

FROM BRICS TO BRIDGE: The South as a driving force of the global energy transition

By Inge Kaul*

Introduction

“ ... energy lies at the heart of all countries’ core interests” – so reads the opening paragraph of the United Nations (UN) Secretary-General’s Vision Statement on *Sustainable Energy for All* (UN 2011). Indeed it is not surprising that energy has, once again, moved to the top of the political agenda, nationally and internationally. Projections show a steep rise in global energy demands, with the developing nations accounting for the majority of this increase. Concurrently, analyses warn ever-more insistently that the transition toward a global low-carbon economy is proceeding too slowly, increasing the risk of global warming far beyond the target of two degrees Celsius.

Hence, if the international community is, indeed, as often stated, committed to promoting more inclusive and sustainable global growth and development, there is a threefold challenge to meet: (1) speeding up the development of additional energy production, while (2) enhancing energy efficiency and increasing the share of energy generated from renewable resources, and (3) ensuring affordable energy for the 1.3 billion people who still lack access to affordable electricity.

This paper argues that the advanced developing countries (ADCs), notably Brazil, China and India are emerging as new major driving forces of the required change processes; and that this trend is likely to continue, perhaps even accelerate in future.

First, the ADCs have emerged as new global ‘power houses’ and innovation leaders in various fields of renewable energy and energy efficiency.¹ So now, at this early stage of the current techno-economic paradigm shift, they could find it to be in their national self-interest to build on this achievement and strengthen their position in the global ‘green’ markets. This might render these markets more competitive and encourage the industrial countries to intensify their investments in these areas, thereby unleashing an accelerated, upward race toward a global low-carbon economy, from which all nations, rich and poor would benefit.

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¹ See Box 1 below for a definition of renewable energy and energy efficiency, as well as other related terms. In line with the terminology of the International Energy Agency (IEA), renewable energy (RE) is defined here as “energy derived from natural processes that are replenished constantly. In its various forms, it derives directly or indirectly from the sun, or from heat generated deep within the earth. Included in the definition is energy generated from solar, wind, biomass, geothermal, hydropower and ocean resources, and biofuels and hydrogen derived from renewable resources”. Available at <http://www.iea.org/aboutus/faqs/renewableenergy/>.

Second, as the ADCs themselves still contain sizeable pockets of poverty, they are likely to focus their energy-related research and development not only on high-end technologies but also on technologies suited for lower-income households, communities and small-scale producers. Thus, given the long-standing concern of the developing countries with technology transfer and considering the solidarity rationale that is said to underpin their South-South cooperation, they might, furthermore, choose to become more actively engaged in ‘green’ multilateralism. For example, they could opt for taking the lead in suggesting that the Green Climate Fund (GCF) include or be linked to a Technology Bank, to which they themselves would contribute patents of special importance to fostering sustainable energy security for all in poorer developing nations.

Additionally, the ADCs could suggest another separate but linked entity for the GCF: a facility that, in close collaboration with the concerned industry and other concerned national and international agencies, would support innovations in natural catastrophe-risk financing. Promotion of such a facility is logical, given the unfortunate reality that the incidence of more severe and costly weather events is likely to increase in future. Improving catastrophe-risk financing would thus be an important adaptation measure, aimed at strengthening the resilience of communities, including that of their energy systems and preventing natural disasters from repeatedly pushing people back under the poverty line.

Again, like the ADCs’ growing involvement in global ‘green’ markets, their deepened engagement in ‘green’ multilateralism might rekindle the industrial countries’ support for international cooperation and further accelerate the progress toward realizing sustainable energy security for all.

With these policy initiatives, the ADCs would set important examples of how the international community could respond in practice to its repeated calls for the facilitation of technology transfer, including the Rio+20 outcome document,² as well as its concern about making the world safer from natural hazards.^{3/4} Or, as IEA (2013.a) put it, we would see a redrawing of the global energy-climate map.

However, the projected ‘upward spiral of progress’ would occur only, if neither the ADCs’ increased engagement in the global green markets nor their deepened multilateral engagement would be taken as a substitute for the commitments made by the industrial countries to support developing countries’ climate efforts. To the contrary, the ADCs’ efforts should lead to clear additionality.

The group of developing countries has become more differentiated. On several indicators, the ADCs now figure close to, if not above, the industrial countries, while according to other indicators, notably ‘per capita’ measures, they still fall squarely into the broader group of developing countries. This means that the world is no longer starkly divided into North and South. The ADCs now occupy an in-between position and seem to play an important bridging role: by – at least so far – slowly intensifying their competition with the North in terms of

² The ‘Rio+20 outcome document’ is the outcome document of the United Nations (UN) Conference on Sustainable Development, entitled “The future we want”. In section VI.B, paragraph 273 the document refers to a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies and requests that – based on inputs from relevant UN agencies – the UN Secretary-General make recommendations regarding the design and establishment of such a mechanism to the UN General Assembly (GA) at its sixty-seventh session. See UN (2012).

³ On the issue of resilience, see especially the Hyogo Framework for Action 2005-2015, adopted at the World Conference on Disaster Reduction held in 2005 in Kobe, Hyogo, Japan and endorsed by the UN General Assembly in resolution A/RES/60/195. See online: <http://unidir.org/we/coordinate/hfa/>.

⁴ Technology transfer is defined here as transfer of technologies across national borders.

technological, economic and political leadership and example setting; and by extending assistance to the poorer countries of the South so that the existing development gaps can be more rapidly and more durably closed.

It is thus time to stop looking at nations like Brazil, China, India and others as just ‘emerging markets’, i.e. as the ‘BRICS’.⁵ Instead, they should be seen as the ‘BRIDGE’ countries, i.e. countries that straddle across the North-South divide, opening up new avenues for meeting global challenges more efficiently, equitable and effectively.

In fact, playing such a BRIDGE role could be in the ADCs’ national self-interests. It would enhance their own national energy security and provide them with new, expanded market, growth and development opportunities. Moreover, the ADCs would – like most other countries – benefit from an overall improvement in the global energy and environmental context. So, the proposed strategy would constitute a smart and responsible exercise of their policymaking sovereignty. It would be a way of meeting their own national interests while at the same time contributing to faster, more inclusive and sustainable global growth and development.

Of course, a further strengthening of the ADCs’ investments and trade in the fields of renewables and energy efficiency could, like any other change processes, as well as like similar change processes in the industrial countries, meet with political opposition – e.g. from fossil-fuel lobbyists or because requisite capacity building may take time or investment resources are limited. So, the current trends signal but a new potential for an accelerated global energy transition.

Whether this acceleration will occur also depends on how the North responds to the growing multi-polarity in the energy landscape: Are the industrial countries ready to view this challenge as an opportunity also for them?

The ongoing negotiations on a post-2015 global agenda, as well as the preparations for the 21st Conference of the Parties on Climate Change, also to be held in 2015, provide an opportunity to begin opening up a new – more multi-polar and more dynamic – era of international cooperation.

In order to develop this argumentation, Section I of the paper will provide a brief overview of the current global energy landscape. This will show that the ADCs have been able to build up national technological capacities that would now allow them to pursue a role as BRIDGE nations. Section II will then explore the reasons that could prompt the ADCs to strengthen their engagement in the global ‘green’ markets and in ‘green’, climate and energy-related international cooperation. Against this background, Section III will examine the possible next steps that the international community might want to take in order to assure the ADCs that their strengthened engagement will renew rather than unravel the North’s commitment to the principle of common but differentiated responsibility and fair burden-sharing.

