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The US-China trade conflict and its impacts to energy security in Asia Pacific:

A Survey of Key Opinion Leaders

Regional Project Energy Security and Climate Change Asia-Pacific (RECAP)
Konrad-Adenauer-Stiftung e.V.

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Foreword

Energy security has traditionally been a high political priority for countries of Asia Pacific region and will become increasingly important in view of the expected population growth and related economic developments in the region. By international standards, Asia Pacific already dominates global energy demand. As a result, global energy trading structures are currently realigning themselves and looking for ways to bring supply and demand together.

Multilateral agreements that give this trade a framework, e.g. through the World Trade Organization (WTO), or that address the challenges of climate change, such as the Paris Climate Agreement, form an important basis for this to the benefit of all. However, the trade conflict between the USA and China which escalated in 2019 is counteracting this approach with consequences for the energy security of Asia Pacific.

Phase 1 of the trade agreement between the USA and China, which many experts have described as a "ceasefire," already shows in its terminology that further rounds of negotiations are to be expected and that further escalations can therefore be anticipated. The content of the agreement, which obliges China to import energy goods worth up to USD52,4 billion from the USA, as well as the fact that many tariffs remain intact, does not suggest any relaxation.

In this context we conducted a survey on the impacts of the trade conflict on energy security in Asia Pacific. The survey was implemented before the coronavirus. Therefore corresponding economic consequences are note part of the report. Nevertheless the results indicate that there are many impacts which might have the ability to change current Asian Pacific energy market structures. These perceptions can give us a idea what to expect for the future of energy security. I wish you an interesting read.

Dr. Christian Hübner
Director

Regional Project Energy Security and Climate Change Asia-Pacific (RECAP)

Konrad-Adenauer-Stiftung e.V.

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Executive Summary

1. Executive Summary

With roughly 60 per cent of the world's population, 50 per cent of the world's greenhouse gas emissions, and 17 of the world's 28 megacities, the decisions made in Asia Pacific over the next decade will greatly influence global geopolitics and decarbonisation. The impacts that trade conflicts, increased protectionism, or a decoupling of the world's two largest economies will have on the energy security and decarbonisation strategies of different countries in Asia Pacific have not yet been comprehensively studied.

This report explores the impacts of the recent U.S.–China trade conflict and the resultant geopolitical changes on seven key-impact countries in Asia Pacific: Australia, China, India, Indonesia, Japan, Kazakhstan and South Korea. They represent a combined population of almost 3.5 billion people and were chosen as representative of their region or as countries of particular importance.

To investigate this topic, GlobeScan conducted a thought leadership study using 44 expert interviews, with a minimum of five from each of the seven focal countries. Respondents were identified from a range of sectors – academia, private institutions, government, and non-governmental organisations. Of the respondents, 41 of the 44 were nationals of the country about which they were speaking, and the remaining respondents had been focusing their work and/or research on the country for more than ten years. In order to speak freely about governments or institutions with or for whom they work, we elected to anonymise the respondents. The interviews were conducted via internet calls between 19th November and 6th January and lasted an average of approximately 45 minutes.

We asked experts what, if any, impacts they had observed in their respective country as a result of the U.S.–China trade conflict; these impacts could be positive or negative, direct or indirect, long-term or short-term, potential, or realised impacts. We also asked each expert to predict what impacts may occur in the future from this trade conflict if it were to continue, worsen, or improve. There was widespread consensus among the experts interviewed for this study that the U.S. –China trade conflict was having only minor direct impacts on the energy security or decarbonisation of the seven countries assessed in this report. The reasons they perceived that such a major global event was not dramatically affecting the energy sectors of these countries were:

The long-term nature of energy contracts and decarbonation strategies shields countries from volatility brought about by trade conflicts such as this.

- Energy security has always been a high priority for countries and decarbonisation is relatively less linked to international affairs. Most countries have taken adequate measures to have a high level of energy security for the near future.
- Domestic issues, such as a country's natural resource endowment, are of higher importance to energy security and decarbonisation than a trade conflict in which the country is not directly engaged.
- Maintaining good relationships with both the U.S. and China is important for most countries, and it is therefore necessary for them to remain neutral.

Although the direct impacts and potential impacts were perceived by the experts interviewed to be limited, they identified various secondary effects that could impact the seven focal countries in Asia Pacific and countries around the world:

- The restriction of trade caused by tariffs causes a restructuring of the international trade market.
- In a more volatile and uncertain world, with a greater degree of protectionism and unilateralism, transitioning to renewable energy will be more difficult.
- In the long term, policy-makers may use the trade conflict to argue for a return to certain forms of energy generation such as coal or nuclear power.

A summary of the impacts that the experts believe that the conflict is, or may be, having on each country.

Expert insights by country: Direct and indirect impacts	
Australia	• Australian exports of LNG could feel pressure from U.S. shale gas that was expected to be sent to China and is coming onto the market at a cheaper price. • Long-term LNG contracts may be more difficult to renew for Australia.
China	• The trade conflict could increase the state control over the energy sector and for self-reliance. • As a result of the trade conflict, China is pursuing foreign investment into oil and gas exploration to enhance its energy security. • China's decarbonisation journey may be slowed by a slowing economy. • A reduction in the transfer of technologies with the U.S. can have an effect on China's transition to renewable energy.
India	• India is promoting imported gas as an area for future growth and could capitalise on U.S. shale gas that is not going to China because of tariffs. • India could capitalise on cheap available solar panels in the market. • India could try to fulfil a niche left by China in solar demand from the U.S.
Indonesia	• Indonesia may experience a reduction in much-needed investment of renewable energy as a result of the trade conflict. • Indonesia may react to reduced coal exports to China (because of a slowing economy) by increasing domestic use.
Japan	• Japan can benefit from more (and cheaper) Chinese solar panels on the international market that are not going to the U.S. • Japan may import more gas from the U.S. that was previously destined for China once the current contracts are completed. • Japan's energy transition ambitions are influenced by the U.S. and China and may be reduced if these countries put less focus on decarbonisation.
Kazakhstan	• Kazakhstan could be negatively affected by changing oil prices as a result of fluctuations caused by the trade conflict. • The tariffs on U.S. energy could allow Kazakhstan to increase energy exports to China.
South Korea	• The U.S. may push South Korea to import U.S. LNG at the end of long-term contracts to account for China importing less U.S. LNG. • South Korea's transition to renewable energy could be accelerated by cheap Chinese solar panels that are no longer going to the U.S. • Proponents of nuclear energy may use the trade conflict as proof of the need to further energy security by expanding this sector.

