Opportunities for Indo-German Cooperation in Bilateral and Multilateral Environment and Development Policy

Introduction

Indo-German cooperation has a long and rich history. High-level political dialogue on climate change and sustainable development between India and Germany comes to pass in bilateral exchanges and within the multilateral negotiations under the United Nations Framework Convention on Climate Change (UNFCCC), on Sustainable Development Goals (SDG) and many other occasions. A row of such bilateral meetings and exchanges within multilateral meetings on environmental and developmental issues has marked a great cooperation opportunity throughout 2015 on the road to COP21 in Paris in December 2015.

The Second Indo-German Environment Forum in January 2015 in Delhi for example gave the Ministers of Environment Prakash Javadekar and Barbara Hendricks the opportunity for exchange and increased understanding on Indian and German solutions to environmental issues. The 6th Indo-German Energy Forum (IGEF) in February 2015 attempted to attract German and European investment in the world's largest renewable energy market. The inauguration of the 2015 Hannover Fair with Angela Merkel and Narendra Modi in April 2015 also provided an opportunity for exchange on environment and development solutions like the cooperation on and investment in renewable energy in India. The second bilateral meeting of the Indian and German heads of government with Angela Merkel's visit in Delhi in October 2015 is seen as a new milestone for Indo-German cooperation, in particular on the agreed solar partnership. Merkel and Modi had also met during the multilateral UN General Assembly in New York where the Sustainable Development Goals were agreed and met again at the climate summit COP21 in Paris in the end of 2015.

Findings from the joint Germanwatch and Climate Action Network South Asia (CANSA) analysis of these interactions suggest high potential for extensive cooperation in the fields of climate change and sustainable development, which would create significant economic opportunities, offer environmental solutions, benefit social development as well as improving trust for international governance. This joint paper of Germanwatch and CANSA focuses of the Indo-German Solar Partnership and sustainable development in India. It will first outline central elements to prepare and start the Indo-German Solar Partnership and set this concrete bilateral cooperation in connection to the multilateral climate negotiations.

Short Background

Both Germany and India foster low-carbon development. Germany seeks in the long run to reach the decarbonisation of its economy and society by the Energiewende and related initiatives. The country has set a target of reducing greenhouse gas emissions by 80–95% by 2050. While the German phase-out of nuclear energy and an impeded exit out of coal is by many seen sceptically for India, the subcontinent certainly has an interest in the technology solutions, policy examples and administrative experience from the Energiewende that could help India towards improved energy security.

India has also has started outlining its low-carbon development policy. It materializes in several national policies such as the mitigation missions of the National Plan on Climate Change (NAPCC) on solar energy and energy efficiency, India's 2030 climate plan (intended nationally determined contribution to the Paris Agreement, INDC) of October 2015 and further energy policies like the ones in the current Five-year Plan. There is scope to build on these plans and utilize India's enormous potential for renewable energy generation.

In the Indian approach, energy security for economic growth and access to energy for the poor are the key drivers for expanding the energy mix to renewable sources and low-carbon development is often seen as a co-benefit of renewable energy and energy efficiency. However, renewable energies gain momentum as Government of India sees them as vital option for energy security for economic growth and for providing electricity access to the poor in the country. In 2014, Prime Minister Modi steeply increased India's renewable energy targets to now 175 GW by 2022. Especially the solar target of 100 GW by 2022 seeks to target energy poverty particularly in the rural areas. Decentralized or grid-connected mini grids or mini-grid clusters are meant to provide a basic energy supply to India's energy poor villages. Decentralized renewables are often a more attractive option for access to energy than waiting for a possibly unreliable grid connection. If renewable energy technology is manufactured domestically in India an additional benefit is gained for the local economy by creating employment for large numbers of young job seekers.

Further, the competitiveness of on-grid renewables has improved in recent years. Government of India has announced ambitious renewable energy targets but it is not yet certain that Indian and international investors will invest in large-scale projects to the extent necessary for reaching these targets. However, first large-scale projects like the Charnka Solar Park in Patan, Bihar, and the Gujarat Solar Park contribute to India's energy security trying to meet the growing demand. With an estimated capacity of 750 MW the planned solar park in Banaskantha, Gujarat, is expected to exceed the Charnka Solar Park. Kochi Airport in Kerala is the world's first fully solar powered airport and the largest single rooftop solar power plant' with capacity of 11.5 MW is located in Amritsar, Punjab.