⁵ The term ‘BRIC’ was coined by Jim O’Neill of Goldman Sachs in 2001 in order to refer to a group of countries, including Brazil, Russia, India, and China that were then seen as the major ‘emerging markets’. South Africa joined the group in 2010, changing the acronym from ‘BRIC’ into ‘BRICS’. Over the years, the group has developed various joint initiatives. For more information on its activities, in particular its Summit meetings see the BRICS Information Centre website at <http://www.brics.utoronto.ca/>.

In addition to Brazil, China, India and South Africa a number of other countries are well on their way to becoming new, emerging economic and political powers, including, among others, Indonesia, Mexico and Vietnam. It is this broader group of emerging powers that – in the absence of another agreed-upon classification—is being referred to in this paper as ‘advanced developing countries’ (ADCs). On the issue of country classifications, see also Nielsen (2011) and UN-DESA (2012).

In more detail the argument is as follows.

I The Current Energy Landscape – Developing Nations Emerging as New ‘Power Houses’

According to the New Policies Scenario of the International Energy Agency (IEA), between 2011 and 2035 the global energy demand will have grown by more than one third, with the ADCs accounting for the largest share of this growth in energy use. While China is currently leading this demand growth, India is expected to become the major energy consumer after 2025 (IEA 2013.a).

In fact, since 2007, the combined electricity demand of the countries in the South has exceeded that of the countries in the North. Besides population growth, a major reason for this is has been development. As nations grow and develop, they expand and modernize their systems of production, transport and communication; and as the incomes of their households rise, so does the consumption of goods like refrigerators and air coolers or heaters, washing machines, telephones, TV sets and computers, as well as scooters and cars. It is the production and use of these types of goods that, besides such other factors as population growth and urbanization, contributes to the soaring – yet in per capita terms still relatively low – demand for energy in developing countries (CERI 2012, GNESD-UNEP 2010, Wolfram et al. 2012).

Moreover, many developing countries must meet a highly diversified mix of energy demands by: catering to urban conglomerates and high-tech firms, as well as to decentralized poor rural communities and traditional, small-scale enterprises and farms. As the Chinese Energy Research Institute (CERI) accordingly concludes in its 2012 *China Energy Outlook*, a key issue in forecasting the future trend of energy consumption in an advanced developing country like China is whether or not it can achieve “the change from energy-intensive industries to clean and high value-added industries” (ibid. p.21) and manage “to increase non-fossil energy supply according to local characteristics” (ibid., p. 38).

Recent analyses show that a growing number of developing countries, especially the ADCs, are already well on their way to mastering this challenge. They are expanding their investments in the production and use of renewable energy and, importantly, in the creation of their own national science, technology and innovation capacities in this field.

1 Increasing investments and trade in renewable energy

In 2011, the total global investment in new renewable energy capacities stood at US \$ 279 billion. In that year, the North contributed US\$ 186 billion or 66 percent of the total and the South US\$ 94 billion or 34 percent of the total. In 2012, global outlays declined to US\$ 244 billion, with the North now accounting for US\$ 132 billion or 54 percent and the South for US\$ 112 billion or 46 percent (Frankfurt School-UNEP Centre/BNEF 2013, p. 16). In other words, the North/South investment gap stood at a mere eight percentage points in 2012, down from 32 percentage points in the previous year. If this trend of rising renewables investments in the South – now unbroken for eight years – were to continue, in a few years’ time the largest part of the investment in renewable energy would, according to the aforementioned source, originate in developing countries.

In 2012, as Annex Box 1 shows, the top five countries in terms of new capacity investments in renewables were, in declining order: China, United States, Germany, Japan and Italy. In terms of

total installed production capacity (including hydro power) the leaders were: China, the United States, Brazil, Canada and Germany. In the same year, the BRICS nations together accounted for 36 percent of total global renewable power production (REN21 2013, p. 13). As can also be seen in Annex Box 1, in addition to Brazil and China, a number of other developing countries figure among the world's leaders in various fields of renewable power, including Algeria, Barbados, India, Indonesia, the Philippines and Vietnam. Yet, while China's 2012 investments totaled US\$ 64.7 billion, those of Brazil and India, for example, amounted to 'only' US\$ 5.3 billion and US\$ 6.4 billion, respectively (ibid. p. 58).

Clearly, wide gaps still exist within the South. Nevertheless, the developing nations are not only increasingly responding to the rising demand for energy at home, they are also becoming ever-more important players in the global renewables markets. This role includes the exports of renewable-energy supply products such as solar panels, wind hydraulic turbines and solar water heaters. For example, China exported over US\$ 10 billion worth of solar panels and cells in 2009 (UNEP 2013, p. 234). Just two years later, in 2011, China exported solar panels and key components worth € 21 billion to the European Union (EU) alone (ibid.).

Similarly, in the area of wind energy, Indian exports of wind turbines and components accounted for about 12 percent of the global trade in 2011 (ibid.). Moreover, several other developing countries are already trading internationally and have the potential to further expand their exporter role. These countries include, among others, Chinese Taipei, Mongolia, the Philippines, South Africa and Vietnam (see, Box 2).

Box 2 close to here

If the export of solar-thermal water heaters were no longer hampered, as is currently the case, by various types of trade barriers, important new trade opportunities could also open up for countries like Argentina, Armenia, Barbados, Chile, Cuba, Dominican Republic, Egypt, Indonesia, Iran, Jordan, Libya, Malaysia, Morocco, Nepal, Pakistan, Saudi Arabia, Sri Lanka, Thailand, and the United Arab Emirates, all of whom possess manufacturing capacity in this area.⁶

2 Expanding national R&D capacity

Underlying the growing role of the developing nations in renewable energy generation and deployment are their strengthened national policy commitments to fostering the transition from a primary reliance on fossil-fuels towards a more diversified energy mix. According to REN21 (2013, p.14): "As of early 2013, renewable energy support policies were identified in 127 countries, more than two-thirds of which are developing or emerging economies".

An important part of these national policy packages, especially in the ADCs, has been support for public and private investments in research and development (R&D) on renewables. In 2011, 75 percent of these expenditures were made in the industrial countries and 19 percent originated in China, meaning that the rest of the world contributed about 6 percent (Hultman et al. 2012, p. 12). Notably, though, while Europe remained the premier center of R&D spending in 2012, China surpassed the group of European countries in terms of government spending (Frankfurt School-UNEP Centre/BNEF 2013, p. 71; see also Figure 1).

Figure 1 close to here

⁶ On the issue of factors that currently constrain both the investments in renewables and the export of RE products, see, for example, Barton (2009), Brewer (2008,2012), Correa (2012), Kim et al. (2012), Jha (2009) and Veen, van der (2012).

The trend in patent applications for energy generation from renewable and non-fossil sources filed from the BRICS countries under the Patent Cooperation Treaty mirrors the evolution of investments in the R&D support. During 2008 to 2010, while the EU countries, Japan and the US held about 77 percent of the patents filed under the PCT in this field, the BRICS plus Indonesia had a combined share of 6.6 percent (OECD 2013.b). As shown in Figure 2, by 2010, the BRICS countries' combined share stood at nine percent, dropping, though, to a mere two percent with the exclusion of China.⁷

Figure 1 close to here

In light of these developments, analysts are now referring to a changed – and still changing – “techno-economic geography of international technology diffusion” (Brewer 2012, p. 3) and to the ADCs and other developing countries as new leading players in this evolving clean energy landscape (see, for example, Gu et al. 2013 and IEA 2013.b). According to Hultman et al. (2012, p. 13): “The new tier of emerging innovators have developed deep capabilities and supportive enabling conditions, and achieved a strong innovation supply chain as a complement to their growing economic activity and development.” Of course, the gap among the developing countries themselves remains wide: “No developing country apart from China is spending more than 1.2 percent of GDP on R&D, and the least developed countries spend well below 0.5 percent. This compares with 2.5 percent on average for developed countries” (ibid.).

