KAS POLICY PAPER

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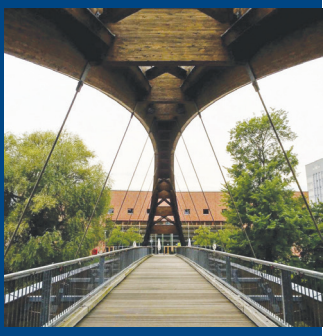

CARBON TAXATION AND MARKET FINANCIAL INSTRUMENTS FOR MOBILIZING CLIMATE FINANCE

O. SUSHCHENKO
R. SCHWARZE

Konrad Adenauer Stiftung

CARBON TAXATION AND MARKET FINANCIAL INSTRUMENTS FOR MOBILIZING CLIMATE FINANCE

Dr. O. Sushchenko, Prof. Dr. R. Schwarze

Carbon taxation and market financial instruments for mobilizing climate finance (2016)

Dr. O. Sushchenko, Associate Professor, Department of Finance, Kyiv National Economic University named after Vadym Hetman (Kyiv)

Prof., Dr. R. Schwarze, Professor, Chair in International Environmental Economics, European University Viadrina (Frankfurt, Oder, Germany)

The aim of this paper is to elaborate recommendations for politicians, authorities in the area of climate finance accumulation, evaluate financial instruments and their role in mobilization of the necessary financial resources. 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 highlight 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).

Young scientists from Scientific Society and Center for BLENDED VALUE Studies of KNEU (Kyiv National Economic University named after Vadym Hetman) and European University Viadrina (Frankfurt, Oder) - T.A. Beyer, E. Schultze, C. Stanek, joined their forces to prepare this paper.

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Bohomoltsia Akademika vul. 5, office 1
01024 Kyiv
Ukraine
www.kas.de/ukraine
office.ukraine@kas.de

CONTENTS

Dear Readers,

For us fighting climate change is the matter of not only ecology, security and socioeconomics. In the first place, it is a matter of responsibility of generations, justice and future of humanity. Nowadays we are witnessing multiple natural and respectively social disasters, caused by the massive use of the fossil fuels to ensure economic growth. The question that arises is how can we fight it?

We believe that in the first place it is necessary to realize the importance of the climate change issue and irreversibility of the negative consequences for many people in case if it is ignored. Unfortunately, we observe the lack of attention paid to this matter in Ukrainian political discourse. Clearly, Ukraine is facing multiple challenges now, but it is impossible to overcome them without the comprehensive approach and without taking into account the principles of sustainable development across all areas of public policy.

Analysis of the causes of global warming suggests the necessity of changing the economical model in favor of carbon-free economy. Ukraine declared the priority of sustainable development by signing the Strategy for Sustainable Development "Ukraine 2020", having initialled the Paris Agreement and assumed obligations on adaptation of environmental legislation and climate change counteraction to European standards and modernization of energy system. Unfortunately, recent monitoring of the Association Agreement implementation shows that there was no progress made in adaptation of Ukrainian legislation regarding creation of the Emission Trading System, which is the centerpiece of the EU climate change policy.

When a separate state commits itself to sustainable development, it has the task of creating effective framework conditions, which allows to properly direct the investment and make investments in cutting emissions more efficient, rather than later invest in overcoming the consequences of the disasters. It is easy to predict that transition to sustainable development will be painful for Ukraine due to its dependency on conventional energy sources and slow pace of economic growth. Redistribution of the resources and decline of certain sectors of national economy as a consequence of refusing from fossil fuels or significant decrease in their extraction, assets withdrawal, resistance from the rent recipients - can not be avoided, which, obviously, will create social tension and nurture the populist moods.

Konrad Adenauer Foundation sees its task in creating the new social thinking of Ukrainians, which would allow to understand the conditions of adherence to ecological, social and economical interests of humanity and climate change prevention. With this aim we implement educational programs, support research and provide advice to politicians and experts.

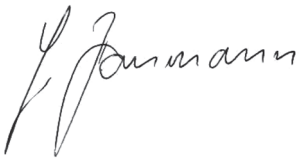
For transition to low-carbon model of economic development Ukraine requires to not only realize the threats, which the climate change results in, but also to have pool of well-informed experts, whom we lack. Our educational programs are aimed at advanced training for youth, who are willing to fulfil their potential in politics and in the area of climate finance, as well as at teachers of the respective subjects.

It is no secret that Ukraine will require multi-billion investments for reorientation towards low-carbon way of life and social transformations. Efficiency of their attraction will depend on what policy regarding use of financial instruments Ukraine will choose under the international agreements.

You are looking at the result of almost one year of cooperation of the experts from KAS Office in Ukraine, young scientists from Kyiv National Economic University named after Vadym Hetman and scientist from the European University Viadrina (Frankfurt (Oder), Germany). This research is dedicated to the relevant for Ukraine issue of financial support for measures to counteract global warming and the threat of the climate change in conditions of limited resources. We hope that this research will become the reference point for politicians and public authorities, who are responsible for creating conditions for climate finance accumulation in Ukraine, and will help to evaluate the potential of separate financial instruments and define their appropriate role for achieving the sustainable development goals.

Enjoy reading!

Gabriele Baumann
Head of the KAS Office in Ukraine



ABBREVIATIONS AND ACRONYMS

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

INTRODUCTION

Our common goals to combat climate change, limit the global warming to well below 2 degrees Celsius and protect the environment are 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, NGOs 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 a 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 to 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 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 from international experience in implementing different financial instruments – prepare Ukrainian companies for the new challenges and show them how to get an access to climate finance at both macro and microeconomic levels, elaborate recommendations for politicians, authorities on how to accumulate climate finance.

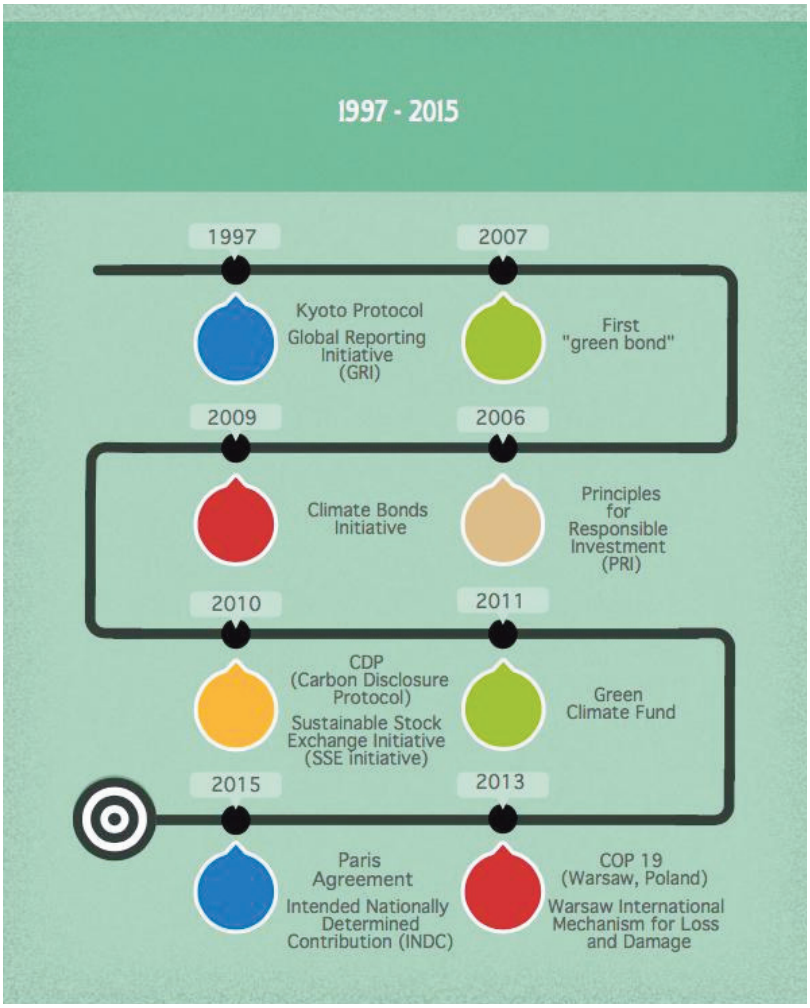
Results of this paper will be presented and discussed at the Second International Summer School "Economic aspects of climate change", involving professors, students and experts from Germany and Ukraine (Kyiv, August 2016).

