

# 4 ENERGIEWENDE IM BEFRAGUNGSLAND?



## 4.1 ENERGIEPOLITISCHE DISKUSSIONEN IN DEN BEFRAGUNGSLÄNDERN

### Situation in Brasilien



#### Beibehaltung des sauberen Energie-Mixes durch Erschließung weiterer erneuerbarer Energiequellen

- Das Urteil, inwiefern Brasilien sich dabei auf einem guten Weg befindet, geht zwischen den befragten Experten allerdings weit auseinander. Während Wirtschaftsvertreter und Politiker die bisherigen Anstrengungen wohlwollend bewerten, ziehen insbesondere NGOs und Wissenschaftler, vereinzelt auch Befragte aus dem Wirtschaftsbereich häufiger eine **kritische** Bilanz. Sie beklagen in der brasilianischen Energiepolitik unter anderem einen Mangel an Langzeitplanung, Widersprüchlichkeit von Entscheidungen, aber auch fehlende Anreizmodelle für private Investoren im Bereich der Erneuerbaren.

- „Keeping the renewable matrix the way it is and making more efforts to bring in a greater amount of other renewable energy such as wind – which is already used but we need more – biomass, solar and SHPs.“ (3.1 Wirtschaft)
- „Brazil needs to continue its expansion policy, where he has the opportunity to combine a series of renewable energy.“ (3.1 Wirtschaft)
- „Ah, Brazil is already showing a trend towards use of renewable energy, right. Crescent basically biomass.“ (3.1 Wirtschaft)

- „We must launch a diversification of the energy matrix here, we're stuck the hydroelectric plants and I think Brazil offers conditions to diversify and seek models that have less impact." (3.1 Parlament)
- „Brazil has its policy for seeking its energies such as hydroelectric power which is reaching its limit, our production is large. ... But Brazil is still in line with some hydroelectric lines, thermoelectric from sugarcane bagasse, and is beginning to discuss the possibility of trash. The question of photovoltaics, or solar energy, is strongly emerging in Brazil. So we have a big basket full of energy matrixes here in Brazil and it's essential so as not to neglect or focus on just one. Of course here in Brazil the focus is very much on hydropower." (3.1 Parlament)
- „Brazil has an enviable energy matrix, more than 75% is renewable, so it's a completely different situation from Germany. And right now we are, for example, in the ten year plan of electricity expansion and the goal is to have a wind energy auction for up to 10% of the energy matrix." (3.1 Parlament)
- „It is important to see that we have one of the cleanest energy matrixes in the world. ... Now we need to evolve, and the steps for that, as I said, are given toward wind energy, reducing impact hydro-power, seeking alternative biomass. Anyway I have a reading that we're on the right track." (3.1 Verwaltung)
- „We, unlike Germany which depends on something around 30% of nuclear energy, we have an even greater dependence on hydropower, more than twice, are 70%. In other sources are almost symbolic the allocations. Yes, Brazil needs a very fast way to encourage and stimulate the production with other sources, especially those sources that are renewable, you know, like wind, solar and also the biomass part. So think Brazil should now follow this path similar to that Germany already has intensified." (3.1 Parlament)
- „Brazil is something a bit complicated because we're way behind on clean energy, like wind and solar, but it is very advanced in hydro. I think Brazil has advanced even in the environmental suitability of the dams that are now much less striking than before, I think the major route from Brazil is proceeding with the hydroelectric plants and gradually increase the solar, wind and biomass, because we have fantastic conditions for this." (3.1 NGO)

- Kaum Unterschiede gibt es in der Bewertung der **Wasserkraft**, die als „sauberes Rückgrat" der brasilianischen Energieversorgung prinzipiell große Unterstützung bei den Energieexperten findet und nicht in Frage gestellt wird. Insbesondere große Wasserkraft-Anlagen wie das Belo-Monte-Projekt werden wegen ihrer negativen Umwelteffekte von Vertretern der NGOs allerdings kritisch bewertet. Vereinzelt problematisiert werden darüber hinaus Fragen der Versorgungssicherheit in Trockenzeiten sowie hohe Netzinvestitionen zur Verbindung von Kraftwerken und Ballungszentren.

