

## 3. 2 SPEZIFISCH

### Versorgungssicherheit

Positiver Effekt auf politische Versorgungssicherheit, technische Versorgungssicherheit nicht unumstritten

- Je nachdem, ob die politische oder technische Versorgungssicherheit in den Blick genommen wird, bestehen unter den Experten in den drei Schwellenländern unterschiedliche Meinungsbilder zur deutschen Energieversorgungssicherheit. Einheitlich positiv fällt das Urteil zur Auswirkung der Energiewende hinsichtlich der **politischen Versorgungssicherheit** aus, die vor allem von den Experten in China und Südafrika thematisiert wird. Gesehen wird der enge Zusammenhang zwischen dem Ausbau inländisch produzierter regenerativer Energien und einer sinkenden Abhängigkeit Deutschlands von Energieimporten.

### Politische Versorgungssicherheit



China

- „Being a country, whose energy sources are mainly gained through import, Germany could be in great danger. If countries such as the USA, those in Middle East, and Russia ceased to provide oil to it, everything would be over. So Germany should try to be self-efficient.“ (2. 1b Wissenschaft)
- „In a short run, the energy transition makes Germany less dependent to foreign energy resources, and thus it contributes to improvement of the security of the energy supply.“ (2. 3a Wissenschaft)
- „It is definitely positive for the security of the energy supply in Germany. Because Germany possesses very few traditional energy resources, and the needs regarding this can only be fulfilled through imports. So the energy transition is for sure positive for the security of its energy supply.“ (2. 3a Wissenschaft)



Südafrika

- „I think it is an excellent idea. Well then they become self reliant then, they don't have to import gasses and stuff.“ (2. 3a Wirtschaft)
- „Look I think it will probably lead to energy security if they can get these renewables energy to achieve a grid parity, for example if they can get the wind farms to achieve grid parity then they don't have to import so much gas or they don't to import the other primary energy sources.“ (2. 3a Wirtschaft)
- „Well I think it is probably a positive move for Germany in terms of energy security, because it reduces dependence on fossil fuel and gas.“ (2. 3a NGO)

## Positiver Effekt auf politische Versorgungssicherheit, technische Versorgungssicherheit umstritten

- Bei der **technischen Versorgungssicherheit** gehen die Meinungen deutlicher auseinander. Ein Teil der Befragten hat ein großes Grundvertrauen, dass die zuverlässige Bereitstellung von Strom durch die Energiewende prinzipiell nicht in Frage gestellt ist. Getragen ist dieses Urteil in weiten Teilen von einem positiven Länderimage Deutschlands als einem „rationalen“, „durchorganisierten“ Staat und damit von der Vorstellung, dass der Energiewende-Entscheidung eine solide Risikoanalyse und Abwägung vorangegangen ist. Hinzu tritt der Glaube, dass gerade Deutschland als eines der führenden Industrieländer bislang noch unge löste technische Herausforderungen durch Forschung und Investitionen langfristig lösen wird. Zumindest ein Teil der Experten verweist auf die stabilisierende Wirkung einerseits eines dezentralisierten Erzeugersystems, andererseits einer höheren Energieeffizienz und damit eines sinkenden Energiebedarfs.
- Zum anderen wird die zuverlässige Energieversorgung aus technischen Überlegungen heraus allerdings auch mit deutlichen Fragezeichen versehen. Als zentrales Problem wird die flukturierende Stromeinspeisung aus erneuerbaren Energieträgern benannt, für die nur zum Teil bereits technische Lösungen gesehen werden. Aus dem Fehlen von bislang überzeugenden technischen Lösungen und wegen eines hohen Umstellungstempos werden zumindest kurz- und mittelfristig durchaus Risiken für **Versorgungsunterbrechungen** identifiziert.
- Unabhängig von technischen Lösungen wird aber vielfach mit der **Möglichkeit von Stromimporten** aus den EU-Nachbarländern als Ausgleichs- bzw. Back-up-Option für Deutschland argumentiert. Einige Experten sehen die Einbindung in das europäische Stromnetz allerdings auch als eine entscheidende Grundvoraussetzung an, um mit dem neuen nationalen Energie-Mix eine stabile und sichere Stromversorgung in Deutschland zu gewährleisten.