[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



Source: built by the authors

Consequently the Paris Agreement provoked a great interest of 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 75 trillion US Dollars 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 earn so much attention from the key players on the financial market only in 2014 , while the first steps to improve the quality of environment were already taken 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 the UN Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992? Mainly because the capacity to respond to 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 GRI (Global Reporting Initiative) was created , which was aimed 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 successful it is 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 providing finance for 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 efficiency[3]. 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 to trigger off 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 100 billion USD annually and to invest these resources in the emission reduction projects. All the necessary governing bodies were created at the COP 17 in Durban, South Africa in 2011.

In a parallel effort of private business capacity building – the CDP (Carbon Disclosure Project) initiative was launched in 2010, the aim of which is not only to display the 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 provides cooperation with representatives of the corporate sector and also is engaged in projects at the municipal level and at 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 overestimated, 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).

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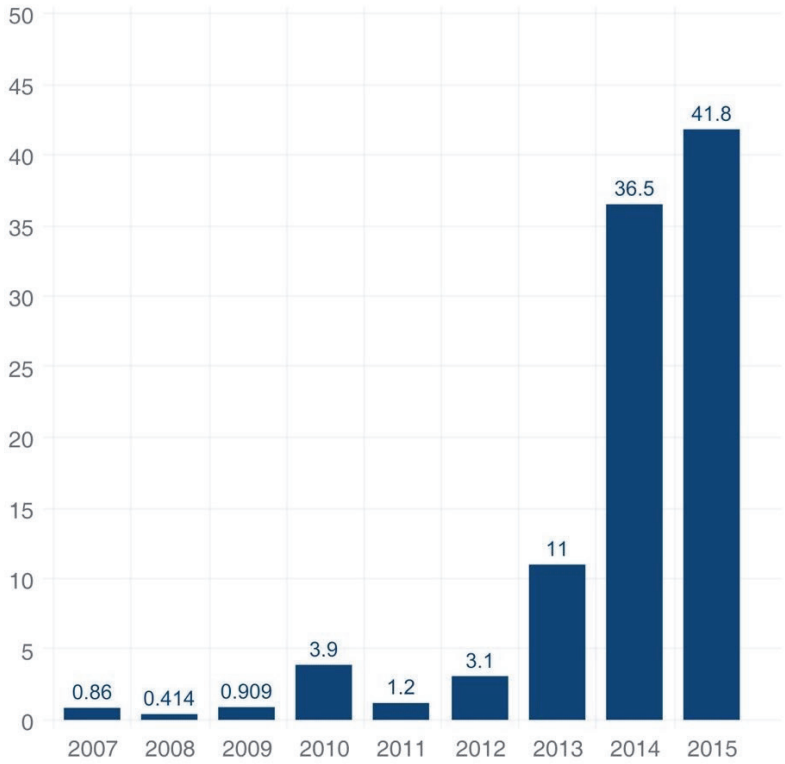
[2] Green Finance and Investment Mapping Channels to Mobilize Institutional Investment in Sustainable Energy (2015). OECD Publishing, p. 43.

[3] What are Green Bonds? (2015). International Bank for Reconstruction and Development/The World Bank, p. 24.

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 done 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).

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



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

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 for contributing to the mitigation of GHG and supporting 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).

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 creating the capacity for emissions reduction, but equally for monitoring, reporting and verification, which is quintessential for taking 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 for 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 is not fully established – in February 2016 the amount of resources collected was only 10.2 billion USD[4]. At the same time, financing the projects by the GCF foresees the involvement of private funds, and the "green bonds" play an important role as well. In particular, GCF approved a funding program for the region of Latin America and the Caribbean using the "green, energy efficient bonds" in the amount of 217 million USD[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 – Mark 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"[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 obligations to introduce over the next decades the mechanism for transferring 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 already been created and the financial institutions only await the launch of the global carbon market.

In Ukraine the preparation is still under 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 six months after already functioning pilot projects needed to verify the system and identify "bottlenecks". But the bill has not yet been introduced to the Ukrainian Parliament.

Even much more needs to be done in the creation of the new financial market infrastructure necessary to organize the trading of 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 – and 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.

In fact, public and private agents all around the world are using different instruments to accumulate financial resources for emission reduction projects i.e. climate finance. And the main discussion is about finding the best way 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 the necessary conditions in the society, while developing an effective mechanism for combating the climate change.

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4 Resource Mobilization. Green Climate Fund. Available at: http://www.greenclimate.fund/contributions/pledge-tracker

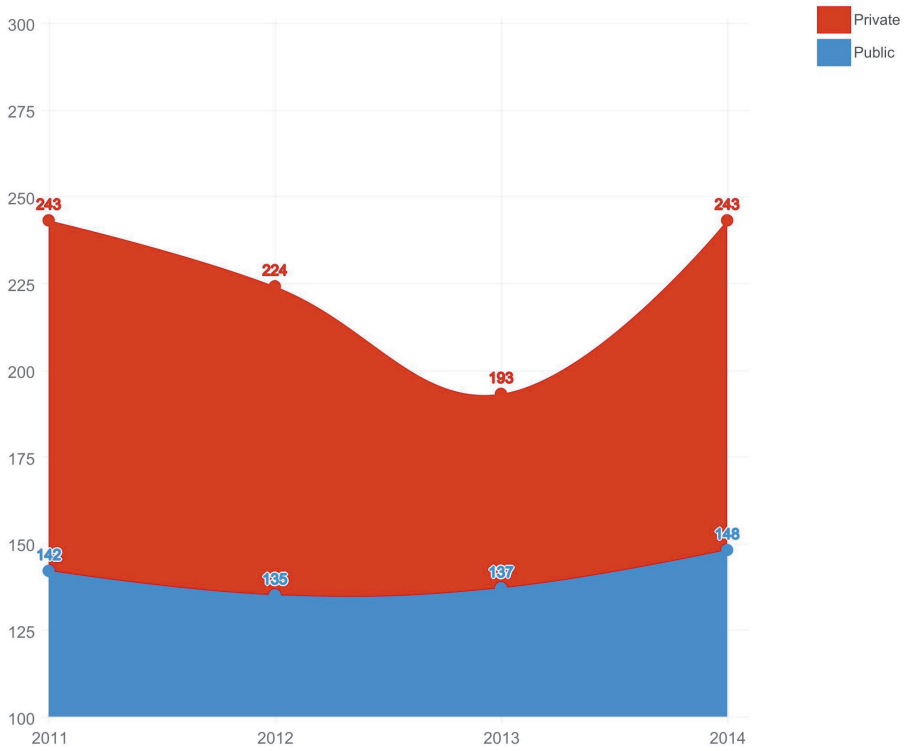
5 Green Climate Funds approves first 8 investments. Green Climate Fund. Available at:http://www.greenclimate.fund/-/green-climate-fund-approves-first-8-investmen-1

6 Climate, Carbon & Stranded Assets. What do they mean for stock exchanges? SSE Leaders Briefing, 7 December 2015, Paris. Available at: http://www.sseinitiative.org/wp-content/uploads/2015/12/SSE-Carbon-Tracker-Climate-Brief.pdf

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 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 weighty 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 for 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 is 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 only create 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 for 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).

