

## **COST AND ENVIRONMENT RELATED GREEN INVESTMENT STRATEGIES MATRIX**

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**Abstract:** *Among the global strategies the one that is changing a traditional organization into green is today the managers' challenge at least for the higher cost that the environment recovery and protection involve. Nevertheless, generally speaking, the organizations need to clarify their strategies in greening their activities by investments. In this context, a brief green investments strategies' literature overview is presented. In addition, based on the documentation and judgment, a matrix of the green investments strategy is proposed to serve as a tool for the managers' decision-making.*

**Keywords:** sustainable development, green investments strategy, decision-making, green investments strategy matrix

**JEL Classification:** O13, Q56, R11, L19, D79

### ***Introduction***

The climate change due mainly to the carbon emissions is the most important challenge that the society is confronting within the contemporary time. The globalization process is sharing the sustainable knowledge and practices around the world, but little progress have been done to reverse the carbon emissions and the climate change progress.

Sustainable development is not an end in itself but a means to stimulate economic and technical progress and to achieve more equitable distribution through its effects on present and future generations. Common problem to all countries at planetary level, the strategy of sustainable

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development should be addressed taking into account the environmental problems existing in the world (Panzaru, S., Dragomir, C., 2012, pp. 102-111).

The sustainable development is any organization's willing, but besides the natural environment protection and recover the "growth requires investment" (Zenghelis, 2012, p.5).

According to the Rio Summit declarations (1992; 2012) and the followed other documents and directives, the global framework of the sustainable development and green investments is extending. Some evidence about the actual results is briefly presented below. In 2012 the total global investment was 244 \$ billion for renewable power and fuels, down with 12% on 2011 record. However there is dauntingly far still to go to reduce the carbon intensity of the generation fleet. But, in 2012, just 6.5% of global electricity was produced using wind, solar, biomass and waste-to-power, geothermal, marine and small hydro technologies up from 5.7% in 2011 (900 megatons of CO<sub>2</sub> was not produced) (McCrone et al., 2013).

At the global context, the Middle east and North Africa seem to be the most affected region, because of water scarce which will be elevating in the future years, having global repercussions until 2080 (Maas and Tänzler, 2009, p.4). On the other part of the world, the emerging countries, located in the Far East or South America, the willing for growth has no natural environment reverse protection limits. 'In the energy sector, public and private entities in the Member States will need to spend around EUR 400bn on distribution networks and smart grids, another EUR 200bn on transmission networks and storage, as well as EUR 500bn to upgrade and build new generation capacity between now and 2020. Last, but not least, it is estimated that between EUR 38-58bn and EUR 181-268bn capital investments are required to achieve the Commission's broadband targets' (Pelly and Kramer-Eis, 2011, p.7).

The EU regulations contribute to the decreasing of carbon emissions and to increasing of alternative sources of energy consumption. Evidence underlines the decrease in carbon emissions expressed in 1000 tones of CO<sub>2</sub> equivalent, with 8% in 2011 against 2008 and the increase of the energy generated from renewable energy sources consumption out of total national energy consumption from 17 % in 2008 to 23.5% in 2012 (Euro stat, 2013).

Nevertheless, the market is requiring greener products, services and processes. In this respect 'some preference for green products and

processes, expressed in an increased willingness to pay (WTP) for them' have been studied (Garcia-Gallego and Georgantzis, 2011, p.72). But, many green solutions are financially more expensive than conventional alternatives, especially in terms of early capital costs. And most investment, even those which clearly cut costs in the long run, such as energy efficiency, require some additional up-front investment (Zenghelis, 2012, p.15). 'The energy sector occupies a central place in the pursuit of a green economy, energy being at once a critical foundation of development and a central part of efforts to address environmental problems such as climate change and air quality' (Crosby, 2013, p.7).

Nevertheless, generally speaking, the organizations need to clarify their strategies in greening their activities by investments. In this context, a brief green investment strategies' literature overview is presented. In addition, based on the documentation and judgment, a matrix of the green investments strategy is proposed to serve as a tool for the managers' decision-making.

