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Advancing an International Energy Transition Policy in North Africa and Beyond

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Germany is widely regarded as a global leader in the promotion of renewable energy and energy efficiency (RE & EE). The German energy transition (*Energiewende*) has been a source of inspiration for many developed and developing countries. As the largest bilateral donor in the energy sector, Germany's expertise in RE & EE has become a core component of its development cooperation. A key success story of multilateral energy cooperation has been the German initiative to create the International Renewable Energy Agency (IRENA).

More could be done, however, to build on these achievements and to strengthen Germany's international cooperation in this sector. A concerted effort to support energy transitions abroad could play an important role in building further momentum for a global energy transition as a major contribution to the implementation of the Paris Climate Agreement and the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda.

With its vast but under-exploited potential for RE & EE, North Africa is an important target for German cooperation in the energy sector.¹ Experiences in the promotion of renewables in North Africa hold important lessons for Germany's international energy transition policy. This policy brief provides three key recommendations to enhance Germany's approach to supporting international energy transitions in North Africa and beyond:²

■ **Message 1:**
Strengthen understanding of partner countries' policy priorities.

Successful international cooperation on RE & EE requires a strong alignment with the policy priorities of partner countries. Nevertheless, little context-specific knowledge on drivers and barriers for RE & EE exists. This deficit should be addressed by fostering policy-oriented research to afford German actors insights on developments and priorities in partner countries.

■ **Message 2:**
Ensure that energy transitions deliver socio-economic benefits.

Employment and domestic value creation are important policy priorities in partner countries that can be addressed through energy transition policies. Germany's international cooperation should provide stronger support for the development of small and medium-sized enterprises by providing access to training and expanding technology transfer through business linkages in promising supply chain segments.

■ **Message 3:**
Streamline communication on international activities.

The creation of a single, government-operated website to provide comprehensive information on the activities of the different ministries and implementing agencies would significantly improve the visibility of German activities.

¹ North Africa comprises the countries Algeria, Egypt, Libya, Morocco and Tunisia.

² This IASS Policy Brief is informed by discussions at the IASS-SWP-DIE/GDI Workshop "Advancing an International *Energiewende* Policy: Lessons from North Africa", held in Potsdam in June 2015. The workshop, which was organised by the authors, brought together representatives from the renewable energy sectors of Egypt, Morocco, and Tunisia with various German actors from government, civil society, industry, and academia.

1. Germany: a strong partner for energy transitions

The German energy transition has important international demonstration effects.³ Germany is renowned for its technological expertise and environmental leadership, and the transformation of the German energy system is followed with intense interest. This process promises to deliver important lessons on the transformation of a conventional energy system to one that is based on high shares of renewable energy, complemented by progressive energy efficiency policies, while maintaining and even strengthening an internationally competitive economy.

Germany is a leader in international cooperation on RE & EE and has engaged with international partners to support its global expansion since the 1970s. As a result of this, Germany enjoys strong credibility in the sector around the world.⁴ A particular strength of its engagement lies in the field of institution building: Germany has played an instrumental role in the development of a number of international organisations dedicated to the advancement of RE & EE. The most notable example is the establishment of IRENA in

2011, which was initiated and strongly supported by the German government.⁵ Today, IRENA is an internationally recognised intergovernmental organisation with more than 145 member states. In North Africa, Germany supported the creation of the Regional Center for Renewable Energy and Energy Efficiency (RCREEE), an organisation for the promotion of RE & EE in the Middle East and North Africa. RCREEE has sixteen member states from the Arab world and is co-financed by Germany, Denmark, and Egypt.

Both in North Africa and globally, Germany is the largest bilateral donor in the energy sector. In 2014, Germany accounted for more than one-third of bilateral Official Development Assistance (ODA) to the energy sector – both in North Africa and globally (see Figs. 1 and 2). The energy sector moreover represents the largest funding area of German development cooperation.⁶ In 2014, Germany disbursed US\$ 1.6 billion in ODA across the global energy sector, of which US\$ 138 million was delivered to countries in North Africa.

³ See Quitzow, R., Roehrkasten, S., Jaenicke, M. (2016). *The German Energy Transition in International Perspective*. – IASS Study, March 2016. Institute for Advanced Sustainability Studies (IASS), Potsdam.

