INNOVATION IN WOODWORKING INDUSTRY AND ENGINEERING DESIGN, 2/2014 (6): 116–128

GREEN GROWTH FINANCING

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ABSTRACT

This article describes the definition of green finance as the broad range of funding for environment-oriented technologies, projects, industries or businesses. There is the analyze of the state of green financemarket. The problems and prospects are identified. It was noted the increasing role of financial instruments in the transition to low-carbon and climate-resilient development.

The conclusion is:greening economic growth is the only way in which sustainable, inclusive development can be achieved. Many countries have seen the benefits of green growth, anddeveloping countries are taking a clear leadership role in various low carbon initiatives and are using domestic policy mechanisms.

Key words: green growth financing, green finance, climate bonds, low carbon economy

INTRODUCTION

In the past decades, the number of countries making affords reducinganthropogenic impacts, mostlygreenhouse gas (GHG) emissionshas been increased a lot. The international community has recognized the real threat of comingecological crisis. Therefore, there is no doubt that it is critical to support countries to make the transition to low emission development pathways and a green economy by assessing emissions-reduction opportunities.

Greening economic growth is the only way in which sustainable, inclusive development can be achieved that will satisfy the basic needs of increasing population and provide them with equal rights to material prosperity and wellbeing . A key challenge is the urgent need to reduce carbon emissions to avoid the ecological catastrophe. Another imperative is the critical need to increase natural resource productivity to meet unprecedented demands for clean water, food and urban development.

It is important to explain the term of *green growth*. Green growth means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies. To do this it must catalyze investment and innovation, which will underpin sustained growth and give rise to new economic opportunities [1]. There is one more definition of green growth: economic growth paradigm that simultaneously pursues growth and improvement of environment by driving growth and job creation through R&D in clean energy and green technology. Improvement of environment by conserving and efficiently using energy and resources and mitigating climate change and environmental degradation [2].

We should understand that green growth is the special path of economic development which helps a country improve energy security, build the innovative industries, improve local health by reducing pollution, and manage natural resources more effectively. Green

Growth makes economy more resilient to climate change and increases the competitiveness in current situation.

It is high time the considerable progress has been made in transitioning to green growth. The transition to low emission development and a green economy is critically because:

1. The impacts of economic activity on environmental systems are creating imbalances, which are putting economic growth and development at risk. Increased efforts to address climate change and biodiversity loss are needed to address these risks.
2. Natural capital, encompassing natural resource stocks, land and ecosystems, is often undervalued and mismanaged. This imposes costs to the economy and human well-being.
3. The absence of coherent strategies to deal with these issues creates uncertainty, inhibits investment and innovation, and can thus slow economic growth and development.

This underscores a need for better ways of measuring economic progress: measures to be used alongside GDP, which more fully account for the role of natural capital in economic growth, human health and well-being [3].

To make the transition to low emission development and a green economy by assessing emissions-reduction opportunities there is a great necessity of creating feasible Green Growth Strategies with main components:

1. policies and legislation;
2. financial and economic instruments;
3. programs and institutions;
4. regulatory environment.

While different country situations will demand different responses, clear and predictable policy signals to investors and consumers will deliver benefits from greening growth in the form of:economic gains from eliminating inefficiency in the use and management of natural capital and new sources of growth and jobs from innovation and the emergence of green markets and activities. [1].

In terms of the OECD's Green Growth Strategy, these would include energy-efficiency projects, many types of renewable energy, carbon capture and storage, nuclear power, smart grids and electricity demand side-management technology, new transport technologies (electric vehicles), floodplain levees and coastal protection as well as sustainable agriculture and water infrastructure [1].

Green growth strategies need to pay specific attention to many of the social issues and equity concerns that can arise as a direct result of greening the economy – both at the national and international level. This is essential for successful implementation of green growth policies. Strategies should be implemented in parallel with initiatives centering on the broader social pillar of sustainable development[1].

The green growth can be stimulating by global investment projects, which we usually call "Green finance".

