

4.2 EFFECTS OF GERMANY'S ENERGIEWENDE ON THE SURVEYED COUNTRIES

Positive effects: learning effect, technology transfer, motivational effect

- Experts in Brazil, China and South Africa saw the positive effects of Germany's Energiewende on their countries' own energy policy as lying mainly in **learning effects** for the gradual expansion of renewable energies in their countries and local improvements in energy efficiency. As expected, the energy experts in all three countries expressed keen interest in technological solutions. They were also interested in the planning, organisation and management of the process of switching to renewables in Germany.
- In relation to the relevance of new technologies to the field of renewable energies and energy efficiency, the experts were **hoping for closer economic and technological cooperation with Germany**. In **Brazil** and **South Africa**, in particular, the experts expected Germany to do more to share its technological lead through the transfer of experience, knowledge and skills. They hoped that technology transfer would involve not only the export of new energy and efficiency technologies but also the construction of plants and elements in their own countries. Since large-scale production of new energy and efficiency technologies will by then be fully mature, the experts expected significant cost advantages. Until then, however, the countries concerned – especially South Africa – will continue to rely partly on financial assistance from Germany, for instance in pilot projects.
- The experts in **China** also quoted the opportunity to acquire mature Western technologies as a positive effect of Germany's Energiewende. However, they also referred to China's innovative ability and saw the Energiewende in Germany as opening up export and sales opportunities for Chinese industry, especially in the photovoltaic sector. In some cases respondents commented very openly on growing cost disadvantages for German suppliers as a consequence of the Energiewende and the resulting competitive advantages for the Chinese manufacturing sector.
- Setting aside economic and technological issues, a few of the respondents believed that a positive outcome of Germany's Energiewende would have a **motivational effect** on their own countries and beyond. Some of the experts hoped that if Germany could demonstrate that the Energiewende is feasible, this would encourage the political and business elites to take further steps towards sustainability and increase society's acceptance of green technologies in general in their own countries.

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*NGO representative,
South Africa*

Learning effects

- “So I think we should learn from them to avoid the same mistakes, it’s like ‘ctrl+c, ctrl+v’ and get it right here. It’s important to adjust some things to our reality because some things that are good for them aren’t necessarily good for us...” (3.2a Industry)
- “Through experience and learning from mistakes and successes and I think that it’ll be very easy for Brazil to implement these renewables because it has much possibility in view of the geographical conditions and opportunities that nature presents.” (3.2a Parliament)
- “I think Germany will always be a reference in technology. The German institutes that study renewable energy are worldwide known for their top-notch technology and they won’t let that go easily.” (3.2a NGOs)



Brazil

- “China can go over the German energy transition policies, learn technologies and implementation, e.g. how to give consideration to interests of parties.” (3.2a Industry)
- “I think the scientific and technological achievements developed by Germany can be learnt by China, such as bioenergy generation and energy storage.” (3.2a Public administration)
- “China should not only learn the technology, but also the attitude of working and useful experience in all aspects from the Germans.” (3.2a Science)
- “Germany attaches great importance to the development of energy technology and construction of grid during the development of renewable energy resources that is to build supporting facility that keeps up with the development. This can be taken as reference. In addition, to increase energy efficiency by constructing energy-saving large buildings, and to promote energy conservation in related industries are also worth being learnt from.” (3.2a NGOs)



China

- “Well I think probably it is going to be technology wise and then watch this space, how do they transition, how does it damage and affect the economy, how is the response from the industry and individuals and government? In other words we can learn valuable lessons going forward.” (3.2a Industry)
- “Well it is obviously that we could learn lessons from what Germany has done and that it could inform our policy processes as well.” (3.2a Public administration)
- “Hopefully we can learn from some of the experiences that Germany is going through now in this transition and apply that learning to the strategy in South Africa.” (3.2a NGOs)



South Africa

Technology transfer



Brazil

- “No doubt we could benefit from that, by the transference of technology, by the production of energy, besides the great potential our country has, we could do it much better and in a much larger scale, everyone knows that, but the situation remains the same. And of course we could advance a lot with a technical cooperation between Brazil and Germany and bring here all that technology and manufacture all the equipment here, because it is very expensive to import all that large materials, photovoltaic cells, the blades of the wind turbines, etc. So the transference of technology would be very important.” (3.2a Public administration)
- “I think Brazil could benefit in several ways. I mean, not the buyer of this technology, but use this technology even for a partnership and have production strategies. Here in Brazil, we have the biggest wind power bases, but if you think about training, through exchanges, we can contribute in part to technological research.” (3.2a Public administration)
- “There could be partnerships with universities and institutions, they could develop something here and apply it back in Germany. Once our researchers receive incentives from a country like Germany, the universities where these researchers work would grow in general. Brazil could benefit by developing partnerships.” (3.2a Science)