*„I think it will not fall. Germany is a country where they plan everything.“*

*Parlamentsvertreter,  
Brasilien*

## Technische Versorgungssicherheit gegeben

- „No, since it's a sustainable measure with a long-term planning policy I don't see any problem. Everything in life depends on planning to be structured.“ (2. 3a Wirtschaft)
- „I'm not an expert on the German energy system but there's a lot of redundancy. I think nowadays they import quite a lot from France. ... There are more than 10 nuclear power plants so it's easy to buy from their neighbor. I don't see it as a critical situation because consumption is stabilized.“ (2. 3a Wirtschaft)
- „I think it will not fall. Germany is a country where they plan everything.“ (2. 3a Parlament)
- „(Germany is) trying to diversify its energy matrix, it starts to mitigate these risks. So I believe it is on track.“ (2. 3a Parlament)



*Brasilien*



China

- „In the medium to long term I see no problem. I see more problems in the short term.“ (2. 3a NGO)

- „I don't think there would be problems in this respect. Despite the increased costs, due to the relatively mature industrial system, security of energy transmission and supply can be guaranteed.“ (2. 3a Wirtschaft)
- „From the perspective of energy security, firstly, energy sources are more diversified, changing the current situation where the supply structure and usage is restrained by others.“ (2. 3a Verwaltung)
- „Western developed countries are rich and can import electricity from other countries if there is shortage. For example, a part of the energy consumed in Germany is transmitted from Poland and Russia.“ (2. 3a Wissenschaft)
- „I think the security of the energy supply in Germany will be better, because power plants of new energy are scattered, so the large-scale blackout can be avoided.“ (2. 3a NGO)



Südafrika

- „Absolutely I think it is going to support the security of supply and besides that, if maybe it doesn't become a success, they have got countries like France and other allied countries next to Germany that they can source their energy from.“ (2. 3a Wirtschaft)
- „I think Germany as a country, my experience with them, they wouldn't have done anything or decide on a certain direction if they haven't researched thoroughly, ...“ (2. 3a Verwaltung)
- „Well I think that I have great confidence in the German people especially their technocrats in thinking this thing through.“ (2. 3a Wissenschaft)
- „Well in the long run it will ensure a more sustainable energy network or an energy supply network.“ (2. 3a Wissenschaft)
- „Well, I think if anybody can do it the Germans can.“ (2. 3a Wissenschaft)
- „I am sure there have been concerns over time about consistency of clean energy sources, but I can't imagine that the German government would make commitments like this without having certainty about the supply.“ (2. 3a NGO)

## Technische Versorgungssicherheit wird bezweifelt

- „This is one problem that must be known in terms of technology. Solar energy provides, but how do you accumulate this energy? Wind energy is more constant, but is more unpredictable. Solar power is more predictable. You know you will have sunlight for some time during the day, so wind is more unpredictable. One problem to be overcome is how you will store this energy.“ (2. 3a Wirtschaft)
- „Now is a big risk. If there's no wind, there's no generation of energy and you do not have a way to store it.“ (2. 3a Verwaltung)
- „Yeah, that's a problem, because when using nuclear energy you have a high capacity factor, ie, the plant is guaranteed.“ (2. 3a Wissenschaft)
- „Yes, it could happen, if it becomes too dependent on renewable sources, as I have mentioned a little earlier, they depend on the weather, if there is wind, or whether it is night or day. Therefore you cannot be very dependent on these sources, you can have other sources such as nuclear energy as a reserve for when there is a supply need.“ (2. 3a Wissenschaft)



Brasilien

- „To my knowledge, the technology of transmission and storage in Germany still needs to be improved. If there is more exhaustion or leak in the transmission and storage, the cost would be increased, the output of electricity would be less, and the price would go up. In this respect, I think there is still room for improvement.“ (2. 3a Wirtschaft)
- „If they wish to replace nuclear energy with all renewable energy for electricity generation during the process of energy transition, equipment transformation and technological development must be completed soon, otherwise it might lead to insufficient supply of the energy needed. In general, I still have some concerns over the security of energy supply.“ (2. 3a Wirtschaft)
- „Temporarily, the energy supply in Germany will become more intense. Because nuclear energy takes up about 20% in Germany now, this is a big proportion. Abandoning nuclear energy might cause energy shortage.“ (2. 3a Wissenschaft)