2

Introduction

2. Introduction

2.1. The U.S.–China Trade Conflict

As a symptom of the escalating tensions between the U.S. and China, the current trade conflict began in earnest in early 2018 after a long breakdown in trade talks. In January 2018, the U.S. imposed tariffs on all washing machines and solar panels, and in March it ordered tariffs on all steel and aluminium imports. China, in retaliation to what it felt were policies directed at Chinese goods, imposed tariffs on 128 U.S. products such as wine and pork. In July, the U.S. responded by imposing 25 per cent tariffs on USD 34 billion worth of goods from China for what many claim as unfair business practices by China for operating as a centrally planned economy (i.e., keeping the value of its currency artificially low, imposing heavy restrictions on foreign investment, and demanding foreign investments forfeit intellectual property).[1] While these were the official reasons for the trade tariffs, commentators have pointed to technological advancement and the potential national security concerns surrounding seemingly everyday products – the Internet of Things, 5G, drones, artificial intelligence, data gathering privacy measures, etc. – as an underlying reason for the tension.[2]

The tariffs received bipartisan political support in the U.S. and were the beginning of "tit for tat" trade tariffs between the two countries and despite attempts to resolve the situation during trade talks, the tariffs continued to increase on both sides into hundreds of billions of dollars.

Within this conflict, energy resource trade was used particularly by the Chinese government as a tool which it felt could harm the U.S. economy, in response to the U.S. targeting China's technology companies such as Huawei and ZTE. Tariffs between countries with large economies, especially those on the scale that has been seen in the U.S.–China trade conflict, can precipitate a fall in global trade, which can disrupt global supply chains with higher costs and lower investments and potentially lead to a global economic slowdown.

For many, the trade tensions between the U.S. and China are seen as part of a global shift toward unilateralism. In September 2018, President Xi Jinping of China noted that "unilateralism and trade protectionism are rising, forcing [China] to adopt a self-reliant approach".[3] Meanwhile, U.S. President Donald Trump's "America First" policy has carried through from his campaign to his policies in office. This move towards unilateralism can have a significant impact on the energy sector, as it is a sector that relies heavily on international trade. The impacts of this trade conflict may not be contained within the U.S. and China; as the two largest global superpowers, virtually all countries may need to recalibrate their trade policies as trade becomes further intertwined with national security issues and geopolitical risk.[4]

[1] The Office of the United States Trade Representative (2018). USTR Issues Tariffs on Chinese Products in Response to Unfair Trade Practices. Retrieved from https://ustr.gov/about-us/policy-offices/press-office/press-releases/2018/june/ustr-issues-tariffs-chinese-products.

[2] Olsen, S. (2019) Trade tensions rise on dual use technologies, trade protectionism and geopolitical risk. Hinrich Foundation.

[3] Wildau, G. (2018, November 13). China's Xi Jinping revives Maoist call for 'self-reliance'. Financial Times. Retrieved from https://www.ft.com/content/63430718-e3cb-11e8-a6e5-792428919cee.

[4] Olsen, S. (2019) Trade tensions rise on dual use technologies, trade protectionism and geopolitical risk. Hinrich Foundation.

The U.S. and China signed a "Phase One" trade deal in January 2020. As part of this deal, China agreed to purchase USD-52.4 billion worth of additional U.S. energy products. The baseline for this increase was taken as the amount of energy traded between the two countries during its peak in 2017 and includes liquefied natural gas (LNG), crude oil, refined products and coal. Although imports of these products slumped during the trade conflict, commentators suggest that China may not be able to meet these new targets, as the tariffs on energy products remain (Table 1.2.). President Trump has stated that the tariffs may be removed in a Phase Two trade deal, but there is no clear timeline for this to happen.

Although the trade truce will slow the rate of the two countries decoupling, it is not perceived as likely to reverse decoupling as a trend in U.S.-China relations. Critics have noted that it is not a structured solution to bilateral imbalances and frictions,[5] such as the vying for technological superiority or the alleged unfair business practices. Rather, it is perceived as a stopgap by both sides so that they can focus on domestic issues.

Table 1.2. Tariffs relating to energy between the U.S. and China after the Phase One trade deal as of the 17th of February 2020. Note that on the 18th of February 2020, in light of the COVID-19 outbreak, China announced that it would accept applications for exemptions from the import tariffs on almost 700 U.S. products and commodities, including LNG and crude oil. At the time of writing, it is, however, unclear how far-reaching these exemptions will be.

The U.S.		China	
Tariff (%)	Product / Commodity	Tariff (%)	Product / Commodity
30	Chinese solar panels	2.5	U.S. crude oil
		25	U.S. methanol
		25	U.S. polyethylenez
		25	U.S. liquified natural gas
		30	propane

[5] Gao (2020) US-China Phase I Trade Deal – A Tactical Engagement on Trade (But Tactics Can Change). Retrieved from https://hinrichfoundation.com/trade-research/global-trade-research/thought-leadership/us-china-phase-i-trade-deal-a-tactical-engagement-on-trade-but-tactics-can-change/?utm_source=MC-SG-KJ-US-China-2020.

