area of climate finance should be aimed at elaboration of recommendations for accounting not only environmental, but also related social and governance assets/results.

**Third step** on the way to reduce transaction costs should be associated with a unified classification of emission allowances/rights as certain financial instruments, common rules for allocation, auctioning and trading (as it stated in Directives 2016/1034, 2014/65/EU – MiFID II, 2003/87/EC and related Regulations).

**Table 3: Existing approaches to the reporting according to the ESG Principles (factors)**

<table>
<thead>
<tr>
<th>Type of Guidance</th>
<th>SASB (Sustainability Accounting Standards Board)</th>
<th>GRI (Global Reporting Initiative)</th>
<th>IIRC (International Integrated Reporting Council)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>Standards</td>
<td>Guidance</td>
<td>Framework</td>
</tr>
<tr>
<td>Scope</td>
<td>U.S.</td>
<td>International</td>
<td>General</td>
</tr>
<tr>
<td>Target Disclosure</td>
<td>Industry specific</td>
<td>General</td>
<td>General</td>
</tr>
<tr>
<td>Target Reporters</td>
<td>Mandatory filing</td>
<td>Voluntary report</td>
<td>Voluntary report</td>
</tr>
<tr>
<td>Target Reporters</td>
<td>Public companies traded on U.S. exchanges</td>
<td>Public and private companies</td>
<td>Public companies traded on international exchanges</td>
</tr>
<tr>
<td>Target Audience</td>
<td>Investors</td>
<td>All stakeholders</td>
<td>Investors</td>
</tr>
<tr>
<td>Type of Organization</td>
<td>501(c)3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Definition of Materiality</td>
<td>Information is material if &quot;a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of the information made available.” (U.S. Supreme Court definition, TSC Industries, Inc. v. Northway, Inc., 426 U.S. 438 (1976) and Basic v. Levinson, 485 U.S. 224 (1988))</td>
<td>Information that “may reasonably be considered important for reflecting the organization’s economic, environmental and social impacts, or influencing the decisions of stakeholders” (GRI definition)</td>
<td>“A matter is material if it is of such relevance and importance that it could substantively influence the assessments of providers of financial capital with regard to the organization’s ability to create value over the short, medium and long term.” (IIRC definition)</td>
</tr>
</tbody>
</table>

Source: Alignment. Sustainability Accounting Standards Board. Available at: http://www.sasb.org/approach/key-relationships/
The next important step is to prepare reports in accordance with requirements, established by the main market players. Nowadays, there are several initiatives, which provide the necessary standards for reporting not only on environmental risks, but also in the social and governance areas: GRI (Global Reporting Initiative), IIRC (International Integrated Reporting Council), SASB (Sustainability Accounting Standards Board), etc (see Table 3).

One of the first initiatives, aimed at providing companies with reporting standards was GRI initiative. Today, companies are mostly using GRI G4 (the fourth version) and this latest version entails not only general standards, which describes the main fields of necessary for reporting information, but also indicators needed to make farther evaluation process possible (see Figure 12).

**Figure 12: Required general standard disclosures.**

- Foundation (GRI 101)
- General Disclosures (GRI 102)
- Management Approach (GRI 103)
- Economic (GRI 200)
- Environmental (GRI 300)
- Social (GRI 400)

Source: built by the author, based on GRI Standard, October 2016.

Starting from 2017 all big companies on the territory of EU should prepare not only reports, which contain financial results but also concentrate on providing investors, creditors and stakeholders with information about environmental and social performance (Directive 2014/95, 2014).

For this purpose, companies must prepare also a set of indicators (KPI’s, Key Performance Indicators), which can be interpreted and used by decision-making on the financial market. On the territory of the EU (European Union) there are recommended indicators for different sectors of economy, developed by the EFFAS (The European Federation of Financial Analysts Societies). These KPI’s were approved and used not only on the territory of EU for the purpose of reporting and evaluation, but also supported by different international organisations (such as: International Corporate Governance Network (ICGN), Global Business Reporting Framework, Organisation for Economic Cooperation and Development) and Japan’s Ministry of Economy, Trade and Industry (OECD, 2012).

**Fourth step** on the way to transaction costs reduction would be associated with implementation of the common and unified standards in sustainability reporting...
according to ESG Principles, accompanied by KPI’s (Key Performance Indicators for ESG).