At the same time, the Government of India also has ambitious plans to build new coal power plans. These plans are under pressure. For the first time a serious discussion is challenging the long-standing conviction that only coal can provide cheap and reliable energy. Energy Minister Piyush Goyal expressed that a new coal power plant would give costlier power than a solar plant. International support to fulfil the government's plans for renewable energies and the proof that energy efficiency and renewable energy can be the solid basis for a quickly growing economy are necessary to build a broad political willingness to move towards long-term decarbonisation. Therefore, a continued cooperative low-carbon development dialogue and a serious and successful solar partnership between India and Germany are essential for progress regarding the decarbonisation debate.

Besides the ambitious renewable targets, various other national missions and acts support India's low-carbon development. Swachh Bharat (Clean India Mission), the Skill Development Mission and the 100 Smart Cities Mission are prominent examples, which invite for low-carbon cooperation between India and Germany. Moreover, India has objectives of providing housing to its homeless by 2022 and ensuring infrastructure access to all the villages including the provision of 24-7 electricity and clean energy by 2022. Basic infrastructure access is ensured to all households in model villages in the respective Model Village Programme.

Several of India's renewable energy programmes and other climate initiatives are supported by German cooperation. For example, the Green Energy Corridors implemented by Gesellschaft für Internationale Zusammenarbeit (GIZ) seek to strengthen the power transmission infrastructure in India to foster the increased use of renewable energy. Cooperation on energy efficiency and promotion of LEDs are other examples. The above mentioned bilateral meetings of India and Germany as the inauguration of the Hannover Fair 2015, the second Indo-German Environment Forum and the Energy Forum also in early

2015 have outlined further possibilities for Indo-German collaboration in the fields of energy, environment, climate and development. The possibly most promising collaboration agreed in Delhi in October 2015 is the Indo-German solar partnership.

Both India and Germany have a strong interest to move renewable energy utilisation forward. In 2012, Germany had started a Renewable Energy Club, of which India is a member – but there is not much action. Prime Minister Modi, seeking to develop solar energy as a niche for Indian international leadership, has announced the Solar Alliance at COP21 in Paris 2015, understood as a South-South cooperation. The implementation of solar energy in India through German support would strengthen this south-south initiative.

1 Bilateral Indo-German Cooperation for Climate Action and Development in India

Bilateral Indo-German cooperation should build evidence for and support a low-carbon development that meets India's development needs. As outlined above, especially during 2015 bilateral meetings even on the highest political level were held on the energy, environment, climate and sustainable development nexus. The most central areas to support the Indo-German solar partnership are highlighted below.

1.1 Framework Setting for Investments

Government of India has introduced several national frameworks to set incentives for national and foreign investment. The land act, feed-in regulations and *Make in India*, a flagship programme aiming at building a stronger manufacturing sector in India and attracting national and foreign investments for the same, are important steps in this direction. Different national finance schemes trigger investments for renewable energy and energy efficiency in India. Other national mechanisms such as the coal cess for renewable energy and environment investment set additional incentives. India could create additional frameworks to facilitate good governance, an investment and project implementation friendly business culture, improved administrative and finance management, further land use reforms and solid vocational training for qualified employees.

The German Government on the other hand could support schemes for decentralised investments and a de-risking strategy to trigger investments by institutional investments through:

a) financial support for Indian feed-in regulations or support schemes of decentralised renewable energy, addressing concerns like incremental costs of the schemes
b) partially assuming risks for large-scale investments (e.g. in cooperation with development banks) and
c) a public private partnership with institutional investors which have an interest to invest in renewable energy, energy efficiency, grids etc. in India.

There is clear scope for Germany to provide financial support for further renewable energy and energy efficiency initiatives beyond the existing projects and technical cooperation via GIZ or cooperation between corporates. To realize larger investments in Indian renewable projects it is critical that Germany supports the de-risking activities for investment in India.

German insurance companies as major institutional investors are generally interested in investing several billion euros in renewable energy and grid infrastructure in India. However, they perceive certain risks that currently hinder those investments, including for example currency risk, political risk (will the regulations change in any unpredictable way?), off-take risk (will there be a buyer for the electricity generated?) and more. Creating a robust de-risking framework could allow these investors to consider operation in India. Under such a framework, both the German and Indian government could agree to cover some of the risks,

e.g. through guarantees, while some of the risks would still have to be borne by the investors. The framework could be designed in a way that it attracts cooperation also in other fields to attract international funding in India regarding sustainable development in general, not restrictively limited to renewable energies. Given that institutional investors are likely going to invest in large-scale projects, it is crucial that robust environmental, social and human-rights safeguards become part of such a partnership.