Fig 2.1

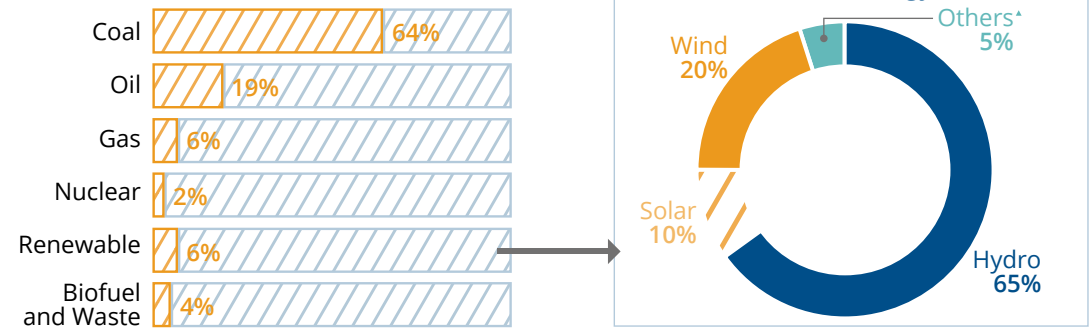
Primary Energy Demand of Seven Surveyed Countries and their Import Routes

This map shows the countries of the Asia Pacific region that are included in this study. Countries are ranked from one to seven based on their overall primary energy demand, measured in ktoe*. Lines between countries show the import routes for coal and oil, where these were deemed significant (>10,000 ktoe). Charts show the total primary energy mix for each country and the breakdown of renewable energy.

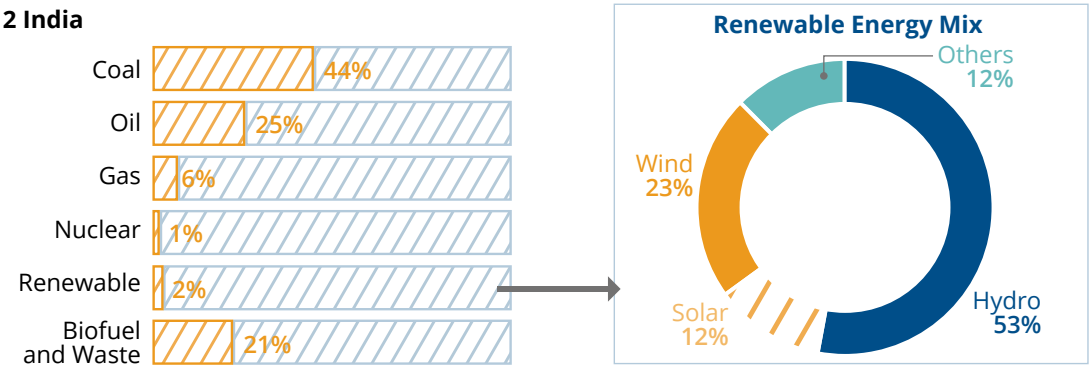
Total Primary Energy Mix[#]