It is also important to underline that in some countries (for example, Chile) the introduction of the carbon tax has been postponed to 2017. So, the overall amount of the energy tax revenues, collected in 15 countries, was about 113 billion EUR in 2014[14][15][16] (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)[17].

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7 Haifeng Deng (2015). Improving the Legal Implementation Mechanisms for A Carbon Tax in China. Pace Envtl. L. Rev., Vol. 32, P. 679.

8 Goulder L.H., Schein A.R. (2013). Carbon Taxes versus Cap and Trade: A Critical Review, Climate Change Economics, Vol. 4, No. 3., P. 23.

9 Cuevro H., Gandhi V.P. (1998). Carbon Taxes: Their Macroeconomic Effects and Prospects for Global Adoption – A Survey of the Literature, IMF Working Paper WP/98/73, P. 32.

10 OECD (2013). Effective Carbon Prices, OECD Publishing, P. 48.

11 Melzer J. (2014). A Carbon Tax as a Driver of Green Technology Innovation and the Implications for International Trade, Energy Law Journal, Vol. 35:45, P. 68.

12 Flannery B.P. (2016) Carbon Taxes, Trade, and Border Tax Adjustments, Policy Brief, No 16-02, P. 2.

13 Corkey, Jim (2009). A Carbon Tax – Onwards, Revenue Law Journal: Vol. 19: Iss. 1, Article 7, P. 3.

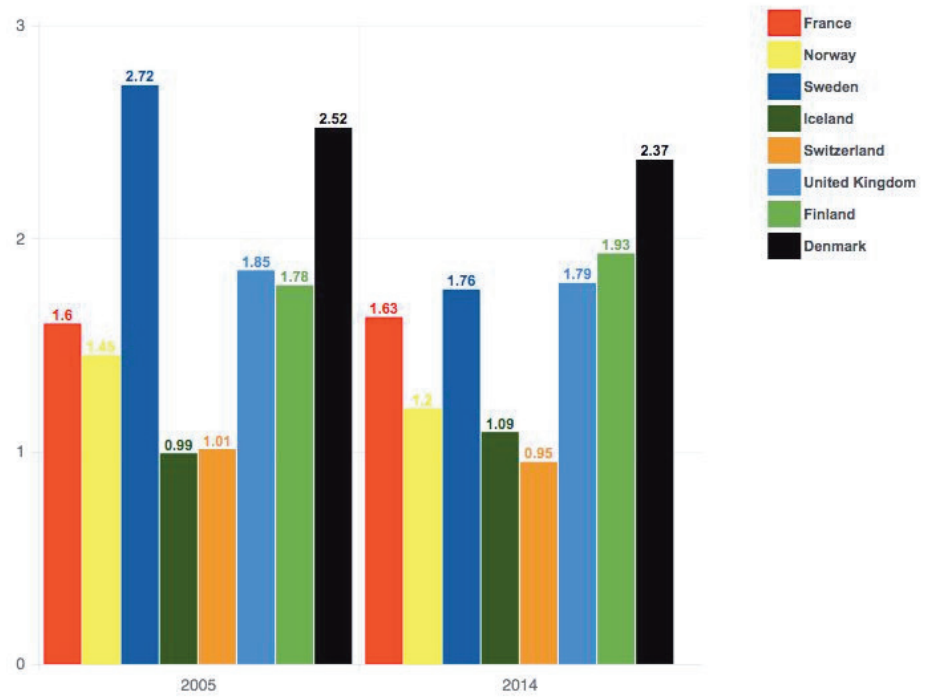
14 Environmental tax revenues Eurostat. Available at: http://ec.europa.eu/eurostat/web/environment/environmental-taxes/database

15 OECD (2015). Revenue Statistics 2015, OECD Publishing, p. 366.

16 OECD (2016), Revenue Statistics in Latin America and the Caribbean 2016, OECD Publishing, Paris, p. 233.

17 Buchner B.K., Trabacchi C., Mazza F., Abramskieh D., Wang D (2015). Global Landscape of Climate Finance 2015. A CPI Report, Climate Policy Initiative., P. 3.

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



Source: Eurostat. Available at: http://ec.europa.eu/eurostat/web/environment/environmental-taxes/database

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 certain amount of EUA – European Emission Allowances)[18]. Around 88% of this income should be used for the purpose of emission reduction projects directly or by establishing special programs/agencies. For instance, at the EEX (European Energy Exchange) by the end of 2015 roughly 1 billion EUR had been accumulated by Germany as a result of auctioning of EUA and EUAA (European Union Aviation Allowances)[19]. These financial resources were the main source for the various programs, established by the German government – ICI (International Climate Initiative), NCI (National Climate Initiative)[20]. About 5 billion USD 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).

Another possible instrument, which allows the government to get financial resources for the purpose of emission reduction, is receiving **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 emissions reduction. 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 and helps in establishing the pilot projects in China[21].

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[18] Commission Regulation (EU) No 1031/2010 of 12 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Derictive 2003/87/EC of the European Parliament and the Council establishing a scheme for greenhouse gas emission allowances trading within the Community. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02010R1031-20111125

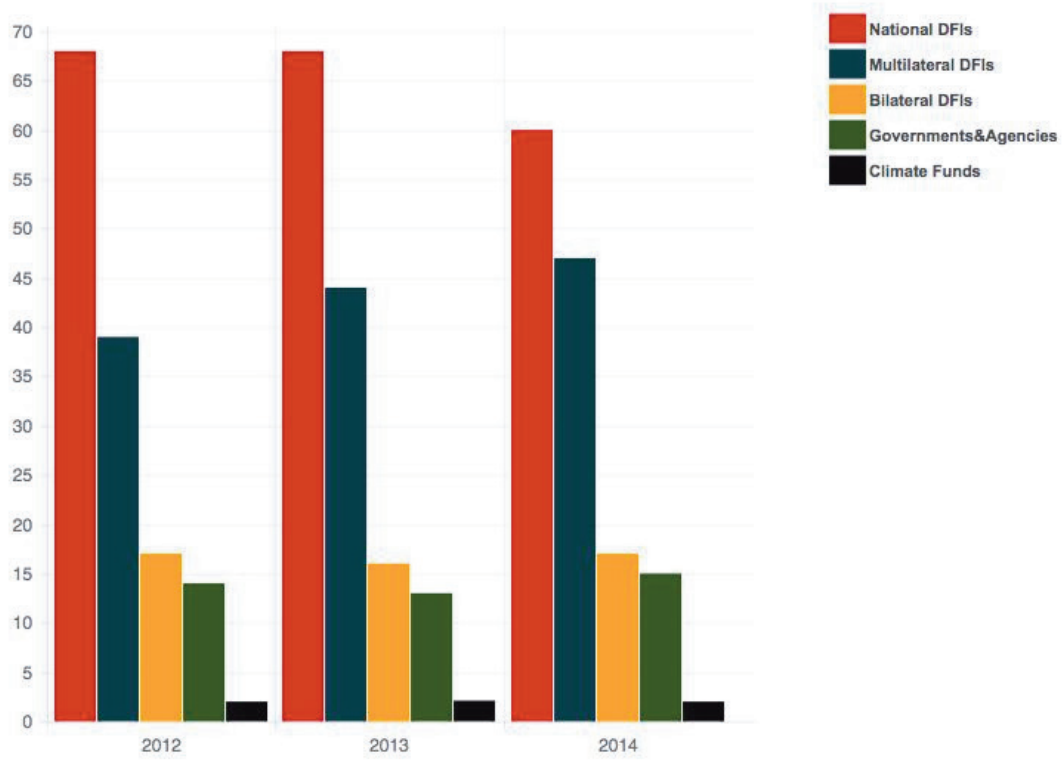
[19] Auctioning. German Auctioning of Emission Allowances. Periodical Report: Annual Report 2015. – German Emissions Trading Authority (DEHSt) at German Environment Agency. – P. 5.

