

Energy Security in a Sustainable World An Outlook from GIBSA¹ countries

Climate Change, Energy Security, Geopolitical Geometry

Climate change is a complex issue strongly related to the reliability of the energy supply. Germany, India, Brazil and South Africa (GIBSA countries) are in a unique position to play a positive, active role in advancing the dialogue on this issue. Together they represent a substantial share of the world energy system and they are relevant actors (often in the role of troubleshooters) in their regions. They share the view that universal access to an affordable, cost-efficient, secure energy supply must be provided while the transition from fossil fuels to environmentally friendly energy sources is facilitated. Based on these shared values, their energy cooperation should be organized around non-controversial aspects, creating room to move ahead to more controversial ones. Three issues are readily available for cooperation: i) cost-effective energy efficiency, enveloping recycling; ii) the supply of reliable energy at affordable prices to the extremely poor, including the supply of water and sewage; iii) public transportation in megacities. Technological innovation and investment in infrastructure are crucial elements of their cooperation.

¹ Germany, India, Brazil and South Africa

1. GIBSA AND CLIMATE CHANGE

Highlighting the Challenge

Climate change is a pervasive issue. We do not know yet the full-scale damages that climate change will cause (models always present uncertainties) but waiting for more scientific evidence on the best practices to fight it is not a reasonable option. Although there is a sense of urgency for mitigating actions, identification of such actions is difficult and these actions must not jeopardize improvements in the quality of life of millions of people who are not able to meet their daily necessities as yet. Governments have to act carefully but responsibly, especially in developing countries that have pressing socioeconomic issues to deal with.

Consumers are reluctant to pay the full costs of the adaptation of their current way of life to an environmentally friendly economy. The over-dramatization of the risk of climate change risks to induce a demobilization effect each time the symptoms of climate change diminish a little. Education is fundamental to promote environmental protection as well as technological innovations but policies regarding climate change must include economic incentives to effectively induce a change in people's behavior. The challenge is whether the young generations, more open to new policies, will be able to change the society is thinking before nature teaches the lessons that climate change will bring.

The world economy has to satisfy the needs of a growing population that will grow more than nine billion people in 2050.² It is not easy to find consensus on the measures that should be enforced to fight climate change and meet these needs. Agreement on such measures can hardly be achieved on a parliamentary basis, with hundreds of governments involved in the process. Parliamentary negotiations are the art of dealing incrementally, moving from less difficult problems to more difficult ones and grand conferences, such as the Rio+20, drive a lot of attention but they raise expectations that can hardly be satisfied. Any measure will have a direct effect on the way we organize our societies - global trade, government budgets and families' revenues will be redefined – and will have to take into account the interests of future generations that are not yet able to express their views on the issue.

Although we should not neglect the incremental advances that have been achieved so far, the multilateral dialogue is not moving the agenda at the speed required by the civil society. One exception may be the recent pressure on politicians in the case of the Fukushima nuclear

² United Nations, *World population to reach 9.1 billion in 2050, UN projects*, 24 February 2005, UN News Center, <http://www.un.org/apps/news/story.asp?NewsID=13451>.



accident in Japan. Governments are often short-term oriented: their actions must be visible to their voters within their time in office. They may show concern towards problems of future generations but their action may be concentrated on the problems affecting the next election and not the next decade. This explains why mitigating climate change measures lost political support with the recent economic and financial crisis.

Climate Change Policies

Germany

Germany is largely dependent on energy imports (98% of oil, 77% hard coal, 82% natural gas)³ but the country is a net exporter of electricity. Nuclear power is a relevant share of the energy mix but the German Government decided to gradually phase out nuclear power by 2022. The German energy transition (“Energiewende”) was approved shortly after the nuclear catastrophe in Fukushima. It is important to remark that this decision has had more continuity than usually observed elsewhere: a nuclear phase out had been decided already in 2000, reducing the nuclear share of the electricity mix from more than 30% in 1999 to 22% percent in 22% in 2010 and further to 16% in 2012.⁴

Germany takes the climate change issue seriously. Decarbonization is a main driver of the country’s energy policy. A feed-in tariff introduced in 1991 promoted the use of renewable energy that represents roughly 10% of the primary energy mix and 20% of the electricity supply nowadays. The target is to increase the renewable share from the current level of 10% to 18% by 2020 and to 60% in 2050. Another pillar of the decarbonization policy is energy efficiency that should reduce energy consumption by 20% until 2020 and by 50% until 2050, as compared to 1990. These targets should reduce greenhouse gas emissions by 40% until 2020 and by 80 to 95% until 2050. Decarbonization is framed to achieve two goals: climate change and energy security. Germany also pushed forward the International Renewable Energy Agency (IRENA).