So, the progress in this area is remarkable – after the Conference in Paris (COP 21, 2015) the leader of G20 launched the Task Force on Climate-Related Financial Disclosure with the aim to develop and offer climate-related risk disclosures, which will help to provide reliable and high-quality information for investors, lenders, issuers, and stakeholders.

**Fifth step** will be dedicated to the question of mandatory nonfinancial risks disclosure by the companies – it is necessary to ensure the access for financial institution to the full range of data for the purpose of investment decision making.

According to the Directives 2013/34/EU, 2014/95, certain large undertakings and groups will be obligated (starting from 2017) to disclose non-financial and diversity information. Moreover, the biggest companies in France are already obligated to disclose nonfinancial risks\(^\text{54}\).

**Figure 13: Number of stock exchanges offering ESG reporting guidance in 2016.**

On the other hand, there are some initiatives, which require from the companies ESG sustainability/ESG reporting. Today, this Sustainable Stock Exchange Initiative brings together more than 50 major global stock exchanges, 15 of them are heading toward the common goal of education and agreed to use the typical SSE Guidelines and recommendations of the WFE (World Federation of Exchanges) in order to help

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\(^{54}\text{LOI n° 2015-992 du 17 août 2015 relative à la transition énergétique pour la croissance verte. Available at: https://www.legifrance.gouv.fr/affichTexte.do;jsessionid=9E21E75BBAB7D78DE25A698CD670B092.tpdila07v_1?cidTexte=JORFTEXT000031044385&dateTexte=29990101}
companies that are listed on these stock exchanges during the preparation of reports according to the ESG Principles (see Figures 13).\textsuperscript{55}

If we are looking at the benefits for the companies from reporting on their sustainable development, the number one should be (according to the research conducted by consulting company EY) an opportunity to increase the company's value, and the second – identify and mitigate the outstanding risks (see Figure 14).

\textbf{Figure 14: The principal objectives for sustainability reporting, \%}

\begin{figure}[h]
\centering
\includegraphics[width=0.7\textwidth]{figure14}
\caption{The principal objectives for sustainability reporting, \%}
\end{figure}

Source: \textit{Sustainability reporting – the time is now}. EYGM, 2014, P. 7.

The next step associated with data analysis and preparing ratings for companies, municipalities and states according to the performance on economic activities, social, and environmental projects. Since September 2015 the biggest rating agencies (S&P, Moody’s, RobecoSAM) have started to use ESG Principles by giving ratings to its clients. All this gave a way to the development of the green bond and social impact on bond markets.

There are some specific features, related to different sectors of the economy, where the weight of each part of the rating differs (see the methodology used by RobecoSAM in Annex 1). And, as mentioned above, all these can give us the necessary information for decision making on the financial market – give an access to financial resources for specific purposes.

\textbf{Sixth step} on the way to transaction costs reduction should be dedicated to mandatory ESG-ratings for the issuers of financial instruments while approaching the stock exchange.

\textbf{Seventh step} is tightly connected with quality of financial instruments – certification of “green” debt securities will provide investors with information about the outstanding risks and planned results (are they realistic or not).

\textsuperscript{55} SSE Engagement. Sustainable Stock Exchange Initiative. Available at: http://www.sseinitiative.org/engagement/
As we have already seen in the previous chapters, the share of certified bonds is growing from year to year (see Figure 7) and the reason is that certified bonds contain less risk than the uncertified climate-aligned bonds. Nowadays, it is possible to get the climate-aligned bond certified and make it green with the Climate Bond Initiative. Once the bond is certified, it is possible to get certain benefits (see Table 4).