⁴ See Steinbacher, K. (2016). *Exporting the Energiewende? German Leadership and Renewable Energy Policy Transfer to Morocco, South Africa, and California*. Dissertation, defended at Freie Universität Berlin on July 11, 2016.

⁵ See Roehrkasten, S., Westphal, K. (2013). *IRENA and Germany's Foreign Renewable Energy Policy: Aiming at Multilevel Governance and an Internationalization of the Energiewende? – SWP Working Paper*, September 2013. Stiftung Wissenschaft und Politik, Berlin; Roehrkasten, S. (2015). *Global Governance on Renewable Energy*. Springer VS Research, Wiesbaden.

⁶ According to OECD.Stat (2016) between 2010 and 2014, 18 per cent of German ODA was channelled to the energy sector. Education was the second largest target sector, receiving 15 per cent of German ODA.

Germany is the largest bilateral donor in the energy sector – worldwide and in North Africa.

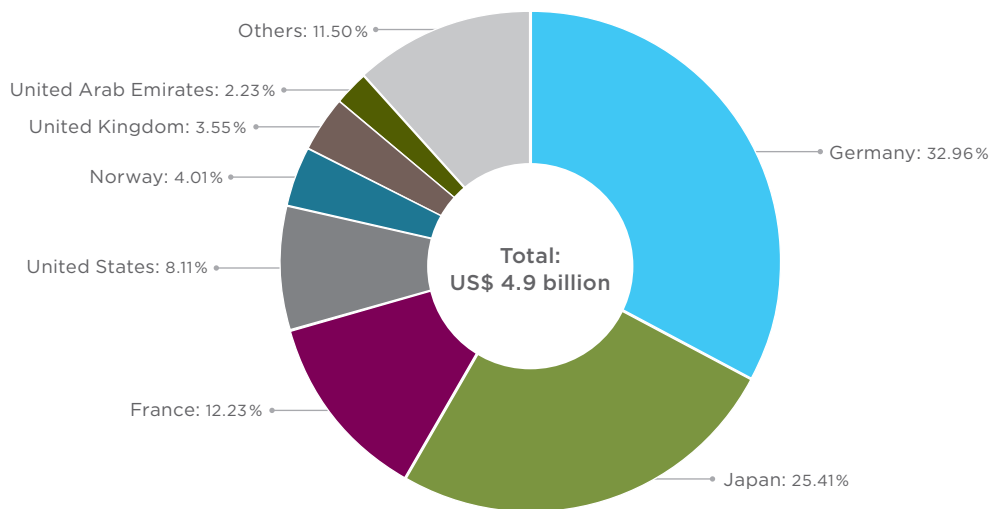


Figure 1: Major bilateral donors to the energy sector worldwide, 2014

Source: IASS based on OECD.Stat

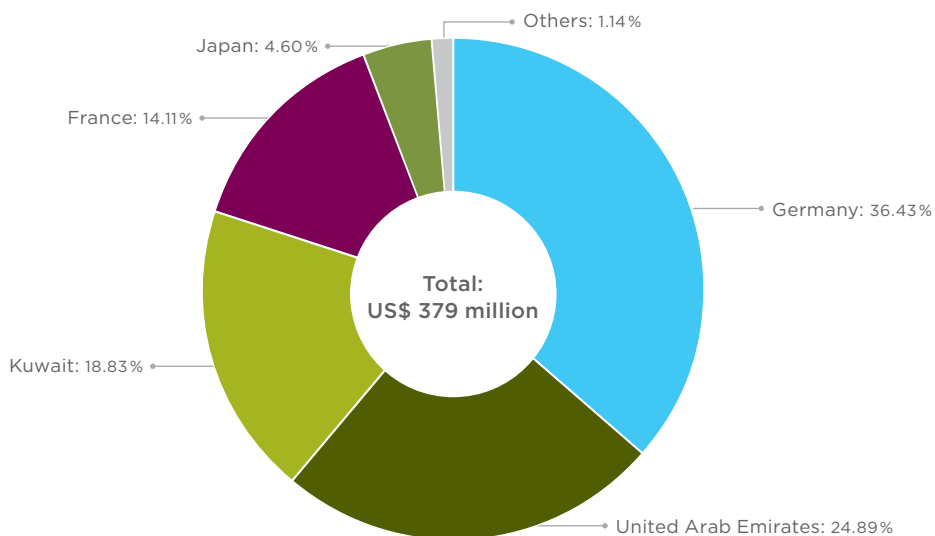


Figure 2: Top bilateral donors to the North African energy sector in 2014

Source: IASS based on OECD.Stat

2. Past achievements and future challenges in North Africa

Renewable energy generation and energy efficiency measures are beginning to gain ground in the North African countries of Algeria, Egypt, Libya, Morocco, and Tunisia. In 2015, installed renewable energy capacities amounted to almost 7 GW. Hydropower capacities, which have remained relatively stable over the last decade, account for most of this (just under 5 GW). Non-hydro renewables have undergone a more than six-fold increase since 2006, with capacities totalling more than 2 GW in 2015. As illustrated in Fig. 3, wind energy accounts for the vast majority of installed non-hydro renewable energy capacities across the region. Most renewable capacities (both hydro- and non-hydro) are located in Egypt and Morocco, both of which are net importers of