These potential investment activities should be aligned with *Make in India* that gives priority to investments for renewable energy. Namely, India's ambitious solar target relies on the national manufacture of solar technology.

1.2 Technology Cooperation

Technology cooperation is one of India's key requests at multinational fora and apart from investment its main interest in bilateral agreements. The international systems, including those under UNFCCC, are not yet satisfying India's needs so that the bilateral technology cooperation becomes essential for India. Thus, Indo-German technology cooperation via e.g. GIZ or cooperation between corporates needs to be intensified. Major technical barriers which could be addressed by technology cooperation include:

- strengthening the grid to make it flexible and smart for uptake of renewable energy generation and for grid extensions in areas that have high renewable energy potential. This is seen as major barrier and technological cooperation very welcome.
- improvement and availability of storage technologies both in the context of off-grid and on-grid solutions with renewable energies;
- quality control of renewable (solar) technology and maintenance (cheap solar products which don't work and missing knowledge to maintain the products creates a high risk of bad reputation especially for solar).
- joint ventures with German companies for manufacturing renewable energy equipment allowing a high local content and regional value creation.

This could be embedded into different renewable energy missions of India and *Make in India* as well as bilateral technology cooperation – but also under UNFCCC.

1.3 Joint Research and Development

Joint research and development (R&D) is not only a key component of technology cooperation but also contributes to a successful implementation of renewables, efficiency and sustainability projects. Exchange programmes between universities and other research institutes, possibly partly in cooperation with business to foster the understanding of the needs for renewable energy and energy efficiency in India and the respective R&D, technology and know-how development in Germany and India should be paid much greater attention to in bilateral cooperation. Innovative solutions that match the Indian context from markets to individual needs should to be developed.

Joint R&D links not only to *Make in India* but also to India's Skill Development Mission that fosters skill training activities across sectors. In particular, its submissions on infrastructure, institutional training and sustainable livelihoods are relevant for supporting Indo-German cooperation in the fields of climate action and development.

1.4 Education from Vocational Training to Higher Education

Indo-German cooperation should further support a more comprehensive education approach including low-qualification, high-qualification, administration and good governance education in order to address the skill shortages that so far stand in the way of *Make in India*. The German dual system of education that combines training in a company and vocational education at a school in parallel could be of particular interest for India.

Education and vocational training link not only to the shortage of skilled labour, which the National Skill Development Agency of Government of India seeks to address, but also to today's and future enormously high new labour force on the Indian job market due to the young population entering the job market with the aspiration for a better life through paying jobs.

1.5 Smart Cities

India and Germany could also work together to develop and implement solutions that strengthen low-carbon urban development, including, inter alia, through initiatives in energy transition in cities, climate-friendly urban mobility, energy efficiency in the housing sector, and energy efficiency in urban water supply as well as on recycling and waste management in major Indian cities. Urban, suburban and possibly rural initiatives for low-carbon and sustainable development could be embedded in different Indian initiatives:

- 100 Smart Cities Project
- Providing reliable public transportation in all towns and cities including inter-city and town connectivity
- GIZ's cooperation project on Lighting Efficiency Programme aiming at distribution of at least 2 LED bulbs to all households across 100 cities by 2016 and conversion of all street lights from incandescent and other bulbs to LED lighting fixtures for 100 cities by 2015
- Solar roof top initiatives for both solar thermal and photovoltaic in various pilot cities
- Model Village Programme aimed at ensuring that villages are converted into Model villages that provide basic infrastructure access to all households.

Germany has selected the cities of Bhubaneswar, Kochi and Coimbatore as the first three cities for Indo-German cooperation to support these cities' pathways to become smart cities for sustainable development. As with Brazil[1], Germany and India could sign a financial agreement for a low interest rate loan to support climate-friendly urban development projects in India.

1.6 Transportation Sector

Both countries could strive to significantly enhance low-carbon development in the transportation sector. Within the framework of the bilateral cooperation, Germany and India could continue the dialogue and share their experience, e.g. in the context of the Faster Adoption and Manufacturing of Electric Vehicles (FAME) programme or development of high-speed rail – an area that India also collaborates on with Japan. This would support the shift of freight from road to rail, tapping a huge emission saving potential.