**Table 4: Benefits for issuer and investor from certifying the bond as “green”**.

<table>
<thead>
<tr>
<th>Issuers</th>
<th>Investors</th>
</tr>
</thead>
<tbody>
<tr>
<td>More diverse investor base (more attractive for investors)</td>
<td>Proactively hedge against future climate risk</td>
</tr>
<tr>
<td>Easier-to-find on the market</td>
<td>Signal to the market about low risks</td>
</tr>
<tr>
<td>Enhanced reputation – contribution to the low-carbon economy</td>
<td>Signal to governments about the future investments in the low-carbon transition</td>
</tr>
<tr>
<td>Low cost than for a second opinion</td>
<td></td>
</tr>
</tbody>
</table>

Source: built by the authors, data from The Climate Bonds Initiative. Available at: https://www.climatebonds.net/standards/certification/benefits

Going these steps, we can handle the main problem, associated with accounting, reporting, and evaluation of the emission reduction activities – high transaction costs, and can make an access to climate finance for big enterprises much easier.
Conclusions

It is clear that on the financial market everyone is worrying only about financial results while other issues are of secondary importance. It looks completely different, however, when there is a possible way to solve global problems, while increasing simultaneously the value of assets and, improving the key performance indicators and risk ratings. The same applies to the businesses whose purpose is also to make a profit in face of significant dependence on the creditors and shareholders. Clearly, no bank will give out loans to the companies for construction of public parks if neither the debtor nor the bank could see any direct benefits. That is why for a long time despite the existence of the CSR concept – corporate social responsibility, it was difficult to counteract effectively the threats of climate change.

Lack of motivation on the financial markets to act more pro-actively and deal with the climate change for a long time was caused, primarily, by the lack of conditions for doing business and obtaining substantial profits from low carbon strategies, also due to the low probability of introduction of a global carbon market and to the lack of a clear commitment to emissions reduction by the countries. In particular, the US and China – major emitters of the GHG were not obligated under the Kyoto Protocol to reduce specific amount of emissions. That is why banks could not count on a guaranteed demand not only for credits or investments, but also on the related products and services such as monitoring, accounting and verification.

As a result of our small research we have found out that the modern economy is on the eve of changes – we are facing today a shift from the CSR concept to ESG Principles. This new framework could bring for companies and institutions of the financial market not only positive but also negative consequences.

For the companies and other economic agents there are some definite challenges:

- additional costs;
- new accounting and reporting approaches;
- more complex risk monitoring and evaluation systems;
- deeper information asymmetry between managers and owners of the company.

But on the other hand these can bring new opportunities:

- influence of all results on overall company`s evaluation;
- link between the needs of companies and the interests of financial markets;
- "cheap" financial resources for the companies;
- more initiatives for the company to improve the "environment".

Our research has shown us that using only fiscal instruments for mobilizing climate finance in combating the climate change is insufficient for limiting global warming to 2 degrees Celsius. Hence, it is necessary to use market financial instruments. At the same time market financial instruments associated with high transaction costs. Hence, carbon taxation could be applicable for small and medium enterprises and for the purpose of reducing/compensating transaction costs for big companies we can offer the following steps:

- release of a clear guidance on emission allowances accounting standards which will bring more clarity to the accounting treatment of such instruments;
- elaboration of recommendations aimed at accounting not only environmental, but also related social and governance risks;
- unified classification of emission allowances/rights as certain financial instruments, common rules for allocation, auctioning and trading;
• implementation of the common and unified standards in sustainability reporting according to ESG Principles, accompanied by KPI’s (Key Performance Indicators for ESG);
• mandatory nonfinancial risks disclosure by the companies – it’s necessary to ensure the access for financial institution to the full range of data for the purpose of investment decision making;
• mandatory ESG-ratings for the issuers of financial instruments while approaching the stock exchange;
• certification of “green” debt securities will bring information for the investors about the outstanding risks and planned results (are they realistic or not).

All these steps can ensure the quality and credibility of information provided by the public and private organizations to the investors, lenders and stakeholders. This will lead to lowering risks and the costs of mobilizing climate finance.
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52. Sustainability reporting – the time is now. EYGM, 2014, P. 7.


I. Annex
Figure A. General vs. Industry-specific Weights by Dimension

**BANKS**

- **ECONOMIC**
  - General: 18
  - Industry-specific: 20

- **ENVIRONMENTAL**
  - General: 17
  - Industry-specific: 7

- **SOCIAL**
  - General: 15
  - Industry-specific: 23

**ELECTRIC UTILITIES**

- **ECONOMIC**
  - General: 18
  - Industry-specific: 17

- **ENVIRONMENTAL**
  - General: 29
  - Industry-specific: 6

- **SOCIAL**
  - General: 9
  - Industry-specific: 21