India

Domestic coal is the core of India’s energy matrix (reserves can supply up to 45 years of the present consumption). Oil consumption is largely met with imports (80%), creating a

³ Working Group on Energy Balances, March 2012, www.bmwi.de/BMWi/Redaktion/Binaer/Energiedaten/energiegewinnung-und-energieverbrauch2-primarenergieverbrauch,property=blob,bereich=bmwi,sprache=de,rwb=true.xls, accessed June 27, 2012.

⁴ Arbeitsgruppe Energiebilanzen e.V., Bruttostromerzeugung von 1999 bis 2012 nach Energieträgern, www.ag-energiebilanzen.de/viewpage.php?idpage=1, accessed February 13, 2013.



tremendous strain in the country trade balance (US\$150 billion in 2011; about 4% of GDP). India has large offshore sedimentary basins underexplored (22%) but was unable to establish a regulatory framework attractive to international oil companies (IOCs). There is no domestic political agreement on the regulations that should be used to share the oil economic rents between the IOCs and the country's government.⁵ As a result of this stalemate, 60% of the oil exploration agreements (34 billion dollars) are stalled.

India's climate change challenges are huge. Replacement of old, inefficient fossil fuel-based thermal power plants to nuclear power and/or renewable energy sources is limited by fiscal and capital constraints while public awareness of the risks of climate change is poor. It is estimated that improvements in energy efficiency can produce up to a 30% short-term reduction in energy consumption but the actual impacts of energy efficiency policies are limited by large energy subsidies and politically difficult to remove. The institutional framework that governs the energy systems on the Indian subcontinent is very inefficient and the central problem is that adequate energy supply must come together with affordable energy prices to the massively poor population. Although India has a vast railway system that can significantly enhance public transportation, the country's preferred choice of mobility is the automobile and the rapid increase in the car fleet is pushing an oil consumption boom.

Brazil

Brazil is in a privileged position as far as climate change is concerned. Its energy matrix is largely based on renewable energy (table 1), electricity is essentially generated at hydropower plants and the share of renewable power (especially windpower and biomass) is rapidly increasing. Moreover, biofuels (ethanol and biodiesel) account for a substantial share of the liquid fuels used to move the country vehicles fleet. Coal is essentially used at the steel mills and marginally used to generate electricity and nuclear power supply is limited to two reactors (another one is under construction). Nevertheless, oil and increasingly natural gas remain the bulk of the Brazilian energy consumption.

Electricity (10% of the domestic consumption) is imported from Itaipu, a binational hydropower plant situated at the Brazilian border with Paraguay, and natural gas is imported from Bolivia (30%). The country has historically perceived imports of oil as a great economic vulnerability but this perception is gradually vanishing with the increase of domestic oil production. Brazil is currently a marginal net exporter of crude oil but it will turn into a large oil exporter at the end of this decade as vast offshore hydrocarbon resources were recently discovered. Oil production

⁵ This is a critical element of the relationship between international oil companies and governments. See Victor, D et alii (2012), *Oil and Governance*, Cambridge University Press, Cambridge.

is planned to reach 6.1 million b/d and oil consumption is expected to be roughly 3 million b/d. The natural gas production is planned to attain 240.5 million m³/d⁶.

Table 1: Brazilian Primary Energy Consumption (%)

Sources	2000	2011
Oil	45,7%	36,6%
Natural Gas	5,7%	10,8%
Coal	6,6%	5,5%
Total Fossil	58,1%	52,8%
Firewood	12,8%	10,2%
Sugar Cane	11,1%	16,8%
Hydropower	14,6%	14,3%
Other	2,5%	4,3%
Total Renewables	40,9%	45,6%
Nuclear Power	1,0%	1,6%
TOTAL (Mtoe)	179,7	257,5

Source: Balanço Energético Nacional 2012, Ministério de Minas e Energia, Brasília

This new situation prompted a radical change at the institutional framework that governs the oil market.⁷ The concession licensing regime was replaced by the production-sharing agreement that must have Petrobras (the national oil company) as the oil block operator. International oil companies are expected to limit their role in the Brazilian oil industry to the financing of Petrobras investments. The traditional oil tax used to induce the substitution of oil derivatives to renewable fuels has been removed. The consumption of renewable fuels (ethanol) is decreasing while the consumption oil derivatives, especially gasoline, is rapidly increasing. This new situation of Brazil being a net exporter of oil reduced the government's previous enthusiasm with the promotion of energy efficiency.