For civil transportation, the government has already initiated the Bullet Train project, aiming at connecting two key cities of Mumbai and Ahmedabad. It will look at possibilities to connect to greater Delhi and other key corridors in the next couple of years. Faster passenger trains could make rail transportation significantly more attractive for travelers and avoid domestic flights.

1.7 Agriculture

Utilization of solar energy in rural areas both in households and adaptation projects helps to improve local livelihoods and therewith the adaptive capacity of the rural population. In this sense, solar energy also plays a central role for the Indian adaptation agenda. Pilot projects on solar water pumps and solar installations above agriculturally used land are increasingly experimented with across India. First projects

[1] Brazilian-German Joint Statement on Climate Change Brasília, 20 August 2015, available at: www.bmub.bund.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/klimakonsultation_deutschland_brasilien_en_bf.pdf

indicate an enormous potential of solar panel installations that partly shade the agricultural fields from sunlight, still allowing plants to grow, and harvesting solar power on top of the agricultural yield.

Measures like early-warning systems to forecast extreme weather events would offer options for cooperation beyond solar energy, if so wanted. Recent research of the Potsdam Institute for Climate Impact Research (PIK) on the prediction of the Indian Summer Monsoon will be of enormous value for the Indian agriculture sector.[2]

1.8 Strengthening Bilateral Cooperation through Civil Society Dialogue

Each of the above cooperation fields aiming at a success of the Indo-German Solar Partnership benefits from supporting NGO dialogue between Indian and German actors. Civil society dialogue on the elements of the solar partnership could build trust, identify Indian needs and support the bilateral cooperation with capacity building for implementation and creating trust and expertise in solar power. The potential of solar power in India is still widely underestimated in the society and the national target of 100 GW by 2022 is by many perceived as too ambitious. The recent prize drop of solar technology leading to competitiveness to coal in certain parts of the country has not yet reached or convinced the potential "prosumers" (producer and consumer in one). Civil society dialogue could help building the case for solar in India by sharing the German experiences. Further, some of the required know-how for solar installations can be transferred by civil society dialogue. Thus, exchange programmes between India and Germany on the topics of solar technology, investment, building an investment de-risking framework and many more could help build the success of the partnership.

Possibilities about research exchanges for PhD candidates in the field of solar energy across the two countries can be communicated via civil society dialogue. Similarly, opportunities for exchange on R&D in companies can be shared over civil society platforms.

At the same time, civil society dialogue could assist in gathering information about the local needs to make the dissemination of solar power a success for the users. These local needs could inform the bilateral collaboration. Accordingly tailored policy could in turn result in faster development by positive mouth-to-mouth communication about the benefits e.g. in terms of energy supply and economic sustainability.

2 Indo-German cooperation in multilateral climate and development negotiations

Bilateral Indo-German cooperation has proven to build mutual understanding and trust in finding solutions in international negotiations. Bilateral cooperation experience has provided learning and confidence for various negotiation items at UNFCCC. Equity, technology cooperation, pre-2020 action, measuring, reporting and verification (MRV) and climate finance are key elements of particular importance for trustful negotiations and low-carbon development implementation in India (and Germany).

The successful implementation of the Indo-German Solar Partnership would build evidence for India in Germany's pre-2020 action, technology cooperation, climate finance and possibly thereby step-wise in equity and differentiation, if the envisioned positive impact on the Indian energy security and climate benefits occurs. Such a positive experience for India could in combination with an understanding of the

[2] Tipping elements of the Indian monsoon: Prediction of onset and withdrawal, 2016, available at: http://onlinelibrary.wiley.com/doi/10.1002/2016GL068392/full

Indian context for climate action on the German side be of enormous value for trustful negotiations at UN level. The MRV framework that is on the agenda for detailed negotiation at UNFCCC is an area that could benefit of solutions that are possible to be identified and agreed due to the mutual understanding based on bilateral collaboration.

The successful implementation of the Indo-German Solar Partnership would further be able to inform the International Solar Alliance which was launched by and has its secretariat in India. Thus, a fruitful and respectful bilateral cooperation of India and Germany on the development of solar energy in India could have positive spill-over effects to larger multinational processes such as the UNFCCC negotiations or the multilateral International Solar Alliance.

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