China

- “In many industries in China, we have learned advanced technologies from other countries, which helped us cut down the investment on R&D at the initial stage. However, in many industries, we only learned the superficial knowledge, but not their core technologies. It would be better if we could develop together with partners in foreign countries, and learn the core technologies.” (3.2a Public administration)
- “As for the fields that Germany doesn’t have superiority to China, China can enter. For example, China’s production ability would be needed, it could produce equipment for renewable energy generation and have them exported to Germany. This is beneficial for us.” (3.2a Science)
- “I don’t think to learn from the German energy transition is necessary. In fact, China is superior to Germany in some aspects. For example, solar water heaters are with a relatively high penetration rate in China; also polysilicon and photovoltaic cells are well developed.” (3.2a Science)

- "So I think the significance is that we don't have to go and reinvent the wheel. We will be able to enjoy some of their economies of scale in terms of manufacturing etcetera. So I am sure there will be a lot of benefit for us in implementing that future technology because there is no R&D costs." (3.2a Industry)
- "If Germany was willing to partner with South Africa in terms of technology transfer where South Africa has an opportunity to see the benefits of moving to renewables, but also if there are any opportunities of funding, where Germany can fund pilot projects in South Africa." (3.2a Public administration)
- "I think they should keep their eyes open and copy the technology that is going to be invented over the next thirty years. And make a technology transfer to South Africa in terms of renewable energy sources." (3.2a Science)



South Africa

Motivational effect

- "If happens there, it'll be an example and it can happen here, too." (3.2b Industry)



Brazil

- "I think that not only Brazil but the whole world could benefit from this German model as long as it becomes successful and becomes a reference. Again, not only Brazil but any country in the world is likely to follow this model when they find out the possibility of improving the energy issue and lessening the environmental impact." (3.2a Science)
- "That thing of inspiration and provocation, I think that since there is something going well, you will already have more concrete cases here in Brazil to promote as a reference, and with that we could go further." (3.2a NGOs)



China



South Africa

- “It can remind the Chinese government in making policy to give full consideration to environmental factors.” (3.2a Science)

- “Well, I think if they can demonstrate that it is achievable and come up with technology efficiencies that can be replicated here, then I think it can demonstrate what is achievable.” (3.2a NGOs)
- “Yes, once it is demonstrated, it is possible.” (3.2a NGOs)

Negative effects of simple adoption of the model

- On the issue of negative effects, opinion varied widely in all three countries. Some of the experts did not envisage Germany’s Energiewende as having **any direct negative effects** on their own country, or believed that the effect would only be negative if the Energiewende failed. This was consistent with the widely held positive view of the Energiewende (Chapter 3, Chapter 5). At the same time, however, the belief in slight negative effects was also based on a **perception** of at most **low energy-policy dependence** between their own country and Germany, as well as on **confidence in national decision-making and regulatory sovereignty** in the field of energy policy.
- For example, many of the experts viewed negative effects as likely to arise specifically in cases where external pressure forced countries to make significant modifications to the course of their energy policy. One negative effect that was mentioned, particularly in China, was the **growing international pressure** to speed up and expand the process of making energy-supply systems more sustainable and environmentally friendly. This reflected concerns about deteriorating foreign relations and possible image problems for the country concerned, as well as a fear of measures that are not compatible with the country’s energy-related and economic circumstances.
- Both industry and government experts were concerned about how **unresolved organisational and technological issues would be dealt with** if Germany’s goals for the Energiewende were simply adopted wholesale, as well as about **technical security of supply** and the expected **high investment costs**. As economic consequences of a significant shift in energy policy, the experts mentioned **problems for conventional energy producers and in energy-intensive and high-emission sectors**. In connection with a comprehensive shift in energy policy, the experts in Brazil and South Africa in particular also raised the problem of the **lack of technical expertise and qualified staff**. This was accompanied by a fear that where countries lack their own expertise and investment strength, foreign companies may divide up

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*Local government representative,
South Africa*

the national energy supply market between themselves. This problem was also mentioned in China, although in this case in a scenario in which the country failed to catch up with the West in terms of technology.