There is no internationally agreed definition of green finance yet. This term describes a broad range of funding for environment-oriented technologies, projects, industries or businesses. In this paper, we understand *the green finance as financial activities, which expand the financial markets, improve the environment and wellbeing, develop environmentally responsible investment and promote economic growth*. A more narrow definition of green finance refers to environment-oriented financial products or services, such as loans, credits, deposits and

different types of securities, insurances. Green investing recognizes the value of the environment and its natural capital and seeks to improve human well-being and social equity while reducing environmental risks and improving ecological integrity [4]. In the international context, green finance is typically defined as incremental cost. It is important to note that the concepts of incremental cost and capital investment are different but closely linked [3]. Other terms used to describe green finance include "environmentally responsible investment" and "climate change investment".

Economic Principles of green finance reflect the core understanding of it. Green finance resources are limited. Therefore, economic efficiency requires that green finance maximize its contribution to its intended objective of GHG emissions abatement. There are three key economic principles that, if followed, will tend to increase the efficiency with which green finance is used:

1. Green finance should reduce costs (or increase revenues) for low-emission investments, thereby off setting the externality of GHG emissions, increasing returns on low-emission projects, and leading to more investments in low-emission projects.
2. Funding should be concentrated on investments with the lowest cost per ton abated.
3. Financial support should not exceed the amount that is needed to cause investment in the project [3].

Green finance requires country-specific public policies and instruments with the public sector taking the lead. Public and private sectors need to work together to develop unique solutions. It is very important to note that most green investments are less financially attractive when compared against traditional but less eco-friendly alternatives. At the same time the financial and institutional interventions for accelerating green investments are wide and numerous.

Green finance helps to reduce and ultimately close the financial gap of low-emission projects by providing an economic rationale for the actions of each stakeholder and, therefore, minimizes the chances of creating inadvertent distortion.

Green industries and technologies are all at different levels of maturity, thus, requiring different levels of funding from different sources of capital. There are generally three sources: domestic public finance, international public finance and private sector finance. Domestic public finance refers to the direct funding by a government while international public finance refers to funding from international organizations and multilateral development banks; private sector finance consists of both domestic and international funding sources. Green financing can be packagedin different ways through various investment structures. Green finance is a core part of low carbon green growth because it connects the financial industry, environmental improvement and economic growth. All green industrial propositions cost money, and many green industry business models are more often than not untested or unconventional. Therefore, traditional finance may find it difficult or commercially unattractive to finance these green industrial propositions. [5].

EXPERIMENTAL METHODS

The international community has created a number of funding mechanisms for green investments. The list of various green financial instruments expands fast. It is important to classify them for better understanding. There are four main categories: corporate &investment finance, retail finance, asset management and insurance (figure 1).

Every year we see that financial companies and different actors create new instruments for each category, they may vary for different regions and countries.

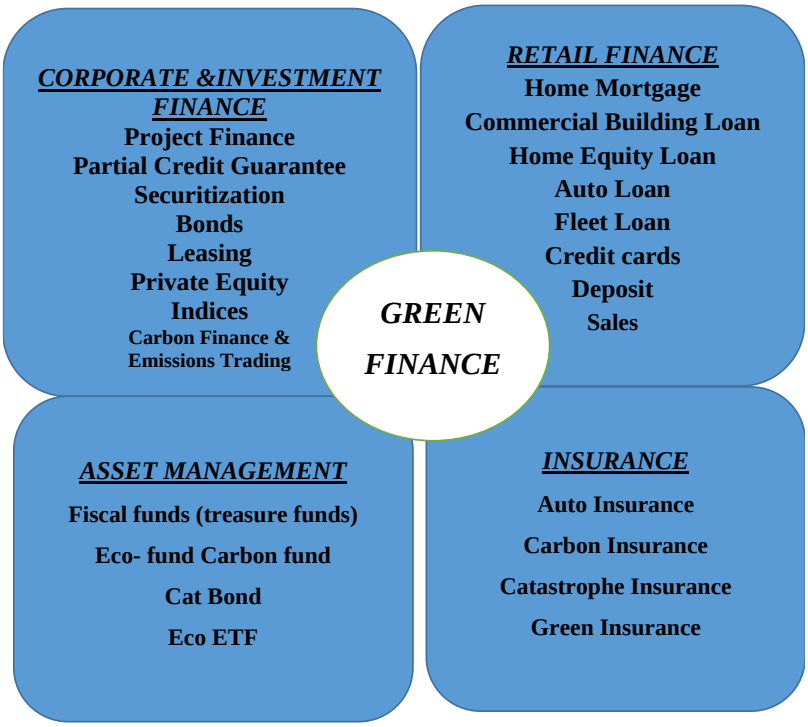

Figure 1: Main categories green financial instruments [6]