### Rolle der Wasserkraft

- „There are some leaders in the country who are going against the Belo Monte, in my opinion this is a lack of technical information, there is a movement of Globos artists speaking, I think they are people who were induced to speak without technical knowledge and are talking a lot of nonsense, that’s my opinion.“ (3.1 Wirtschaft)
- „I think this is an urgent issue; we are not against hydroelectric power stations, if they don’t have large social and environmental impact and they are dispersed into small and medium-sized hydropower stations. In fact, this madness of millions of kilometers of cables, they are totally crazy.“ (3.1 Parlament)
- „So I think the biggest problem in Brazil today is get rid of that stigma of hydropower, electricity as something harmful to the environment, as indeed it is not.“ (3.1 Verwaltung)
- „The use of the Amazon land for projects that raise much controversy is very questionable, either for the difficulty for distribution or for its impacts on the environment, or even for the reduction of the potential in generating energy during part of the year.“ (3.1 Wissenschaft)
- „The Belo Monte plant, despite all the controversy, did not require as much destruction as plants such as Itaipu and others. So I believe that there is a need to carry on capturing hydro energy, since once it is captured it is not polluting and it is very safe.“ (3.1 Wissenschaft)
- „In Brazil it’s very different, because we have a hydroelectric capacity that is not explored and building dams in the Amazon, like the Belo Monte, is not good.“ (3.1 NGO)
- „So you have to work to generate energy from renewable sources and thus end up with this story that hydropower is clean energy because it is not. So thus also harness the potential of hydropower in a more sensible, right.“ (3.1 NGO)

- Auffallend kaum im Fokus der brasilianischen Experten steht die Frage, welche Rolle **Kernkraft** und **Pre-Salt-Ölvorkommen** bei der Diversifizierung der brasilianischen Energie-Matrix künftig spielen sollen. Wenn doch, gehen die Meinungen jeweils deutlich auseinander. Im Fall der Kernkraft gibt es ebenso wenig ein klares Meinungsbild wie bei der Erschließung der Ölfelder vor der brasilianischen Küste.

### **Rolle der Kernkraft**

- „...We should reduce the thermal ones as much as possible, gas, coal, including the nuclear station which is still scheduled.“ (3.1 Wirtschaft)
- „About nuclear energy, I think Brazil shouldn't go down that way. We should concentrate on the resources which have a strong potential, as much as wind power, solar power and hydroelectric power station.“ (3.1 Wirtschaft)
- „The expansion of biomass are coming with greater force, now when we think in a decade, certainly has room for gas, nuclear, and the amount of wind and biomass.“ (3.1 Verwaltung)
- „We are going to carry on having our hydroelectric stations, this is a competitive advantage that Brazil has, but unfortunately, we will also invest in nuclear power, contrary to the direction Germany is taking.“ (3.1 Verwaltung)
- „Even nuclear energy. I do not think something as dramatic as well, which is an energy that generates no emissions...“ (3.1 Verwaltung)
- „I think that we also need to have nuclear plants in order to diversify our energy mix, because it is energy that is always available if we need it.“ (3.1 Wissenschaft)
- „Yes, Brazilians have to walk to try to decrease nuclear power entirely, we still have some.“ (3.1 NGO)

### **Rolle von Pre-Salt-Ölvorkommen**

- „We will not have the pre-salt question soon, then the gas on the one hand is welcome, it is a fossil fuel, reasonably clean, and as much as others can give you security energy.“ (3.1 Wirtschaft)
- „I think that oil is a finite product, I mean there are tanks, we've discovered things such as pre-salt but it is finite and also polluting.“ (2.1c Parlament)
- „What we are doing is madness and the prospect of the pre-salt, so that we can get more fossil fuel. This is a very difficult moment for Brazil. The focus is wrong.“ (3.1 Parlament)
- „I think the negative impact on Brazil could be mid-term as Brazil prioritizes the replication of the current model, that is, if Brazil continues to go down the hydroelectric path and bet more on pre-salt, as it is, to generate a volume of energy focused more on conventional thermal technologies, it will lose innovation and competitiveness.“ (3.2b NGO)

## Situation in China



### Verbesserte Effizienz und Emissionsreduktion, Förderung sauberer Energiequellen – inklusive der Kernkraft

- Die chinesischen Experten betonen fast einhellig, dass konventionelle Energiequellen, insbesondere Kohle, auf absehbare Zeit eine weiterhin zentrale Rolle in der Energieversorgung des eigenen Landes spielen werden, um bei einem wachsenden Energiebedarf die Versorgungssicherheit im Land zu garantieren. Als realistisches Zukunftsszenario für die zukünftige Entwicklung der chinesischen Energiepolitik gilt somit eine **schrittweise Veränderung**. Schwerpunkte der künftigen chinesischen Energiepolitik sollten die **Verbesserung der Energieeffizienz** auf Erzeuger- wie Verbraucherseite bilden sowie der **stetige Ausbau erneuerbarer Energiequellen** (Wind, Solar, Wasserkraft). Ein weiteres zentrales Augenmerk der künftigen chinesischen Energiepolitik sollte nach Ansicht der befragten Experten auf eine **technologiegetriebene Emissionsreduktion** bei der Nutzung konventioneller Energieträger sowie die **Einführung bzw. Kontrolle von Umwelt- und Sicherheitsstandards** gelegt werden.