By country

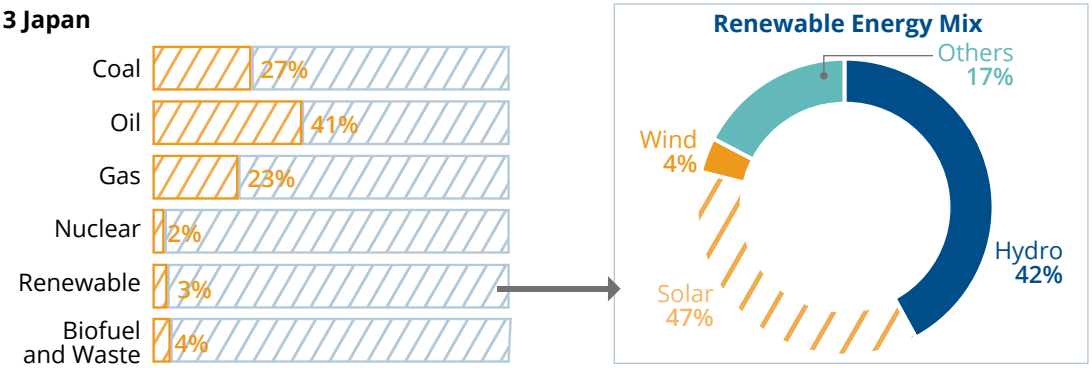
1 China



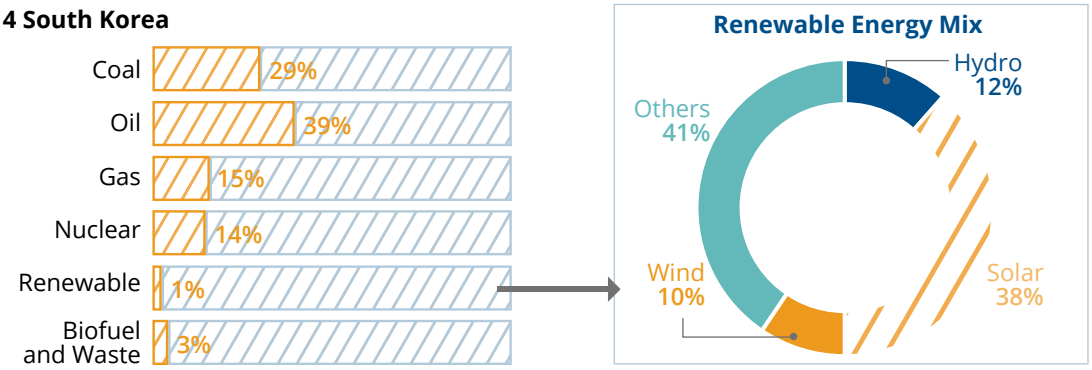
2 India



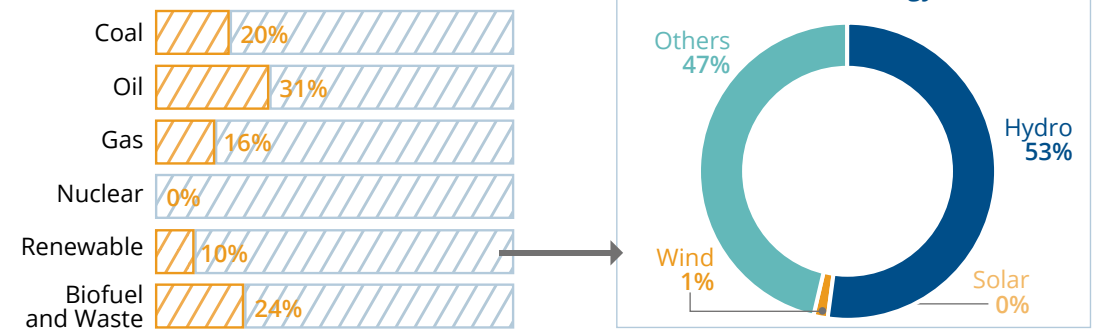
3 Japan



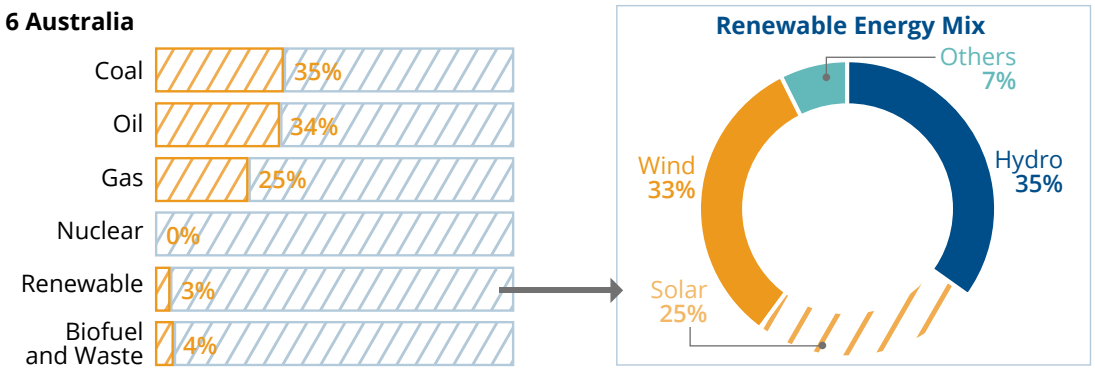
4 South Korea



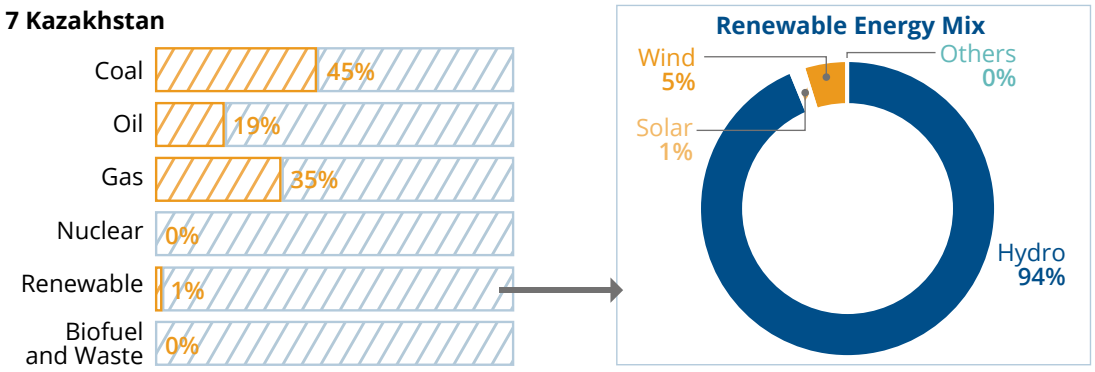
5 Indonesia



6 Australia



7 Kazakhstan



* A tonne of oil equivalent (toe) is a commonly-used unit of energy that is the equivalent to the energy released from burning one tonne of crude oil. Ktoe is the unit for kilotonne of oil equivalent.

\# The total percentage may not add up to 100% due to rounding up.

▲ Other renewable energy may include geothermal, biomass, waste, wave and tidal. Traditional biomass is not included.

Source: International Energy Agency Data and Statistics (2017), BP Statistical Review of Global Energy (2019).

2.2 Energy Security and Decarbonisation

Energy security is multifaceted, with long-term energy security relying on timely investments to supply energy in line with economic development, reducing reliance on imports for energy production, and maintaining a diverse range of import partners to reduce the dependence on a single source that may become unstable. Short-term energy security focuses on the ability of energy-generating systems to react quickly to sudden changes in the supply-demand balance and to avoid black-outs or load shedding as a result of interruptions to the energy grid. Energy security can also be improved by increasing energy efficiency or decreasing consumption to lower a country's energy needs.

The strategies for increasing energy security for each country will differ greatly, depending on their natural resource endowment and the structure of their energy mix (Fig 2.1.). The experts interviewed for this study primarily focused on the long-term energy security of energy imports but also noted possible impacts of the U.S.-China trade conflict on short-term energy security.

For many developing economies in Asia Pacific, there is a high likelihood that they will increase in their energy consumption as their economies grow, and even many developed economies are increasing their energy demand. These increases are dependent on the size of the country, the energy mix of each country, the level of reliance it has on fossil fuels and how the economy is developing as well as many other factors, meaning that there is a large disparity between the CO_2 emissions of different countries (Fig 2.2.). The potential associated increases in carbon emissions as economies grow can be somewhat offset by various means: the use of renewable or low carbon energy resources; countries lowering their energy intensity; or by increasing their energy efficiency. Many countries, especially those with developing economies, struggle to find a balance between development that grows the economy, promotes jobs and increases the quality of life for inhabitants, while moving towards decarbonisation of their economy. An increase in energy consumption can provide tax revenue and jobs for communities that greatly need it, but the need to decarbonise is clear in light of scientific evidence pointing toward human-induced climate change.

