

# Industrial Policy, Investment and Green Growth

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**Abstract** The Juncker Plan, along with other measures of economic policy, is an attempt to rectify the fall in demand of European investment, raising investment and innovation capacity of enterprises, in a framework of perceived excess of austerity policies and some progress towards a new European industrial (and fiscal) policy. The Plan indicates the need to reconstitute investment profitability and the importance of environmental policies. Green growth policies have become particularly popular in the last decade, but their effects could be much greater because of the growing importance of intangible investment and the industrial changes, such as those expected from the EU program “Industry 4.0”, the growing e change as market failure “global”, and because the green technologies seem to offer the prospect of a new technological, industrial, and research-driven paradigm. The UN Report “Better Growth”, “Better Climate” main thesis is that climate mitigation policies may not have a negative impact, but can even represent a stimulus for economic growth. The idea is that it is possible to combine growth and climate objectives by increasing resource efficiency, by investing in infrastructure and promoting innovation in urban policies, land use and energy sources.

The concept of sustainable development appears to be one of the drivers of green financing, with a growing influence on public awareness of a broad accountability set of criteria to judge governments and corporations on ethical grounds. In many cases, green projects lack an articulated financial structure that allows them to be competitive in attracting financial resources: they may be too small, too specialized, dependent on very specific and risky sources of income, or, due to their public or quasi public nature, not capable to generate appropriable cash flows that may permit risk sharing through concessions or similar private public partnerships. The role of the government in improving this situation is thus expandable on a number of fronts and may prove to be decisive.

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## 1 The Empirical and Theoretical Conditions

Economists are generally skeptical or hostile to industrial policy. Hostility probably can be traced back to the debate on import substitution and the free trade and, more recently, to the theories of rent seeking. These identify the industrial policies as one of the main culprits of faults created by the contiguity between policy makers and economic and financial lobbies. A more benevolent interpretation includes under the name of industrial policy measures that, taken together, are designed to improve the ability of a country to cope with its economic environment by improving the structure of its businesses. The word “industrial” indicates that these policies seek to generate changes in the economic structure of the country and, therefore, should be directed to the institutions and mechanisms of the market, rather than to specific groups of economic operators. The policies typically included under this denomination therefore belong to three broad categories: (a) the introduction of incentives or disincentives to improve the efficient operation of markets, to avoid or reduce the so-called “market failures”, (b) the amendment of legislation and of state controls, to prevent or reduce the so-called “government failures” and, (c) the restructuring of the parastatal sector and in general of public intervention in the economy.

Green growth policies belonging to all three of these categories have become particularly popular in the last decade, and the growing importance of climate change as a form of “global” market failure, and because the green technologies seem to offer the prospect of a new technological, industrial, and research-driven paradigm. This paradigm has a vision not only of short term improved welfare, but also of a virtuous balance between long-term economic development and environmental protection. The policies range across these three types of interventions and are the most varied: in a recent article, Rodrik (2014) lists 50 types of such policies in three important countries (the US, Germany and China).

The empirical reason for the simultaneous application of such a plurality of measures appears to be primarily the recognition of a broad social consensus on the need to improve the environmental consequences of economic activity. More technically, the many types of policies put in place testify to the conviction of the existence of significant areas of economic inefficiency. These inefficiencies are induced by the imperfection or absence of markets for natural resources and, in particular from under-pricing of carbon. They also stem from the inability of the legislative and regulatory actions to intervene effectively in the mechanisms of formation of incentives to move the frontier of innovation to protect the environment, from environmental externalities, and climate change.

The existence of institutional rigidity and the reluctance of governments to take bold political and radical actions, such as, for example, the carbon tax, leads also often to prefer a policy of gradual reforms on several fronts, rather than an incisive public policy.

From the theoretical point of view, it is difficult to see a rational basis in the policy of multiple reforms, if not in the fact that it embraces the principle of moving towards a “green economy”, working in all possible directions. A similar policy, as

we are taught by the theory of the “second best”, certainly does not guarantee that the situation “after” is better than the situation “before” the interventions considered. If the multiplicity of specific interventions increases the likelihood that they will lead the economy in the direction of greater efficiency, it can be said that there is a reasonable presumption that the simultaneous and gradual increase of the incentives to reduce emissions triggers a slow process of structural improvement, but it is doubtful that this process is at least “asymptotically” efficient.

Two additional theoretical arguments that can be invoked in support of opportunity ‘to carry out on more’ fronts, are also provided: (a) by the Tinbergen theorem about the matching of instruments and targets, (b) by a similar theorem of the theory of “second best” on how best to counter the most ‘distortions’ through an equivalent number of countermeasures.

According to theorem (a), the achievement of a given number of targets are ‘conditional to the availability’ of an equivalent number of tools. If the diagnosis of the inefficiencies of the market for environmental goods and related externalities has therefore led us to identify distinct objectives of public intervention (the reduction of more polluting industrial plants, carbon taxation and the removal of other price distortions), to ensure the achievement we will need to identify at least as many measures of economic policy. Although the operations of structural changes tend to be accredited more ‘goals, one can claim that a maximum of correspondence exists between objectives and instruments in terms of large aggregates. This means that taxation and incentives are addressed mainly to the removal of market distortions and the regulation’s aim is to reduce free riding behavior. The present calls for an active industrial policy, finally, aim to the redevelopment of part of the productive sector, in order to seize the opportunities offered by “green growth”, i.e., a new paradigm of economic development based on the enhancement of the environment.

According to the theorem (b), on the other hand, the optimal way to reduce the social costs of distortion is ‘to apply a set of counter-distortions of the same type’. This theorem is reminiscent of Tinbergen and strengthens it with the specification of the quality of the instruments: in a non optimal situation not only the amount, but also the quality of the instruments should be consistent with the objectives of reducing the effects of market failures. This involves a search of a plurality of instruments capable of opposing the distortions in place. In this way it can be invoked a theoretical basis for the reduction of price distortions through taxation of externalities (first of all CO<sub>2</sub> emissions) and the introduction of incentives for the development of clean technologies. This to the extent that government interventions are not limited to directly reduce the distortions in place, but introduce factors to offset the causes of distortion that cannot be eliminated.

