



FINANCIAL CRISIS, SUBSIDIES AND CLIMATE CHANGE IN THE EQUATION OF SUSTAINABLE DEVELOPMENT

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ABSTRACT. – **Financial crisis, subsidies and climate change in the equation of sustainable development.** An irreducible situation such as the contemporary financial crisis creates the premises of major overthrow in decision criteria. Meanwhile, significant progresses in overcoming the ecological crisis, fueled mainly by the climate change are also in relation with such changes. This convergence is easy to be observed due to logical connections. If its existence was noticed at decisional levels is the overarching question that structure the paper. Since the answer is positive, there are explored the visions and plans of measures developed within this confrontation. There is applied a global approach and that is why each discussion considers also the implications of economic globalization and of global environmental action as influence factors on the path and direction of change.

Keywords: financial crisis, climate change, fossil fuels, subsidies, sustainable development.

1. INTRODUCTION

Sustainable development is a continuous challenge that animates the debates in science, in policy making and creates an intense information flow within the science-policy dialogue. Its accomplishment necessitates significant changes for which the momentum is quite rare.

The third millennium is foreseen as a consequence of basic mutations in the deployment of economic activities, geopolitical relations, human interactions, but above all in the architecture of values against which we measure ourselves in the constant effort of filling with significance the human existence. As it expected these changes are the results of irreducible situations that have impact on the global population at such a rate that policy-corporate decision makers feel threatened their interests.

The first part of the paper refreshes the debate of sustainable development by bringing in discussion its main challenges. The interface that connect financial crisis, subsidies, and climate change in the equation of sustainable development is energy. Therefore the next section there is granted with a generous space for analyzing the energy perspectives and the global vision on changes that will occur

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in the structure of sources used by humankind starting with the position recently launched by the International Energy Agency. As long as the architecture of incentives that will determine profound changes in global energy economy is regarded it is noticed that most of the documentations are converging toward cutting subsidies for fossil fuels. This measure is discussed in order to highlight its impact against the triple bottom line of sustainable development: economic, social, and environmental.

2. SUSTAINABLE DEVELOPMENT

In the first decade of the new millennium sustainable development is assumed in most developed countries as a strategic vision for the only possible future. Despite this wide consensus the path toward sustainable development could be quite different from one country to another. The main challenges to be addressed are: substitutability, equity, uncertainty and irreversibility.

The capital model which gained a widespread application in contemporary economy states that stock of capital should be preserved and all the expenses should be covered from the interest brought in by the capital. In neoclassical economics capital is considered as a single entity, regardless to the patterns of its components. This view is challenged by ecological economics that recognizes more capital types (natural, human, social, manufactured, financial etc.) and interprets the capital model according to these new condition. Thus, the stock of each capital type should be maintained. Thus, substitutability is not infinite, the loss of one type of capital, e.g. natural, could not be compensated by using more from another type of capital, e.g. manufactured. Sustainable development necessitates the adoption of the ecological economics' capital model.

Equity refers to the share of benefits coming from the exploitation of resources among its users. According to its first and most frequently cited definition, sustainable development is the development that allow to satisfy the needs of present generation without compromising the chance of future generations to satisfy their own (Brundtland, 1987). That means an equitable share of benefits among generations as users. Although complying with such a requirement could be difficult because there are countless future generations, there is little knowledge about the real needs of current generation and how technological progress will reshape the chances, it is addressed mainly by stressing the need of increased efficiency and of correlating the path of extraction with the path of renewal (Bran and Ioan, 2002).

The infatuation of complete knowledge on the world brought humanity very close to catastrophic transformations of the world. This was possible since the positivist approach, emerging some hundreds years and being responsible for most of the scientific progresses, assumes that anything could be explained in an analytical manner, departing from the behavior and characteristics of components. Since many things were decomposed and their behavior and/or functioning was understood and verified it was created the illusion that we, humans, have an



exhaustive knowledge and that all that could count for us could be foreseen, allowing time and resources for preparation and adaptation. Environmental degradation, among others, taught us a different lesson: our knowledge on human-nature interaction is limited and even the existing one is not valued entirely, there are processes that cannot be understood by using the analytical approach, and changes that escape our understanding could undermine human existence and wellbeing. Thus, in order to go forward to sustainable development it is necessary to recognize that there are uncertainties and that they could trigger irreversible changes.