South Africa

Renewable energy plays a very small role in the energy matrix of South Africa. The country produces approximately 40% of Africa's carbon emission, ranking among the top 20 carbon

⁶ Plano Decenal de Expansão de Energia 2020, Ministério de Minas e Energia, Brasília

⁷ de Oliveira, A (2012), Brazil's Petrobras: Strategy and Performance, in Victor, D; Hulst, DR; Thurber, MC (2012), Oil and Governance, Cambridge University Press



emitters in the world.⁸ The country has the 9th largest world coal reserves⁹ which are dominantly used as primary energy source (65%).¹⁰ Natural gas represents roughly 2% of its primary energy consumption and a single nuclear power reactor is producing electricity.

There is a large potential of shale gas (probably about 450 trillion cubic feet)¹¹ that could be developed, eventually reducing carbon emissions. However, water scarcity is major challenge for South Africa. The country has to import water and the fracking of shale gas will potentially aggravate this situation as the process is environmentally harmful and it may lead to vast contaminations of the subsoil water bed. In April 2011, South Africa went under a moratorium for shale gas fracking that lasted until September 2012.¹²

Traditionally, electricity supply was cheap in South Africa mainly because Eskom (the main power utility) was able to buy domestic coal at preferential prices (50% to 60% percent of the export price). This situation is changing as subsidies for coal used in power generation are being removed. The National Planning Commission also established that the country's reliance of coal power plants should be reduced from 90% to 60% by 2030. Approximately 40 GW of new power capacity is required to replace the aging coal fired capacity. However, the multilateral banks are unlikely to offer soft financing for the replacement of old coal fired power plants. Moreover, recent reports indicate that the actual construction costs of the power plants are three times their initial estimates.

The discussion currently centers around the possibility to build a fleet of (possibly six) nuclear power stations. Such a solution will have a massive drain on the financial resources of the country that could be better used to benefit the poor population. The government's ability to transfer much higher electricity costs to consumers is unclear. Most probably, electricity subsidies will remain (nowadays poor consumers get 50 KWh basically free of charge).

⁸ Source: US Energy Information Administration website <http://www.eia.gov/countries/country-data.cfm?fips=SF&trk=p1> (Accessed 10 February 2013)

⁹ Source: US Energy Information Administration website <http://www.eia.gov/countries/country-data.cfm?fips=SF&trk=p1> (Accessed 10 February 2013)

¹⁰ Source: South African Department of Energy Website http://www.energy.gov.za/files/coal_frame.html (Accessed 10 February 2013)

¹¹ Devlon Maylie, "Fracking Debate Racks South Africa", in: *The Wall Street Journal*, 5 August 2012, <http://online.wsj.com/article/SB10000872396390444130304577559273891708802.html>.

¹² Wendell Roelf, South Africa Fracking To Proceed After Shales Gas Moratorium Is Lifted, 7 September 2012, Reuters, http://www.huffingtonpost.com/2012/09/07/south-africa-shale-gas-fracking_n_1864260.html.



2. GIBSA AND ENERGY SECURITY

Highlighting the Challenge

Oil still dominates the global energy system but this situation is unsustainable. Oil is a main source of green house gases and it will be exhausted eventually, leading into the consensus that a transition to alternative energy sources has to speed up. Nevertheless, this transition has gone at slow path so far. The lack of a comprehensive alternative to oil derivatives in transportation is the main reason for this situation. After the 1970's oil crisis, the OECD countries drastically reduced their oil consumption but their per capita level is several times higher than observed in the rest of the world. It is expected that the oil consumption will remain stagnated in the OECD countries but it should increase at 2.7% a year in the non-OECD countries.¹³ The economic growth of emerging economies, especially China, is inducing a substantial increase in their world oil consumption, in spite of policies aiming to reduce oil consumption.