- „Our current technology might block the process of energy reformation. New energy can not completely replace the existing energies in China, coal is still one of the major energies.“ (3.1 Wirtschaft)
- „What China should do is, first: increasing the reserves of conventional energy sources; second, putting „energy conservation and emission reduction“ into practice, instead of treating it just as a slogan; and third, which is also the most essential, is attaching nationwide importance to the environmental protection.“ (3.1 Wirtschaft)
- „China has made perfect industry standards and policies about pollutant control. However, the implementation was bad. Thus I think China should make higher and stricter standards in energy industry.“ (3.1 Verwaltung)
- „I think in China, the proportion for renewable energy resources should be increased to around 30% in the next several decades from now.“ (3.1 Verwaltung)
- „It’s not quite possible for China to apply new energy sources such as wind and solar power on a large scale. China should right now focus on increasing the use efficiency of traditional energy sources such as coal, and control the using amount of them.“ (3.1 Wissenschaft)
- „Currently we should put focus on energy conservation and emission reduction, instead of the development new energy resources.“ (3.1 Wissenschaft)
- „First, to improve the efficiency of energy use. 70% energy in China is generated by consuming coal, so the improvement of use efficiency of fossil energy resources is beneficial to economic development, reduction of pollutant emission, and decreasing the impact on climate.“ (3.1 NGO)

- „China should increase the percentage of new energy sources in the future. The environmental pollution is quite severe in China. And the neglect of environmental protection will ultimately harm our own interests in the future.“ (3.1 NGO)

## Verbesserte Effizienz und Emissionsreduktion, Förderung sauberer Energiequellen – inklusive der Kernkraft

- Hinsichtlich der zukünftigen Rolle der Kernenergie in der chinesischen Energieversorgung gibt es weitgehende Einigkeit unter den Experten und zwar unabhängig davon, welchem Sektor sie angehören. Die Mehrzahl spricht sich für eine **Beibehaltung der Kernenergie** im chinesischen Energie-Mix aus, wenn nicht sogar für deren künftig größeren Stellenwert. Nur vereinzelt wird für eine Zurückdrängung der Kernenergie bzw. für den kompletten Ausstieg nach deutschem Vorbild plädiert.

- „With our current technologies, we could replace some nuclear power by other energy resources. However, if we want to replace nuclear power fully, we need more time to improve our technologies. China needs decades or even longer to develop the technology for energy transition.“ (3.1 Wirtschaft)
- „In long term, I think China still needs to develop nuclear power. China has greater demand on electricity than Germany, due to population and production base, therefore, China encounters more resistance than Germany when implementing energy transition... In the same time, we should develop nuclear power as soon as possible. When we have advanced technology utilizing nuclear power, we can control the pollution to very low level. However, we should be cautious and make stable development on nuclear power, since it still has pollution to environment.“ (3.1 Wirtschaft)
- „China should continue with the use of nuclear power, while should use solar, wind, and hydro power as auxiliary energy resources.“ (3.1 Wirtschaft)
- „First, China should reduce the proportion of energy generated by coal consumption and hydro power plants, accelerate nuclear energy use, develop renewable energy resources appropriately, such as geothermal and flammable gas.“ (3.1 Verwaltung)
- „We should continue with the use of nuclear power. To abandon nuclear power in China is unrealistic. Using renewable energy sources exclusively cannot meet the demands of economic development in China.“ (3.1 Verwaltung)

- „China cannot abandon nuclear power at this stage, because it's the only very mature energy industry besides thermal power industry, while renewable energy sources are not. So the energy transition of Germany would be a very meaningful reference, but there is still a gap for China to implement this policy.“ (3.1 Wissenschaft)
- „It's impossible for China to follow Germany's path of energy transition. There are two things China should do: First, greatly improve the utilization of renewable energies. Second, moderately develop the usage of nuclear power, under the precondition of guaranteed safety.“ (3.1 Verwaltung)
- „I think China should also stop using nuclear energy. Because China has a large population, and where we build our nuclear power stations owns high density of population, so it is very dangerous. Nuclear energy does not take up large proportion of our energy, even we give it up, the influence on our economy and energy supply is not great.“ (3.1 NGO)
- „At the same time of developing renewable energy, our country should make sure of the security of nuclear power, and popularize the fundamental knowledge of nuclear energy.“ (3.1 NGO)

## Situation in Südafrika



### Wunsch nach gradueller Diversifizierung: Weg von der Kohle hin zu Erneuerbaren und Kernenergie

- Die südafrikanischen Experten gehen für ihr Land davon aus, dass der einheimische Hauptenergieträger **Kohle** über einen längeren Zeitraum für die eigene Energiestruktur **von primärer Bedeutung** bleiben wird. Ausgehend von der aktuellen Bedeutung der Kohle für die Energieversorgung wird gerade von den Wirtschaftsexperten vielfach mit dem Entwicklungsstand Südafrikas und dem weiter wachsenden Energiebedarf von Wirtschaft und privaten Konsumenten gegen einen zügigen Umbau in Richtung Nachhaltigkeit argumentiert. Betont wird die Notwendigkeit, eine Balance zwischen einer nachholenden energieintensiven wirtschaftlichen Entwicklung und den Anforderungen einer umwelt- und klimaschonenderen Energiepolitik zu finden.