This logic includes, for example, measures of market liberalization or deregulation activated in the presence of monopolies of public type that have not been privatized. Other measures may be extended to forms of management, such as leasing or granting concessions, which allow to offset the lack of competition in the property rights of companies with the activation of the competition in the production of services. Other examples of liberalization “offset” are: (a) the partial

elimination of the exemptions monopoly in the sectors of telecommunications, energy, marketing of certain products, etc. (b) the de-regulation in sectors where the market power of the companies was partly dependent on the authorities that they are given (in law or in fact) to “manage” the sectoral legislation, (c) the creation of channels distribution of subsidies to production or consumption alternative to the public sector, (d) the increase of the share capital in private companies with state participation.

Despite these arguments, however, the theoretical basis of industrial policies greens are much less explicit and, to some extent, rely on more complex models than those used to propose the reduction of public intervention in the economy of a country. In other words, although it may appear otherwise, it is much easier to give a theoretical justification to the policies of liberalization in the regulation or taxation. The process of reducing the role of the state, which began after the oil crisis of the 70s, but is still in place, tends to contradict the “green” policies, because it is above all the result of the comparison between the predictions of the intervention theories and the actual performance of public institutions. In this context, the reversal of the trends of nationalization and public involvement in the market economy stems from the belief that the theories of “market failure”, of “natural monopolies”, of “strategic sectors”, of “central planning” led to an oversized and even aberrant public sector from the point of view of the same theories that had inspired its formation and growth.

On the other hand, the policies of “green growth” seem to offer an opportunity to develop an international public action on global externalities. They can then be consistent with an “internationalist” paradigm of the role of the state, consistent with a reduction in its “local” industrial policies. Given this setting, redesigning the public sector is first and foremost a macro-economic choice: a choice, that is, that aims to dramatically increase the efficiency of the whole system. It follows naturally the need to proceed in different directions by operating at the same time on the “physical” dimensions of the public sector (privatization), on its sphere of influence (liberalization and deregulation) and on the territorial perspective of its policies. These policies should be less and less of the “beggar thy neighbor” variety and more and more integrated into a global effort. However, to proceed in so many different directions also means not having clear priorities and to advance, at least initially, a bit ‘blindly’.

## 2 The Prospect of Industrial “Green” Policies

Scientists have set a goal of 450 ppm of CO<sub>2</sub> in the atmosphere (or less) as an input which could create a global temperature rise of 2 °C, with a probability of 50 % of exceeding it 3°. This objective has been generally accepted as a “doable” reduction of CO<sub>2</sub> in the atmosphere—an increase of approximately 65 ppm from current levels.

Even the possibility of reaching the target of 450 ppm is far from obvious. To get a peak at this level of CO<sub>2</sub> in the atmosphere requires emission reductions of 50–80 % from current levels. To get an idea of the enormity of the task, take the United States as an example. Current emissions are around 20 t of CO<sub>2</sub> per capita. In a business as usual scenario, emissions are expected to increase to 40 t per capita in about 40 years. To achieve the goal of a 80 % reduction in emissions, this amount would need to drop to about 4 t per capita against a neutral projection of about 10 times that amount. In comparison, India's emissions are currently about 1.2 t per capita and China about 6 t per capita. But as for the United States, these emissions are projected to grow, in a business as usual scenario, to a level of more than twice the current one.

Another way to look at this challenge is to quantify some decisive actions that would be required to get a billion tons of emission reductions from existing stocks of energy production. Currently, US emissions are about seven billion tons per year out of a total of 14 billion tons. To obtain a reduction of 50 % (below the target of 80 %) of current emissions seven billion tons should be cut in a business as usual scenario. Pacala and Socolow (2004) have suggested seven actions of one billion tons each:

1. Build 700 gW of nuclear power to replace the installed capacity in coal-fired (twice the current world nuclear capacity);
2. Decrease the move for two billion cars from 10,000 to 5000 miles per year;
3. Capture and store emissions of greenhouse gases of 800 coal power plants of large dimensions;
4. Improve the energy efficiency of a quarter of the existing buildings and appliances;
5. Producing a quantity equal to 100 times the current production of ethanol in the USA;
6. Produce two billion cars traveling at 60 miles rather than 30 miles per gallon of gasoline;
7. Create two million megawatts of wind turbines to replace coal.

These quantifications are extreme, but they give an idea of the technological challenge that climate change offers. Without a break-through multiple technology, and innovation spread, in fact, we cannot take effective action on the basis of the current scenario. The world needs technological solutions, but innovations must also be tested quickly. They depend not only on the experimentation of the great solutions, but also from specific solutions and their likely spread, for example in the field of biotechnology, energy efficiency, technology of sequestration and storage of CO<sub>2</sub>. But to achieve these innovations we do not need grand schemes: we must instead move the frontier of business innovation and direct it in the right direction, through a better functioning of the economic and financial sector and the construction of a framework of appropriate incentives.

### 3 The European Business, Innovation and the Plan Juncker

What is the current state of innovation in European companies? Conflicts of interest involving the credit and the choice of investment projects is a crucial element in the relationship between banks and enterprises in the “bank-centered” system prevailing today in Europe and, under the current circumstances, take on a particular relevance. These conflicts, which have been widely analyzed by economic theory, arise because of the simultaneous presence of debt and limited liability. These two conditions, in fact, induce entrepreneur—shareholders to act in a strategic way: if an investment achieves larger earnings than interests on debt, they are the only ones to benefit. Conversely, the creditors are the only ones to suffer the possible failure of the investment.