Although in many respects still nascent, analysts tend to agree that major shifts in the global energy landscape are underway. New global ‘power houses’ are emerging in the South, in particular among the ADCs.

This is an encouraging finding, especially in light of the recent analyses which have warned that we are transiting too slowly towards a low-carbon, energy-secure and sustainable global economy (see, for example, IPCC 2013, IEA 2013.a, PIK/WB 2012, WEF 2012, 2013). But it also prompts the question of whether the current trends are likely to continue? Will the countries of the South seek to further strengthen and solidify their investments and activities in the energy-climate area?

These are the questions to which Section II will now turn.

II Combining Green Global-Market Power with Green Multilateralism – In Enlightened National Self-Interest *and* for the Global Common Good

Although future policy choices are difficult to predict, there exist at present a number of facts, which suggest that the ADCs might seek to further strengthen and solidify their role as new lead actors in the global energy transition. According to Veugelers (2011, 2013), the ADCs' innovation ambitions are strong and likely also to drive their performance in the future.⁸

⁷ When interpreting these statistics, it is important to bear in mind that, as Correa (2013) and others (e.g. Lanzi et al. 2012, Lee et al. 2009 and WIPO 2012) argue, patent statistics do not necessarily tell us much about the rate and nature of the innovation taking place within a country. Patenting standards vary across countries; reported patent activity may refer to resident and non-resident applications; and for many technologies, especially those developed in developing countries no patent applications may be filed.

⁸ This finding holds beyond the renewable energy sector. The report on the Global Innovation Index 2013 (Cornell University et al. 2013) shows, for example, that the countries whose rankings on the Index

In fact, as the following discussion will show, there are strong reasons for why the ADCs could find it to be in their national self-interest: (1) to strengthen their country's position in the global green-product markets; and (2) to play an active role in multilateral cooperation, especially in the GCF.

In fact, now seems to be an opportune time for the ADCs to pursue such a strategy because we are still in an early phase of the energy transition characterized by ongoing exploration for, and experimentation with, technologies. Under such as-yet-unsettled conditions it tends to be easier for 'new-comers' to successfully enter international markets and politics.

1 Strengthening 'global green-market power'

Given the importance that markets have gained during the past several decades, an ever-larger number of public policy purposes can now also be promoted through appropriate, i.e. environmentally friendly private products. For example, clean-energy products can contribute to a reduction in CO₂ emissions; greater reliance on energy generated from sources like solar or wind power can be a step towards more sustainable energy security; and energy-efficient products can lead to a de-coupling of growth and resource use.

Changing one's individual or national patterns of production and consumption in the direction of agreed-upon global goals is a decentralized, market-intermediated form of international cooperation. The advantage of this form of cooperation is that it is driven by local preferences and willingness to pay. As such, it might also be more responsive to local circumstances than a more centralized, standardized strategy and allow countries to better combine national, regional and global interests.

At present, there seems to be widespread preference among states, including the ADCs, for a market-based approach in the climate and energy areas. Therefore, a strengthening of the ADCs' global market positions might well form an important part of their future energy strategies.

Importantly, global green markets are likely to expand. Many countries have adopted renewable energy targets and will require relevant technologies, products and services. In fact, UNCTAD (2011, p.2) estimates that the size of the global markets in low-carbon and energy efficient technologies will nearly triple to US \$ 2.2 trillion by 2020; and Bloomberg-NEF (2013, p.10) forecasts that US\$ 8.2 trillion – or some 73 percent – of the total investment in power generation until 2030 will be directed to renewables.

Thus, there might be a strong 'business case' for creating a policy framework that encourages further investments in the renewable-energy sector by the ADCs and other developing countries. They could meet their own national energy goals in a more diversified and sustainable way and further expand their international trade relationships.⁹ As the ADCs have in part built

underwent the biggest changes from 2012 to 2013 include (in this order): Uganda, Costa Rica, Bolivia, Cambodia, Mexico, Uruguay, Indonesia, and Ecuador. And the group of countries that the report calls 'innovation learners' includes, among others: China, India, Uganda, Vietnam, Malaysia. They are said to demonstrate rising levels of innovation results, because of improvements made to institutional and policy frameworks, as well as education and training.

⁹ Looking at the broader picture of trade in capital goods, UNCTAD's Technology and Innovation Report 2012 notes: "Developing countries have surpassed developed countries as major partners of other developing countries for trade in capital goods.[This shows] that developing countries, particularly emerging countries, are increasingly offering competitive products in a variety of industries involving a range of technologies.....As part of rising South-South trade, the share of developing countries' imports from other developing countries has increased steadily, from 35 per cent in 1995 to 54 per cent in 2010"

up high-end technological capacity but also still share common development experiences and conditions with the other developing countries, their firms would be well-equipped to participate in both South-North and South-South trade.

Moreover, promoting energy security is 'naturally' a top priority for most, if not all countries, because the lack thereof tends to impose a major – and often, mounting – burden of 'regrettable expenditures', i.e. expenditures aimed at merely correcting, if at all possible, reversals in growth and development but not leading to higher levels of income and development.¹⁰ Examples include expenditures for the treatment of diseases caused by outdoor and indoor air pollution or the alleviation of poverty stemming from un- or underemployment due, in turn, to absent or unaffordable energy. Rather than being repeatedly compelled to incur such 'regrettable expenditures' countries would, clearly, be better off investing in eco-efficiency and sustainable energy security for all.¹¹

Also, to the extent that countries opt for switching towards greater reliance on renewables countries they could re-allocate the public resources now being spent on undesirable fossil-fuel subsidies.¹²

Last but not least, by pursuing an active low-carbon strategy, contributing to global climate change mitigation while meeting their own, national energy goals would support the concerned states' role and standing as responsible sovereigns and 'good global citizens'.

Thus, there could be important reasons for countries with the requisite technological capacity to strengthen their position in the global green markets.

But what could be the ADCs' motivation to do the same in respect to multilateral cooperation?

2 Engaging in green multilateralism

Standard economic theory tells us, public goods, including global public goods (GPGs) tend to be underprovided, if their provisioning is left solely to markets or, in the case of GPGs, just to markets and national policy choices (see Kaul et al. 2003 and Kaul 2013).

Therefore, in addition to strengthening their position in 'green markets', it would also be desirable for the ADCs to help re-stimulate 'green multilateral cooperation' so that it could do what markets and individual states, if guided solely by private and national interests, may not be good at doing.

(ibid., p.7). Thus, an increased trade in renewables could build on this rich network of existing South-South trade relationships.

¹⁰ Nordhaus and Tobin (1973).

¹¹ As some analysts (e.g. Weizsäcker et al. [2009] and UN-SE4ALL 2012 show, it would be technically feasible – through measures of eco-efficiency alone – to radically transform the global economy through 80 percent improvements in resource productivity.