### ***The green investment strategies: an overview***

The literature offers plenty of works related to the investment strategies. The most known and applied strategies are the foreign direct investment, such as Greenfield, mergers and acquisition and joint-ventures.

- Greenfield is the newly designed and constructed facility, seen as 'a slower way to enter a new country with less risk' than M&A (Wang, 2009).
- Mergers and acquisition is a mean to integrate economies.
- Joint-venture is the equity partnership when 'a JV partner can guide firms in developing sales and market penetration' (Norris, 2011, p. 58).

But, these strategies are not necessarily involved into the environmentally-oriented investments. The 'environmentally-oriented investments are a source of firm heterogeneity and also impact indirectly on the internationalization of firms by affecting their productivity levels' .... 'more the capability of firms to penetrate markets with stricter environmental regulations and standards' ....'which captures an investment strategy aimed solely at reducing the environmental impact'. (Antonietti and Marzucchi, 2013, p. 6, 7, 12).

The investment in going green is a strategy itself. ‘Greening the economy is an important strategy with which to combat climate change and to prevent worst case scenarios. A green transformation has manifold dimensions, the most important of which is to reduce carbon emissions and to secure sustainable energy for all. This includes offering secure universal access to modern energy supplies, doubling the share of renewable energy in the global energy mix, increasing energy efficiency, and phasing out inefficient fossil fuel subsidies’ (UN 2013).

The environment standardization process is one of the main strategies that an organization might adopt to contribute to the planet greening. But, critics have been brought to the standards implementation. It has been compared two particular instruments, namely uniform versus differentiated standards (Heyes and Dimons, 2011).

Another perspective is the supply chain green management ‘involving various firms, such as suppliers, manufacturers, distributors, and retailers, the cumulative greenhouse gas emissions per unit product increase as materials and products move from one stage to the next. ...In short, as products move along a supply chain from supplier to consumer, the revenue of the firm increases but the cumulative emission of greenhouse gases increases as well’ (Sim, S. and Jung, H. (2013) p.455). In the supply chain the strategy’s alternatives for the green investment are as follows (Sim and Jung, 2013, p.455):

- Purchasing eco-friendly raw materials that cost more than convention raw materials but whose use in production results in lower CO emissions;
- Replacing current facilities with new eco-friendly facilities that have the capability to reduce CO emissions; and
- Changing modes of transport from less eco-friendly to more eco-friendly modes’

The investment in greening the environment have at least two benefits for the organization: the obtaining of the competitive advantage and the optimization of the expected return on investments (Orsato, 2006). The author is discussing four ways of investments for the competitive advantage gain, i.e.:

- Strategy 1: eco-efficiency;
- Strategy 2: beyond compliance leadership;
- Strategy 3: eco-branding and

- Strategy 4: environmental cost leadership.

While the strategies 2 and 3 have the basis in differentiation, the strategies 1 and 4 are based on the cost lowering.

The change strategy in going green is another approach of the green investment. 'A green transformation is a societal challenge. To make the use of public leveraging instruments more effective, investors – and also their clients – have to be educated and informed' (Lindenberg, 2014, p.39). In the change strategy, the forces that are pushing towards investments could be considered to be:

- Green consumers forces which prefer to pay more for ecological products;
- Pressure groups that comprise the NGOs fighting for greening the society;
- The national and international organizations that are recommending the use of environment standards;
- The organization's management that is willing to implement environment protection technologies;
- The community that is expecting a safe and healthy environment from the business.

In forestry domain the strategic options could be: the wood waste utilization, the wood reuse, the plantation establishment, the enrichment planting, the agro forestry practices, the solar energy tapping and utilization and the maintenance of the forests (Ogunwusi, 2013).

Aras and Crowther (2009, p.254) have proposed different other three strategies that could be applied to any activity, i.e.:

- The identification of the true scarce resources and develop techniques to use them efficiently;
- The measure and record all effects of organizational activity and ensure an equitable distribution of these effects;
- The development requires the continuing balancing of all relevant factors and the privileging of none.