China



Südafrika

- „I think security will only be assured by having neighboring countries who can fulfill shortages of renewable they are not in a position to supply.“ (2. 3a Wirtschaft)
- „They can't provide security unless they buy electricity.“ (2. 3a Wirtschaft)
- „Well a lot of renewables, there's a problem with security of generation because a lot of them are weather dependant, whereas coal or nuclear you can generate regardless of the weather or conditions so I think there is an issue around security of generation, ...“ (2. 3a NGO)
- „I don't think it's going to be as secure as having nuclear.“ (2. 3a NGO)

## Umwelt- und Klimaschutz

### Energiewende: Schritt in Richtung eines besseren Umwelt- und Klimaschutzes, negative Begleiteffekte nicht ausgeschlossen

- Das Gros der befragten Experten versteht die Energiewende als **umwelt- und klimafreundlichen Policy-Wechsel von fossilen bzw. riskanten Energiequellen hin zu emissions- und risikoarmen Energieträgern**. In diesem Sinne werden die energiepolitischen Veränderungen grundsätzlich als Schritt in Richtung eines besseren Umwelt- und Klimaschutzes bewertet. Die Umwelt- und Klimaverträglichkeit der Energiewende selbst steht damit für die meisten der befragten Experten in den drei Schwellenländern außer Frage. Fast durchgehend werden seitens der befragten Experten positive umwelt- und klimapolitische Nettoeffekte der Energiewende für Deutschland erwartet.
- Unabhängig davon sind **negative Begleiteffekte der Energiewende** für die Klima- und Umweltsituation in Deutschland auch in den Schwellenländern bekannt. Genannt werden von den befragten Experten Landschaftsverschandlungen, geänderte Flächennutzungen (Wind, Solar, Trassenausbau), Geräuschbelästigungen (Wind). Identifiziert werden ebenso Belastungen durch THG-Mehremissionen in der Anlagenherstellung (Photovoltaik), als Folge des Aufbaus fossiler Energieträger als Brückentechnologie oder aber der Bereitstellung fossiler Back-up-Kapazitäten (Kohle, Gas) für die Grundlastproduktion.
- Neben negativen auf Deutschland beschränkten Begleiteffekten der Energiewende wird zumindest von Teilen der Experten auch auf die Möglichkeit von **Verlagerungseffekten** hingewiesen, im Sinne des **Exports von Umwelt- und Klimabeeinträchtigungen** in andere Länder. Angesprochen werden in diesem Zusammenhang Kostenanreize für stromintensive oder emissionsstarke Industriesparten, aus Deutschland ins Ausland abzuwandern. Gesehen wird das Risiko, dass

*„The environment protection is actually the outcome of the energy transition.“*

*Wirtschaftsvertreter,  
China*

positive Klima- und Umwelteffekte der Energiewende auf Deutschland begrenzt sein und sich in einer grenzüberschreitenden Gesamtrechnung relativieren könnten.

- Vereinzelt gibt es Stimmen, die auf einen **geringen globalen Effekt** der Energiewende hinweisen, solange sich der Umbau des Energiesystems auf Deutschland als einzelnes Land beschränkt. Vielfach wird aber gerade auch auf eine Initialwirkung der deutschen Entscheidung und ihre Adaption durch andere Länder gesetzt, so dass mittelfristig der deutschen Energiewende auch global positive Wirkungen zugeschrieben werden.

## Energiewende als Schritt in Richtung eines besseren Umwelt- und Klimaschutzes

- „I think it's is very good because you're taking the electric matrix out of power plants, thermal power plants, coal, natural gas, etc., which intensify the greenhouse effect and then you're putting energy sources that are much less evasive into the environment instead.“ (2. 3b Wirtschaft)
- „Look, this is the most positive aspect of this change: the concern with environmental issues is a concern that needs to happen worldwide.“ (2. 3b Parlament)
- „If you change the energy matrix by a matrix that is much cleaner and with less emission of consumed particles per unit of energy consumed, it will happen.“ (2. 3b Verwaltung)
- „I think it's a form of environmental protection. This policy maximizes the environmental protection mechanisms used today.“ (2. 3b Wissenschaft)
- „I think the effect is favorable because it goes toward reducing the demand of natural products, at least in energy and greenhouse gases.“ (2. 3b NGO)