¹² Undesirable fossil fuel subsidies are those that sustain uneconomic energy sources. They need to be distinguished from those that governments provide in order to support the energy consumption of poorer population groups. According to IMF estimates (2013), on a 'pre-tax' basis, subsidies for petroleum products, electricity, natural gas and coal reached US\$ 480 billion in 2011 (that is, 0.7 percent of global GDP or two percent of total government revenues). On a 'post-tax' basis, which also factors in the negative externalities of from energy consumption, subsidies amounted to US\$ 1.9 trillion (that is, 2.5 percent of global GDP or 8 percent of total government revenues). These figures show how important it is to identify undesirable or regrettable subsidies.

Multilateral cooperation consists of two main strands, viz.: first, the political strand of international negotiations for the purpose of formulating global policy frameworks such as the multilateral trade regime; and second, the operational strand of joint follow-up to multilateral decisions that call for collective action at the international level such as the creation of the Climate Technology Centre and Network (CTCN)¹³ or the establishment of the Green Climate Fund (GCF)¹⁴.

Well-governed and efficient international markets for renewable energy products and services are intermediate GPGs – intermediate, because they feed into the provisioning of the final GPGs of global climate change mitigation or global energy security. Yet, as trade in related goods and services has increased, it has become evident that in a number of issue areas a better alignment between the international trade regime and the domestic policies for the promotion of renewable energy still needs to be sought (see, for example, Bahar et al. 2013, Brewer 2012, Correa et al. 2011, Levine and Walther 2013, Lewis 2012, Stephenson 2013, UNEP 2013). This will be important for avoiding possible conflict and fostering cooperative and productive competition that sets in motion the upward spiral of progress towards the renewable energy targets that countries have set for themselves.

Many of the issues concerning the compatibility between the international trade law and renewable energy policies are already under consideration in various multilateral forums, including with the active participation of the ADCs. Therefore, the focus of this Section will be on the operational strand of green multilateralism, notably on what global public policy measures could help promote global equity in the energy field, which will need to complement enhanced market efficiency so that the goal of energy security for all can be realized; and on what could be the ADCs' motivation for adopting such measures.

It seems that from the viewpoint of global equity it could be desirable for the ADCs and other developing nations to deepen their cooperation by establishing a joint Center for Energy Security and Sustainability (CESS) that would, among other functions, serve as the South's hub for cooperation with the Green Climate Fund (GCF) and perhaps also other international-cooperation mechanisms addressing the energy-climate issue.

Clearly, South-South cooperation has been expanding and deepening in recent years, at both the political and the operational level.¹⁵ The additional value of CESS could be to advise its member states and their partners, including private business and civil society organizations, on collaborative initiatives that they might want to pursue jointly rather than bilaterally.¹⁶

¹³ The CTCN is the operational arm of the UNFCCC Technology Mechanism. It is hosted and managed by UNEP in collaboration with UNIDO and with the support of 11 Centers of Excellence located in developed and developing countries. CTCN's mission is: to build or strengthen the capacity of developing countries to identify technology needs; facilitate the preparation and implementation of technology projects and strategies to support climate change mitigation and adaptation; and to enhance low-emission and climate-resilient development. For further information about CTCN see <http://www.unep.org/climatechange/ctcn/>.

¹⁴ The purpose of the GCF is to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change. See also <http://gcfund.net/>.

¹⁵ See, Lee and Mathews (2013), UNCTAD (2012), and UNDP (2013).

¹⁶ Perhaps, the China-Brazil Center for Climate Change and Innovative Technology for Energy could form the starting point for the CESS network proposed here. See also IEA (2013) and <http://www.centrochinabrasil.coppe.ufrj.br/en/conheca-centro/>.

In light of the South's long-held concern with fostering a balanced, development-conducive approach to the issue of intellectual property rights (IPRs), as well as its concern with global equity, two such initiatives come to mind, for which CESS could act as technical support and consultation unit. The initiatives are: (1) the establishment of a GCF-linked *Renewable Energy Technology Bank* (RETB) – aimed at facilitating the transfer and dissemination of select, high-priority technology to the least developed countries (LDCs); and (2), the creation of a GCF-linked *Catastrophe Risk Financing Facility* (CRFF) – aimed at strengthening the capacity of poorer nations to cope with natural disasters, including by climate-proofing their energy systems.

The two initiatives are complementary. Enhanced availability of energy would mean little to people whose communities are being ravaged by floods, storms or prolonged droughts. Strengthened local resilience is a precondition for greater reliance on low-carbon technologies actually to translate into more sustainable and inclusive growth and development. Therefore, the promotion of environmentally sound energy technologies ought to go hand in hand with efforts to reduce people's and communities' vulnerability to natural disasters. Together, enhanced resilience and energy security would form a strong basis for effective development.

But again, just as in the case of the ADCs' increased participation in the energy markets, the aim of their deepened multilateral engagement would not be for them to shoulder a larger share of the global responsibility for more inclusive and sustainable growth and development. To the contrary, their demonstrated willingness to cooperate should motivate other actors, particularly the conventional 'donor' countries, to also live up to these development challenges.

In more detail, these initiatives might involve the following.

1— Support for the establishment of a Renewable Energy Technology Bank (RETB)

Proposals for the creation of international-cooperation mechanisms to facilitate knowledge and technology transfer from more advanced to less advanced countries abound; and many follow-up initiatives have been taken. The result is that even when only considering the fields of climate and energy, one finds a large array of partnerships, programs and projects which focus on a particular aspect like, for example, the sharing of information about available knowledge and technologies or training in technology assessments, negotiating and designing transfer agreements and dispute resolution procedures.¹⁷

Similarly, earlier proposals have been made for the creation of a technology bank for the LDCs. For example, UNCTAD's *Least Developed Countries Report 2010* called for a "technology license bank" (UNCTAD 2010, pp. 214-215); and in operative paragraph 8(d) of the Istanbul Declaration, adopted at the Fourth UN Conference on Least Developed Countries (LDCs) in 2011, UN member states undertook "to promote access of least developed countries to knowledge, information, technology and know-how and to support the least developed countries in improving their

¹⁷ An overview of proposed and existing UN-linked mechanisms for technology facilitation is presented in the UN Secretary-General's report on 'Options for a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies' (UN 2012). This report was prepared pursuant to paragraph 273 of the outcome document of the 2012 UN Conference on Sustainable Development (the Rio+20 Conference), which calls for a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies.

scientific and innovative capacity needed for structural transformation ... with the aim of establishing a Technology Bank”, which the Government of Turkey has offered to host.¹⁸

It appears that the technology bank called for in the Istanbul Declaration would be multi-sector in scope and perform three basic functions: (i) provide licenses to LDC actors for products protected by patents or other forms of intellectual property; (ii) assist the LDCs in building endogenous capacity in science, technology and innovation; and (iii) act as a science and technology research depository facility (see, again, UN-OHRLLS 2013, pp. 8-9).

Notably, though, a technology bank that covered all of these functions across several issue areas would be a vast and complex undertaking. Thus, it could be desirable to organize the global technology bank called for in the Istanbul Declaration as a multi-disciplinary and multi-sector network of technology banks that are each focused on a specific high-priority issue. Renewable energy might be one such area and the focus of the GCF-linked RETB.