Green finance can be used in two ways to close the capital market and financial viability gaps:

1. by rebalancing policy distortions that cause some low-emission investments to be financially not viable;
2. by monetizing the benefits that low-emission investments create by reducing GHG emissions and local air pollution reduction. [7]

Table 1: Policy measures promoting the green finance sector [6]

Policy measure	Description
Environmental requirements reflected in statutes for investment, lending, credit rating, accounting, etc.	• Require financial institutions to address environmental concerns: fiduciary and lender's liability on the environment.• Reflect environmental factor in credit rating and accounting procedures
Corporate disclosure of environmental information	Environmental information as a requirement for listing and disclosure. Shift from voluntary to mandatory disclosure Gradually o Finance institutions in industrialized countries already are required to disclose comprehensive environmental information pursuant to voluntary guidelines, such as the Global Reporting Initiative
Certification of green technology, enterprise and industry to guide investment and lending	Green business certification programmes, which are specific to industry, technology, business type and size rate environmental performance; for example, categorizing green and non-green businesses

Policy measure	Description
Green indices	Green enterprise index to promote green investment Green (carbon) risk index to promote investment in green bonds JPMorgan and Innovest co-developed the JPMorgan Environmental Index-Carbon Beta (JENI-Carbon Beta Index), the world's first bond index that reflects climate change risk of businesses
System for green information provision	Build a mechanism to access essential green information. Information for financial institution's credit and investment decisions: license and approvals from the environment ministry and other authorities, regulatory compliance, green enterprise designation, participation in voluntary agreements, etc
Green enterprise rating agency	Promote green company rating agencies Three major rating agencies that specialize in corporate environmental performance are Innovest (US), EIRIS (UK) and SAM (Switzerland)
Green financial professionals	Train professionals for research, review and investment to provide green financial services Introduce professional training programmes and promote expertise
Green financial consumer education	Initiate public and consumer education to promote awareness of: the need for green growth green bubbles, environmental risks and other issues
Conference on green finance	Regular conferences on green finance in different regions

In addition, green finance are used in many sectors and transformed to many various products. Main categories for green finance implementation are infrastructure finance, financial assistance for industry or firms and financial markets. Green financing related to climate change includes mitigation and adaptation investments [8].

There are three main streams for such mechanisms; they are public, private and combined. Such investments could be classified to domestic, foreign and international. Many private investors perceive the risks of environmentally sustainable projects as not justified by the expected returns. Public financing mechanisms can tilt this balance in favor of perceived profitability; for example, by offering soft loans or guaranteeing loans from private banks. Public funding can help spur private investment [3].

Global investment in green growth is not a new category or a phenomenon nowadays. In general, we use this definition from 1970s, but the special significance it is given for last two decades, especially after Kyoto Protocol (1997).

Global investment in renewable energy in 2012 hit a new record; up 17% on 2010 to 302 billion USD. This represented a six-fold increase between 2004 and 2011and it was 93% higher than in 2007, the year before the global financial crisis. (BNEF, 2013a) [9].

Now from the numerous reports of International Organizations, we know that the green economy's investment needs are relatively modest compared to global infrastructure investment. Independent of green growth, there will be major investment in infrastructure over the coming 10 years. Total infrastructure investment worldwide is estimated at about 7USD trillion per annum by 2020 of which 1.5USD trillion is energy related [1]. The report of International Organizations for Economic Co-operation and Development (OECD) tells us that additional investment needed to meet the climate challenge—for clean energy infrastructure, sus-