[20] Gonta A., Kotina H., Stepura M., Sushchenko O. (2015) Sustainable Development Policy: Experience of Germany in Combating Environmental and Social Risks, Possible Ways to Implement it in Ukraine. KAS Policy Paper No 23, P. 21.

[21] Capacity Building for the Establishment of Emission Trading Schemes in China. Available at http://ets-china.org

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).

Figure 5: Total public finance by actor in 2012-2104, billion USD.



Source: Buchner B.K., Trabacchi C., Mazza F., Abramskieh D., Wang D. (2015). Global Landscape of Climate Finance 2015. A CPI Report, Climate Policy Initiative., P. 3.

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

As we know, total financial resources, provided by public and private institutions for the emission reduction projects in 2014, were 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 Celsius is much bigger. So, according to the report published by the World Economic Forum in 2013, up to 114 trillion USD will be needed to invest by 2030 in order to limit the speed of global warming within 2 degrees Celsius. It means that in the 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

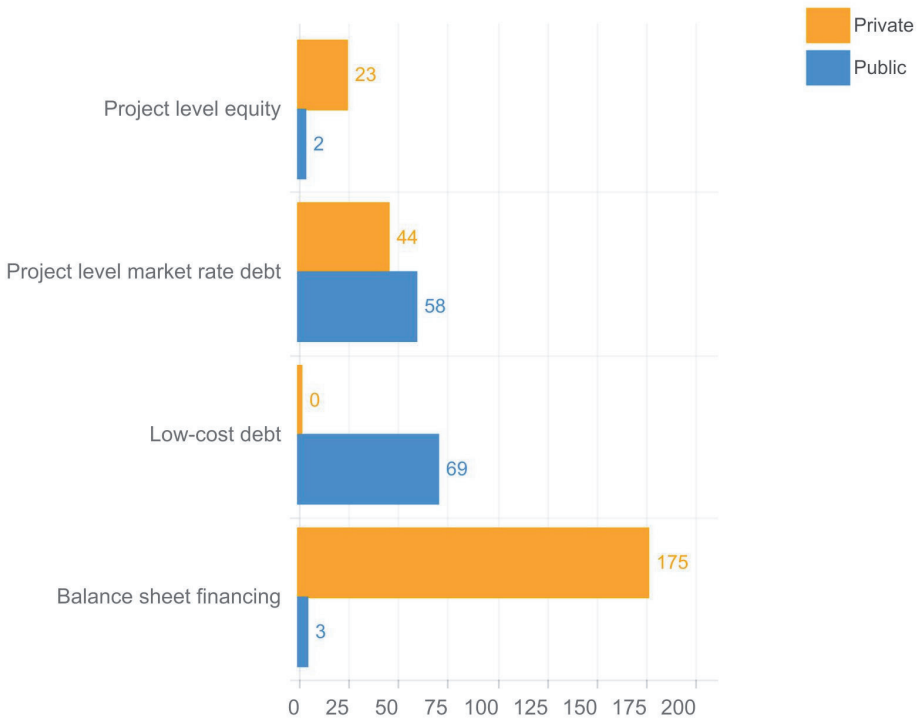
As we have already mentioned above, carbon tax is not a tool that can allow us to accumulate the necessary amount of financial resources for emission reduction projects. And even in those countries where they are used together with a system of trading greenhouse gas emissions (ETS - Emission Trading System), they are related to the 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 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.



Source: Buchner B.K., Trabacchi C., Mazza F., Abramskieh D., Wang D. (2015). Global Landscape of Climate Finance 2015. A CPI Report, Climate Policy Initiative., P. 7.

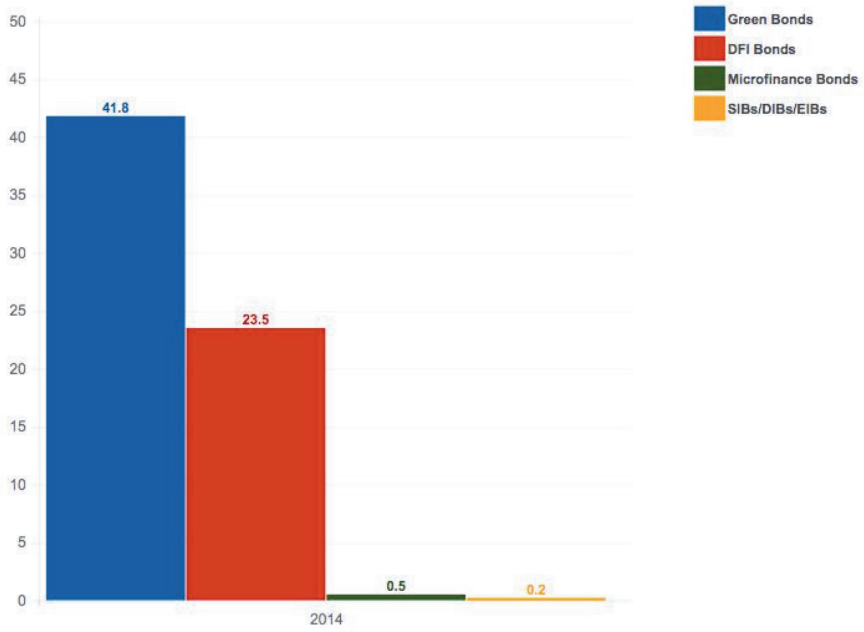
Private finance is mobilized through **equity, debt securities, and derivatives**. As we have already mentioned in the first chapter, the entry into force of the Kyoto Protocol and especially the preparation of the NDCs after COP 19 (Warsaw, Poland) in 2013 were not only important impulses for the development 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 the important instrument for facilitating 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].

Nowadays, we can find different types of sustainable development bonds (SDBs) – debt securities issued by private or public entities to finance activities or projects linked to sustainable development[23]. There are different types of SDB: green bonds, DFI Bonds, Microfinance Bonds, SIBs (Social Impact Bonds)/DIBs (Development Impact Bonds)/EIBs (Environmental Impact Bonds) (see Figure 7).

Figure 7: SDBs by Classification, billion USD.



Source: European Impact Investing

In fact, investors can get additional benefits (receive additional financial resources) 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 vast majority of transactions are in the form of **derivatives: futures, forward, options**[24].