The international oil market operates a sort of unstable equilibrium in which international oil companies (IOCs) govern the demand side and state-owned companies (SOCs) manage their oil supply.¹⁴ The bulk of the known oil reserves are concentrated in the Middle East, a complex region where the geopolitical instability jeopardizes the global oil supply. As result of, oil prices jumped to unprecedented levels and became extremely volatile, provoking waves of economic instability and the global economy crisis. On the other hand, oil importing regions such as North America, are consolidated countries, democracies and economies. The region has a relevant share of the world oil reserves (13.2%) and its production of oil started to increase in recent years, pushed by the development of unconventional hydrocarbons resources in the US (mostly natural gas) and Canada (tar sands). The bulk of the Venezuelan oil continues to flow to the U.S. and the identification of vast offshore oil fields in Brazil prompted a diplomatic effort by the U.S. to guarantee access to these resources. A relatively small share of the U.S. oil imports comes from the politically troubled Middle East.

Europe's small regional production in the North Seas is supplemented by a diversified flow of imports. Africa (North and South Sahara) is a relevant contributor but it can hardly supply the bulk of the European oil consumption. A substantial oil flow from the former Soviet Union countries diminishes European dependence on the Middle East but shifts this dependence on political events in Russia. The region has been unable to get significant access to the oil resources of South America so far. The European countries agreed that efficiency improvements

¹³ Finley, M. (2012), The Oil Market to 2030: Implications for Investment and Policy, in Economics of Energy & Environmental Policy, Vol 1, no 1.

¹⁴ Victor, D; Hults, DR; Thurber, MC (2012), Oil and Governance, Cambridge University Press



should be a relevant aspect of their energy policy but were unable to find a unified strategy to substitute fossil fuels and mitigate the risk of climate change: France invests in nuclear power while Germany is concentrating their energy transition strategy on renewable energy sources.

The Asian countries are almost completely dependent on oil imports from the Middle East. A disruption of the oil supply from the Middle East (for instance a blockade in the Hormuz strait) will have a dramatic effect in their economies. The region had elected nuclear power as its main energy strategy to reduce its dependence on oil imports and to reduce carbon emissions as well but the Fukushima accident had a dramatic effect on this strategy. It is likely that Asian regional geopolitics of energy will remain largely on the import of hydrocarbons and the regional production of coal, if the popular reaction to nuclear power gains momentum.

The Middle East holds the bulk of the known world oil reserves (48.1%) and dominates the supply side of the world oil trade (51.8%). The former Soviet countries and Africa (North and South Sahara) provide the bulk of the remaining oil supply (23.7% and 18%). Although these known oil resources can supply several years of consumption as yet, new oil fields must come to the production stream to replace depleted oil fields. Roughly 16.5 million b/d a day must be added to the current level of production (86 million barrels a day) in the coming years to avoid world shortages. A large share (75%) of this increase in the oil supply is expected to come from OPEC (principally Saudi Arabia and Iraq) and to a lesser extent from South America (mainly Brazil), Africa and the former URRS.¹⁵

South America is a relatively small (6%) but growing supplier to the world oil market. This region has vast underdeveloped oil reserves (311 billion barrels) and the oil resources recently identified in the pre-salt layer of the Brazilian offshore sedimentary basins are expected to add a substantial volume.¹⁶ Moreover, differently from the heavy Venezuelan oil that has difficulty to find buyers in the oil market, the Brazilian resources are of light oil that can be easily processed by the existing oil refineries.

Energy Security Policies

Energy security is at the core of national security and it is usually related to the conditions of access to the supply of primary energy resources, particularly oil. This is a narrow perception of the issue. The reliability of the infrastructure available to transform and to transport the energy

¹⁵ Finley, M (2012), op. cit.

¹⁶ BP Energy Outlook 2030, www.bp.com on August 05, 2012.



to consumers and the environmental sustainability of the energy system are both relevant aspects of energy security.

The GIBSA countries play a significant role in the global energy security system. They are among the main energy consumers of oil, natural gas and coal in their respective regions: oil consumption makes up 10.3%, natural gas consumption 5.0% and coal consumption 12.9% of the world total.¹⁷ Moreover, the interconnection of their energy systems to their neighboring countries has a direct effect on the regional energy security, affecting global energy security eventually.