tainable transport, energy efficiency and forestry—is about 0.7 USD trillion per year.[1,9]. Recent World Bank and IEA studies have noted that a large proportion of this investment shortage will need to be provided by East Asia and Pacific (EAP) region countries [7]. To move to a low carbon pathway consistent with 2ºC warming, Project Catalyst[1] estimates that about 290 billion USD per annum by 2020 of this total capital investment will be needed for low carbon infrastructure in developing countries (these include all middle income, rapidly industrialising countries as well as least developed countries)Capital investment is defined as the upfront capital investment required for infrastructure and typically takes the form of debt, equityor investment grants. This could be either on concessional terms, mostly from governments and multilateral development banks (MDBs), or commercial terms from MDBs or the private sector.Figure 1 reflects that most of the capital investment, 215 billion USD of the 290 billion USD, occurs in wealthier developing countries, which have well established capital markets and where project developers should be able to mobilise local capital as long as the projects are economically viable. This high share of mitigation measures in wealthier nations can be explained by the availability of mitigation opportunities because of these countries' higher overall emissions. This group includes BRICS[2], Mexico, and Middle East. The second group includes rest countries of developing Asia, developing Europe (outside EU) and Latin America. All of them need 70 billion USD. Only 5 billion USD of the estimated required capital investment is needed in the least developed nations (approximated here by countries with no capital markets), which might not be able to raise investment capital locally but might require financial support from developed nations for the investment [1].

Globally, more and more countries are embarking on the transition towards green growth. Action is no longer limited to developed nations. Increasingly, developing countries are taking a clear leadership role in various low carbon initiatives and are using domestic policy mechanisms such as standards (for renewables, buildings, appliances, vehicles) or support mechanisms such as feed-in tariffs or tax credits to achieve results.Developed countries have committed to support developing countries' transition to green growth with $100 billion per annum in public and private finance by 2020[3].

[1] Project Catalyst was launched in May 2008 to provide analytical and policy support for stakeholders engaged in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations on a post-Kyoto international climate agreement. Project Catalyst and its working groups provide a forum where key participants in the global discussions can informally interact, conduct analyses, jointly problem solve, and contribute ideas and proposals to the formal UNFCCC process.[1]

[2]Group of emerging countries: Brazil, Russia, India, Chine, SAR

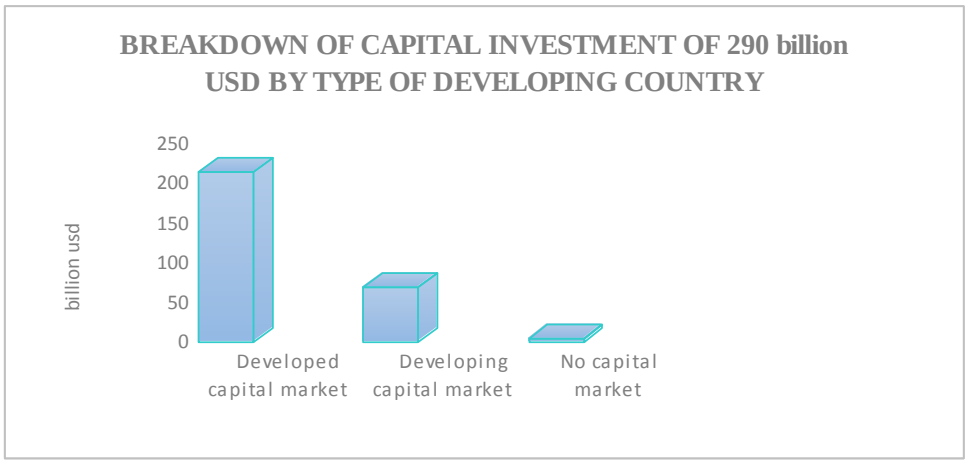

Figure 2: Breakdown of capital investment of 290 bn. USD [1]

Private financiers see these massive investment requirements as an opportunity. Today, we see major growth in clean energy investment, with financial flows worldwide approaching those in carbon intensive energy sources. Further, developing countries are proving an increasingly important source of capital. Since 2007, clean energy investment originating from outside the OECD grew at 27 % per year compared with 10 % per year from OECD countries, albeit from a far lower base [9]. The situation is different in developed countries, the large emerging economies and other developing countries where a significant amount of investment in green infrastructure will be needed a lot.

The financing needs differ by sector: Project Catalyst analysis suggests that most of the capital investment in developing countries is concentrated in the power sector (155 USD billion per year by 2020) and energy efficiency measures (123 USD billion per year by 2020). Forestry and land use and adaptation on the other hand have little investment capital associated with them [3].