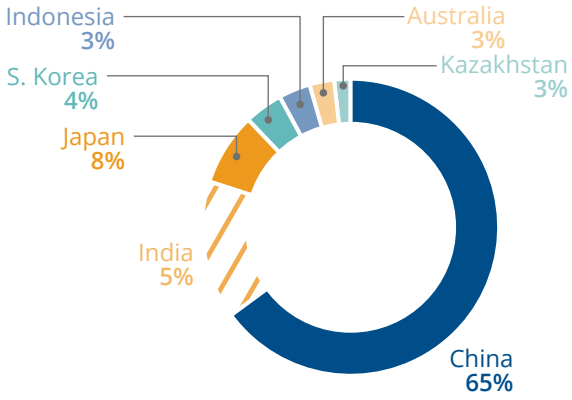


Fig 2.2. Pie chart showing the percentage of carbon emissions released by each of the seven markets in this study Source: IEA (2018)

With roughly 60 per cent of the world's population, 50 per cent of the world's greenhouse gas emissions, and 17 of the world's 28 megacities, the decisions made in Asia Pacific over the next decade will greatly influence global geopolitics and decarbonisation. The impacts that trade conflicts, increased protectionism, or a decoupling of the world's biggest economies will have on the energy security and decarbonisation strategies of different countries in Asia Pacific have not been comprehensively studied. Different geopolitical landscapes among countries will greatly influence their ability to adapt to or mitigate threats and even seize opportunities in a changing world. The impacts of this trade conflict, even if a full deal is eventually reached, will be both wide reaching and long lasting, with overall confidence in the prevailing economic conditions inevitably shaken. This report explores the impacts of the U.S.–China trade conflict and the geopolitical changes that result from it in seven key countries in Asia Pacific.

[6] The energy intensity of a country is a measure of the level to which the energy used in that country benefits the economy. High energy intensities indicate a high cost of converting energy into GDP. Low energy intensity indicates a lower cost of converting energy into GDP.

3 Methods

3. Methods

Konrad-Adenauer-Stiftung (KAS) commissioned GlobeScan, an independent international research consultancy, to conduct a thought leadership study to better understand what impacts, if any, the U.S.–China trade conflict is having on the energy security and decarbonation strategies in Asia Pacific. This research focuses on seven key-impact countries – Australia, China, India, Indonesia, Japan, Kazakhstan, and South Korea – that provide insights into how the region as a whole is being affected by U.S.–China trade relations. These countries are diverse in many aspects: from the developing to the developed; from net energy importers to net energy exporters; and from those at the forefront of decarbonisation to those lagging behind. They represent a combined population of almost 3.5 billion people or 45 per cent of the world's population and were chosen as representative of their region or as countries of particular importance.

GlobeScan selected expert interview respondents, independently of KAS, based on the respondents' expertise in the topic as a whole and particularly their knowledge and local perspective of a particular country. Respondents were identified from a range of sectors – academia, private institutions, government, and non-governmental organisations. Often, the experts recommended other suitable respondents, and these were then contacted for interviews where appropriate. Semi-structured interviews were chosen because they allow for a great degree of freedom for the respondent to speak on different topics about which they may have more expertise. While the experts gave insights into the background of energy security and decarbonisation in their country of focus, these sections also involved extensive desk research. Sections of this report focusing on the impacts of the U.S.–China trade conflict on the focal countries were compiled from expert opinions and perceptions. In order to speak freely about governments or institutions with or for whom they work, we elected to anonymise the respondents. The interviews were conducted via internet calls between 19th November and 6th January; on average, interviews lasted approximately 45 minutes.

We conducted 44 open-ended, semi-structured interviews, at least five in each of the seven countries, and additional interviews with international experts. In-country experts were locally based to deliver a national perspective on the topic. Of the respondents, 41 of the 44 were nationals of the country about which they were speaking, and the remaining respondents had been focusing their work and/or research on their country for more than ten years. In some cases, the comments made by the country experts have been summarised, synthesised, or reworded for clarity, but every effort has been made to preserve the original meaning and intent of the information given. Where the meaning of an answer was unclear, it has not been included here to maintain the integrity of the interpretations. Where numbers and statistics were independently verifiable, we have done so and included references where appropriate. Where "experts" are mentioned in this report, this refers to the experts interviewed as part of this study.

We asked the experts what, if any, impacts they had observed in their respective country as a result of the U.S.–China trade conflict; these impacts could be positive or negative, direct or indirect, long-term or short-term, potential, or realised impacts. We also asked each expert to predict what impacts may occur in the future from this trade conflict if it were to continue, worsen, or improve.

The information provided by these experts form the basis of the text of this report. While expert opinion is based on decades of experience and offers deep insights that are otherwise unavailable, it is important to recognise the limitations of such information: this information complements, rather than replaces systematically acquired knowledge, as it provides qualitative rather than quantitative insights. The information gathered in expert opinion surveys may be subsequently added to or disputed by other experts and/or future published research. It also represents the opinions and insights of individuals who may be susceptible to their own biases or interpretations of events or data and is replicated in text via a facilitator who could bring their own biases or misinterpretations. Regardless, expert opinion surveys offer invaluable insights based on decades of first-hand experience and are of great value.

List of Abbreviations

4. List of Abbreviations

ASG	Asia Super Grid
CO_2	Carbon Dioxide
E.U.	European Union
G2	Group of 2
GDP	Gross Domestic Product
IEA	International Energy Agency
IIEE	Indonesian Institute for Energy Economics
LNG	Liquefied natural gas
OECD	Organisation for Economic Co-operation and Development
PLN	Perusahaan Listrik Negara (Indonesian government-owned utility)
PV	Photovoltaic
SDGs	Sustainable Development Goals
TPES	Total Primary Energy Supply
U.S.	United States

Australia

5. Australia

Australia – overview	
Key background points	• Large natural resource endowment of coal, uranium, and natural gas with a high potential for solar and wind energy. • Cutting its own carbon emissions while increasing its extraction of fossil fuels for export. • Close strategic partner of the U.S., while China is Australia's biggest export market.
Key expert insights	• Australia's abundant natural resources shield it from energy security concerns associated with the U.S.–China trade conflict. • Not likely to change its decarbonisation path as a result of the trade conflict. • Australian exports of LNG could feel pressure from U.S. shale gas that was expected to be sent to China and is coming onto the market at a cheaper price. • The federal government should set more ambitious targets for transitioning to renewable energy as this will benefit both decarbonisation and energy security. • Australia should increase funding for green hydrogen as it is very well placed to reap the benefits of hydrogen as a fuel source and energy storage mechanism.