The market tends to react to this situation, trying to mitigate the incentives that shareholders would otherwise have to adopt riskier investments. Banks ration credit, increase their natural caution and impose higher interest rates. As a result, shareholders may be tempted to leave out the projects with positive net present value. The chain of incentives and disincentives in response to shareholders’ moral hazard determines therefore a solution in which everyone loses: the entrepreneurs, because money is more expensive, credit is harder to get and not all projects that are economically viable are financially attractive. Creditors lose too, because their behavior, while having the effect of lowering the overall risk of the credit, also has the effect of depressing the economy and discouraging innovation.

This phenomenon, known as “asset substitution” (i.e., “replacement activity”) is the result of the interaction of two economic entities: a principal and an agent, responding to different aims. The principal is the shareholder who uses the agent “bank” to pursue her business objectives, while the bank has its different business objectives to be pursued. The “agency costs” consist mainly in a level of investment lower than optimal, caused by the conflict of interests between agent and principal.

The intensity of the conflict of interests and the relative magnitude of the costs, however, are not the same for all sectors and/or types of business. The most innovative firms with the highest growth rates are more penalized, because the stronger would be for their shareholders the incentives to undertake riskier projects. From theory we can then deduce the prediction that firms in mature industries, with production more stable and with fewer opportunities to innovate will be preferred by creditors. They will then obtain credit on better terms and will have higher debt.

But in a recession, companies operating in mature industries are those subject to the effects of the strongest demand reduction. Not only the opportunities for growth for them are lower, but typically they also produce goods with greater pro-cyclical components. Construction companies, for example, are the first to suffer in times of slowdown or reversal of growth, because they operate in mature industries where the dynamics of supply and demand is slow even in the best years, while ‘the vulnerability’ is high with respect to reductions in strategic purchases by consumers.

The Juncker Plan, along with other measures of economic policy, is an attempt to rectify this situation, raising investment and innovation capacity of enterprises, in a framework of a substantial excess of austerity policies and seeking progress towards a new European industrial (and fiscal) policy. As an investment program, the Juncker Plan may seem still vague and not big enough for a significant impact, but its most important features are already defined, although the Plan is still, largely, “in progress”.

The first notable feature of the Plan is that it identifies for the first time a supranational European mechanism for the identification and financing of projects of public and private investment backed by European institutions as well as national states. This can be a first step to building a policy-making capability to put in place fiscal policy measures (infrastructure, environmental and industrial) in the European area and to raise funds on the basis of the creditworthiness of the European Union. In other words, a first step towards a European fiscal union.

The second important feature is the size of the Plan: 21 billion of European resources (Commission and EIB) for 3 years, which should serve as a basis to collect contributions of the member states (exempt from the restrictions of the Stability Pact) and financing on international and domestic markets. 21 billion euros of liquid resources for 3 years are a substantial amount, even though they may seem inadequate when compared with the so-called investment gap, which for Europe amounts to approximately 600 billion. To give orders of magnitude, consider that the World Bank has a paid-up capital of only \$ 14 billion (compared with a subscribed capital of 236 billion) and provided loans and grants for about 40 billion dollars in 2014. Similarly, the European Investment Bank (EIB), after the last capital increase of 10 billion, has a paid-up capital of about 21 billion euros and has financed projects for 72 billion euros more in 2014. The Bank of Infrastructure of BRICS, launched recently with great ambitions by China and India, will have an initial paid-up capital of only \$ 10 billion.

This first supply of 21 billion Euros to fund investment therefore is not to be despised, for its absolute size, as well as considering that it finances the first (cautious) testing phase of a funding mechanism that can be repeated in the future, with progressive increases in size (as in the case of the capital increases of the development banks). The 21 billions are also the budget that allows setting up a special EIB sponsored institution called European Fund for Strategic Investments (EFSI) aimed to finance and promote investments that have a potential value much greater than the initial financial funding. From a strictly financial point of view, EFSI may use the initial funding to create, through effective leverage, debt capital by issuing bonds. Given the sovereign nature of the guarantee, it is expected that EFSI may issue bonds for about 60 billion euros. These funds can be added to the contributions of member states, which may be granted in derogation of the Stability and Growth Pact. Commitments from the member states so far amount to about 26 billion Euros, although it remains unclear whether they will be used for direct funding or also as part of a guarantee fund. Even limiting the resources to the original 21 billion Euros, the loans obtained through bond issues in Europe (60 billion euro) can in turn be used as collateral for private funding at a ratio of 1–5.

This means that private investors participated in the financing of projects guaranteed by the Fund would be protected from a sixth of the potential losses related to these projects. This procedure includes pure financial leverage, of the same type used, for example, by the International Finance Corporation, an institution of the World Bank Group, which works with the private sector. In addition to pure leverage, however, a smart financial commitment on the part of one or more institutions that receive international market confidence can mobilize a greater amount of private investment through indirect leverage mechanisms, such as syndicated loans, co-financing, risk management products, technical support and other tools that facilitate the creation, aggregation and management of financial investments and public-private partnerships.

A guarantee amounting to one-sixth of the value of the investment can contribute significantly to the reduction of credit risk, but in the current situation this may not be enough to change the European business climate. Resources must also be mobilized quickly, to make quantitative easing a counterpart of a credible fiscal expansion that can jump-start economic growth. For this reason, many expect that the ECB will come into play, providing in turn guarantees that can further reduce the price of risk. How could this involvement happen? A simple and direct way could consist in the purchase by the ECB of asset backed securities or other forms of securitized assets that arise from the program funded by EFSI. These assets would be attractive because they possess the sovereign guarantees (from EFSI and the EU or from member states). To be acceptable to the ECB, they should also correspond to the projects selected according to the highest standards of quality and evaluated according to international best practices.