fossil fuels.⁷ Reducing import dependency is a major rationale for expanding renewable energy in these countries. All of the countries in this region have adopted renewable energy targets.⁸ Egypt and Algeria have established feed-in tariffs for renewable energy, while Morocco has developed a successful system of auctions to promote renewables. Throughout the region, renewable energy is seen as an important instrument to satisfy rising energy demand and stimulate socio-economic development. Energy efficiency regulations have also been implemented in most countries. A number of countries, including Egypt, Morocco, and Tunisia, have started to reduce fossil fuel subsidies. This is an important policy change that will boost the expansion of RE & EE.⁹

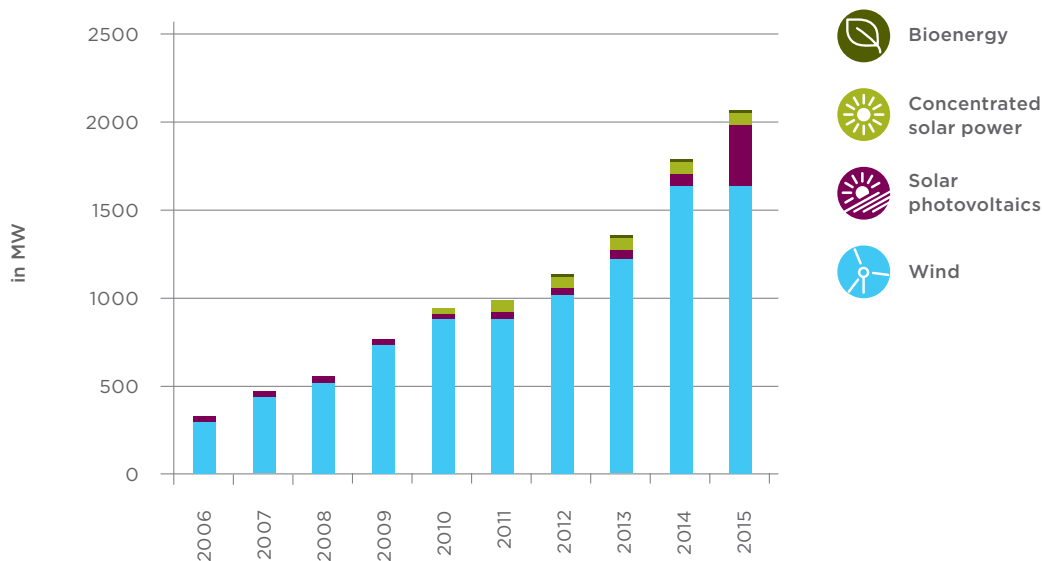


Figure 3: Installed non-hydro renewable energy capacity in North Africa

Source: own calculations based on IRENA (2016): Renewable Capacity Statistics 2016

⁷ Own calculations based on IRENA (2016): *Renewable Capacity Statistics 2016*. Available at: http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Capacity_Statistics_2016.pdf

⁸ See IRENA (2015): *Renewable Energy Target Setting*. Available at: http://www.irena.org/DocumentDownloads/Publications/IRENA_RE_Target_Setting_2015.pdf

⁹ For further information, see: RCREEE (2015): Arab Future Energy Index™(AFEX) - Energy Efficiency. Available at: <http://www.rcreee.org/projects/arab-future-energy-index%E2%84%A2-afex>