No negative effects expected

- "I do not think so because our land availability is much larger and has a greater capillarity in power generation." (3.2b Parliament)
- "No, not in Brazil, it is very improbable. We don't export energy, we export oil." (3.2 Public administration)
- "At first, no. At first, no. ... They do not import Brazilian energy, right. So it will not impact in any calendar marketing." (3.2 Public administration)
- "I don't think so, I don't think German is dependent on Brazil in terms of energy. Germany doesn't buy coal, gas, oil from Brazil. I mean, Germany doesn't import any energy input or technology from Brazil so I don't see any impact in this regard." (3.2b Science)



Brazil

- "The German energy transition isn't much relevant to China. So China is not under especially negative impacts. Germany has its own practice in energy development and so does China too." (3.2b Science)
- "There isn't specific negative impact on China. China has relatively good energy complementarity, with different key energy forms in various places. Germany has different environment and water resource situation vs. China. So their policy might not necessarily be suitable for us." (3.2b Science)
- "I don't think it will have a great negative impact on China, because different countries have different conditions." (3.2b NGOs)



China

- "I don't know of anything that would have a negative impact." (3.2 Industry)
- "I don't think there can be any." (3.2 Public administration)
- "I don't think there is much of a negative impact if at all." (3.2 Public administration)
- "I can't really see it actually, no they may be something but I can't at the moment get the link between Germany's energy and ours." (3.2 NGOs)



South Africa

Negative effects expected



Brazil

- "This issue of renewable energy is extremely expensive and inefficient. They'll want to bring this idea over here and then subsidize it to enable this more expensive energy. It'll affect our production and energy cost in a bad way. The cheap energy would have to subsidize the expensive one." (3.2 Parliament)
- "Look, the only thing we can't allow to happen is that any kind of radicalism takes over. ... Ideally, the dream is that we only use renewables in the future but you can't get too radical to the point of compromising the development and growth of the country." (3.2b Parliament)
- "Investment capacity, then I do not know how much it will cost, if it is more expensive than here in Brazil, may still impact, it depends on the investment." (3.2 Public administration)
- "I think the only issue is that they have more money to invest and here, in Brazil, we don't have so much money to invest in this way, in other forms of generation. So I think this is the problem. Their engineering is more advanced than ours and they have more money to invest." (3.2b Science)



China

- "However in the future decades, if China were forced to implement the energy transition, but were not well prepared for it, thus the market were occupied by foreign enterprises, then there would be negative impacts. Without foreign technology and products, China would face very great difficulties in energy consumption then." (3.2b Industry)
- "Social and world-wide pressures will exert negative pressures on Chinese government who will be urged to implement Energy transition policy as well. Nevertheless, it is infeasible and time-pressing for China to carry out Energy transition policy." (3.2b Public administration)
- "The negative impact I assume is the international pressure. When energy transition becomes the global trend, as a country that gives out a lot of emission, China would be under supervision by the whole world, especially by the US. If something happened, China would be forced by the US to develop green energy (clean energy). So China would be under greater pressure when making policy." (3.2b Science)



South Africa

- "The ability to make use of that technology. The ability to afford that technology obviously is a negative." (3.2b Industry)
- "So you're going to end up with an energy industry in South Africa that is literally owned by foreigners. Renewable industry is a very lucrative industry so you're going to get all those profits expatriated to Germany and that will not support the government objectives such as Black empowerment and economic growth." (3.2b Industry)

- “Costs. Well on the industry, to be tremendous effect. Our exports, our manufacturing, everything, it is terrible.” (3.2b Industry)
- “It could be if people have to lose their jobs that are currently working at power stations, people that are in the mines that are digging the coal. If that can be transformed for them to get jobs in this new whole idea of greening, that will be of good benefit to everybody in this country.” (3.2b Public administration)
- “If they come in and take more of our natural resources and our land – our arable land. Start taking more of what we have got – our water. And then we land up with nothing.” (3.2b NGOs)

4.3 TRANSFERABILITY OF GERMANY’S ENERGIEWENDE

Transfer rather than copy

- In all three countries, the experts surveyed tended to regard **simple wholesale copying** of the German model for switching to renewables or the accelerated adoption of it, as **not very realistic**. They explained this on the grounds that the future direction of national energy policy must take account of local social and political conditions, the particular country’s state of economic and technological development, and of course the existing energy situation, for example the main fuels currently in use. In all three countries, they therefore regarded the **chances of adoption of the Energiewende succeeding** as depending on both the **extent** of the changes and the **speed** at which they are made.
- Nevertheless, the **fundamental attitude to the transferability** of Germany’s Energiewende was mainly **positive** in all three countries. The fundamental options for adopting the model were most often perceived in **China**, while more cautious opinions were heard in the other two countries. The reservations expressed in **Brazil** related mainly to the major role that renewable energies have traditionally played in the national energy mix. Experts in **South Africa** not only mentioned the collision with economic goals but also emphasised the country’s status as a developing country with limited resources (money, expertise, skilled workers) as an obstacle.
- However, the vast majority of the experts surveyed emphasised that **elements of Germany’s Energiewende are in principle transferable**: in all three countries, the experts saw some aspects of it – such as investment in renewables, improved energy efficiency, and transparency and public participation – as steps that could be incorporated into their own energy policy or that should be compulsorily adopted.

“There are certainly elements, that can be transferred. I don’t think everything can.”

*Science representative,
South Africa*