The possible intervention of the ECB is linked to the long-term consequences of the Juncker plan. If the Juncker bonds (the word looks too much like junk bonds, but is pronounced in a very different way ...) are securities backed, in fact by the European Union, and if they were purchased by the ECB, directly or indirectly, this would provide a link between fiscal policy and quantitative easing that is not there yet. This would make the Juncker Plan not only an attempt to foster structural intervention, but also to start a drive towards fiscal union in the Eurozone.

Credible estimates place the investment gap in Europe in the interval of 400–600 billion Euros. The gap corresponds to a reduction of its historical level with respect to total economic activity, which in aggregate has returned to pre-crisis levels. The reduction is mainly due to lack of ability to take risks by companies and financial institutions in Europe and the conflict of interest that the crisis creates between banks and innovative businesses. It depends on the high bad debts (about 900 billion Euros according to the latest estimates of the International Monetary Fund), the uncertainty about the prospects for long-term growth and the reluctance of investors to commit funds in the presence of institutional barriers and high volatility. On the other hand, Europe has opportunities for highly profitable projects in the areas of strategic infrastructure, including projects of preservation and enhancement of the environment, digitization, transport and energy (in particular interconnections and energy efficiency), and research and innovation in all these areas. Other significant investments to capture opportunities in green growth relate to the frontier of

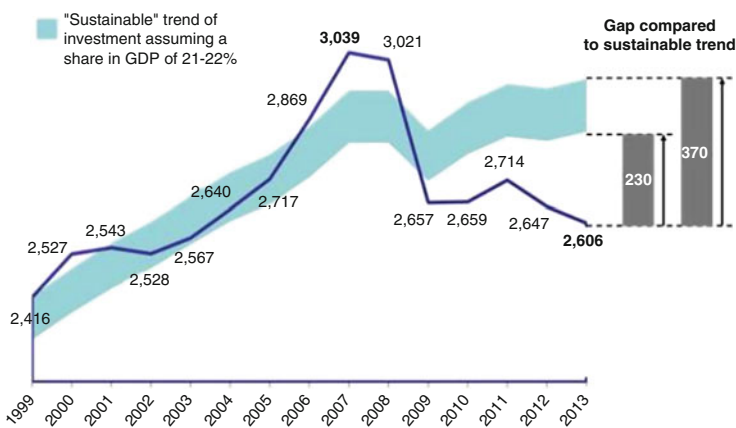


knowledge of SMEs: education, research and innovation and sustainable projects. To invest in these areas, it is necessary to design the projects, using modern tools such as, in particular, “bundling”, i.e., creating projects of sufficient size to attract funding of institutional investors (investment funds, pension funds and companies insurance together administer around 83 trillion dollars), through diversification, in order to reduce risks, and combine components with social benefits, but unprofitable in terms of private business, with investments that can generate cash flows and are thus attractive to private investors.

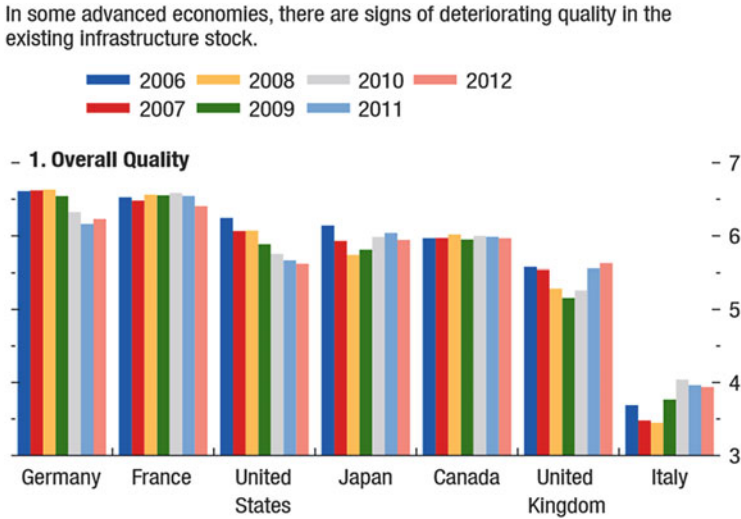
The project design problem is not trivial, and cannot be addressed in an amateurish way. The procedures concerning it, its regulation and its operations, in a sense, are more important of the same project. Both from the point of view of physical and economic project design, and of its financing, it needs systematicity and competence. The evaluation of the project must be made from the point of view of all stakeholders involved : the promoters, those who issue project bonds, banks that underwrite them, investors, governments and affected communities. It must use the most modern tools of economic and financial evaluation, and be thorough, reliable, controllable and certifiable, to become an essential tool for both the selection of projects, and for the reduction of risks associated with them (Fig. 1).

Although the Juncker Plan intends to remedy the fall in demand of European investment (measurable, according to the Commission’s findings, in a gap of 300–400 billion Euros), or to the investment gap measured with respect to longer term growth (400–600 billion Euros), more ambitious, structural effects may also be involved.

The Plan indicates the need to reconstitute investment profitability and reduce risks, but its effects could be much greater because of the growing importance of intangible investment and the industrial changes, such as those expected from the EU program “Industry 4.0”.



**Fig. 1** The “Investment Gap” in Europe (Real gross fixed capital formation, EU-28, 2013 prices, EUR billion). *Source:* EC/EIB, 2014



**Fig. 2** Quality of Infrastructure in G7 Economies (Scale, 1–7; higher score indicates better infrastructure). Sources: World Economic Forum, Global Competitiveness Report survey; and IMF staff calculations. Note: The G7 comprises Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States

Because the quality of infrastructure matters to development (Fig. 2), it is important to look beyond the mere aspects of short term efficiency, since most of the effects of higher quality may be the consequence of spill overs and synergy with industrial change. Because these spill overs are not easily internalized by the private sector, this may be the time for a renewed commitment of the public sector.

For industry and services, if we assume a scenario of massive change as the one expected and pursued in Industry 4.0, the goal of ensuring competitiveness for European industry may require more resources, 90 billion (according to R. Berger) with respect to the Juncker Plan to be mostly directed to new technologies.