5.1 Background – Energy Security and Decarbonisation

Australia has a large natural resource endowment of coal, uranium, and natural gas, but also great potential for renewable energy, with ubiquitous sunshine, wind, and open spaces. Australia is one of the most coal-dominated countries in the Organisation for Economic Co-operation and Development (OECD), with coal providing 35 per cent of its total primary energy supply (TPES).[7] After Indonesia, it was the second-largest coal exporter worldwide in 2018, with about 10 per cent of its total coal production used domestically and 90 per cent being exported.[8]

While Australia has almost one-third of the world's total of known deposits of uranium, it has never had a nuclear power plant and nuclear power was effectively prohibited in Australia in 1998.[9] Among the 20 highest electricity-consuming countries, Australia is the only country without nuclear power in its energy mix and which does not have plans to develop this sector.[10] Natural gas is Australia's third-largest energy resource and is a crucial part

[7] IEA Energy Statistics 2017.

[8] International Energy Agency (2018). Energy Policies of IEA Countries: Australia. Retrieved from https://webstore.iea.org/energy-policies-of-iea-countries-australia2018-review.

[9] World Nuclear Association (2018). Australia's Uranium. Retrieved from https://www.world-nuclear.org/information-library/country-profiles/countries-af/ australia.aspx.

[10] Minerals Council of Australia (2017). Removing the Prohibition on Nuclear Power. Retrieved from https://minerals.org.au/sites/default/files/ 180605%20Removing%20the%20prohibition%20on%20nuclear%20power.pdf.

of Australia's energy mix, providing a quarter of the nation's overall energy needs.[11] Australia was one of the largest natural gas exporters worldwide in 2019 (including liquefied natural gas), and is predicted to overtake Qatar as the world's biggest LNG exporter within the next year.[12] From an energy security standpoint, these natural resource endowments and surplus energy make Australia secure, especially in the electricity sector where the country can provide for all of its own needs, though it is still reliant on petroleum imports for the transport sector. As a large country with a relatively small population, Australia produces a surplus of energy and has the capacity to further increase its yield.

Australia faces issues with its energy security with the imminent closure of many of its coal-fired power plants, which affects the affordability and reliability of energy. In a market economy, these power plants do not have government-mandated closure dates and the closure of the Hazelwood coal-fired power plant in 2017 occurred with very little notice.[13] The increases in price and decreases in reliability of the energy are being felt by consumers in Australia.

Another issue for Australia's energy security is the intervention of the government in what is supposed to be a purely market economy, causing issues for investment. Even with plenty of resources and companies willing to invest, government intervention and lack of coordination between federal and state governments are leading to increased uncertainty, resulting in a higher risk for investment, which then leads to higher prices and less reliability, i.e., less energy security.

The federal government, currently led by the Liberal-National Coalition, is regularly criticised for not setting ambitious targets for decarbonisation and being slow to act on emissions reduction by stakeholders who advocate a transition to a low-carbon economy. This criticism has intensified in the wake of bushfires that have scorched the nation in 2019 and 2020. Decarbonisation remains low on the federal political agenda, though the current government does not go so far as to exit international treaties, such as the Paris Agreement, as the U.S. has done. However, some state governments, such as the Queensland government, are pursuing their own more ambitious low-carbon and renewable energy targets.

Because of these efforts by state governments and consumers, renewable energy in Australia is growing at a per capita rate ten times faster than the global average,[14] even though subsidies are disappearing. Electricity generated by renewable energy increased to 21 per cent of total power generation in 2018 to reach its highest-ever level, though carbon emissions from the transport sector are rising and the efforts to reduce oil in the energy mix are still far behind those to remove coal. The growth in wind and solar power has accelerated since 2009, but each still represents around 1 per cent of the TPES for the country as a whole. In South Australia, within a few years, it is projected that it will be possible to export energy on sunny days from rooftop solar energy.

[11] IEA Energy Statistics 2017.

[12] US Energy Information Administration (2019). Australia is on track to become the world's largest LNG exporter. Retrieved from https://www.eia.gov/ todayinenergy/detail.php?id=40853.

[13] Anderson, S. (2017). Hazelwood power station closure: What does it mean for electricity bills, the environment and the Latrobe Valley? Retrieved from https://www.abc.net.au/news/2017-03-30/hazelwood-power-plant-shutdown-explained/8379756.

[14] Stocks, M., Blakers, A., Baldwin, K. (2019). Australia is the runaway global leader in building new renewable energy. Retrieved from https://theconversation.com/australia-is-the-runaway-global-leader-in-building-new-renewable-energy-123694.

5.2 The Impacts of the U.S.-China China Trade Conflict

Expert insights: The impacts of the U.S.-China trade conflict on Australia

Australia has strong ties with both the U.S. and China. Politically, culturally, and in terms of security, it is closely aligned with the U.S., but for trade, China is a far more important partner, with trade of fossil fuels (namely coal and LNG) to the U.S. representing less than 5 per cent of the trade volume of fossil fuels to China. Australia potentially faces more risks than rewards from the U.S.–China trade conflict and must navigate carefully to maintain good relationships with both partners. Although unstable geopolitics and the current trade conflict are something that is being discussed in the energy sector and viewed as a concern in some regards, the majority of issues faced when it comes to Australia's energy security and decarbonisation are domestic and the "short-term" nature of the trade conflict means that it is not affecting Australia significantly. The fluctuations in the prices of iron ore, aluminium, nickel, and lithium – the key components in batteries – are so extreme that they overshadow the few extra percentage points that could be added because of changing trade negotiations being eclipsed by the normal daily market changes. Moreover, the impacts on coal and gas in Australia are limited by long-term contracts. As a net importer of oil, Australia is being greatly affected by the changing price of oil, which is in turn being affected by the U.S.–China trade conflict.