The total value of the global carbon market in 2014 reached 45 billion USD[25]. On different levels 17 subnational, national or regional emission trading schemes (ETS) were responsible for around 7.7 billion metric tons of trading volumes[26]. Nowadays, we can witness a sharp decline in prices and trading volumes as a result of the oversupply on the markets. Consequently, low

[22] Investors raise €1.6bn for offshore wind. Environmental Finance. Available at: http://env-finance.msgfocus.com/c/11kXJZzs1WbWSZR8CQOP4xNIj

[23] Sustainable Development Bonds. European Impact Investing, Luxembourg, 2016, P. 2.

[24] Review of the Markets in Financial Instruments Directive (MiFID) and Proposals for a Regulation on Market Abuse and for a Directive on Criminal Sanctions for Market Abuse. MEMO/11/719. Available at: http://europa.eu/rapid/press-release_MEMO-11-719_en.htm?locale=en

[25] Global carbon market to reach record volumes by 2017. Available at: http://www.commodities-now.com/reports/environmental-markets/18014-global-carbon-market-to-reach-record-volumes-by-2017.html

[26] Carbon Markets: Renewed Expectations. Available at: https://www.iif.com/sites/default/files/general/cmm_carbon_vf_1.pdf

prices lead to 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 **carbon offsets** purchased. The analysts of the World Bank are saying that a diminishing number of new corporate offsetting programs were responsible for that[27].

EU ETS, the biggest mandatory market, 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 tons, while the average price was about 5 Euros per ton[28]. 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 was 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 ton)[29]. 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 is 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) were around 300 TWh in GO, and were traded in 2014 at the average price of about 0.27 EUR per MWh[30]. The prices for **Renewable Energy Certificates (RECs)** on the territory of the USA (voluntary market) are almost equal to those mentioned above in the EU – roughly 1 USD per MWh. On the compliance market the price range for RECs varies from 1 USD to 60 USD per MWh.

But the main question stays the same: why are the companies and financial institutions 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 has it become so attractive to shift from the voluntary corporate social responsibility to the completely new way of dealing with environmental problems?

[27] P. Kossoy A., Peszko G. (2015). State and Trends in Carbon Pricing 2015. The World Bank Group, P. 37.
[28] EU must scrap carbon compensation scheme. EUobserver. Available at: https://euobserver.com/opinion/133058
[29] See State and Trends in Carbon Pricing 2015. The World Bank Group, 36.
[30] EEX 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

We can find the answer to the question mentioned in the previous chapter in the changing philosophy of doing business and making investment decisions.

The way of doing business is changing – new business models appear, where the main goal is not only to make a profit, but also to create the so-called "blended value". In other words, companies want to meet financial, social, and environmental goals. The investors tend to create and evaluate financial returns, social value and related returns[31].

The notion of what we know today as the CSR was introduced in 1953 by H. Bowen in his book "Social Responsibilities of the 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"[32]. 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"[33]. 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 50s of the XX century international organizations, civil activists, NGOs started to search for the ways to stimulate employers to be more active in creating more favorable work conditions, paying equally for work and facilitating freedom to join the so-called trade unions.

But only in 80s the concept of CSR (corporate social responsibility) began to gain awareness among all the key economic agents. The companies spent money on the charity, which allowed to improve their image 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).

So, in 2011, considering numerous disadvantages of CSR concept, M. Porter and M. Kramer offered its new version, called Creating Shared Value (CSV – creating shared value)[34]. 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 can "feel" such value on their balance sheet.

Nevertheless, the main problem continued to exist – 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.

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 8).

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31 Jed Emerson (2003). The blended value map. Tracking the Intersects and Opportunities of Economic, Social and Environmental Value Creation. URL: http://www.hewlett.org/uploads/files/BlendedValueMapFinal.pdf

32 Bowen, Howard B. Social Responsibilities of the Businessman, Harper, 1953, p. 276.

33 Perkins, George W. The Modern Corporation. The Currency Problem and the Present Financial Situation, New York, The Columbia University Press, p. 163.

34 Porter M.E., Kramer M.R. (2011) Creating Shared Value: How to Reinvent Capitalism – and Unleash a Wave of Innovation and Growth. Harvard Business Review, January/February 2011, pp. 63-70.

Figure 8: CSR transition to CSV.

Source: Lapina I., Borkus I., Starineca O. (2012). Corporate Social Responsibility and Creating Shared Value: Case of Latvia. International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, Vol:6, No:8, 2012, p. 2231.

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 on 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;
- does not encourage 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 new one was developed – the "triple bottom line", created by J. Elkington and presented in his book "Cannibals with Forks: The Triple Bottom Line of 21th Century Business" (1997)[35]. 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 businesses and for the players on the financial market. First of all, there was a shift from the "voluntary responsibility" to the new business models, which are oriented towards 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 their activities, evaluate them (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

[35] Elkington J. (1997) Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Capstone, Oxford, 402 pp.

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.

There are certain challenges for the companies and other economic agents:

- 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 forced the companies to take into account not only financial but also social, environmental, and governance risks during the company's performance evaluation. 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 to the specific features of each business activity. The more complex and integrated reports are, the more sophisticated skills most owners of the companies should 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 stimuli 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 relatively "cheap" financial resources 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 agents.

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[36]

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 for 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[37]. 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[38] 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 to appear. 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**[39].

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"[40]. 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[41]. 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 their excessiveness. 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 benefits of the trading system, which are connected to the opportunity to sell the surplus of emission rights[42]. The same applies to companies with different emission quantities. For small emitters the 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[43].

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

[36] This chapter was prepared together with the young scientists of the European University Viadrina. Special thanks to T.A. Beyer, E. Schultze, C. Stanek.
[37] Pigou A.C. The Economics of Welfare. Palgrave Macmillan, 2013, p. 896.
[38] Coase R.H. (1960). The Problem of Social Cost. Journal of Law and Economics, Vol. 3, pp. 1-44.
[39] Dahlman, Carl J. (1979). The Problem of Externality. Journal of Law and Economics. 22 (1),pp. 141–162.
[40] Williamson, O. E., (1989). Transaction Cost Economics. HANDBOOK OF INDUSTRIAL ORGANIZATION VOLUME I, P. 142.
[41] Frasch, F., 2007. Transaction Costs of the EU Emissions Trading Scheme in German Companies. SUSTAINABLE DEVELOPMENT LAW & POLICY, p. 51.
[42] Hertz R., Lo V. (2010) Mittelständische Unternehmen im Emissionshandel: Unsicherheiten dominieren. Nr. 17, Februar 2010, p. 7.
[43] See Hertz R., Lo V. (2010)

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 it does not have to buy all its allowances at an auction[44]. Furthermore, through careful inspection of the business partners as well as the internal consumption, companies can also detect hidden risks and opportunities. These opportunities also contribute to the value created by sustainability reports[45]. 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, such as 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[46].

"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"[47]. New technologies are associated with transaction costs, as it has to be assessed whether it pays to invest into these technologies.

But the major part of transaction costs relates to the search and verification of **information** on the market, starting from the level of installations. According to A. Löschel (Barometer 2010, 2011) one of the biggest significant causes of transaction costs in the EU ETS occurs from monitoring, reporting and verification (MRV)[48]. Companies are committed to measure or compute their emissions. As 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"[49]. The MRV process is required for compliance reasons in the EU ETS and might create costs for the participating companies. Costs for monitoring include costs for the planning of a monitoring concept, costs for application of an internal monitoring system and costs for 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[50]. 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 potential 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

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44 Heidl P. (2012) Transaction Costs and Tradable Permits: Empirical Evidence from the EU Emission Trading Scheme. Discussion Paper No. 12-021, März, p. 21.