Despite these achievements, overcoming fossil fuel path dependencies in North Africa and establishing favourable investment conditions for RE & EE still pose tremendous challenges. The North African electricity mix is dominated by fossil fuels. In 2013, natural gas (75%), oil (15%), and coal (4%) accounted for the largest share of the electricity mix. Hydropower and non-hydro renewables, on the other hand, accounted for just five and one per cent respectively.¹⁰ Fossil fuels continue to be heavily subsidised in North African countries. This practice incentivises their wasteful consumption and distorts competition for renewable energies.¹¹ The prevailing slump in oil prices poses an additional barrier to the expansion of RE & EE in the region. Efforts to accelerate investment will face significant challenges, which are further complicated by political instability and security issues affecting a number of countries. These factors are hampering increased regional integration, which is a potential enabler for investment in RE & EE.

The focus of Germany's energy ODA to the region lies squarely on promoting renewable energies, particularly wind and solar power. The bulk of German energy ODA to this region is directed to Morocco, which was the recipient of 77 per cent of German energy ODA to North Africa between 2010 and 2014. Substantial support is provided to the large-scale concentrated solar power plant located in Ouarzazate. Twenty one per cent of German energy ODA to North Africa during this period flowed to Egypt.¹² The German government has signed bilateral energy partnership agreements with Morocco, Tunisia, and Algeria, which involve regular intergovernmental

consultations to expand the use of RE & EE technologies. German civil society and private sector actors have also supported cross-Mediterranean initiatives to harness the potential of the Sahara Desert for renewable energy generation.

Cooperation between Germany and North African countries has a sound basis and can build on established relationships. Germany is regarded as an important international frontrunner in the energy sector and enjoys strong credibility as a partner. Compared to other donors, German development cooperation places a strong emphasis on the alignment of its energy programmes with the national priorities of its partner countries. Another strength of German development cooperation is a clear commitment to ensuring that decisions are informed by a sound analytical basis, for example through studies of renewable energy potentials.

Nevertheless, German energy cooperation with North Africa faces a range of challenges. There is an urgent need to link RE investments to efforts to support the development of other sectors (e.g., agriculture and industry) and improve private sector competitiveness as a means to enhance job creation. Moreover, German energy cooperation involves a relatively large number of ministries and implementing agencies. This fragmentation of actors poses a challenge to policy coherence that should be addressed. Finally, despite Germany's relative strength in this area, more could be done to align its energy cooperation strategy with partner countries' priorities.

¹⁰ Own calculations based on IEA country statistics available online.

¹¹ See Sdravovich, C., Sab, R., Zouhar, Y., Albertin, G. (2014). *Subsidy Reform in the Middle East and North Africa: Recent Progress and Challenges Ahead*. International Monetary Fund, Washington DC.

¹² Own calculations based on data from OECD.Stat.

3. Strengthen understanding of partner countries' policy priorities

It is widely recognised that successful international cooperation on RE & EE requires a strong alignment with the policy priorities of partner countries. This applies to the focus of activities in partner countries and to strategies for communicating the potentials of RE & EE in different contexts. Cooperation with partner countries should build on the drivers and opportunities specific to each context.

As a first step, it is important to acknowledge the different starting points and dynamics of energy transition processes in Germany and North African countries. While Germany faces the need to replace (phase-out), modernise, and restructure existing infrastructure, North African countries must meet rapidly growing demand by creating and expanding infrastructure and capacities. In Germany, mitigating nuclear risks and climate change while enhancing leadership in future technologies have been key drivers for the domestic promotion of RE & EE. In fossil fuel importing countries in North Africa, reducing import dependency is a major motivation for the domestic expansion of RE & EE. Creating opportunities for local value creation and employment are also important policy priorities and feed in to efforts to enhance regional stability. Local environmental benefits, such as the mitigation of air pollution and enhanced water security, can be additional drivers.¹³ Cooperation strategies should identify and build on these and other country-specific drivers.