Expert insights: The impacts of the U.S.-China trade conflict on energy security and energy exports in Australia

In terms of energy security, although it faces internal difficulties with the transition away from coal and government intervention in the market, the experts pointed out that Australia is very self-reliant, and oil is its only significant energy import. For exports, Australia's strength in the past has been its reliability to make long-term contracts for its energy resources and there are a number of markets that Australia can export to. Because of this, the experts interviewed for this study believe that Australia's energy security faces minimal risk from the U.S.–China trade conflict.

The experts do, however, believe that there are some indirect ways in which Australia could be affected by the trade conflict. Australia is an export-dependent economy and if the U.S.–China trade conflict causes a global economic slowdown, which would lead to less energy consumption, the Australian economy would suffer from a reduction in its ability to export coal and gas.

The natural gas market is perceived as one that could be affected in a variety of ways by the trade conflict. Australian exports of LNG to China have increased to the point that Australia now provides 53 per cent of China's LNG, up from 40 per cent in 2016. These new contracts are not a result of the trade conflict as they have been agreed since the early 2010s and are only coming into effect now. During this time, U.S. shale LNG that was expected to go to China, and had begun to enter the Chinese market, has diminished to zero because of the trade conflict. U.S. LNG is predicted to be cheaper than Australian LNG, so its entry into other markets in Asia instead of going to China could upset the Australian dominance in the region. Although currently locked into long-term contracts, South Korea and Japan – two of the largest importers of Australian LNG – could look to source their gas from the U.S. when the contracts are over.

Australian energy security can be affected by the instability brought about by the trade conflict as there is an associated risk for investors in an uncertain environment.

"Oil is a classic example where the risk of a real war or a trade conflict can increase the price of oil and because a lot of the LNG contracts have linkages to oil, then that would actually increase the price of LNG which then has a flow-through in terms of gas prices for Australian domestic gas." – Scenario Analyst

According to the experts interviewed, if the trade conflict precipitates a slowdown of the Chinese and global economies, the demand for Australian LNG could drop. Additionally, U.S. shale LNG is not being absorbed by the Chinese market and this may drive down the price of uncontracted Australian LNG on the spot market. The spot market reacts much faster to the variations in trade disputes and is therefore much more volatile.

If the export value of gas was to decrease, the domestic market in Australia may become more enticing to gas companies, which could drive down the high domestic price of gas. If this lower gas price continued, the marginal price of gas could compete with that of coal which, combined with the advantages that gas has in its flexibility for energy distribution in power plants, could lead to coal-fired power plants exiting the market sooner than anticipated, thus speeding up decarbonisation.

Expert insights: The impacts of the U.S.-China trade conflict on decarbonisation in Australia

The experts noted that Australia's decarbonisation journey is largely determined by the party that forms the government at the time, with the current coalition criticised for not moving fast enough on environmental issues and the Labour Party pushing for more ambitious targets. While parties may use the international decarbonisation landscape to promote their own agendas, their decarbonisation strategies remain relatively unaffected by the U.S. – China trade conflict.

"I don't think international policies on carbon or decarbonisation have very much of an influence on Australian policies at all."
– Chief Executive Officer

Australia benefits from economically appealing renewable energy opportunities on both a large and small scale, and this is the primary driver of decarbonisation in the country. At this time, the experts do not therefore believe that the trade conflict is having a significant effect on Australia's decarbonisation trajectory. However, most of the experts mentioned some indirect impacts of the trade conflict on Australian decarbonisation.

If the U.S.–China trade conflict negatively affects the overall Australian economy, there may be a natural drop in the amount of carbon produced because the demand for energy would drop, especially in energy-intensive activities such as mining and steel manufacturing. While this may lead to lower carbon emissions, the experts pointed out that it could also slow down Australia's energy transition to renewable energy because it will in part take growing demand to bring new renewable energy projects online; competing with depreciated coal and gas in a recession will be more difficult.

Renewable energy such as wind or solar are less predictable than other forms of energy generation such as coal or gas because they are reliant on external, uncontrollable factors to function. For this reason, they carry a higher level of risk associated with investment and, in an unstable world with trade conflicts and volatility in the markets, it becomes more difficult to invest in these energy forms. This investment risk carries over to deep storage techniques such as pumped hydro, which is very expensive to produce on a large scale and is a long-term asset, but in a climate of uncertainty, finding investment in these kinds of projects is more difficult.

"You need storage from somewhere and the amount of storage needs to be enormous. The question is, who pays for that? If you have high amounts of renewable energy and ambitious emissions and/or renewable targets, someone is going to have to pay for that somewhere. In an uncertain world, are the [Australian] States going to be in as much of a position to do that? It's a tough call, but it's obviously riskier in a world where there's a trade conflict." – Scenario Analyst

Expert insights: How can Australia react to the current climate of instability?

In a world where uncertainty, protectionism, and unilateralism are increasing, with a higher potential for trade conflicts such as the one between the U.S. and China, Australia is looking to supply all of its own energy, or as much as possible. Australia is closer to achieving this goal than other countries and has ample room to further increase its energy security. To do this, Australia needs to use its natural resource endowment and continue to switch to renewable energy, though this should be led by the federal government through ambitious targets. As noted by several of the experts on the Australian energy market, renewable energy production has already become the most competitive energy source for new builds, and small-scale solar PV has also been adopted widely throughout many parts of the country for economic reasons. Australia's abundant natural resource endowments have allowed it to make plans for the largest solar farm in the world, while it opens one of the largest coal mines. Australia can also provide the materials for lithium-ion batteries domestically and this could provide a great deal of energy security if these can be constructed in-country.