Brasilien

- „The environment protection is actually the outcome of the energy transition.“ (2. 3b Wirtschaft)
- „I think the energy transition in Germany, if it is successful, would contribute to the environmental protection. For example, to use natural gas to replace the current non-renewable energy sources for power generation is a very good way of protecting the environment.“ (2. 3b Verwaltung)
- „This can definitely reduce the climate-damaging greenhouse gas emissions, reduce energy consumption, and is beneficial to the environment.“ (2. 3b Wissenschaft)



China



Südafrika

- „I am of course positive to it. First, as EU is actively urging its members to raise their goals of emission reduction, Germany can play a role in energy transition by protecting climate and environment with its action and act as a leader in the world as well. Second, theoretically, the more oil and coal are replaced with renewable energy, the less greenhouse gases such as CO<sub>2</sub> would be emitted.“ (2. 3b NGO)

- „Well, it is a big move towards that because their goals are reduction of greenhouse gases. Reduction of using fossil fuels, going for more sustainable forms of energy.“ (2. 3b Wirtschaft)
- „I think it will go far to reduce greenhouse gas emissions and it will also help to influence the agenda for the international program to reduce green house gases.“ (2. 3b Wissenschaft)
- „I think it's a very good step forward that will actually present more pollution and perhaps it will restore the environment to as much as possible natural levels that existed before.“ (2. 3b Wissenschaft)

## Negative Begleiteffekte für Umwelt- und Klimasituation



Brasilien

- „If it gives up nuclear power right now, it'll have to consume more coal until the new renewable energies are available. Then, this, at first, this decision to forgo nuclear energy could lead to an increase in emissions.“ (2. 1b Verwaltung)
- „What we have worked in the Ministry is the idea that it doesn't work thinking that renewable energy alone is friendly, environmentally speaking.“ (2. 3b Verwaltung)
- „The only issue that deserves more attention is when it comes to wind on the territorial issue. I believe it will be in the sea, which brings up fewer problems in this regard, but the portion of the land has to be done carefully, even considering the population density in Germany, which is higher than Brazil.“ (2. 3b NGO)
- „I just think the issue of coal is a little dangerous, because most of that nuclear power will have to be replaced by power coal and gas plants.“ (2. 3b NGO)

- „The negative aspect is the environmental pollution. For example, the generation of solar energy is still harmful to the environment. When producing solar energy equipments, there are wastes and litters which might do harm to the environment as well.“ (2. 1b Verwaltung)
- „The German energy transition does harm to the environment at a certain level. For example, manufacturing of solar energy equipment pollutes the environment at a certain extent.“ (2. 3b Wissenschaft)
- „Towards the critical thing of this energy transition at my point of view, because no nuclear power, it may increase the amount of the use of coal; while the amount of coal increases, so as the carbon dioxide, followed by increasing greenhouse gases, and this would be a very serious problem.“ (2. 1b Wissenschaft)
- „... For example, a part of the energy consumed in Germany is transmitted from Poland and Russia. In such a case, pollution is shifted to Poland and Russia, and thus is still harmful to the global environment.“ (2. 3a Wissenschaft)



China

- „Well I think in the short term it's actually bad because turning off nuclear reactors and supplementing it with coal is worse.“ (2. 3b Wirtschaft)
- „..., the renewables they have an environmental footprint, because if you're going to install wind farms, you need a lot of land, ..., so there is an environmental footprint, however, in terms of carbon emissions, renewables they've got very little carbon emissions, so it will be a plus for carbon emissions and for the rest of the environmental footprint.“ (2. 3b Wirtschaft)
- „...you know there are negative impacts about having lots of wind generation infrastructure, there are certainly negative impacts there, but you know there is no free lunch, ...“ (2. 3b Wissenschaft)
- „Again, I think that you know, what would be an impact, would be the visual, the landscape I mean they've been very good about landscape design in Germany.“ (2. 3b Wissenschaft)