Moreover, by drawing on the work of the numerous existing – and perhaps, yet to be developed – technology mechanisms the RETB could have, as its core function, the creation of an intellectual property (IP) license system and patent pool.¹⁹

As also suggested in the follow-up studies to the Istanbul Declaration, it would be important to state in the bank’s charter that it undertakes to protect any IP transferred under its aegis. This could, for example, be done by working with participating LDCs to establish a corresponding legal framework within their borders. Moreover, the original owners of the IP to be transferred should get fees at market prices and, perhaps, additionally a label that could support their corporate image as a ‘goodwill firm’ (UN-OHRLLS 2013, p. 8-9).²⁰

In addition to advocating the creation of such a mechanism, the ADCs and other developing countries in a position to do so could, with the support of CESS, encourage concerned national private and public actors to contribute relevant IP elements to RETB. If this were done free of charge or for a fee below the market value of the transferred IP, the ‘donation’ part could be counted as a contribution to the resourcing of the Technology Bank (again, see Veen, van der 2012).

For the ADCs to take a lead in this matter would be in line with the policy position that the developing countries have been advocating for decades; and it might spur further donations from Northern patent owners, as well as cash contributions from Northern donors, be they official, philanthropic or private.²¹

The added value of the proposed RETB would be: to facilitate the LDCs’ access to, and use of, relevant IP; and, *second*, to stimulate and accelerate progress towards realizing the goal of

¹⁸ The Istanbul Declaration can be found at <http://www.unohrlls.org/UserFiles/Filepolitical%20declaration.pdf/>. For more detail on the follow-up to this Conference and the related Istanbul Programme of Action for the LDCs, see also UN-OHRLLS (2013).

¹⁹ A similar proposal has been put forward by Veen, van der (2012).

²⁰ For more details on the points to be reflected in IP transfer agreements, including the issue of how to reconcile TRIPS article 66.1 and article 66.2, see UN-OHRLLS 2013, pp. 8-12. On the design of a possible licensing and/or patent pooling arrangement, see also Correa (2012) and Veen, van der (2012).

²¹ Initiatives worth studying in this context might, for example, be: ‘WIPO GREEN: Facilitating Dissemination of Green Technology’ (<https://www3.wipo.int/green/>); and ‘Eco-Patent Commons’, which was launched in 2008 by IBM, Nokia, Pitney Bowes and Sony in partnership with the World Business Council for Sustainable Development. See <http://www.wbcscd.org/work-program/capacity-building/eco-patent-commons.aspx/> and the analysis of the experience gained with the Eco-Patent Commons initiative by Hall and Helmers (2013).

sustainable energy for all. The role of CESS in this process would be to assist the ADCs and other participating developing countries to overcome the involved collective-action problems. In other words, it would be the entity that identifies and suggests opportunities for cooperation and nudges member states to come together and join forces – for their individual national public good and for the global common good.

In fact, in both the North and South awareness and political support seems to be growing for the position that more open science and technology cooperation “provides new opportunities to poorer countries and ... might prove the cheapest option for improving research, development and demonstration, to the benefit of all” (UN 2012, p. 11; see also Raustiala and Sprigman 2013). From this perspective, the time might be right for the ADCs and other developing countries with sufficient capacities to do so to move forward toward a more open, participatory approach to fostering science and technology for development.

2—Support for a Catastrophe Risk Financing Facility (CRFF)

While some analysts are still debating whether climate change has brought about more frequent natural catastrophes, most agree that many parts of the world will be affected by more severe weather events like storms, floods, or heat waves and droughts. The costs of these events are also predicted to rise for several reasons, including the expansion of urbanization and built-up land in general. More people and more assets are now located in high-risk areas (see, IPCC 2011, MunichRe 2013.a). Moreover, major new investments will need to be made during the forthcoming years and decades. According to some estimates (e.g. Stern et al. 2013), the incremental investment spending required for emerging markets and other developing countries to alleviate growth constraints and meet crucial development and environmental goals is around USD 1 trillion per year over and above what is currently spent. This means that more people and capital – including energy infrastructure – will be in harm’s way, causing a surge in not only disaster costs but also in ‘regrettable expenditures’.

Against this context, it must be noted that the response capacity of many developing nations remains weak. Moreover, many rely on ex-post arrangements for the financing of disaster relief and reconstruction. This means that they can begin to mobilize reconstruction – through, for example, budgetary restructuring, tax increases or debt issuance – only after a disaster has struck. And all this takes time. Also, recent analyses of the effectiveness of humanitarian assistance show that these ex-post funds often arrive late and fall short of identified needs, leading the *Global Humanitarian Assistance Report (GHA) 2012* to conclude that: “Humanitarian crises not only occur in parts of the world where many people are already poor: they deepen poverty and prevent people from escaping it.” (DI 2012, p. 6) In addition, the penetration rate of natural catastrophe insurance in developing countries is still relatively low. During the period 1980-2012, developing countries accounted for 10% of the overall losses from natural disasters but only for 1% of the insured losses worldwide (MunichRe 2013.a).

The result, as Ghesquiere and Mahul (2010) note, is that poorer countries and smaller states in particular may experience a serious post-disaster liquidity crunch that delays urgently needed relief and reconstruction work (see also Figure 5).

Figure 5 close to here

This raises the question of how the current natural-disaster financing arrangements could be improved. Of course, improved risk management and disaster financing, in and by themselves, will not improve countries’ resilience nor reduce the frequency of severe weather events. But, as long as the threat of severe natural catastrophes looms large, risk management and disaster financing ought to be part and parcel of countries’ growth and development strategies so that

natural disasters do not repeatedly undo what development efforts such as those aimed at promoting energy security seek to accomplish.

Thus, like encouraging accelerated progress in terms of renewable energy, improving natural-disaster risk management and financing seems to be an issue of high self-interest to developing countries. It therefore could be one that the ADCs might want to collectively pursue within the supportive framework of the CESS, with the aim of promoting the creation of a GCF-linked Catastrophe Risk Financing facility (CRFF).

Working in close collaboration with the concerned national and international agencies, as well as the private insurance industry, a major aim of the CRFF could be to shift disaster financing from the current ex-post model towards an ex-ante one in order to enable affected communities, firms and households to recover faster and more fully. It would be desirable to devise affordable market-based risk transfer arrangements and improved public ex-ante mechanisms. The latter could benefit in particular the poorer – and often, uninsurable – population segments. As the LDCs and their poor communities will, in the case of a natural disaster, largely depend on international humanitarian assistance, it would furthermore be important to explore ways and means of strengthening the ex-ante facilities of international humanitarian assistance like, for example, UN-OCHA's Central Emergency Revolving Fund.²²

Box 3 profiles one of the existing pilot initiatives of catastrophe financing arrangements for developing countries, the Caribbean Catastrophe Risk Insurance Facility. The proposed CRFF could build on the experiences gained through this and other similar initiatives.²³

Box 3 close to here

Like the RETB, which was discussed before, the CRFF could be organized as an independent legal entity with non-profit status for the purpose of complementing the work of the GCF. It could offer advice and support on natural-disaster financing to countries requesting GCF/CRFF support. In addition, the CRFF could advise the GCF on managing the catastrophe risk exposure of its project portfolio.

III A More Differentiated Approach to the Principle of Common but Differentiated Responsibility and Respective Capabilities

By following such a strategy, the ADCs could render the global green-product markets more competitive and efficient. This would bring down prices and help make green products more affordable – including for them, their national budgets, as well as their firms and private households.²⁴ It would be an important step towards making energy more affordable and, thus, available for today's 1.3 billion people still lacking energy access.²⁵ Their strengthened involvement in green multilateralism could introduce a new dynamism into both global markets

²² For information on this Fund, see <http://www.un.org/ha/moreha.htm/>.