Financing for green infrastructure such as renewable energy comes in a variety of forms. In the OECD in 2011, 62 % of new investment in renewable energy came from project finance or financial arrangements specific to individual projects, which are common for power and infrastructure investments in general. The remaining 38 % was invested by companies, using their balance sheets. Within project finance, roughly 63 % was financed through debt, including loans from commercial and public banks, as well as debt finance provided for projects by institutional investors and publicly traded companies (CPI, 2013a) [1]. These debt investments are accompanied by equity investments, from project developers, banks, asset managers, and others. As previously mentioned, the situation is different in emerging and developing economies where the "quasi-public" sector plays a much larger role.With over USD 83 trillion in assets, institutional investors are frequently cited as an alternative source of financing long-term investment, yet direct infrastructure investment only accounts for around 1 % of the asset allocation of the average OECD pension fund (OECD, 2012c), and some estimates suggest that green infrastructure accounts for around 3 % of that amount — a tiny proportion of assets available worldwide for investment (BNEF, 2013a) [4,10].

The United Nations Environment Programme (UNEP) estimates that US$10 billion of public funding for climate mitigation could leverage 50–150 USD billion of private investments. It is important that public

finance is used to create 'smart' leverage, i.e., to generate as much investment flow as possible, for example through lending or equity investment. The design of the mechanisms is critical – some mechanisms can create leverage of more than 10 times [3, 5].

Even if public investment is small relative to private funds, it can catalyse corresponding private-sector activities. Direct government financing for green growth can also take place through sustainable public procurement and eco-efficient investment in public buildings and enterprises[7]. Public action and support can attract private investment by reducing the cost of capital of green growth. Figure 3 shows current and potential required public and private investment in bn. USD and figure 4 reflects the current estimated climate-specific investment flows in 2011 (USD billions).So it we can see that the parts of domestic and cross border investment are almost equal 63 USD bn and 75 USD bn. each.

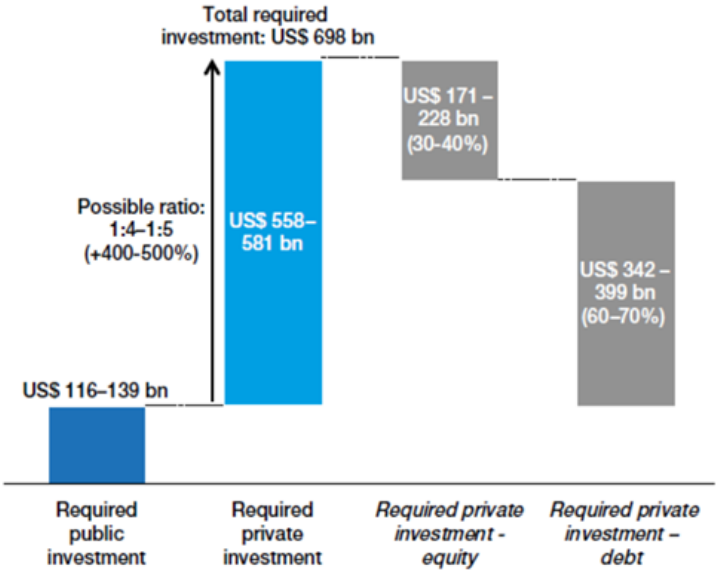

Figure 3: Potential public-private finance mobilization to close the cost gap for climate-specific investment. in bn. USD [9]