Germany

Energy is perceived by the German authorities as a commodity that does not need to be managed as a strategic tool by foreign policy. Energy imports are dealt with under the concept of mutual interdependence (meaning that the energy supplier relies on the revenues of the sales to the German energy market at the same length that the German consumers rely on its supply). This approach has its roots in the Gas-Pipe-Deals with the Soviet Union of the early 1970's. Lately, with the Energiewende, energy security has become more pronounced with regard to system reliability in the electricity sector. Major concerns about supply security are related to gas imports from Russia.

The creation of the European Union internal market for electricity and gas moved the management of the energy security issue to the European Commission in Brussels. Increased competition resulted in weakening the market power of German energy companies vis-à-vis the big suppliers such as Gazprom. Indeed, the market share of the European gas market is diminishing as result of both its transition to a low carbon energy system and the fast growing consumption of gas in the Asian market. Russia is pursuing the diversification of its gas consumers and it is demanding secure contracts in Europe for investments in the hydrocarbons energy supply chain.

Reliability of the power system is becoming a major issue because of the intermittence in the supply of renewable power. Gas fired power plants could back up the supply of renewable power but the gas price is not competitive as compared to the coal price. A carbon tax could improve the competitiveness of gas fired power plants if natural gas is envisaged as a bridge towards a more sustainable energy future. Batteries for the storage of power is a strategy

¹⁷ BP Statistical Review of World Energy 2012, June 2012, http://www.bp.com/assets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/statistical_review_of_world_energy_full_report_2012.pdf, pp. 11/ 25/ 33.



alternative. In any case, it is worth remarking that the Energiewende has no energy strategy for the transport sector so far.

Germany sees with concern the divergence between the US strategy towards non conventional fossil fuels (shale oil and gas) and the European effort towards renewable sources. It seems that the U.S. (and the Americas) are looking for a kind of semi-autarchy that may lead to isolation. It is unclear what this would mean for global oil and gas trade. It can have a dramatic effect on the Middle East. If the U.S. reduces its military capabilities in that region, the result might be increasing volatility in the energy prices that are already having damaging effects on the economy. It is important to note that Germany has no multinational oil or gas companies that can deal with these problems.

India

Currently India's energy security present itself as a formidable challenge. India struggles not only to have access to energy supplies, but also need supplies at affordable prices. Domestic sources of crude oil, gas and coal are not adequate to meet the growing demands of its rapidly expanding economy. As an example, India's coal reserves have been revised down for only 40 years. India's crude supplies imports accounts for approximately 80% of its needs, and the spiraling price of crude has had major effect on hard its import bill. Also, this situation has heavy impact on petrol pricing for the consumer and because of this, diesel has been receiving large subsidies to remain economically viable.

Despite the fact that only approximately 22% of India's sedimentary basin has been explored until now, the exploration policy, from the Government, has not yet been successful. Regardless the successive rounds, most of the largest oil companies in the world have not come to India for exploration. In fact over 50% of the oil exploration agreements of 34 billion dollars have remained unfulfilled.

Regarding renewable energy sources, it seems that India has not pushed as hard as it could have (even though, news on its solar thermal production have shown significant investments). Although the country has potential in water voltaic, hydro-energy, solar thermal and wind power, they remain largely unexploited. Though, it is also noteworthy that an expansion on renewable sources has to be aligned with the food security issue, which is definitely one of India's policy priorities.

In fact, India's biggest challenge is not only to meet its current demand and supply sectors. India as a booming country also has to address to its rapid growth and try to avoid its energy supply from becoming a bottleneck that constrains its development.



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Brazil

Oil import has been a major vulnerability of the Brazilian economy until recently. To increase the security of its energy supply, Brazil invested heavily in renewable energy sources (ethanol and hydropower) and created large infrastructure for imports of energy (power and natural gas) from its neighboring countries. Nowadays, oil is a relatively small share of the Brazilian energy system.

The recent discovery of very large offshore hydrocarbon resources (oil and natural gas) radically changed the Brazilian dependence on energy imports. Indeed, Brazil will become a large exporter of oil (and natural gas as well) in the coming years. This new situation induced the Brazilian government to move towards an autarky approach where geopolitics will have a central role instead of commercial liaison.¹⁸ The decisions of the Bolivian government to nationalize investments of Petrobras (Brazilian state-owned oil company) and the Argentinean government to limit exports of natural gas to Chile have both increased the Brazilian aversion to regional energy integration. Plans to exchange power with the Mercosur countries and to increase natural gas imports from Bolivia were abandoned.