The standards and regulations are contributing to the greening, but the 'investment in environmental practices may be the result of a large set of factors and motivations, not only regulation (Ghisetti and Quatraro, 2013). These further motivations may be related to costs reduction or revenues increase (Ambec and Lanoie, 2008) and eventually lead to increasing business performances. Developing from these points, scholars have

empirically investigated whether the green investment strategies (i.e. investments in machinery and equipment aimed at reducing the environmental impact of production) influence firms' productivity and international competitiveness' (Antonietti and Marzucchi, 2013, p.21).

### ***The green investment strategies matrix***

The general scope of the investment is the highest expected benefit or yield to be obtained by using the object of investment (the return on investment). In the case of the green investments, the decision maker has to harmonize three issues, i.e. the investment's object, the financing instrument and the expected return in order to apply the best fitted strategy. It also has to be forecasted the implications of the strategy chosen on the environment.

The decision-makers have to choose among the strategies that are the best fitting the organization's objectives. The most applied strategies in the green investment process are the followings:

- Green direct investment: fixed capital investments or financial capital investments;
- Green joint-venture: financial capital investments;
- Green mergers & acquisition: financial capital investments and/or intellectual capital investments;
- Alliances and partnership: financial capital investments;
- Green products diversification or differentiation: financial capital investments;
- Standards & regulations implementation (for example, ISO 14000: 2004-2012): intellectual capital investments;
- Environment risks management: intellectual capital investments;
- Change into green strategy-adaptation: intellectual capital investments and/or fixed capital investments and/or financial capital investments;
- Green products or services diversification and differentiation: intellectual capital investments and financial capital investments and/or fixed capital investments;
- Green products & technologies innovation: intellectual capital investments;
- Green knowledge sharing: intellectual capital investments;

- Social green responsibility: human resources capital investments, financial capital investments.

Selecting the strategy for the green investments, the organization has to analyze at least the correlation between the cost of the investments capital and the implications on the natural environment. In this respect, the decision-maker may use the matrix proposed in the figure no.1.

The matrix emphasis four extreme situations:

- Left-up corner: low costs - low environment effects (joint venture, green knowledge sharing, alliances and partnership);
- Left-down corner: low costs - high environment effects (mergers and acquisition, social green responsibility, green products diversification or differentiation);
- Right-up corner: high costs - low environment effects (standards and regulations implementation, environment risks management);
- Right-down corner: high costs - high environment effects (green direct investments, change into green strategy - adaptation and green products and technologies innovation).

		<b>Environment related</b>	
<b>Cost-related</b>	<b>Low</b>	<b>Joint-venture</b> <b>Green knowledge sharing</b>	<b>Standards &amp; regulations implementation</b> <b>Environment risks</b>
	<b>High</b>	<b>Mergers &amp; acquisition</b> <b>Social green responsibility</b> <b>Green products diversification or differentiation</b>	<b>Green direct investment</b> <b>Change into green strategy-adaptation</b>
		<b>Green investments strategies</b>	

*Figure no. 1. Cost and environment related green investment strategies matrix*

Nevertheless, the practice emphasizes that the process of the green investments might combine strategies and the costs and the implications on the environment may differ.

According to the practice of the organizations that are making green investments the above presented matrix may be improved.

### ***Conclusions***

In order to do green investments the decision-makers have to choose the right strategy that is the best fitting the organizations vision and strategic objectives.

The strategies to invest green imply fixed, financial, intellectual and human resource capital, depending on the investments' objects. The strategy conceptualization of the green investments strategy process comprises four issues: the investment objects, financing, return on investment and the implication on the natural environment.

In choosing the strategy or the combination of strategies the decision-maker needs to take into account the costs of the investment and the implications of the investment on the natural environment and the matrix proposed might be a useful tool.

The matrix has a limitation, coming from lack of considering the combination of the strategies and the consequences of these combinations. This limitation may be used to the matrix improvement.

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