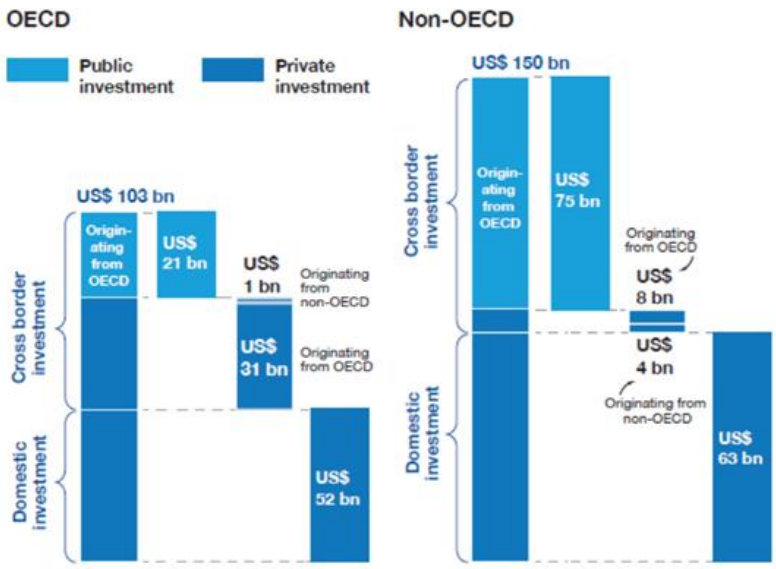

Figure 4: Current estimated climate-specific investment flows in 2011 (USDbillions) [9]

Current international private finance flows to low carbon investments are estimated roughly at 40 USD billion [3, 11]. Global green investment could be accelerated by focusing more on developing country markets as a source of investment. Looking through a clean energy lens, investment in asset finance originating from non-OECD countries for both domestic and cross-border uses grew from 4.5USD billion in 2004 (19 % of total asset finance) to 68 USD billion in 2011 (41 % of total asset finance), at a rate of 47 % per year. Foreign cross-border investment from outside the OECD represented the highest growth rate in any clean energy flow category: 61 % per year on average, a 28-fold increase. Based on current growth rates in investment originating in non-OECD countries, clean-energy asset finance flows are expected to exceed those originating from the OECD in 2012 [4].

Traditionally, bonds have been the dominant asset class favoured by different investment fund managers in the world, making up on average around 33 % of portfolios [4]. Green bonds are another emerging source of finance, with an estimated market size of 174 USD billion, which can also help reduce capital costs of green investment and close the cost gap [9, 12]. Figure 5 shows a taxonomy of public instruments and mechanisms to create attractive green-growth investment conditions. They are described by instruments, mechanisms and examples with different public support mechanisms and public financed instruments.