Südafrika





## Verlagerungseffekte bzw. beschränkte globale Wirkung



Brasilien

- „It doesn't work if Germany is a clean country when countries like China, India, Brazil, have an dirty expansion of the generation park. So from the standpoint of mitigation of the effect of greenhouse gases, we cannot just look at Germany isolately. The impact on the industry pushes companies to reallocate plants; industries go to China and continue their emissions over there. Then the benefit is zero – or even negative; this on my point of view of greenhouse gas.“ (2.3b Wirtschaft)
- „I do not know how much Germany power means to the world, but by my calculations, today it represents 13% of global energy. So it is not very significant. If this program in Germany took place in China or the U.S., then the two together would consume 25% of world energy, then the impact on the environment would be much more significant.“ (2.3b Verwaltung)



China

- „However, regarding overall situation, it will only have a light impact. As long as other countries continuously generating carbon dioxide, greenhouse effect still exists, even the carbon emission in Germany is reduced to zero. It is utterly inadequate to the global environment protection. I think the key is that the countries, such as America, China and India, which use the most energy, reduce the emission of carbon and sulfur.“ (2.3b Wirtschaft)

## Wirtschaftlichkeit

### Energiewende: Hohe Startkosten, aber gutes Investment für die Zukunft

- Das Urteil zur Wirtschaftlichkeit der Energiewende fällt unterschiedlich aus, je nachdem, ob von den Befragten eine Kurz- oder Langfristperspektive eingenommen wird. Für so gut wie alle Experten aus den drei Ländern ist der Blick auf die Energiewende geprägt durch **hohe Startkosten**. Vor dem Hintergrund der im Vergleich zu anderen Energiequellen höheren Erzeugungspreise für Erneuerbare Energien, dem großen Investitionsvolumen für Neuanlagen, Trassen, Speichersysteme, Back-up-Kapazitäten sowie Forschung und Entwicklung gilt die Energiewende in allen drei Schwellenländern kurz- bis mittelfristig als sehr teures Projekt. Vielfach verbreitet ist jedoch die Meinung, dass Deutschland als reiches Industrieland in der Lage ist, diese Übergangskosten auch zu tragen. Vereinzelt wird zudem darauf verwiesen, dass sich die Umweltkosten der konventionellen Energieerzeugung bisher nur zum Teil in den Energiepreisen widerspiegelt haben.

- Wird die Wirtschaftlichkeit der deutschen Energiewende langfristig betrachtet, überwiegt eher ein optimistisches Urteil: Erwartet werden in einer **Langfristsperspektive** sinkende Kosten für die Bereitstellung und Versorgung mit Erneuerbaren Energien. Einige Experten verweisen vor dem Hintergrund erwartbarer Rohstoffverknappungen bei steigendem globalen Energiebedarf zudem auf langfristige Kostenvorteile eines auf Erneuerbaren Energien beruhenden Versorgungssystems gegenüber der Nutzung von fossilen Energieträgern.
- Wenn es um die unmittelbare Bewertung der Wirtschaftlichkeit der Energiewende geht, beziehen auffallend wenige Experten in den drei Ländern eine **gesamtwirtschaftliche Kostenperspektive**, die auch die Auswirkungen auf andere volkswirtschaftliche Sektoren miteinbezieht. Berücksichtigt man zusätzlich aber die wirtschaftlich gelagerten Antworten zu den Vor- und Nachteilen der Energiewende, ergeben sich jedoch wiederum unterschiedliche Bewertungen in Abhängigkeit von kurz- oder langfristigen Effekten. Kurzfristig ist die Ansicht weit verbreitet, dass aufgrund rasch steigender Energiekosten eher negative volkswirtschaftliche Wirkungen mit der Energiewende verbunden sein werden, d. h. der Verlust von Wettbewerbsfähigkeit und Arbeitsplätzen in einzelnen Industriesparten. Langfristig werden dagegen mit der Energiewende eher Potenziale für Export und Beschäftigung verbunden.