#### 4 The Industry 4.0 Program and Green Growth

The Program of the EU Industry 4.0 assumes a new industrial cycle in which innovation and digital technologies are combined with new skills and human capital through the Internet of Things (IoT). It is a model in part similar to the model described by Ge and McKinsey as “Industrial Internet”. Innovation, digital technology and knowledge are constitutive elements with dramatic changes following in skills, tasks and in the establishment of a new centrality of work increasingly linked to skills.

Within this framework of renewed expectations for growth fueled by human capital development, Europe is committed to start what the Commission has called

at the beginning of 2014 an “industrial renaissance” and, at the same time, to live up to its environmental objectives that will find a redefinition in Paris in 2015. This raises the question of green growth, and its relationship to innovation and human capital, in a context of the insufficient dynamism demonstrated in the past 40 years by the European economy.

Policies to mitigate climate change, according to Khaneman and Spence (two authors of the recent UN report on climate change), are crucial to innovation and growth in the coming decades. This is consistent with the 150 billion dollar plan, which, according to President Obama, will create five million jobs in the green economy in the US in the next 10 years. The SET-Plan, adopted by the European Union in 2008, is a first step to establish an energy technology policy for Europe aimed, among its main objectives, to select and encourage energy technologies that reconcile investment and a low carbon economy.

The United Nations summit on climate change in New York, in September 2014, took as a reference the report of the Global Commission on the Economy and Climate entitled “Better Growth, Better Climate: The New Climate Economy Report”. The thesis of the report is that climate mitigation policies may not have a negative impact on economic growth, but can represent a stimulus. The idea is that it is possible to combine growth and climate objectives by increasing resource efficiency, by investing in infrastructure and promoting innovation in urban policies, land use and energy sources.

Innovation plays a key role not only in combating and adapting to climate change, but also in its interaction and spillover effects on and from green infrastructure, clean energy sources and low carbon technologies. An example is the development of technologies of computing for geospatial analysis. The low-carbon innovation has important spillover effects in the field of materials for the turbines for wind systems, robotics and nanotechnology. Energy efficiency also plays a very important role in the relationship innovation—climate-growth.

For example, according to the UN report, cloud computing is one of the most promising innovations capable of linking technology, and reduction of CO<sub>2</sub> emissions and production costs. Google estimates that for an office of 50 employees the energy used per employee with cloud computing is only 2.2 kWh per employee per year, compared with 175 kWh without innovation of the cloud. According to the E. MacArthur Foundation, another sector where innovation, employment and reduction of CO<sub>2</sub> is combined is “remanufacturing”. This is based on the concept of the so called “Circular economy”, which seeks to rebuild capital, whether this is financial, manufactured, human, social or natural, to ensure enhanced flows of goods and services.

## 5 Green Financing

While the whole sector of green financing is undergoing a progressive change toward a greater degree of both self-regulation and outside scrutiny (Perez 2007), the normative needs of an effective capacity for sovereign financing in the green area requires an altogether novel approach. In order to be able to benefit from sizable amounts of green financing, national governments, in fact, will have to convince subscribers and market investors that their creditworthiness is enhanced by the greening program in terms of commitments and delivery capacity. For this, they will need a more rigorous and more general type of assessment of their greening policies and programs, with the provision of credible guarantees at aggregate and project level on the use of the proceeds and the impact of the projects.

While not immediately effective from the operational point of view, the concept of sustainable development appears to be one of the drivers of green financing, with a growing influence on public awareness of a broad accountability set of criteria to judge governments and corporations on ethical grounds. The Dow Jones Sustainability World Index (‘DJSI World’) is a good example of the increasing attention that investors pay to the ethics of the corporate sector. The index covers the top 10% of the biggest 2500 companies in the Dow Jones World Index in terms of economic, environmental and social criteria and was first published on 8 September, 1999. It is constructed by following an analytical multi-criterion methodology, based on the so called “Corporate Sustainability Assessment”, with the criteria divided into three dimensions: Economic, Environment, and Social, each including a list of criteria, sub-criteria and weighting. For the environmental dimension the criteria are specified as follows in Table 1.

**Table 1** Dow Jones sustainability world index

Dimension	Criteria	Weighting (%)	Sub-criteria
Environment	Environmental performance (Eco-efficiency)	7	• Key performance indicators (KPI)—Energy • KPI- GHG • KPI- Waste • KPI- Water Coverage
	Environmental reporting	3	Content—Environmental reporting coverage
	Industry specific criteria	Depends on industry	• Environmental management systems, • Climate strategy, biodiversity impacts, product stewardship, etc. • Media and stakeholder analysis (MSA): selected industry specific criteria

The reporting guidelines issued by the Global Reporting Initiative ('GRI')<sup>1</sup> is the major example of the emergence of social and environmental standards at global level. The latest (2015) GRI Sustainability Reporting Guidelines are said "to offer Reporting Principles, Standard Disclosures and an Implementation Manual for the preparation of sustainability reports by organizations, regardless of their size, sector or location. The Guidelines also offer an international reference for all those interested in the disclosure of governance approach and of the environmental, social and economic performance and impacts of organizations. The Guidelines are useful in the preparation of any type of document which requires such disclosure."

The concept of sustainable development, in spite of some of its ambiguities, appears a good venue to a new ethos of socially responsible financing. The Guidelines provide detailed prescriptions for reporting on three main aspects of the activities of organizations: economic, environmental, and social, with the view that 'achieving sustainability requires balancing the complex relationships between current economic, environmental, and social needs in a manner that does not compromise future needs'. As Table 2 shows, while the Environmental dimensions loom large in the aspects identified by the Guidelines, the economic and social aspects appear equally important, and, for many variables, highly interdependent within a nexus including the environmental variables.