3. ENERGY OUTLOOK

The world energy system faces, according to IEA (2008), two major challenges: securing continuity in energy providing and reform of energy supplying system in such a way that a significant carbon dioxide emission reduction to be obtained.

Securing continuity in energy supply represent a major challenge because, at world level, it is foreseen a continuous and strong increase of energy demand (EIA, 2005). This trend is explained through economic growth, correlated with population growth and productivity increase, especially in developing countries.

Table 1. Population level and growth until 2030

Region	Population (millions)		Population growth	
	2005	2030	Millions	%
North America	441	542	100	0.8
Western Europe	534	548	45	0.1
OECD Pacific	200	194	-6	-0.1
OECD	1 175	1 284	110	0.4
Latin America	423	535	112	0.9
Middle East and Africa	779	1 265	486	2.0
South Asia	1 482	2 023	541	1.3
South-East Asia	395	500	104	0.9
China	1 322	1 481	159	0.5
OPEC	560	803	242	1.4
Developing countries	4 961	6 606	1 645	1.2
Transition economies	341	338	-3	0.0
World	6 477	8 228	1 751	1.0

Source: OPEC (2007), *World Oil Outlook 2007*, pg.31, www.opec.org, 20.11.2008

According to the most recent scenarios made by different international organizations (OPEC, IEA, EIA), at global level the population will increase with an annual rate of 1%, reaching more than 8 billion inhabitants in 2030. From the total population growth 94% will be due to the demographic evolutions of developing countries and North America (table 1). Productivity increase is due to capital increase, international trade intensification within globalization, and the impact of economic reforms.



In these conditions it is estimated a world economic growth of more than 3% at the purchasing power parity. Regional contribution to this growth is differentiated as it is resulting from data presented in table 2. Thus, China could be considered an engine of global economic growth. In addition, in 2004, 2005, and 2006 China recorded two digit economic growth rates. A very dynamic growth is to be expected in India also where a large population has to be added the results of economic reforms that will improve productivity and will enhance capital endowment.

Table 2. Annual average GDP growth rates (purchasing power parity)

Region	2006- 2010	2011- 2015	2016- 2020	2021- 2025	2026- 2030	2006- 2030
North America	2.8	2.6	2.5	2.4	2.3	2.5
Western Europe	2.2	2.0	1.9	1.7	1.5	1.9
OECD Pacific	2.4	1.9	1.7	1.6	1.4	1.8
OECD	2.5	2.2	2.1	2.0	1.9	2.1
Latin America	3.8	3.2	3.0	2.9	2.7	3.1
Middle East and Africa	4.3	3.5	3.4	3.2	3.1	3.5
South Asia	6.5	5.3	4.8	4.4	4.1	5.0
South-East Asia	4.5	3.9	3.6	3.2	3.2	3.7
China	8.3	6.1	5.7	5.5	5.3	6.2
OPEC	4.8	3.6	3.4	3.3	3.3	3.7
Developing countries	6.3	5.0	4.7	4.5	4.4	5.0
Transition economies	5.2	3.2	2.7	2.5	2.5	3.2
World	4.2	3.5	3.4	3.3	3.3	3.5

Source: OPEC (2007), *World Oil Outlook 2007*, pg.33, www.opec.org, 20.11.2008

In the last decades the cumulated energy consumption of China and India represented an increasing proportion of the world consumption. Thus, in 1980, their cumulated consumption represented 8% of the world total, while in 2005 this proportion was double, being estimated to reach one quarter of world consumption in 2030 (EIA, 2005). USA's participation to world consumption is expected to drop from 22% (2005) to 17% in 2030.

World energy consumption is expected to increase continuously until 2030, with 1.6% annual rates, reaching 17 010 Mtoe. Securing continuity in energy supply is conditioned by massive investments in energy infrastructure. The current financial crisis is not expected to affect long term investments but could lead to delays in the accomplishment of ongoing projects. More than half of the investments will be necessary for maintaining the current level of supply. In oil and natural gas industry investments are also needed for the exploration of new reserves and for increasing processing capacities. Thus, in the 2006-2020 period the refining capacity will need to be expanded with 13 Mbarrels per day.



The energy supply system reform in order to reduce carbon dioxide emissions or in other terms the diminishing of energy's carbon intensity is needed for protecting the global climate system. Climate change is considered one of the most important environmental problems to be faced by humankind.