45 Ioannou, I. & Serafeim, G., (2011). European Business Review. Available at: http://www.europeanbusinessreview.com/the-rise-and-consequences-of-corporate-sustainability-reporting/

46 See Frasch, F.(2007)

47 See Heidl P. (2012), P. 6.

48 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.

49 See Heidl P. (2007), P. 3.

50 Nazari M. (2010) What are Cost Drivers of Sustainability Reporting for First Timers? Available at: http://prizmablog.com/2010/06/27/what-are-cost-drivers-of-sustainability-reporting-for-first-timers/

used to the procedure[51]. These processes drive the costs. External assurance is provided by the "Big Four" accounting firms and a couple of niche providers, and 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[52]. 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 2.000 EUR to over 100.000 EUR. 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[53].

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"[54]. Especially challenging, and thus costly, is the reporting on connections and interdependencies of all the activities and the supply chain.

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 1).

Table 1: Strategic business model risk disclosure recommendations (following a meeting of representatives of the financial market at COP 21).

Incorporating climate change into valuation		
1	Information should disclose any divergence between the company`s commodity market planning assumptions and demand levels implied by climate and energy policy targets	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
Risk management & strategic planning		
2	Information should reflect how the board oversees climate risk management	This allows investors to understand the board`s role in assessing climate risk, including whether the board considers third party information and assessments.
3	Information should discuss how management would incorporate climate policy targets into investment decisions	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.
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	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.
Stress-testing		
5	Explanations should capture company vulnerability to price risk through stress-tests or sensitivity analysis	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
6	Information should clarify assumptions underpinning financial reporting and impairment analysis	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

[51] See Nazari M. (2010)
[52] See Nazari M. (2010)
[53] Global Reporting Initiative (2015). Cost and Burden of Reporting. Available at: https://www.globalreporting.org/resourcelibrary/Cost-and-burden-of-reporting.pdf:
[54] Tisdall M. (2016) Insight into Integrated reporting. Available at: http://www.insightcreative.co.nz/blog/insight-integrated-reporting

Compliance		
7	Explanation should be given in the absence of answers to the above	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.

Source: Climate Carbon & Stranded Assets. What do they mean for stock exchanges? SSE Leaders Briefing, 7 December 2015, Paris. Available at: http://www.sseinitiative.org/wp-content/uploads/2015/12/SSE-Carbon-Tracker-Climate-Brief.pdf

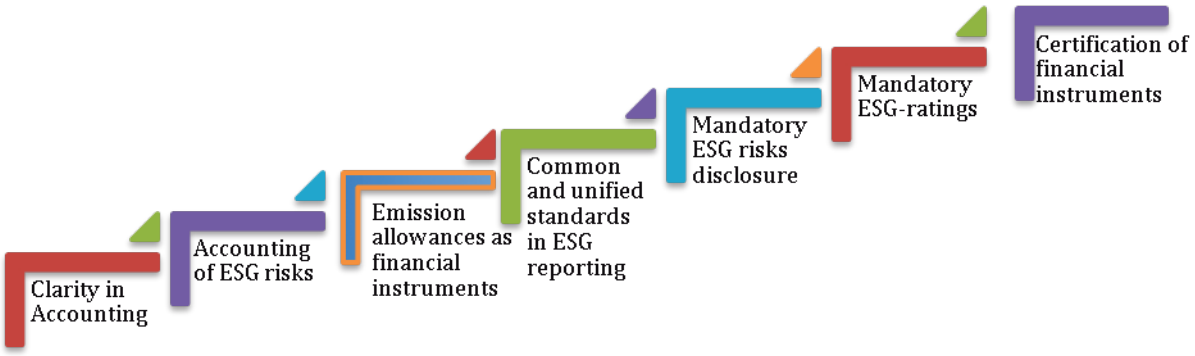
Since the major part of transaction costs are associated with monitoring/accounting, reporting and verification/evaluation, the main task for all the players on financial market is to find the ways how to reduce them.

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 resources, 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 9).

Figure 9: Major steps on the way to reduce/compensate the transaction costs while accumulating climate finance.



Source: built by the authors

First of all, it is about 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 previously use recommendations on how to apply three different IAS (International Accounting Standards) (IASB, 2010):

- IAS 38, Intangible Assets (emission allowances allocated by the government or purchased on the market);
- IAS 20, Government Grants and Disclosure of Government Assistance (if emission allowances were issued for less than 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 stated in Directives 2016/1034/EU, 2014/65/EU – MiFID II, 2003/87/EC and related Regulations).

Table 2: Existing approaches to the reporting according to the ESG Principles (factors)

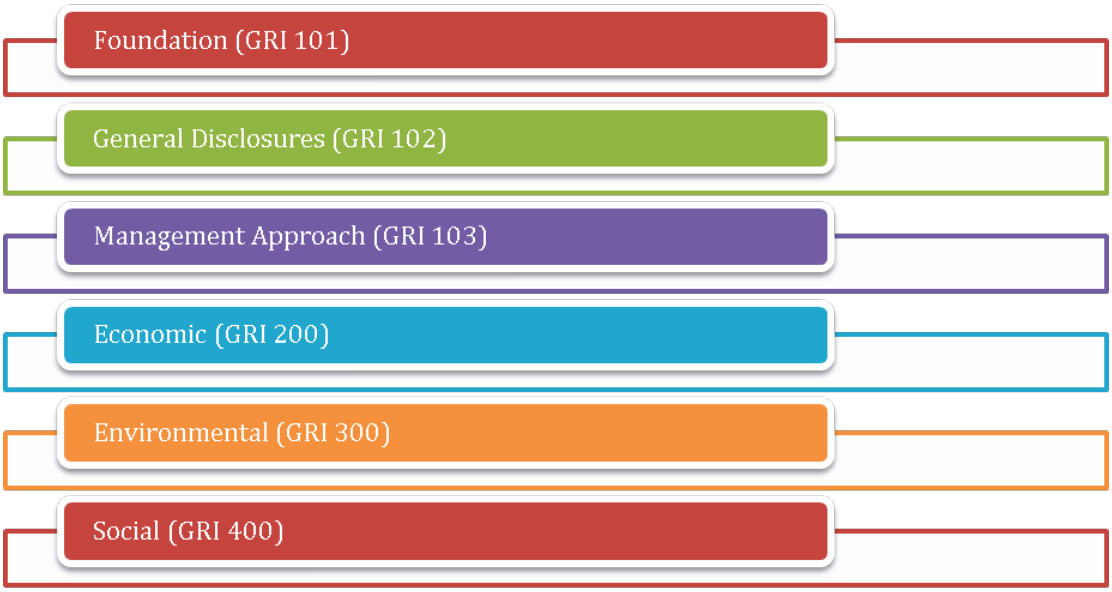
	SASB (Sustainability Accounting Standards Board)	GRI (Global Reporting Initiative)	IIRC (International Integrated Reporting Council)
Type of Guidance	Standards	Guidance	Framework
Scale	U.S.	International	International
Scope	Industry specific	General	General
Target Disclosure	Mandatory filing	Voluntary report	Voluntary report
Target Reporters	Public companies traded on U.S. exchanges	Public and private companies	Public companies traded on international exchanges
Target Audience	Investors	All stakeholders	Investors
Type of Organization	501(c)3	NGO	NGO
Definition of Materiality	Information is material if "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))	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)	"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)

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 2).

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 further evaluation process possible (see Figure 10).