Developing strategies tailored to specific national contexts requires a deep understanding of partner countries' policy priorities and contexts. However, context-specific knowledge on drivers and barriers for the expansion of RE & EE in different countries remains scarce. As a result, the 'export' of German and EU energy regulations as a means to liberalise energy markets and kick off competition has faced serious limitations. Policy-oriented research that links knowledge on the domestic energy sector with a sound analysis of the related political economy and industrial capabilities in partner countries could make an important contribution to identifying entry-points for successful cooperation strategies. A contextualised analysis of the potential benefits and costs of RE & EE investments is a first step. Further research should then consider how different policy options for supporting these technologies might affect and be affected by key stakeholders in the country.¹⁴

Finally, communication strategies tailored to the particular potentials of RE & EE in a given country must be adopted to enhance the impact of international energy transition policy. Narratives must be adapted to different contexts and target groups if they are to be persuasive. This means not only selecting appropriate themes and messages; it also implies an active process of mutual exchange that will grant German actors insights into developments and priorities in the partner countries. This is crucial to gaining a better understanding of particular national contexts and sends an important signal to partner countries that their concerns and objectives are being taken into consideration.

¹³ See Roehrkasten, S., Schaeuble, D., Helgenberger, S. (2016). *Secure and Sustainable Energy in a Water-Constrained World*. – *IASS Policy Brief*, February 2016. Institute for Advanced Sustainability Studies (IASS), Potsdam.

¹⁴ See Vidican, G., Böhring, M., Burger, G., de Siqueira Regueira, E., Müller, S., Wendt, S. (2013): *Achieving Inclusive Competitiveness in the Emerging Solar Energy Sector in Morocco*. – *DIE Studies*, no. 79. German Development Institute, Bonn.

4. Ensure that energy transitions deliver socio-economic benefits

Creating opportunities for local value creation and employment are important policy priorities within the context of efforts to promote RE & EE in North Africa and other developing regions. Unemployment, especially among educated youth, is a widely recognised problem throughout the region and poses a significant risk to regional stability. While energy transitions hold important potential as a means to alleviate unemployment, overcoming the diverse socio-economic and political challenges around their implementation requires long-term commitment and concerted efforts on multiple levels.

Among the economic challenges are the relatively weak industrial base, lack of skilled labour, and small market size. A GIZ estimation of the value-added potential of the Tunisian solar industry in 2013, for example, revealed the limited extent of local production capacities for specific photovoltaic and concentrated solar power components.¹⁵ On the other hand, the same study identified industrial manufacturing potentials in selected segments of the supply chain – comprising, for example, cables and glass – and a large potential for downstream value creation (engineering, development, finance). A study of value chains in Morocco arrived at similar conclusions.¹⁶

Enhancing local value creation requires targeted and integrated interventions that build on promising segments of the supply chain. Concerted efforts are needed to support the development of small and medium enterprises (SMEs), build domestic capabilities, and expand opportunities for technology transfer

through business linkages. In order to achieve this, energy and industrial policy and regulations must be attuned to the needs of common policy objectives. This means that technical cooperation, which has proven effective in developing a regulatory framework and knowledge on energy policy, and financial cooperation, which has catalysed large investments in RE & EE, must also be aligned more strongly to private sector development programmes. This would create broad opportunities for local value creation (in terms of employment, manufacturing, and service provision). The newly established RE-ACTIVATE programme, implemented by the GIZ, moves in this direction and aims to strengthen the job creation potentials of various RE & EE projects in the North African region. It is still too early to assess the effectiveness of this initiative however.

Fostering technology transfer and creating training opportunities are crucial to ensuring that energy transitions deliver socio-economic benefits. Bilateral cooperation to support business partnerships, joint ventures, and other ways of linking local firms with German companies could offer tremendous opportunities for the transfer of know-how and technology. One such initiative was implemented in Morocco in connection with the establishment of a solar industry cluster. The initiative consisted of targeted exchanges that brought Moroccan companies and policymakers together with German private sector stakeholders, policymakers, and scientists to enhance understanding of the factors that contributed to the sector's development in Germany. Exchanges of this kind also

¹⁵ See Borbonus, S., Fink, T., Brand, B., Wane, S., Viebahn, P., Fritzsche, K., Blattmann, K., Zaoui, S., Hannachi, J., Jafaar, A., Amri, N. (2013). *Analyse de la chaîne de valeur des technologies relatives à l'énergie solaire en Tunisie*. Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, Eschborn.

¹⁶ See Kost, C., Thomsen, J., Schlegl, T., Fluri, T., Philipps, S., Lude, S., Hädrich, I., Weber, D., Platzer, W., Wirth, H. (2012). *Support for Moroccan Solar Plan. Solar Technologies in Morocco: Industry and Value Chain Assessment*. Fraunhofer Institute for Solar Energy Systems ISE, Freiburg.

underscore the fact that the transition to a sustainable energy system is about more than technology development and exports. Rather, it holds significant potential for domestic industrial development and job creation.¹⁷ One option that could be further explored is the creation of a mobility and circular labour migration partnership to promote professional education and training in RE & EE as a contribution to North African energy transitions and regional stability.