At national policy level, governments<sup>2</sup> appear increasingly involved on extending and refining environmental regulation along the financing front. Securities regulation, in particular, is evolving towards wider disclosure requirements of environmental data. While for the time being the rationale for this disclosure appears to be the concern about the impact of environmental changes on the

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<sup>1</sup> The GRI was founded in 1997 by the Coalition for Environmentally Responsible Economies in partnership with the United Nations Environment Programme, <https://www.globalreporting.org/reporting/g4/Pages/default.aspx>

<sup>2</sup> In addition to direct issuance, and following the example of the international Development Banks, governments are also engaging or contemplating actions to develop the market for green bonds by supporting deal flow and aggregation, and creating the enabling policy and risk environment. Some of these actions are the operations of Credit Enhancement/Guarantees/De-Risking, whereby the credit rating of the bond is improved by a partial or total guarantee provided by the government (E.g., US Department of Energy Loan Guarantee program). Public entities can insure Power Purchase Agreements (PPAs) on renewable energy generation projects as well as provide credit enhancement wraps for Collateralized Debt Obligations (CDOs) of project loans to address political and other market risks and first-loss (default) risk. Backstopping operations are also being used, whereby governments purchase sub-tranches of subordinated debt from early bond issuances to improve the risk profile of bonds by temporarily taking some first-loss layers from early issuances which would serve to lower their price and help the market gain familiarity. The government could also insure the credit or debt of the bond issuer. (E.g., European Investment Bank offers credit enhancement product targeted for clean energy). Governments also can, as demonstrated in the case of the state of Pennsylvania, purchase and securitize energy efficiency loans to recycle capital for further lending. As already experimented in the US, tax preferencing, in the form of total or partial tax exemption, can also be an effective way of developing a green bond market.

**Table 2** Categories and aspects in the guidelines of the global reporting initiative

Category	Social		Category	
Aspects III	<ul style="list-style-type: none"> <li>• Economic performance</li> <li>• Market presence</li> <li>• Indirect economic impacts</li> <li>• Procurement practices</li> </ul>		<ul style="list-style-type: none"> <li>• Materials</li> <li>• Energy</li> <li>• Water</li> <li>• Biodiversity</li> <li>• Emissions</li> <li>• Effluents and waste</li> <li>• Products and services</li> <li>• Compliance</li> <li>• Transport</li> <li>• Overall</li> <li>• Supplier environmental assessment</li> <li>• Environmental grievance mechanisms</li> </ul>	
Category			Social	
Sub-categories	Labor practices and decent work	Human rights	Society	Product responsibility
Aspects III	<ul style="list-style-type: none"> <li>• Employment</li> <li>• Labor/Management Relations</li> <li>• Occupational health and safety</li> <li>• Training and education</li> <li>• Diversity and equal opportunity</li> <li>• Equal remuneration for women and men</li> <li>• Supplier assessment for labor practices</li> <li>• Labor practices grievance mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>• Investment</li> <li>• Non-discrimination</li> <li>• Freedom of association and collective bargaining</li> <li>• Child labor</li> <li>• Forced or compulsory labor</li> <li>• Security practices</li> <li>• Indigenous rights</li> <li>• Assessment</li> <li>• Supplier human rights assessment</li> <li>• Human rights grievance mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>• Local communities</li> <li>• Anti-corruption</li> <li>• Public policy</li> <li>• Anti-competitive behavior</li> <li>• Compliance</li> <li>• Supplier assessment for impacts on society</li> <li>• Grievance mechanisms for impacts on society</li> </ul>	<ul style="list-style-type: none"> <li>• Customer health and safety</li> <li>• Product and service labeling</li> <li>• Marketing communications</li> <li>• Customer privacy</li> <li>• Compliance</li> </ul>

firm’s future revenues, expanding reports and analysis of this issue would certainly serve also the need to monitor individual and collective impact of financing on the environment. A broader interest for transparency on environmental impact seems to be at the basis of the steps taken by the U.S. Environmental Protection Agency (‘EPA’) in cooperation with the U.S. Securities and Exchange Commission (‘SEC’), to improve compliance with SEC disclosure requirements. Government regulators are also developing mandatory reporting schemes for companies which may impact the environment within a broad area of public concern. Examples of these schemes are those required by the U.S. Toxic Release Inventory program (‘TRI’), the European Pollution Emissions Register (‘EPER’) and the Canadian National Pollutant Release Inventory Scheme (‘NPRI’).

Even though transparency and full information on security issuance has been one of the prime concerns of governments regulating financial markets, so far no special attention has been given to the quality and extent of security issuers as to their sustainability conditions and the environmental impacts of the investment financed. This is not only true for general corporate financing, but also for the case of “green” financing, where the governments so far have stayed away from trying to regulate issuance documentation, reporting and monitoring of the use of proceeds and the impact of the projects financed. The legal landscape for these types of securities is rapidly changing, going from self-labeling to self-regulation to various types of verification and ratings. For example, for the so called “green bonds” or bonds issued to finance green investment, standards have been established in a set of “green bonds principles” by a plurality of diverse stakeholders.

The experience developed for green bonds is an especially important component of the new type of financing for several reasons. First, as private debt financing instruments, bonds are a favorite form of fund allocation for institutional investors and have traditionally been used by the public sector to finance major infrastructure projects. Second, projects financed with bonds issued by central or regional governments and municipalities were often revolving around environmentally impacting projects such as railways, roads, sewage systems, energy grids and hospitals, toll roads, bridges and water ways, electric and gas systems and utilities. Third, most of these bonds were targeted in the sense that their proceeds were earmarked to the financing of one particular project or sets of projects. Finally, these bonds were typically attractive for investors because they were exempt from federal income taxes and often also from local taxes. They had also a much lower default rate than corporate bonds (0.04 % against 9.83 %, between 1970 and 2002), even though they had lower yields than corporate bonds.