²³ On this point, see also ADB (2008).

²⁴ Analyses of cost trends for renewable power from various sources are presented in IRENA (2013.c). Based on the analysis of some 8000 projects and a literature review, the study concludes that already “the rapid deployment of renewables, working in combination with the high learning rates for some technologies, has produced a virtuous circle that is leading to significant cost declines and is helping fuel a renewable revolution” (ibid., p. 4).

²⁵ See, for analyses of the current trends in climate finance and clean-energy finance, among others, Frankfurt School-UNEP Centre/BNEF 2013, OECDStatExtracts (2013), Patel and Brown (2013), Terpstra (2013) and the Climate Funds Update on <http://www.climatefundsupdate.org/>.

and global public policy and further help achieve ‘a world transformed’ (Figueres 2012), i.e. more inclusive and sustainable growth and development.

As Box 2 shows, all of this could unlock important gains that may allow policymakers to do more of what they are already doing.

Box 2 close to here

If for these and other domestic and external reasons a growing number of ADCs’ were to aim at becoming more powerful players in the markets for renewable technologies, the industrial countries might respond by hastening to upscale their investments, with the result that the overall global investment level would rise, the pace of the energy transition accelerate and CO₂ emissions decline.

If the aforementioned proposals were to materialize, i.e. if the ADCs were to strengthen their position in the global green markets and in green multilateralism – via their support for the GCF – , they would clearly come act as a bridge between North and South. Their deepened engagement might reassure the North and stimulate a stronger commitment on its part to the goals of sustainable energy security. In turn, the poorer countries of the South, most notably the LDCs could benefit in terms of both more efficient green markets and increased support for international cooperation. The result could be a ‘quadruple win’:

- The ADCs would be better off, because they would have strengthened their national capacities and improved their own energy security, while also gaining new trade and income-earning opportunities;
- The LDCs would be better off, due to the increased availability and affordability of sustainable energy for all;
- The developed countries, too, would benefit from the enhanced efficiency of green markets and improved energy security at home; and
- The world as a whole would be better off, given the overall acceleration in the transition to a global low-carbon economy.

At this point, it is important to stress again that the BRIDGE role proposed here for the ADCs is not meant to suggest a retreat from the principle of common but differentiated responsibilities and respective capabilities (CBDRRC). To the contrary, it should reinforce this principle.

As Rajamani (2013, p.152) notes, one of the fundamental premises of the 1992 UN Framework Convention on Climate Change (UNFCCC), and of its 1997 Kyoto Protocol of 1997, is “that leadership from developed countries in combination with differential treatment in favor of developing countries is the equitable basis on which the international response to climate change must be structured.” The rationale for this principle of common but differentiated responsibility is that the bulk of historical greenhouse gases (GHGs) emitted into the atmosphere can be traced back to industrial countries and that the industrial countries’ capacity to respond is also stronger than that of the developing nations.²⁶

Yet, as Rajamani adds: “The nature and extent of differential treatment in the climate regime has remained contentious through the years.” (ibid.) In fact, it is becoming increasingly contentious as ADCs enter the category of ‘high GHGs emitters’, with China having already surpassed the US in this respect.

So, instead of allowing international negotiations to get bogged down by debates about emission levels, it could be more productive to focus, as the CBDRRC principle does, on

²⁶ See Stone (2004) for the conceptualization and treatment of this principle in international law, as well as its application in different issue areas.

‘respective capabilities’. While leaving the established responsibility of the industrial countries untouched, including the commitments these countries have made to assist developing countries in undertaking efforts aimed at climate change mitigation and adaptation, one could recognize the broadened, more differentiated spectrum of national capabilities that exists today as a result of the progress achieved by many developing countries.²⁷ Especially when considering the ‘quadruple win’ that a deepened engagement of the ADCs in the field of sustainable energy could generate, one wonders “Why not?”

From the perspective of the ADCs, pursuing a more differentiated, dynamic approach to the CBDRRC principle seems to be a ‘smart’, realistic and responsible exercise of national policymaking sovereignty. Perhaps this is the reason why, de facto, they are already pursuing such a strategy by combining, as we saw in Section I, national and global interests through increased exports and the promotion of South-South cooperation in renewable energy-related fields. Given this progress, maybe now is the time for these countries to recognize their strengthened capacities and initiate a new, invigorated era of international cooperation in the climate and energy areas.

Conclusion

The present paper has examined the role that the advanced developing countries (ADCs) could play in fostering accelerated global progress towards sustainable energy security for all and, in the process, promoting a global low-carbon economy, as well as climate change mitigation and adaptation.

Section I presented facts and figures on the emergence of the ADCs as new global ‘powerhouses’ in the field of renewable energy. Against this background, Section II then outlined various ways in which the ADCs could concurrently foster their own, national goals – in terms of energy security for all – and promote accelerated progress towards achieving a global low-carbon economy. The argumentation suggested that if the ADCs were to further strengthen their participation in the green global markets and deepen their engagement in green multilateralism, particularly their support for the Green Climate Fund (GCF), the countries of the North would likely also upgrade their involvement in both endeavors. As a result, green global markets would become more efficient and multilateral cooperation more effective, two policy outcomes from which, in turn, the poorer developing countries might benefit.

Therefore, a perspective change appears timely: we should no longer view the ADCs as just the ‘BRICS’, i.e. as emerging market economies, but as ‘BRIDGE’ countries that can perform an important role in terms of bridging the current North-South policy divides.

Importantly, though, Section III emphasizes that this deepened engagement on the part of the ADCs should not be regarded as a substitute for the commitments that the developed countries have made in line with the principle of common but differentiated responsibilities and respective capabilities (CBDRRC). Rather, the ADCs’ increased engagement should lead to clear additionality.

²⁷ This approach would also be in line with the outcome document of the Fourth High-level Forum on Aid Effectiveness held in Busan, South Korea, from 29 November to 1 December 2011. Article 14 of this Document states: “While North-South cooperation remains the main form of development cooperation, South-South co-operation continues to evolve, providing additional diversity of resources for development.” (See www.busanhlf4.org/) This principle of South-South cooperation being additional to North-South cooperation has been reaffirmed in paragraph 260 of the outcome document ‘The Future We Want’ which was adopted at the Rio+20 Conference held in Rio de Janeiro, Brazil in June 2012. (See <http://www.un.org/en/sustainablefuture/about.shmtl/>)

In sum, what would be desirable – and is already happening in many respects – is for the developing countries, and especially the ADCs among them to accept that a more differentiated approach to the to the CDRRC principle is now not only feasible but also in their own national interest, as well as in the shared global interest of fostering more inclusive and sustainable growth and development.

The choice to let the proposed ‘race to the top’ begin is ours – the South’s and the North’s.

References

(to be completed)

Box 1:

World leaders in selected climate-relevant technologies

Technology	Production and exports	Technology use
Ethanol (from sugar Cane)	Brazil	USA, Brazil
Biodiesel (from jatropa)	India	India, Indonesia, EU
Wind energy	China, India	China, Germany
Solar photovoltaic	China	Germany
Compact fluorescent lamps	China, Indonesia	EU
Solar water heaters	Mexico	China
Coal gasification	China	China, USA
Heat pumps	China	Switzerland, EU
Hybrid fuel vehicles	Japan	USA, EU, Japan
Wood waste use	Sweden	Sweden

Source: UN (2012), p. 7, drawing on Brewer (2008)

Box 2:

The outlook for renewable energy and energy efficiency: 'Promising'

According to IEA's World Energy Outlook 2012 the future of renewables looks bright and promising.