- „I think I South Africa in particular we still have a collaborative approach, wherein we go green gradually but at the same time we are being mindful of our sources of energy that we have, which are largely really fossilized – that is now coal that has been turned into electricity. So we need to balance it, not rush into your space of renewable, that could be very costly and damage the economic situation of the country“. (3.1 Wirtschaft)
- „...But as I said earlier, our immediate problem is more in creating jobs and having an economy that shows some form of growth. So I think a slow conservative approach by phasing in more sustainable energy.“ (3.1 Wirtschaft)
- „Oh ok, remember South Africa it's a developing country so you've got pockets of the country which is very developed and we also have large pockets that are underdeveloped.... So in simple terms, the focus should be first on driving economic growth, giving access to that and thirdly on the climate change, for me. The climate change should not be the key priority because we are not the biggest emitter of greenhouse gases in the world, it's the Chinese and the US.“ (3.1 Wirtschaft)

- Dennoch überwiegt bei den befragten Experten in Südafrika die Forderung nach einem langfristigen **Zurückfahren des fossilen Energieträgers Kohle** im Land. Problematisiert wird die fast vollständige Abhängigkeit von einer singulären Energiequelle, ferner die sich aus der Kohleverstromung ergebenden Emissionsbelastungen. Die notwendige Diversifizierung des südafrikanischen Energie-Mixes sollte nach Ansicht der Befragten dabei allerdings in mehrere Richtungen verlaufen und nicht allein auf die vermehrte Nutzung einer einzigen Energieträgerart setzen. Als mögliche Hemmnisse für den Diversifizierungsprozess werden von den Experten neben fehlenden finanziellen und technologischen Ressourcen auch ein Mangel an politischer Willens- und Handlungsfähigkeit ausgemacht.
- Als eine Diversifizierungsoption gilt in Südafrika der **Ausbau der Erneuerbaren**. Unter Verweis auf die günstigen geophysikalischen Potenziale für Erneuerbare Energien sprechen sich die Experten insbesondere für verstärkte Investitionen im Bereich der **Solar- und Windenergie** aus. Als zweite Diversifizierungsoption wird von den befragten Experten die verstärkte **Nutzung der Kernenergie** betrachtet. Während die graduelle Veränderung im künftigen südafrikanischen Energie-Mix vorrangig betrachtet wird, werden Effizienzaspekte deutlich seltener benannt.



- „Well I think they got to wean off coal and put more nuclear in and wait for the renewable to catch up.“ (3.1 Wirtschaft)
- „I think the percentage of renewables should be increased. I think there must be support for initiatives that contain the amount of CO<sub>2</sub> emissions from the coal fired plants. I think the reliance on coal must be reduced. And I believe that nuclear is a viable alternative for South Africa, because of the limitations on access to hydro power in South Africa.“ (3.1 Wirtschaft)
- „We should go the same route, invest more in alternative sources but also educate the masses in terms of saving electricity so that the current power that is generated from our coal fired power stations, the demand is also reduced from the grid.“ (3.1 Verwaltung)
- „It’s renewable energy policy should be updated and increased because of our abundance of solar energy in this country.“ (3.1 Verwaltung)
- „Well I think that we need to take a leaf out of the German book and start taking alternative energy very seriously. So you know my feeling is to start phasing out coal, we cant do that immediately, but certainly over the next 30–40 years to phase out coal. Stay well clear of nuclear and yet invest heavily into alternative energy sources.“ (3.1 Wissenschaft)
- „I think in South Africa we should also move a little bit away from coal and focus more on for instance solar energy which we have abundance of in South Africa. We should become very much more energy aware especially our big companies. The small households and the people using small amounts of electricity can also contribute to that but our big energy consumer is the big industry should look at ways in which they could decrease their dependence on energy.“ (3.1 Wissenschaft)
- „So I would suggest that perhaps South Africa should invest in solar energy by about sixty per cent. And I would also suggest a nuclear power for some years to come. I think it should be a combination of the two. Nuclear power stations and solar energy. And about ten percent wind energy.“ (3.1 Wissenschaft)
- „No I think there should be a gradual change to renewables, I think they should not discount nuclear, I think they should decrease their reliance on coal fired power stations, because that’s where we get a lot of acid rain and pollution problems...” (3.1 NGO)
- „Well renewable energy, sun solar and wind, as well as nuclear. I think you have to go nuclear and reduce the use of coal power stations, I think they causing tremendous impact.“ (3.1 NGO)