Figure 10: Required general standard disclosures



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

Starting from 2017 all big companies on the territory of the 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 2013/34/EU, 2014/95/EU).

For this purpose, companies must also prepare a set of indicators (KPIs – Key Performance Indicators), which can be interpreted and used during 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 KPIs were approved and used not only on the territory of the 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 KPIs (Key Performance Indicators for ESG).

So, the progress in this area is remarkable – after the Conference in Paris (COP 21, 2015) the leaders 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 non-financial 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.

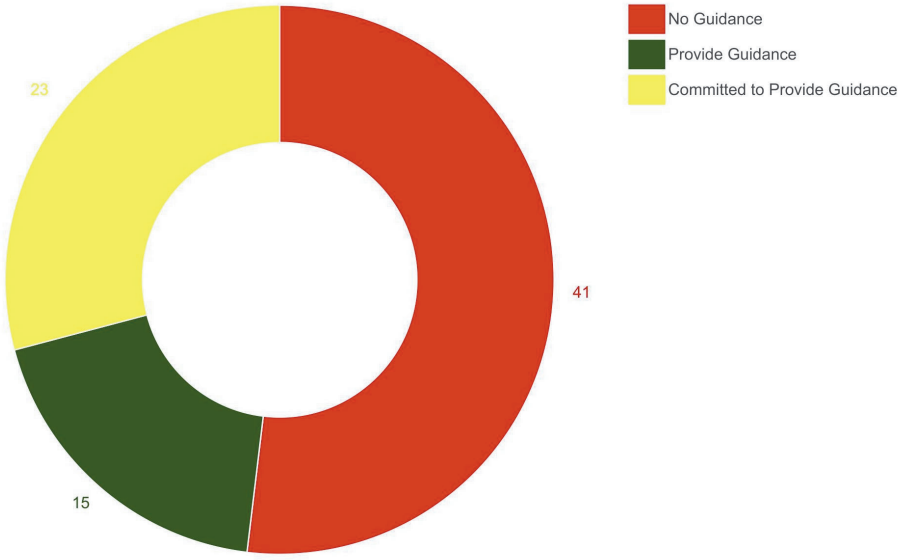
According to the Directives 2013/34/EU, 2014/95, certain large undertakings and groups will be obligated (starting from 2017) to disclose non-financial and diversity information. Moreover, the biggest companies in France are already obligated to disclose non-financial risks[55].

On the other hand, there are some initiatives, which require ESG sustainability/ESG reporting from the companies. Today, this Sustainable Stock Exchange Initiative (SSE) 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 companies that are listed on these stock exchanges during the preparation of reports according to the ESG Principles (see Figures 11)[56].

[55] 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

[56] SSE Engagement.Sustainable Stock Exchange Initiative. Available at: http://www.sseinitiative.org/engagement/

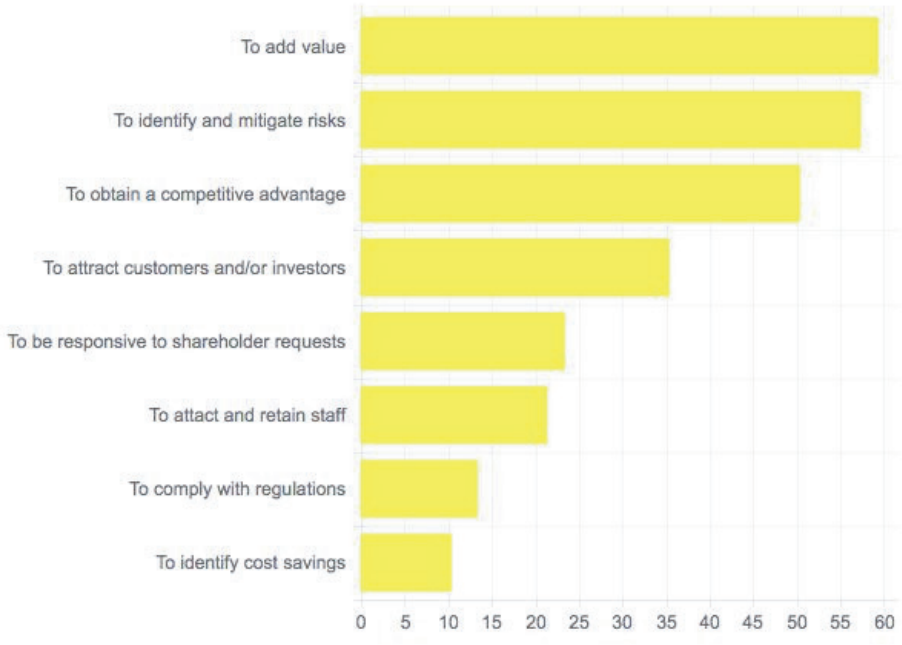
Figure 11: Number of stock exchanges offering ESG reporting guidance in 2016.



Source: SSE campaign to close the ESG guidance gap. Sustainable Stock Exchange Initiative. Available at: http://www.sseinitiative.org/engagement/esg-guidance/

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 EY consulting company) an opportunity to increase the company's value, and the second – identify and mitigate the existing risks (see Figure 12).

Figure 12: The principal objectives for sustainability reporting, %



Source: Sustainability reporting – the time is now. EYGM, 2014, P. 7.

The next step is 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 have started to use ESG Principles by giving ratings to their 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 oekom AG). 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.

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.

Seventh step is tightly connected with quality of financial instruments – certification of "green" debt securities will provide investors with information about the existing risks and planned results (whether they are realistic or not).

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 3).

Table 3: Benefits for issuer and investor from certifying the bond.

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

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

Following 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 worried 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 simultaneously increasing 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 can 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 effectively counteract 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 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 to reduce specific amount of emissions under the Kyoto Protocol. 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 not only positive but also negative consequences for companies and institutions on the financial market.

There are certain challenges for the companies and other economic agents:

- 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 it 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;
- encouraging 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 are associated with high transaction costs. Therefore, carbon taxation could be applicable to 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 KPIs (Key Performance Indicators for ESG);
- mandatory non-financial 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 investors the information about the existing risks and planned results (whether they are 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.