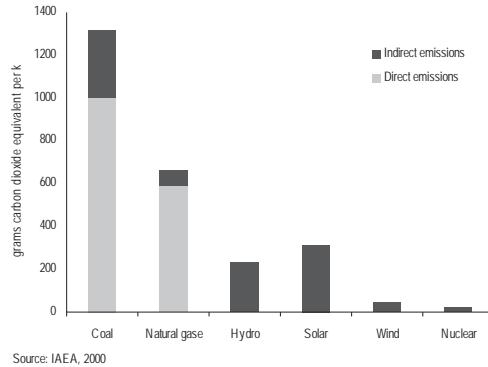


Fig.1. Carbon dioxide emissions in electric power production

It is interesting to notice that for obtaining energy from other primary sources necessitates also the use of fossil fuels and implies carbon dioxide emissions. Fig.1 illustrates the carbon dioxide emissions per energy unit resulting directly, through burning, or indirectly, through the life cycle.

Energy sector has a key role in greenhouse gas emission reduction, the main changes being increased energy efficiency, modification of primary energy sources structure, and the development of new carbon storage technologies.

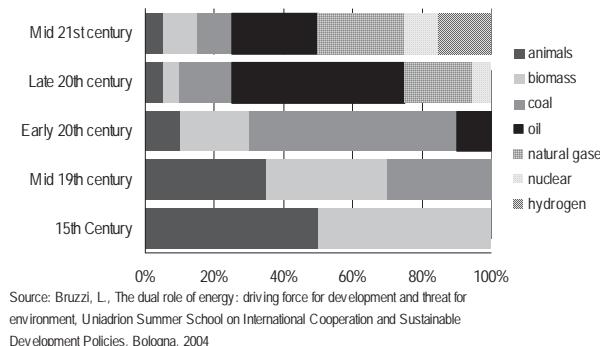


Fig.2. Structure of primary energy sources in different historical stages

The accomplishment of such changes is possible if governments will succeed in applying a combination of policy instruments (regulations, financial incentives, communication, and information) that secure continuity of energy supply and emission reduction in an integrated manner. IEA (2008) considers that the elimination of subsidies in non-OECD countries could bring a major demand reduction and thus important emission reductions too.



Climate and energy policy created pressures will not lead to significant changes in energy sources structure in the fore coming decades (fig.2).

According to IEA (2008), fossil fuels will have an important contribution in satisfying the energy needs. This is estimated to be 80% in 2030, and 60% in 2050. Further, oil will be the dominant fuel although the coal demand is increasing in absolute terms due to its use for power generation and China and India (85% of the global consumption growth). Oil will have a 30% quota of world energy consumption in 2030.

4. FINANCIAL CRISIS' IMPACT ON INVESTMENTS

The recent financial crisis generated a powerful global action, outstanding by its intensity and global coordination. Nevertheless, the mitigation actions should be replaced by regular actions that should be constructed by considering both the causes of the crisis and the vision on the next growth model.

According to OECD (2009), the growth model has to rely more on medium and long term approaches that will result in being: i. stronger, ii. cleaner; and iii. fairer. *Stronger* means that better regulation of financial markets, a healthy balance between markets and government, and policies to promote more innovative long-term growth in a more balanced global economy. *Cleaner* refers to a low carbon growth path, in line with ongoing efforts to mitigate climate change. Supporting economy should not be an excuse for environmentally harmful investments. *Fairer* signifies more effective trade, investment, and development policies, stronger social frameworks and a common global governance structure based on cooperation between developed and developing countries. In this respect, open markets remain a fundamental principle of well-functioning economies.

In the equation of sustainable development, financial crisis play a role by creating momentum to change criteria for investments, by the *cleaner* component of the growth model. This is also linked to climate change, since cleaner investment means going away from conventional fuels to other types of energy, such as renewable energy sources (RES). This “move” is also necessary since these cleaner energy sources cannot compete with fossil fuels since investments made in their exploitation are already recovered and were made using huge subsidies. Another supportive reason is that exploitation of RES necessitates large investments with efficiency indicators becoming attractive only on a medium and long term perspective.

The win-win opportunities are represented by:

- green tax reform – moving away from labor and capital towards pollutants or polluting activities and using auctioned pollution permits that generate revenues;
- reforming and removing inefficient policies, especially subsidies to fossil fuel production and consumption;
- removing barriers to widespread practice in energy and transport efficiency.