The green bond principles (GBP) were put together by a group of interested parties including NGOs, investors, and banks in February 2004.<sup>3</sup> They suggest disclosure and reporting procedures aimed at achieving transparency for the process of issuing the bonds, and directing their proceeds to the green targets chosen, before, during and after project implementation. However, because GBPs are conceived as a guide for voluntary commitments on the part of the issuers, they do not imply or recommend any form of impact evaluation and do not link disclosure or reporting to any standard except those that may be freely chosen by the issuers at the time of issuance.

Nevertheless, in spite of being perhaps too general, somewhat vague and somewhat under-ambitious in their purported undertaking, GBPs represent an important landmark in the recent history of green financing. The reason for this is that they clearly define an important difference from the traditional sustainable development

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<sup>3</sup> A consortium of investment banks—Bank of America Merrill Lynch, Citi, Crédit Agricole Corporate and Investment Bank, JPMorgan Chase, BNP Paribas, Daiwa, Deutsche Bank, Goldman Sachs, HSBC, Mizuho Securities, Morgan Stanley, Rabobank and SEB announced support for the initiative after it was made public through the website of CERES, a leading NGO in the field of collective action for policies toward climate change.

approach and the rationale for a whole set of new financial instruments in support of the environment. Whilst sustainability reporting relates to the behavior of an organization with respect to the environment both in terms of its procedures and of the consequences of its acts, reporting on green bond issuance is seen as mainly focusing on specific projects, their structure and performance. The organization procedures and other actions are still likely to be important, but only to the extent that they may or may not yield credibility to its commitments and claims. In this respect, a sustainability report that identifies a negative condition and the need to change may be the point of departure and even a promising support for green projects that signal a step in a totally new and virtuous direction. Thus, in some sense, GBPs can be the basis to report on increasing sustainability of an economic agent, and the instrument to turn around a negative assessment of black or gray corporate subject.<sup>4</sup>

The World Bank (WB) has been the initiator and the main issuer and has thus already established some of the basic rules that identify green bonds. Because of the overriding importance of its mission to support sustainable development, poverty reduction and inclusive growth, the WB also claims that all its bonds, in a sense, have a green quality.<sup>5</sup> Within this general characterization, however, green bonds are seen by the WB as a “smart” financial product capable of concentrating investors’ interest in sustainable investment opportunities focused specifically on climate change mitigation and adaptation.<sup>6</sup> To some extent, this dual approach based on the idea that all WB bands are green, but green bonds are more specifically so, reflects on the selection and monitoring process that is offered to investors as a form of assurance of the effectiveness of the targeting that GB pursue.

The due diligence/assurance<sup>7</sup> process proposed by the WB is thus threefold. First, eligible projects are selected through a rigorous review and approval process. This process is the same that the Bank follows for all projects, but in the case of GB is more focused on questions concerning climate change and natural resource issues and includes, in addition to the usual technical, economic, and institutional analysis

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<sup>4</sup> In this sense, there may be an important element of additionality incorporated in green bonds, in the sense that their impact may be more valuable if it is considered with respect to a counterfactual, e.g., the possibly harmful projects that would be pursued by the same issuers in an alternative scenario.

<sup>5</sup> See, for example: *Green Bond, Sixth Annual Investors’ Update, 2014, The World Bank-Treasury*: “All World Bank bonds support sustainable development, poverty reduction and inclusive growth. They fit well with investment strategies that incorporate Environmental, Social and Governance factors into the decision-making process”.

<sup>6</sup> For more information on WB sustainable development projects see:

<http://treasury.worldbank.org/documents/IBRDInvestorPresentation.pdf>

<sup>7</sup> Due diligence concerns all activities of information collecting and analysis on the structure and performance of an object of purchase on behalf of the purchaser. In the case of an investment, due diligence aims to enable the potential investor to make informed decisions concerning the risks and the opportunities that the transaction offers. Due diligence assignments is generally combined with assurance, a process aimed to focus on the credibility of the information reviewed during the due diligence assignment, whose lack may result in the abandonment of the potential investment.



of projects' scopes and opportunities : (i) an early screening to design concrete mitigation actions and to identify environmental and social impacts, and (ii) a further selection by environmental specialists of approved projects that meet the green bond eligibility criteria. These criteria are not specified in detail, however, and appear to delegate the selection to the staff on the basis of a mix of subjective judgments on intrinsic projects' characteristics (e.g., renewable energy production), and their expected impacts, in terms of mitigation or adaptation to climate change.

A second component of the WB process aims to guarantee the targeting of the GBs from a financial point of view. For this "Ring Fencing" is used, by crediting GB proceedings to a separate Green Cash Account from which they are invested in accordance with IBRD's conservative liquidity policy until allocated for eligible green project disbursements.

A final component is constituted by the Monitoring and Reporting phase, concerning project implementation both in the construction and operational phase, through investigation and disclosure of projects' progress, outputs and outcomes, and the evaluation of the objectives achieved. This information is projected to be made available on the main World Bank website and summaries and key impact indicators to be provided on the World Bank's Green Bond website.

The WB due diligence process appears simple and straightforward, and, so far seems to have satisfied investors. Several factors, however, render this process insufficient for other institutions and especially so for sovereign issuers. First, most institutions, governments or corporate entities, cannot claim, as the WB does, that a rigorous process of selection and implementation of all projects is already in place for them. Thus, some basic questions will have to be addressed on the capabilities to select and effectively carry out the projects put forward for financing. Second, project eligibility and impact evaluation in the case of the WB is predicated upon already existing "green assessment" procedures at both country and sector levels, while for most issuers no such processes are already in place. Public sector issuers, in particular, would have to provide investors of evidence that both their general strategies and the specific projects selected would contribute to the achievement of the objectives to which the GBs issued are aimed. Third, again in contrast with the WB situation, we could think of a large category of GB issuers, with a "black" rather than a green record in their environmental policies and investment history. While these issuers could provide an even more valuable contribution to green objectives, such as mitigation or adaptation measures, they would have the burden to demonstrate that the program/project proposed is likely to achieve its targets, despite the handicap of previous choices and the consequent unfavorable industrial and institutional framework. They would also have to show that a significant green impact is likely to be achieved by the individual project, either because of its size and qualities, or as part of a broader strategy.