REFERENCES

1. Green Finance and Investment Mapping Channels to Mobilize Institutional Investment in Sustainable Energy (2015). OECD Publishing, p. 43.
2. What are Green Bonds? (2015). International Bank for Reconstruction and Development/ The World Bank, p. 24.
3. Resource Mobilization. Green Climate Fund. Available at: http://www.greenclimate.fund/contributions/pledge-tracker
4. Green Climate Funds approves first 8 investments. Green Climate Fund. Available at:http://www.greenclimate.fund/-/green-climate-fund-approves-first-8-investmen-1
5. Climate, Carbon & Stranded Assets. What do they mean for stock exchanges? SSE Leaders Briefing, 7 December 2015, Paris. Available at: http://www.sseinitiative.org/wp-content/uploads/2015/12/SSE-Carbon-Tracker-Climate-Brief.pdf
6. Haifeng Deng (2015). Improving the Legal Implementation Mechanisms for A Carbon Tax in China. Pace Envtl. L. Rev., Vol. 32, P. 679.
7. Goulder L.H., Schein A.R. (2013). Carbon Taxes versus Cap and Trade: A Critical Review, Climate Change Economics, Vol. 4, No. 3., P. 23.
8. Cuevro H., Gandhi V.P. (1998). Carbon Taxes: Their Macroeconomic Effects and Prospects for Global Adoption – A Survey of the Literature, IMF Working Paper WP/98/73, P. 32.
9. OECD (2013). Effective Carbon Prices, OECD Publishing, P. 48.
10. Melzer J. (2014). A Carbon Tax as a Driver of Green Technology Innovation and the Implications for International Trade, Energy Law Journal, Vol. 35:45, P. 68.
11. Flannery B.P. (2016) Carbon Taxes, Trade, and Border Tax Adjustments, Policy Brief, No 16-02, P. 2.
12. Corkey, Jim (2009). A Carbon Tax – Onwards, Revenue Law Journal: Vol. 19: Iss. 1, Article 7, P. 3.
13. Environmental tax revenues Eurostat. Available at: http://ec.europa.eu/eurostat/web/environment/environmental-taxes/database
14. OECD (2015). Revenue Statistics 2015, OECD Publishing, p. 366.
15. OECD (2016), Revenue Statistics in Latin America and the Caribbean 2016, OECD Publishing, Paris, p. 233.
16. Buchner B.K., Trabacchi C., Mazza F., Abramskieh D., Wang D (2015). Global Landscape of Climate Finance 2015. A CPI Report, Climate Policy Initiative., P. 3.
17. Auctioning. German Auctioning of Emission Allowances. Periodical Report: Annual Report 2015. – German Emissions Trading Authority (DEHSt) at German Environment Agency. – P. 5.
18. Gonta A., Kotina H., Stepura M., Sushchenko O. (2015) Sustainable Development Policy: Experience of Germany in Combating Environmental and Social Risks, Possible Ways to Implement it in Ukraine. KAS Policy Paper No 23, P. 21.
19. Capacity Building for the Establishment of Emission Trading Schemes in China. Available at http://ets-china.org
20. Buchner B.K., Trabacchi C., Mazza F., Abramskieh D., Wang D (2015). Global Landscape of Climate Finance 2015. A CPI Report, Climate Policy Initiative., P. 7.
21. Commission Regulation (EU) No 1031/2010 of 12 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Derictive 2003/87/EC of the European Parliament and the Council establishing a scheme for greenhouse gas emission allowances trading within the Community. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02010R1031-20111125
22. Investors raise €1.6bn for offshore wind. Environmental Finance. Available at: http://env-finance.msgfocus.com/c/11kXJZzs1WbWSZR8CQOP4xNIj
23. Green Bond Principles, 2015. Voluntary Process Guidelines for Issuing Green Bonds.ICMA (International Capital Market Association), P. 6.

24. Review of the Markets in Financial Instruments Directive (MiFID) and Proposals for a Regulation on Market Abuse and for a Directive on Criminal Sanctions for Market Abuse. MEMO/11/719. Available at: http://europa.eu/rapid/press-release_MEMO-11-719_en.htm?locale=en
25. Global carbon market to reach record volumes by 2017. Available at: http://www.commodities-now.com/reports/environmental-markets/18014-global-carbon-market-to-reach-record-volumes-by-2017.html
26. Carbon Markets: Renewed Expectations. Available at: https://www.iif.com/sites/default/files/general/cmm_carbon_vf_1.pdf
27. P. Kossoy A., Peszko G. (2015). State and Trends in Carbon Pricing 2015. The World Bank Group, P. 37.
28. EU must scrap carbon compensation scheme. EUobserver. Available at: https://euobserver.com/opinion/133058
29. EEX 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
30. Jed Emerson (2003). The blended value map. Tracking the Intersects and Opportunities of Economic, Social and Environmental Value Creation. URL: http://www.hewlett.org/uploads/files/BlendedValueMapFinal.pdf
31. Bowen, Howard B. Social Responsibilities of the Businessman, Harper, 1953, p. 276.
32. Perkins, George W. The Modern Corporation. The Currency Problem and the Present Financial Situation, New York, The Columbia University Press, p. 163.
33. Lapina I., Borkus I., Starineca O. (2012). Corporate Social Responsibility and Creating Shared Value: Case of Latvia. International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering, Vol:6, No:8, 2012, p. 2231.
34. Porter M.E., Kramer M.R. (2011) Creating Shared Value: How to Reinvent Capitalism – and Unleash a Wave of Innovation and Growth. Harvard Business Review, January/February 2011, pp. 63-70.
35. Elkington J. (1997) Cannibals with Forks: The Triple Bottom Line of 21st Century Business. Capstone, Oxford, 402 pp.
36. Pigou A.C. The Economics of Welfare. Palgrave Macmillan, 2013, p. 896.
37. Coase R.H. (1960). The Problem of Social Cost. Journal of Law and Economics, Vol. 3, pp. 1-44.
38. Dahlman, Carl J. (1979). The Problem of Externality. Journal of Law and Economics. 22 (1), pp. 141–162.
39. Williamson, O. E., (1989). Transaction Cost Economics. HANDBOOK OF INDUSTRIAL ORGANIZATION VOLUME I, P. 142.
40. Frasch, F., (2007). Transaction Costs of the EU Emissions Trading Scheme in German Companies. SUSTAINABLE DEVELOPMENT LAW & POLICY, p. 51.
41. Hertz R., Lo V. (2010) Mittelständische Unternehmen im Emissionshandel: Unsicherheiten dominieren. Nr. 17, Februar 2010, p. 7.
42. Heidl P. (2012) Transaction Costs and Tradable Permits: Empirical Evidence from the EU Emission Trading Scheme. Discussion Paper No. 12-021, März, p. 21.
43. Ioannou, I. & Serafeim, G., (2011). European Business Review. Available at: http://www.europeanbusinessreview.com/the-rise-and-consequences-of-corporate-sustainability-reporting/
44. 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.
45. Nazari M. (2010) What are Cost Drivers of Sustainability Reporting for First Timers? Available at: http://prizmablog.com/2010/06/27/what-are-cost-drivers-of-sustainability-reporting-for-first-timers/
46. Global Reporting Initiative (2015). Cost and Burden of Reporting. Available at: https://www.globalreporting.org/resourcelibrary/Cost-and-burden-of-reporting.pdf:
47. Tisdall M. (2016) Insight into Integrated reporting. Available at: http://www.insightcreative.co.nz/blog/insight-integrated-reporting

48. Climate Carbon & Stranded Assets. What do they mean for stock exchanges? SSE Leaders Briefing, 7 December 2015, Paris. Available at: http://www.sseinitiative.org/wp-content/uploads/2015/12/SSE-Carbon-Tracker-Climate-Brief.pdf
49. Alignment. Sustainability Accounting Standards Board. Available at: http://www.sasb.org/approach/key-relationships/
50. SSE campaign to close the ESG guidance gap. Sustainable Stock Exchange Initiative. Available at: http://www.sseinitiative.org/engagement/esg-guidance/
51. 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
52. Sustainability reporting – the time is now. EYGM, 2014, P. 7.
53. SSE Engagement. Sustainable Stock Exchange Initiative. Available at: http://www.sseinitiative.org/engagement/
54. Measuring Intangibles. Rebecosam`s corporate sustainability assessment methodology. RebecoSAM. 2015, p. 17.

ABOUT THE AUTHORS

Dr., Oleksandr Sushchenko

Head of the Scientific Society, Associate Professor in the Department of Finance, Kyiv National Economic University named after Vadym Hetman; head of *Center for BLENDED VALUE Studies*.

Prof., Dr. Reimund Schwarze

Chair in International Environmental Economics, European University Viadrina (Frankfurt, Oder, Germany);

Head of Department of Climate Economics - *Center for Environment Research* (Leipzig, Germany).