Based on its *New Policy Scenario*, which takes account of policy commitments and plans that countries have already announced, the IEA forecasts that between now (i.e. 2010 to 2012) and 2035:

- The share of renewables in the global energy mix is to rise from 20 percent to 31 percent;
- The investment in renewables will amount to a total of US\$ 6.4 trillion; and
- Cumulative subsidy payments for renewables will stand at a level of US\$ 3.5 trillion.

As a result, CO₂ emissions could be reduced by over 4.1Gt in 2035, contributing lower oil and gas import bills, cuts in local air pollution and, in many instances, also reduced stress on water resources.

The future could look even brighter, if countries were to adopt current and proven technologies to improve energy efficiency.

The IEA's *Efficient World Scenario* is based on this more optimistic assumption. It suggests that, if countries were to opt for this policy path, the following goals could be achieved:

- Energy intensity improves at 2.6 times the rate of the last 25 years;
- Growth in global primary energy demand will be halved;
- Global economic output receives a cumulative boost of US\$ 18 trillion; and
- Energy-related CO₂ emissions peak before 2020 and decline to 30.5 Gt by 2035, pointing to a long-term average temperature rise of 3 degrees Centigrade.

These figures once again underline what von Weizsäcker et al. have stressed in their 2009 study entitled *Factor Five: Alone through measures of eco-efficiency we could radically transform the world economy and our welfare and wellbeing.*

Source: IEA (2012.a, Chapter 7) and IEA (2012.b) and Weizsäcker et al. (2009).

Box 3:

The Caribbean Catastrophe Risk Insurance Facility: Covering Immediate Liquidity Risk

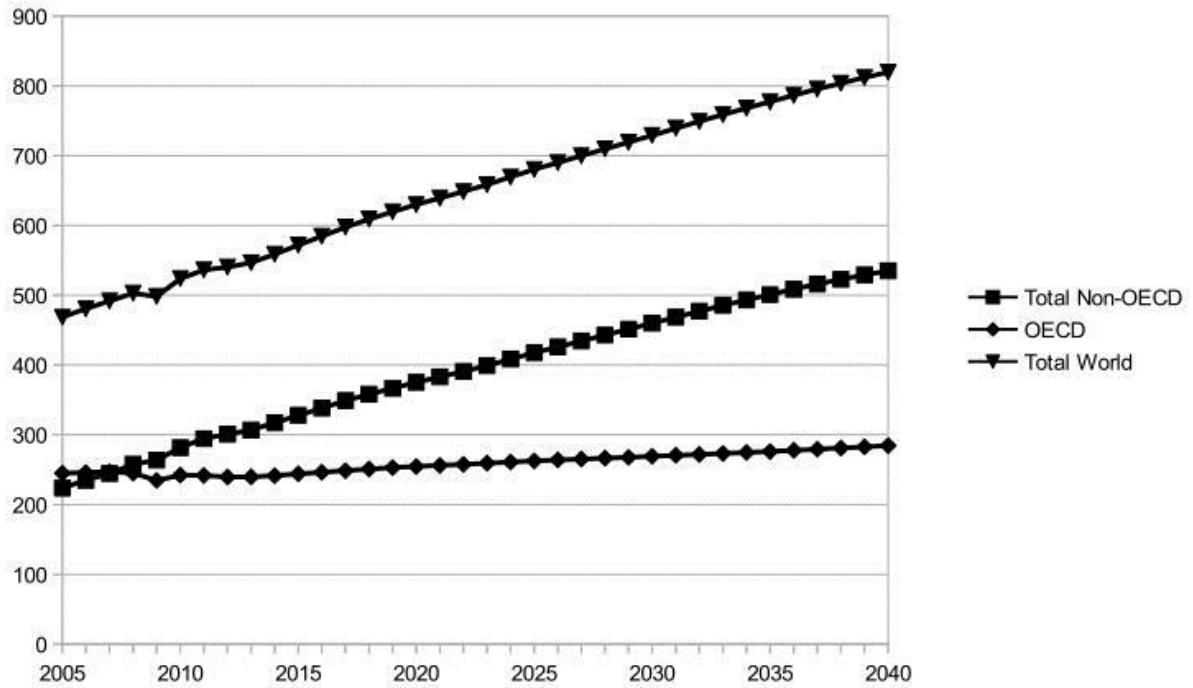
The Caribbean Catastrophe Risk Insurance Facility (CCRIF) provides an example of how states, notably smaller and poorer states could act together to secure access to immediate liquidity in case of a major disaster. More specifically:

- CCRIF Acts as risk aggregator, pooling country-specific risks into a more diversified portfolio
- Claim payments depend on parametric triggers, i.e. pre-defined events rather than actual losses
- Insured countries pay an annual premium commensurate with their own specific risk exposure
- Donors have so far pledged support for CCRIF amounting to some US\$ 50 million to help meet its operational expenditures and build up reserves from countries' insurance premiums more quickly
- The total premium volume is US 17 million for a sum insured of more than US\$ 400 million
- CCRIF transfers the risks it cannot retain to international financial markets
- The Facility is established as an independent legal entity.

Source: Ghesquiere and Mahul (2007)

Figure 1:

Total Primary Energy Demand, by Region (in quadrillion Btu)

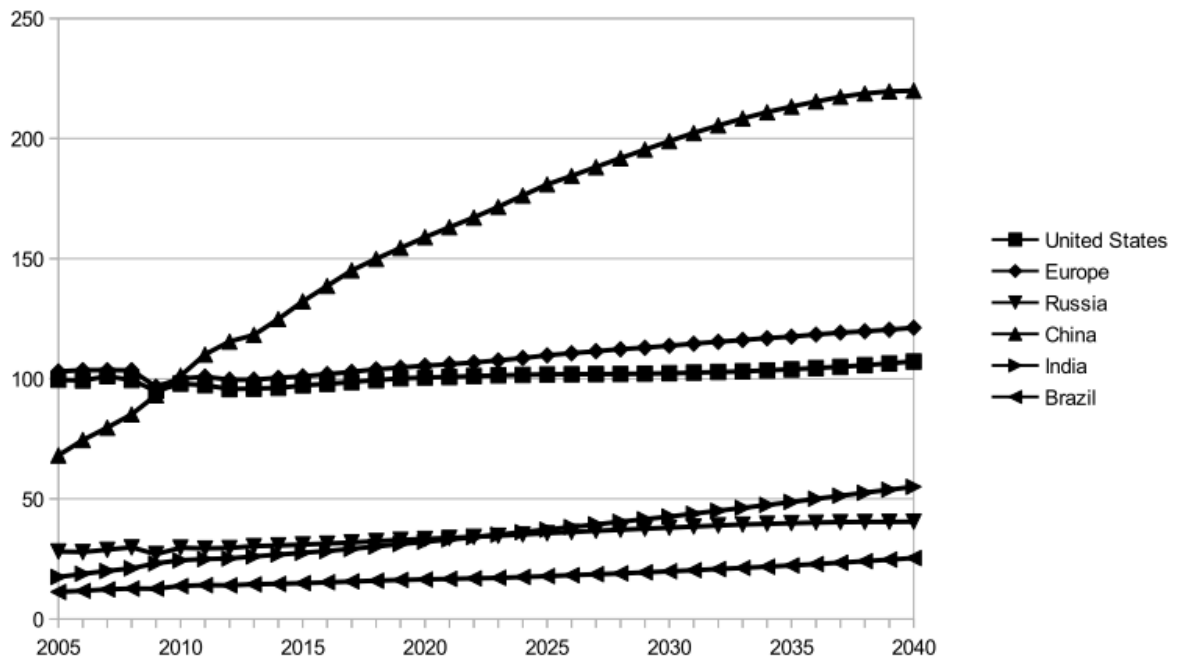


Source: USEIA (2013).