However, the growing insertion of the Brazilian oil industry into the global market and the movement to the west of the Brazilian economy are changing the Brazilian energy security policy. Brazil is planning the construction of hydropower plants in its neighboring countries and it is becoming a relevant supplier of oil to the Asian countries, especially China that offered substantial financial resources (US\$ 10 billion) to develop the Brazilian deep offshore oil resources.

Brazil can play a relevant role in the security of the energy supply to the South American energy market, and extend it to other regions of the globe. Its vast reservoirs of hydropower offer a privileged position to take the leadership in the regional transition to a sustainable, low carbon power system in South America. Its exports of biofuels exports can be combined with its oil exports to provide a secure supply of a low carbon liquid fuels mix. This will reduce uncertainties and price volatility that is indispensable for an organized energy transition away from fossil fuels.

¹⁸ de Oliveira, A (2009), Integración y Transición Energética, in Foreign Affairs Latinoamérica, Vol 9, N° 2



South Africa

South Africa faces a double challenge: energy security and energy poverty. During the Apartheid regime, energy security was dominated by the breaking of international sanctions to imports of oil. The energy surplus that was a characteristic during the Apartheid regime shifted dramatically to widespread energy shortage afterwards. The needs of the poor population are competing with the intensive energy industries (especially mining) for the access to the cheap domestic supply of energy.

In the case of South Africa, energy security cannot be dissociated from affordable energy prices. Many people in the country have no access to modern energy sources as yet. They receive social grants through various mechanisms, including subsidies for their energy consumption. The inclusion of this part of the population in the modern energy system is crucial for the country's political stability.

South Africa can have a central role in the regional organization of the energy market in the South of Sahara. Hydropower and natural gas imports would have positive effects on the South African energy security (and climate change as well). Congo can provide hydropower, Angola oil and Mozambique natural gas. However, very complex political problems prevent South Africa from accessing these energy resources. The Ministry of Energy announced that the discussion around the construction of gas pipelines across the region will be initiated.

Political stability has been a major constraint to regional energy integration in spite of very large resources in neighboring countries. South Africa focused its agenda outside the region, leaving room for the insertion of the Chinese and the Indian state companies in the region.

Comparing Goals and Strategies

Although there are differences in the GIBSA countries approach to their energy security, there is a common element: the diversification in their supply of primary energy sources. The global energy market will be more heterogeneous regionally to handle different energy security strategies. The Americas are aiming for a larger degree of autarchy, with a strong focus on fossil fuels, while Europe invests heavily in renewable and energy efficiency. Access to affordable energy for the poor population remains the critical energy issue in Africa South and in the Indian subcontinent, suggesting that subsidies will remain a critical policy in these regions where the conflict between food supply and the production of energy from biomass is a major issue. Starting from different positions, the GIBSA countries are using different strategies with a similar goal: secure, affordable, environmental friendly energy system. This scenario suggests that the GIBSA dialogue can add much value to the multilateral negotiations on energy security.



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3. Reconciling GIBSA Agendas

We tend to concentrate our attention on dialogues engaged at global institutions but regional, multilateral dialogues are not less relevant. They offer opportunities for incremental advances among groups of countries, increasing the likelihood of global effective actions. The GIBSA countries can take advantage of their global presence to move forward the climate change issue. Although their interests diverge in many policy areas such as international trade and agriculture, they share common aspects such as being large, multicultural democracies that have growing populations (with the exception of Germany) and economic power. GIBSA is pragmatic group of countries that often operate as troubleshooters.¹⁹

The global economy is exhausting our stock of natural resources. Carbon emissions by fossil fired power plants are a critical aspect of the climate change issue in India and in South Africa but are not relevant in Brazil where deforestation is the key carbon emissions problem. Security of energy supply is not a pressing issue for energy exporting countries like Brazil but is vital for a country that is largely dependent of energy imports like Germany. Access to affordable supply of modern energy sources is essential for countries like South Africa and India but not important in Germany. Technological innovation is critical for the transition to a lower carbon economy in India, Brazil and South Africa but is not a significant issue in Germany.

This reality suggests that we should not search for agreements on controversial issues to reconcile the energy security and the climate change agendas of GIBSA countries. Rather, a more efficient and promising approach to move into a lower carbon global energy system is to focus on concrete, less controversial issues which then would allow broadening the agenda step-by-step.