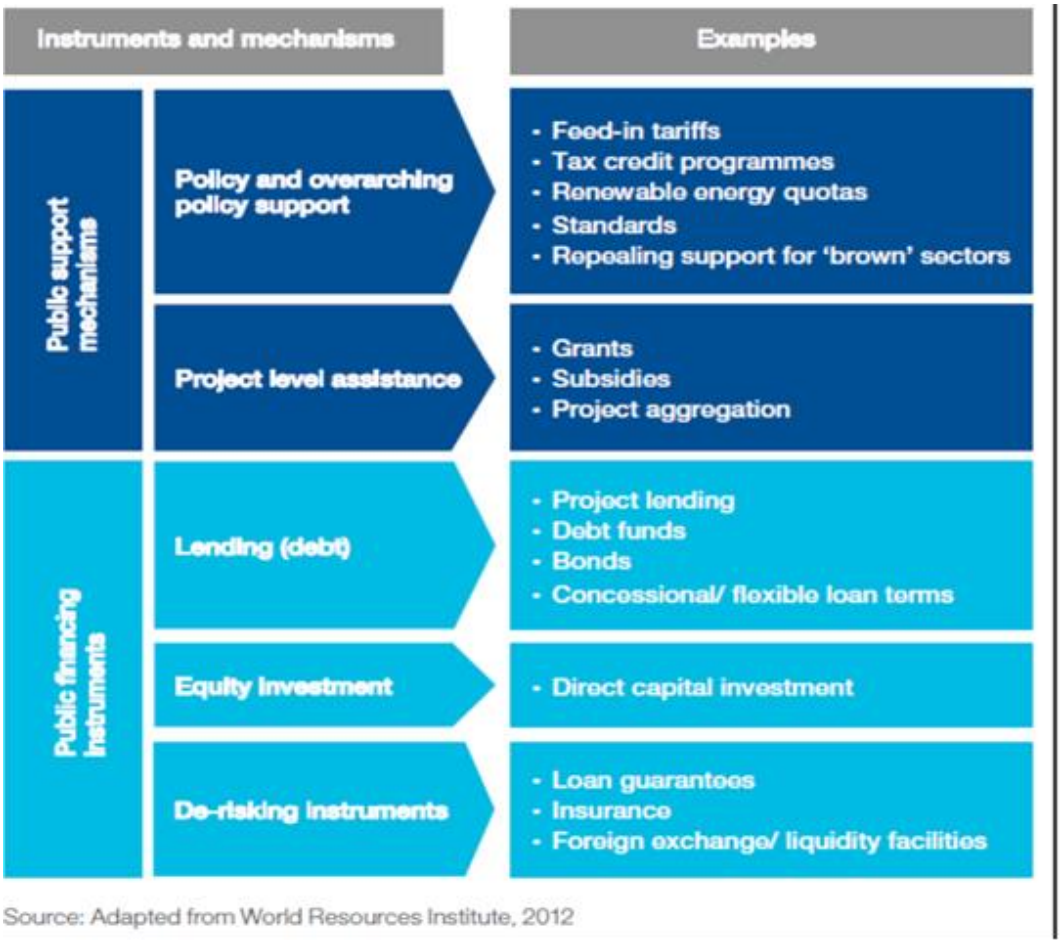

Figure 5: A taxonomy of public instruments and mechanisms to create attractive green-growth investment conditions [9]

Of course we realize that any investment faces with a number of different risks and green finance is the same. Public action and support can attract private investment by improving the risk-reward calculus because private investment in green technologies faces a number of risks, the maim of them are:

- Political risks include changes in government that affect the legal system, and the risk of civil unrest in certain countries.
- Macroeconomic risks include fluctuations in economic conditions and commodity prices, interest and exchange rates.
- Financing risks refer to the situation in global and domestic economy, development of capital markets.
- Policy risks entail regulatory changes, such as those to feed-in tariffs or fossil-fuel subsidies that can alter a project's economic viability.
- Technology and operational related risks are those intrinsically related to the technology in question. These range from performance-related risks, where revenues might be lower than expected, to risks resulting from the lack of or unreliable supporting infrastructure, such as electrical and water-grid networks.
- Capacity risks refer particularly to development assistance and aid, where institutions and governments are unable to ensure funding is disbursed to projects and utilized [9].

Many green investments present unique risks because of their cash profiles [7]. Mobilizing private finance at scale requires that the risks of green investments be reduced to about the same levels as those faced by alternative investment.Therefore, there is no doubt that it is critical to create and upgrade comprehensive risk management system under each project.

One of the most powerful actor in this area of green growth financing is the World Bank Group, which manages a wide range of windows that could be used to introduce tools and instruments that improve financial viability. Major windows include several funds, they were designed to provide financing for climate-related investment to combat climate change. They are disbursed as grants, highly concessional loans and risk-mitigation instruments and are administered through multilateral development banks (MDBs). The World Bank Group Climate Investment Funds (CIF) – a 6.4 USD billion facility that draws on the expertise of several MDBs to help developing countries pilot low-emission and climate-resilient development. Since September 2008, 14 donor countries have pledged over 7.6 USD billion (in historical value) to finance the two CIF trust funds. [13]. CIF consists of two funds:Clean Technology Fund (CTF) and Strategic Climate Fund (SCF). Clean Technology Fund (CTF) provides highly concessional financing targeted at large-scale, country-initiated low-carbon projects in the power sector (nearly two thirds of funding), the transport sector (~14 % of funding) and for energy efficiency (~20 % of funding). It is very important to note that CTF funds have mobilized an estimated 8 USD in co-financing for every dollar allocated from public sources (implying a ratio of 1:8). The total amount pledged by the nine contributing countries to the CTF has been 5.154 USD billion (in historical value) as of March 31, 2013 [14]. As of September 2012, 9 donor nations had pledged 4.8 USD billion to the CTF Trust Fund, and 1.9 USD billion was approved for 28 projects in 18 countries. This has led to co-financing of 16.4 USD billion, of which 6.4 USD billion (40% of total co-financing) is from private

sources, with the remaining co-finance provided by governments, multilateral financial institutions and carbon finance. Taking a leverage definition of CTF funding to private sources of co-financing only, the revised ratio is 1:3.3. Further 66 projects are awaiting approval of 2.2 USD billion of funding with expected additional co-financing of 18.2 USD billion [7,14].