Other opportunities for green growth are related to public investments in energy efficiency of buildings, public transport, renewable energy networks, more efficient water treatment supply and sanitation, as well as infrastructure to prevent flooding, and other environmental risks and degradation.

5. POTENTIAL OF REMOVING SUBSIDIES FOR FOSSIL FUELS TO CONTRIBUTE TO GHG EMISSION REDUCTIONS

In a long-term perspective removing subsidies has an important environmental contribution through what is called by OECD (2009) as double or triple “dividend”. This will arise from:

- removing inefficiency in resource allocation in the economy;
- pushing the green agenda; and
- saving governments and tax payers money.

According to Stern (2007), the trading scheme of GHG emissions implemented through the Kyoto Protocol has the potential to reduce the amount of emissions to the level required to not exceed the 2 Celsius degree increase of global average temperature.

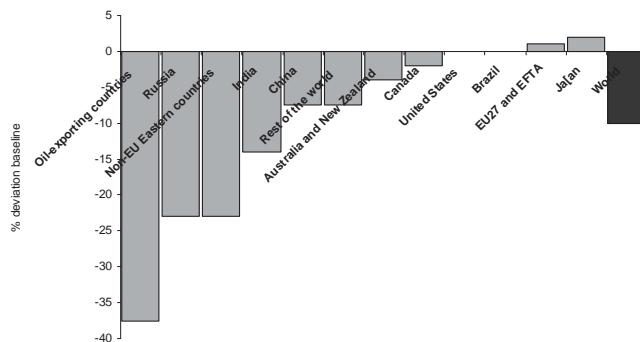


Fig.3. The effects on GHG emissions of removing fossil fuel subsidies in emerging and developing countries combined with caps on emissions in developed countries (horizon 2050)

However, there are voices that point on the difficulties of meeting the emission goals even in countries with high commitments in this respect, such as the European Union. Further, the recent high level climate meetings (Copenhagen 2009, Cancun 2010) are evidence for the resistance to change toward a low carbon future. Thus, other means of reducing emissions should be considered. OECD sees subsidy removal for fossil fuels as one of these.

Fossil fuel and electricity subsidies accounts for more than a half of total subsidies around the world being of 310 billion USD in 2007. Combining the effects of emission caps for developed countries and removing subsidies for fossil fuels will produce by 2050 a 10% reduction of GHG emissions at global level, with the largest reduction in Oil-exporting countries, Russia, and non-EU eastern countries (fig.3).



Removing subsidies to fossil fuels production and consumption is a difficult decision to make given its harsh social impact. Another consequence that arrive via demand drop is income loss in oil exporting countries. Such impact will hit especially Russia and non-EU eastern countries. Meanwhile, the impact on GDP, calculated as percentage deviation in 2050 from the 2005 level is negative for the same country groups, being comprised between -1.8% and -4.7%.

6. CONCLUSIONS

The challenges of sustainable development remains after more than two decades of converging efforts at high decision levels. Its environmental dimension is a great contributor in this respect with climate change on the top of priority list. The paper examined two means to contribute in this area: changes in investment patterns due to the new growth model emerging in the aftermath of the financial crisis and the removal of subsidies for fossil fuel production and consumption.

In the first case we found that the new growth model has a “green” component stemming in green-tax reform, reforming and removing inefficient policy measures, and removing barriers of energy and transport efficiency. As long as the second component is regarded, the triple “dividend” that could be obtained includes pushing the green agenda. However there are important barriers to overcome, such as social impact and income loss for oil exporting countries.

Further research should consider what are the economic and social implications of this global picture in Romania and if there are measures to be applied in order to prevent revenue and GDP loss due to subsidies removal.

REFERENCES

1. Bran, F., Ioan, I. (2002), *Ecosferă și politici ecologice*, Bucharest: ASE Publishing.
2. International Energy Agency (2008), *World Energy Outlook 2008 – Executive Summary*.
3. OECD (2010), *Synthesis report on the strategic response*, Meeting of the OECD Council at Ministerial Level, 24-25 June 2009.
4. OECD (2010), *Preliminary results on key elements of the green growth toolkit*, Meeting of the OECD Council at Ministerial Level, 27-28 May 2010.
5. OPEC (2007), *World Oil Outlook 2007*.
6. Stern, N. (2007), *The Economics of Climate Change. The Stern Review*, Cambridge University Press.