## Hohe Start-, langfristig sinkende Kosten

- „Renewable energy is currently more expensive than conventional. ... , some of the reasons are: you have a low production rate of renewable technologies that, as a matter of scale, raise the price of these technologies...“ (2. 3c Wissenschaft)
- „There is no doubt the cost is higher, because these new generators, particularly in relation to energy that is being converted from solar to electricity... Nevertheless, the cost is coming down, that is, an increase in production means more manufacturing and the tendency is that the cost will come down.“ (2. 3c Wissenschaft)
- „I think in the beginning they will have to invest a little more. There is a willingness of the government to see that, and then the cost drops significantly.“ (2. 3c NGO)



Brasilien



China

- „Currently, the energy transition is non-profitable, or can only gain a very tiny profit, or even, its prospect is not optimistic. But in the long run, it's already laid a good foundation for the future development, and is making steady progress in the areas of technology, production, and people's awareness." (2. 3c Wirtschaft)
- „The energy transition can save costs. German lacks of natural energy resources except coal. Oil and natural gas are all imported. So the transition to renewable energy resources can help Germany get rid of dependence on importing traditional energy resources from other countries, and can allow it to control the costs of energy resources as well." (2. 3c Wirtschaft)
- „New energy belongs to a rising industry, so heavy investment at the beginning stage is needed, as well as the support from the Government. As the technology develops, Germany might get increased benefits at the later stage." (2. 3c Verwaltung)
- „As regards to the long-term benefit, to develop renewable energy resources will definitely be better than using traditional ones. The German energy transition will promote the development of technology related to solar and wind energy. Then, the costs of using solar energy, wind power, and geothermal energy will be lower than using nuclear power." (2. 3c Verwaltung)
- „The costs caused by the environmental pollution are not covered by the current electricity price. If includes the cost of pollution, it might be higher than the cost of generating electricity by renewable energy sources." (2. 1b NGO)



Südafrika

- „In our experience in our country, if you go to renewables you pay at this stage more, but I think in the long run, when you take all the direct and indirect costs and consequences and the impact on the environment, it will work out then in an efficient way, but maybe short term it will have a cost premium, but maybe on the long term of you look at direct and indirect costs, it will have a positive economic spin." (2. 3c Verwaltung)
- „Well it's said that renewable energy will cost more but I'm sure as the technology increases that the tipping point will come where it becomes just as viable as coal based or other fossil fuel based energy sources." (2. 3c Verwaltung)
- „I think over the long term it is going to be considerably more cost effective as the prices of conventional energy gets more and more expensive." (2. 3c NGO)

## Gesamtwirtschaftliche Kostenperspektive

### Negativ

- „Energy is getting very expensive and we try to protect it. But it is expensive for the home consumer, and this compromises the income that will be lacking for other investments and other expenses.“ (2. 1b Wirtschaft)



Brasilien

### Positiv

- „Transforming from the thermal or nuclear power generation into new energy power generation can stimulate the economic development, upgrade energy technologies and equipments, and enlarge exports.“ (2. 1a Wirtschaft)
- „The German energy transition is highly beneficial to the sustainability of economy and industry of Germany. The benefits will mainly impact the economy, energy policy, and the burden to people’s life.“ (2. 1a Verwaltung)
- „Ideally, energy transition will bring a positive impact to the German economy ultimately.“ (2. 3c Wissenschaft)



China

### Negativ

- „I think if the implementation is too fast, it would cause industrial crisis.“ (2. 1b Wirtschaft)
- „Moreover, the sudden energy transition has a certain impact on its industrial development and people’s life. After all, the very quick increase of electricity price makes the expenses of each household be higher. All these impacts are negative.“ (2. 1b Verwaltung)
- „In the long run, the energy transition can improve Germany’s international influence and economic competitiveness. However, at the initial stage of transition, it might cause economic burden on Germany.“ (4. 1 Wissenschaft)



Südafrika

### Positiv

- „I think it's gonna be on a large scale, it's also got to be like creating more job opportunities also and seeming that they a first class country that they can produce energy actually cheaper then.“ (2.3c Verwaltung)



- „I think it is expensive but there are motives to undergo this expense and in the medium term there may be benefits in terms of technology development and therefore export opportunities.“ (2.3c Wissenschaft)
- „I think it will stimulate a lot more entrepreneurship and jobs in a new greener energy sector, so Germany is obviously aiming to be at the cutting edge of that technology, which it will be able to sell worldwide.“ (2.1b Wissenschaft)

### Negativ

- „So I am sure with careful planning and a staggered implementation of this thing, I don't know of the 2022 goal for the nuclear thing is achievable but it is obviously going to hurt their economy but I think they will be able to manage it.“ (2.3c Wirtschaft)
- „It's going to negatively impact on that. Germany will be in the short run be left competitive economically wise against countries who still use nuclear and coal.“ (2.3c Wissenschaft)