Note: USEIA's Reference Case Scenario underlying the projections presented here is most directly comparable with IEA's Current Policies Case (see USEIA 2013, pp. 293-296). This means that the Scenario assumes no changes in policies from the mid-year of publication, including no change in terms of the adoption of energy-efficiency technologies.

Figure 2:

Total Primary Energy Demand and Projections in Selected Countries (quadrillion Btu)

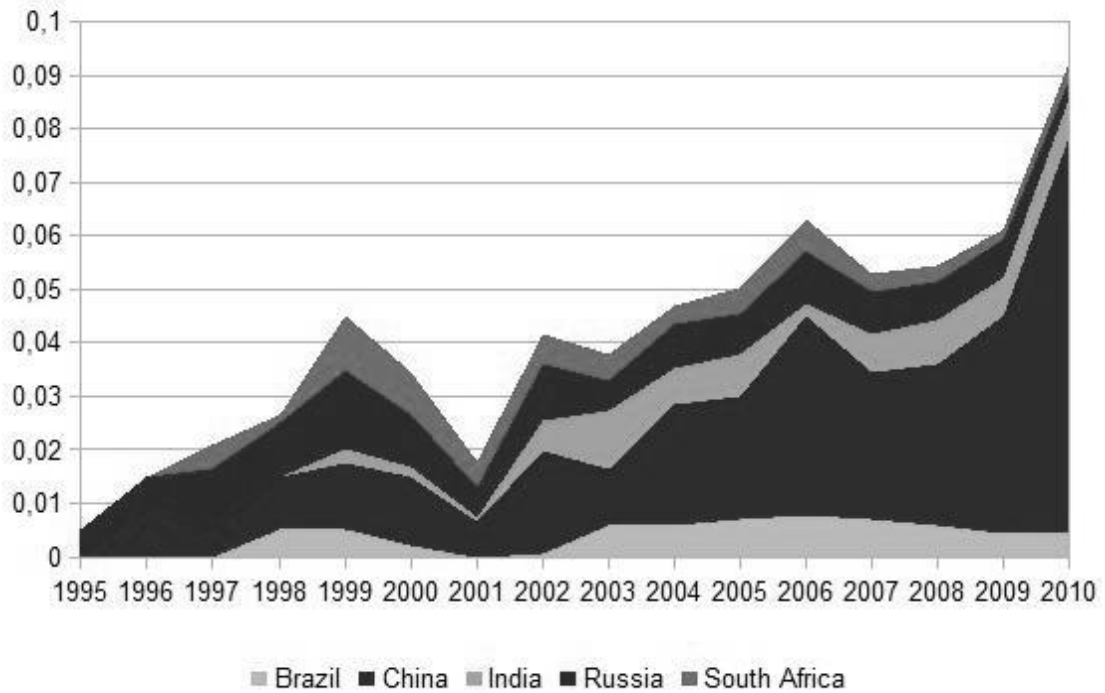


Source: USEIA (2013).

Note: USEIA's Reference Case Scenario underlying the projections presented here is most directly comparable with IEA's Current Policies Case (see USEIA 2013, pp. 293-296). This means that the Scenario assumes no changes in policies from the mid-year of publication, including no change in terms of the adoption of energy-efficiency technologies.

Figure 3:

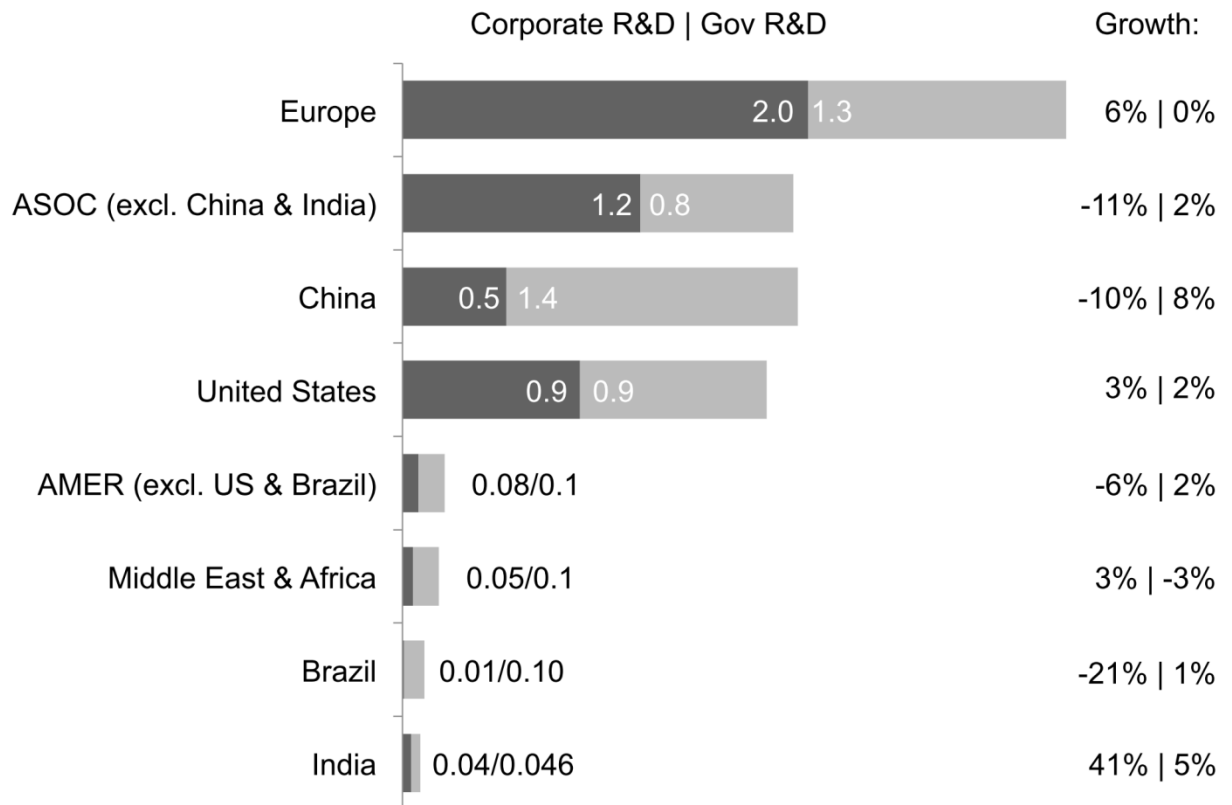
Share of the BRICS Countries in Global Patent Applications for Energy Generation from Renewable and Non-Fossil Sources under the Patent Cooperation Treaty



Source: Own calculations, based on data from http://stats.oecd.org/Index.aspx?DatasetCode=PATS_IPC

Figure 4:

Corporate and Government R&D in Renewable Energy by Region, in US\$ Billion



Source: Frankfurt School-UNEP Centre (2013), p. 71.