At the same time, it is important to recognise that the goal of domestic value creation may not always be aligned with the interests of German exporters of renewable energy technologies. At present, little systematic assessment of these trade-offs and their possible implications exists. Developing an analytical basis for more informed decision-making in this field

offers important potential for better aligning the activities of various German ministries. An assessment of these aspects should consider the particular challenges that German firms face when entering markets in these countries. Germany's renewables industry is characterised by a high share of SMEs, which require stable and predictable frameworks to invest abroad. Large corporations and state-owned enterprises of third countries are, as a rule, better equipped to manage risk and cope with uncertainty. Last but not least, the small scale and step-by-step solutions required for RE & EE face asymmetric competition from nuclear power technologies strongly promoted in the region by Russia and France, offering an attractive 'packaged' alternative to renewable energy for decision-makers in the region.

¹⁷ See Vidican et al. (2013).

5. Streamline communication on international activities

A range of actors contribute to Germany's international energy transition policy, with responsibilities spread across five separate government ministries: the Ministry for Economic Cooperation and Development (BMZ), the Ministry for Economic Affairs and Energy (BMWi), the Federal Foreign Office (AA), the Ministry for the Environment (BMUB), and the Ministry for Research and Education (BMBF). In addition, Germany's development programming is divided into technical and financial cooperation, carried out by the Gesellschaft für Internationale Zusammenarbeit (GIZ) and the German Development Bank (KfW), respectively. The involvement of so many different actors offers important advantages, as it facilitates comprehensive and multifaceted activities, but it is not without its drawbacks. Activities are not always well coordinated, and the different German ministries and implementing agencies communicate their activities largely independently from each other. As a result, it is often unclear to international partners how responsibilities are distributed across their German partners.

A streamlined approach to communicating Germany's international energy transition policy could significantly increase its visibility and boost recognition of German leadership in the field. Setting up a single government website that provides comprehensive

coverage of German activities would be an important step in the right direction. It would also offer stakeholders in Germany and abroad a clearer understanding of the German government's approach and possible entry-points for cooperation. The US government's Power Africa initiative offers a good example of a streamlined communication strategy. Through this whole-of-government communication strategy, the US has ensured a high degree of visibility of its portfolio on the continent and established itself as a recognised actor within the sector.

The development of a joint communication strategy would require cross-ministerial dialogue, which would further facilitate the internal coordination of activities. It could therefore be an important step towards a more strategic coordination across the goals and objectives of Germany's international energy transition policy. Streamlining communication could also increase the involvement of decision-makers at higher political levels. At present many of the activities undertaken to promote RE & EE in North Africa address the technical level. Engagement with stakeholders at higher political levels will be crucial to efforts to mobilise political support for RE & EE. The establishment of energy partnerships has been a first step in the right direction in this respect.

6. Towards a global energy transition

A global energy transition remains a distant goal, with conventional sources still accounting for almost 90 per cent of global final energy consumption in 2014.¹⁸ The recent adoption of the Paris Agreement and the UN Sustainable Development Goals sends a clear message: there is an urgent need to increase global efforts to promote RE & EE and to phase out the use of carbon-intensive fossil fuels.

Germany is in a very strong position to play a key role in the much-needed global cooperation effort. To do this, Germany must tap into its vast experiences in international cooperation for inspiration and insight. This will require a comprehensive evaluation of Germany's international activities and an assessment of the lessons learned. Comparing experiences from

different countries could offer important insights for this purpose. Experiences with countries like India and South Africa may be of particular interest. In both cases the cooperation approach was based on a whole-of-government model, bringing actors with different interests together for a common agenda. Approaches of this kind promise to deliver greater coherence, emphasise complementarities between the different German partners involved, and enable synergies to be harnessed across activities. A reassessment of cooperation strategies, based on previous experience and lessons learned from different contexts, would be critical for addressing the interests of all those involved, and for effectively advancing a global *Energiewende*. ■

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¹⁸ See REN21 (2016). *Renewables 2016 Global Status Report*. Available at: <http://www.ren21.net/status-of-renewables/global-status-report/>



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