A large share of the population in India, Brazil and South Africa still lives in unacceptable material conditions. The right to affordable and cost efficient supply of modern energy sources, essential for a decent standard of living, merits more attention by the GIBSA countries. However, the improvement in the standard of living will necessarily put pressure on their natural resources endowment. The misuse of the raw material water and energy are non-controversial aspects that deserve close attention of the GIBSA countries as well.

There are plenty of studies and practical examples of how to save natural resources and energy (therefore improving energy security, protecting the environment, saving resources and reducing carbon emissions), if the right policies are enforced. We have noted that there is not enough exchange of knowledge about the lessons learned from the energy policies adopted by each GIBSA country.

¹⁹ See Annex.

For instances, the Brazilian experience offers a good example that the improvement in living standards of extremely poor families has the side benefit of slowing down the demographic exponential increase, and diminishing the pressure on natural resources consumption as well. The access for poor families to power and LPG was promoted in combination with energy efficiency policies and with a family income program that demands that families send their children to schools.²⁰ As a result, both population growth and the consumption of firewood for cooking diminished rapidly. This Brazilian experience shows that there is no need to use authoritarian demographic policies to mitigate population growth and deforestation problems induced by poor families.

Technological cooperation is a good starting point to move forward the dialogue among GIBSA countries. Germany has a large contribution to GIBSA in this aspect. The storage of renewable energy and efficiency improvement in the public transportation in megacities are two good examples of other non-controversial topics. Transportation is a time and revenue consuming activity that can reduce the living standard of the poor population considerably. Cooperation in this regard does not necessarily have to be operated at central government level seen as one of the positive results of the Rio+20 conference in June 2012.

Technology by itself cannot eliminate the risk of climate change but it has a decisive role in a secure global transition to lower carbon economy. However, it is important to note that for the IBSA countries, Germany not included, the issue is not technological breakthroughs but, rather, sharing technologies that are already available. The main constraints for the use of these technologies are related to regulations, pricing and the lack of capital to develop the needed infrastructure.

It is important to remark that energy security and climate change policies must not be isolated from food security. These are strongly interlinked issues that are particularly relevant in Asia, where large subsidies to energy prices are given to farming however, this it is becoming relevant globally as well, as a result of the increasing production of biofuels to substitute oil derivatives.

Rising powers, like the IBSA countries, transform the established hierarchies and, in a way, challenge the status quo. Rising powers move from being troublemakers to becoming troubleshooters. This is not only a question of accommodation of new players, but a process of accommodation on both sides.

²⁰ Brasil Sem Miséria, <http://www.mds.gov.br/falemds/perguntas-frequentes/superacao-da-extrema-pobreza%20/plano-brasil-sem-miseria-1/plano-brasil-sem-miseria>.



ANNEX

BRAZIL: LATIN-AMERICAN TROUBLESHOOTER

A troubleshooter country in the present context can be identified by the way it pursues three objectives whenever it faces a problem with international impact. The first objective is to contain the conflict, preventing it from expanding into new, violent clashes. The second is to circumscribe the conflict, so as to prevent it from spreading to other countries. The third is to reverse the crisis so that the relations between the parties, domestic or otherwise, return to normal.

The industrialized western powers do not perceive Latin America as a threat or as a source of danger for the international community. Latin America is a nuclear weapons-free region, there are no violent conflicts between states and there are no risks of cyber warfare. But transnational organized crime and drug trafficking are serious security problems, not only for other regions but for Latin America as well. The governments of the South American countries do not accept U.S. intervention in the region as they tend to have defensive, nationalist positions. With the notable exception of Colombia, which relies strongly on U.S. security support.

Nationalism is a very narrow understanding of sovereignty. South America has to establish its own security agenda (which must include climate change and global secure supply of energy) and share it with countries from other regions. In this sense, Brazil is in a privileged position to take a leading, constructive role on climate change that is very much in its national interest. The country energy matrix is largely organized around renewable energy sources and it can offer secure supply of hydrocarbons to the global energy market. Deforestation, a major problem in the past, is rapidly diminishing as a result of both government action and increasing productivity in the agribusiness. Brazil is setting up to be a large supplier of food to the global market preserving its forests. Although the Brazilian government failed to contain, circumscribe or reverse some recent regional crises, Brazil can be historically classified as a troubleshooter.