More generally, and with reference to all potential GB issuers, one can ask what would have to be the key components of disclosure and reporting that investors would need, in order to make an informed decision on the matter. In theory, investors should be first guaranteed of effectiveness of bond targeting (ring fencing and timely disbursement against the stated goals). But in addition to these basic

requirements, they should also be interested in two main dimensions: (i) returns, and (ii) impact. The first dimension includes expectations and uncertainty of returns and of repayments, with risks possibly looming large in many cases of corporate and sovereign bonds. In this respect, disclosing and reporting needs may be very different for issuers that do not have a high credit rating, as instead was the case of the World Bank and the other institutions that followed its lead in the first wave of bond issuance. The second dimension concerns the evaluation of the outcomes and impact of the project, including direct and indirect, and intended and unintended consequences. For this task, while WB reports generally do make a brave attempt at describing and, less often, at providing some quantification of the intended effects of the GB supported program or project, an accepted set of best practices simply does not exist at the moment. In the case of sovereign debt, in particular, a methodology of impact analysis would have to integrate the environmental impact assessment with program evaluation, tying the principles of government green strategy with the characteristics of the program or project that the green bond issuance aims to finance.

Green bonds are perhaps the most characteristic security, but they are not the only innovative instrument of the new green finance. Other instruments include many other individual and packaged securities, directly or indirectly targeted to green investment. They also include, as in the Juncker Plan, asset or liability backed securities aimed to reduce market risk in a field, such as green innovation, where uncertainty is often pervasive. At the project level, innovative forms of financial design of project financing, project bundling and project securitizing are evolving to achieve optimal size and composition, by exploiting scale economy and risk diversification.

Sovereign issuances and guarantees of innovative instruments for sustainable and green investments, such as those of the Juncker plan, are especially important in fostering financial innovation and in general a more active government role in green bond regulation, insurance, tax treatment and cofinancing. In order to tap the deep pools of capital of institutional investors, these instruments have to achieve investment grade (at least BBB rating and competitive rates of return). However, both credit rating and rates of return largely depend on the characteristics of the financial products and the price of risk in the financial markets. Many green projects may thus fail to be financed because they are considered too risky, insufficiently remunerative or both, this being the consequence of imperfections in the capital markets, that are dominated by information asymmetries and agency costs. Part of the financial gap is thus caused by the failure to tackle with these imperfections and to match the demand for funds emanating from projects that are priced out of the market, because they are too innovative to be considered safe and because they do not appear sufficiently remunerative for the private investors, despite their positive economic impact for the collectivity. In many cases, green projects lack an articulated financial structure that allows them to be competitive in attracting financial resources: they may be too small, too specialized, dependent on very specific and risky sources of income, or, due to their public or quasi public nature, not capable to generate appropriate cash flows that may permit risk sharing through concessions

or similar private public partnerships. The role of the government in improving this situation is thus expandable on a number of fronts and may prove to be decisive. In addition to the issuance of sovereign green bonds, that can be sold to the public to complement the usual debentures to finance the budget, the government can reduce the market price of risk by judicious management of a number of financial instruments. For example, Sustainable Prosperity <sup>8</sup>(2012) lists the following possible financial interventions:

1. **Credit Enhancement/Guarantees/De-Risking:** The government could use its own assets to provide a guarantee for some portion of the underlying liabilities to enhance the credit rating of the bond. This helps to reduce the bond's risk level ("de-risk"). (E.g., US Department of Energy Loan Guarantee program). Public entities can insure Power Purchase Agreements (PPAs) on renewable energy generation projects as well as provide credit enhancement wraps for Collateralized Debt Obligations (CDOs) of project loans to address political and other market risks and first-loss (default) risk.
2. **Backstopping:** The government could purchase sub-tranches of subordinated debt from early bond issuances to improve the risk profile of bonds by temporarily taking some first-loss layers from early issuances which would serve to lower their price and help the market gain familiarity. The government could also insure the credit or debt of the bond issuer. (E.g., European Investment Bank offers credit enhancement product targeted for clean energy). Governments can, as demonstrated in the case of the state of Pennsylvania, purchase and securitize energy efficiency loans to recycle capital for further lending.
3. **Tax Preferencing:** Using internationally standard qualifying criteria, governments could make the income from green bonds either tax-free or taxed at a lower rate than typical investments. For example, the United States provides tax credits for clean energy bonds.
4. **Bond Issuance/Marketing:** Governments at all levels could issue retail green bonds, similar to Canada Savings Bonds, but to fund renewable energy or other projects. According to a poll conducted by Nanos, 81.8 % of Canadians support the green bonds idea, and 62.2 % stated that they would purchase them if they had an interest rate similar to that of Canada Savings Bonds.

In addition to these financial interventions, the reduction of financial risk from issuing green bonds may come from the capacity on the part of the government and government sponsored institutions at engineering financial packages to fund projects. In these packages, the presence of sovereign bond financing would be symbolic of the government commitment to support investment, guarantee a proper use of the funding to improve the environment, and avoid default. Furthermore,

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<sup>8</sup> Sustainable Prosperity is a national research and policy network, based at the University of Ottawa. SP describes itself as focusing on market-based approaches to build a stronger, greener, more competitive economy and in bringing together business, policy and academic leaders to help innovative ideas inform policy development.

because green investors are motivated by the expected impact of the investment on the environment, and not only by the expected return—risk combination, they will be more likely to favour a strategy of long term holding for green bonds, thus reducing the pressure on the secondary markets, with beneficial consequences also on the perceived risk of sovereign debt.

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