The second body is the Strategic Climate Fund (SCF)—targets three separate programs to channel financing for climate change mitigation and adaptation investments. The programs include the Forest Investment Program, the Pilot Program for Climate Resilience, and the Program for Scaling-Up Renewable Energy in Low Income Countries. These funds are of course in addition to the non-climate specific windows of the World Bank Group including IBRD lending to middle-income countries, IDA concessional finance to low-income countries, IFC finance of private companies in developing countries, as well as guarantees offered by MIGA, the IFC and the World Bank Partial Risk and Partial Credit Guarantee products. [7, 14]

Institutional investors – particularly, pension funds, Public Pension Reserve Funds (PPRFs), insurance companies, investment funds such as mutual funds and other forms of institutional savings– are increasingly important players in financial markets and in green finance market particularly . With around USD 22 trillion of assets under management and USD 1 trillion of new capital inflows in 2012 in the OECD, pension funds play an important role in the economy. Although Sovereign Wealth Funds (SWFs) have less available capital compared to other institutional investors, with assets under management of approximately USD 6 trillion (SWF Institute, 2013) [4]. They are increasingly being approached for funding green ventures — particularly in emerging and developing economies.This is certainly critical in the case of unprecedented demand for capital to fund low carbon infrastructure.

RESULTS AND CONCLUSIONS

Green growth financingshould be based on Green Growth Strategy with its main bricks:

- policies and legislation;
- financial and economic instruments;
- programs and institutions;
- regulatory environment.

To support and to activate the transition of developing nations towards green growth, the international community will have to take steps to grow the current climate finance system towards its long-term financing objective and to improve its effectiveness. The main elements of this system include bilateral development agencies, bilateral development banks, international agencies and funds, and MDBs, which transfer public finance from developed nations. Together these elements provide around 10 USD billion per annum for the last three years [10].

Development and testing of new financing tools in different regions with MDBs and NGOs to design and test public financing structures to mobilize private finance. Such cooperation is also helping to unlock private financing for clean energy in underdeveloped and emerging countries by exploring bottlenecks to deploying private finance. Specific models have been already developed and tested through this process.

As developments in recent years have shown, an increasing number of countries are realising the benefits of green growth and are putting measures in place to transition their economies to a climate resilient and sustainable future. This transition has progressed largely and nowadays many countries have

seen the benefits of green growth and that increasing momentum towards green growth is moving the world in the right direction. Action now needs to be focused on sustaining and accelerating this momentum.Benefits of green growth are neat arrangement of argumentsand include: low carbon economy, energy and resource security, creation of new innovative industries, transition to renewable energy resources, sustainable forestry and sustainable development.

There are a lot of to do for green finance to be effective, it is important to make system performance clear and comprehensible, green flows leverage the much larger underlying capital flows including development finance and private capital flows towards green growth. This critically requires a serious reframing: from green finance to green growthfinancing. Currently, green finance flows are very intransparent and economic actors very poorly understand their impact still. The transparencyrequires to be improved. The information on how much financing is provided for climate (in particular what type of money has been provided – grants, loans, equity, or guarantees), what it is spent on (what share is mitigation and adaptation, which sectors is it spent on and which countries) and how effective this spending has been (how many tonnes of mitigation have been delivered, how much of that is truly additional, what was the effective cost per tonne of mitigation delivered). There is no standard way of reporting on these issues yet, and reviews of effectiveness are likely to be intrusive and hence likely to be objected to by providers and recipients of funds [10,11]. The green system's performance of green finance needs to be more comprehensive and consists of set of principles and measures. It will be developed such way that donors and recipients to understand for each dollar spent how many tonnes of emissions are mitigated, whether investment has been transformational to green economy, whether long term lockin effects have been avoided and whether an economy has been made more climate resilient [3].

To make conclusion we should note that green finance and economic growth are very close categories. So green finance funds green enterprises and technologies, stimulates development ofnew green financial products and services and green investors. It is possible to display much consideration of environmental risks in lending decisions and stimulate efficient operation of emission trading market. All of these items reflect development of new technologies, promotion of eco-friendly industries, develop environmentally responsible investment and promote economic growth.

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