The experts agreed that Australia should pursue hydrogen as an alternative to diesel and as a form of energy storage. However, the experts also agreed that this is not commercially viable at present and will need five to ten years to make up a meaningful part of Australia's fuel mix.

"Australia is in a unique position to produce green hydrogen because our direct normal irradiance (DNI)[15] is so good. It is easy for us to produce this. We have existing infrastructure that we can use to create ammonia because it's denser than hydrogen and we have the facilities to transport it." - Director

Internationally, the experts believe that Australia should maintain its middle ground between the U.S. and China. Closely aligned with both the U.S. and China, there is little to be gained by Australia taking one side or the other in trade disputes. By maintaining a neutral position in trade disputes in which it is not involved, Australia will mitigate threats to its energy security. And it is in its own interest to try to reduce internal trade tensions between the superpowers and act as a buffer or intermediary in a G2 world.

[15] Direct Normal Irradiance (DNI) is the amount of solar radiation received per unit area by a surface that is always held perpendicular (or normal) to the rays that come in a straight line from the direction of the sun at its current position in the sky.

6

China

6. China

China – overview	
Key background points	• China imposes tariffs on U.S. energy: a 5 per cent tariff on U.S. crude oil; a 25 per cent tariff on methanol, polyethylene, and liquefied natural gas (LNG); and a 30 per cent tariff on propane. The U.S. has a 30 per cent tariff on Chinese solar panels. • China is the largest global emitter of CO_2 with 28 per cent of global emissions but also has the highest capacity for renewable energy. • As a newly emerging trade, U.S. LNG exports to China reached a peak in October 2017 before reducing to zero in May 2019. • Tariffs on energy remain unaffected by the Phase One trade deal; China has agreed to buy USD-54.2 billion of additional U.S. energy products over two years but will struggle to fulfil this.
Key expert insights	• China has a diverse range of countries from which it imports so its dependence on the U.S. for its energy is low. • The trade conflict could have a impact to the government which already has a strong desire for state control over the energy sector and for self-reliance. • As a result of the trade conflict, China is pursuing foreign investment in oil and gas exploration to enhance its energy security. • China's decarbonisation journey may be slowed as a secondary effect of the trade conflict but will not change significantly. • The transfer of technologies with the U.S. can have an effect on China's transition to renewable energy. • China's path towards increased energy security by diversifying its energy generation types and energy imports will further shield it from the impacts of the trade conflict.

With the development of the Chinese economy since the 1980s, China has had an almost insatiable appetite for energy. In 2018, the country was the largest contributor to the global growth of energy consumption for the 18th consecutive year.[16] Because China's energy consumption continues to grow at such a fast pace, the country's use of coal, oil, gas, nuclear power, and renewable energy is increasing, though at different rates: while coal use rose 0.9 per cent in 2018, consumption of renewable energy grew by 29 per cent in the same year.

[16] BP. Statistical Review 2019: China's energy market in 2018.

China is the world's largest coal consumer, the second-largest oil consumer, the third-largest gas and nuclear power consumer, but at the same time, the largest global investor in renewable energy, with over twice the installed capacity of renewable energy of the U.S., its nearest competitor for renewable energy capacity. Despite natural resources within its own borders, China has long surpassed its ability to provide for its own energy needs, leaving the country with a large energy deficit that must be filled with imports.

In the mid- to late-2000s, the high oil prices, rapid increase in energy needs, lower domestic yield of energy resources, and lower diversity of trading partners led to severe energy supply crises in China, highlighting China's energy security concerns. Energy security in China has improved over the last decade, though the level that China is reliant on outside energy varies between natural resources. To increase energy security in the country, China is also promoting the transition to electric vehicles and installing subway systems in many of its cities, which will reduce its energy needs and especially its dependency on oil. Although anxiety over its energy security is less of a concern than it was before 2012, one of the experts interviewed for this study remarked that, in China, energy security has regained the spotlight and is very firmly the top priority of its energy policy, with clean energy having crept down the agenda.

China is the world's largest carbon dioxide emitter with 28 per cent of global emissions, more than the next three largest CO_2 emitters (the U.S., India and Russia) combined. By 2012, the country had surpassed the combined contribution of both the U.S. and the E.U. and has continued to do so ever since.[17] While the use of fossil fuels continues to increase in China, the country has been making major steps towards transitioning to renewable energy. The coal industry argues that because China has a lot of coal and not a lot of natural gas, the focus should be on "clean coal".[18] Others on the clean energy side argue that China should be moving away from coal entirely and should focus on renewable energy technology. In practice, for such an energy-hungry country, China is approaching decarbonation from many angles in an "all-of-the-above" strategy.

"To reach Chinese commitments on carbon emission reduction, China will be forced to develop in every way, including renewable and nuclear energy." – Senior Fellow

[17] Rapier, R. (2018). China Emits More Carbon Dioxide Than The U.S. and EU Combined. Retrieved https://www.forbes.com/sites/rrapier/2018/07/01/ china-emits-more-carbon-dioxide-than-the-u-s-and-eu-combined/#35ea6a17628c.

[18] The term "clean coal" which many consider a misnomer, was created by the coal industry. Although a vague term with multiple interpretations, it is most often understood to refer to coal-fired power plants that capture carbon dioxide emitted from smokestacks and bury it under ground as a way of limitingglobal warming via carbon capture and storage (CCS). The term is also sometimes used, however, to refer to highly efficient coal-fired power plants that do notuse CCS but emit less carbon dioxide into the atmosphere than older coal-fired power plants.

China is now the world's largest investor in the renewable energy sector and has become a leading global centre for clean technology manufacturing. The current renewable energy capacity in China is comparable to the renewable energy capacity in the next five leading countries (Fig 6.1.). For renewable energy, China focuses mainly on solar and wind energy. In 2004, none of the top 10 manufacturers of solar panels and cells were Chinese companies; in 2018, seven of the top 10 were Chinese companies, showing the global shift in development and manufacturing for these products.

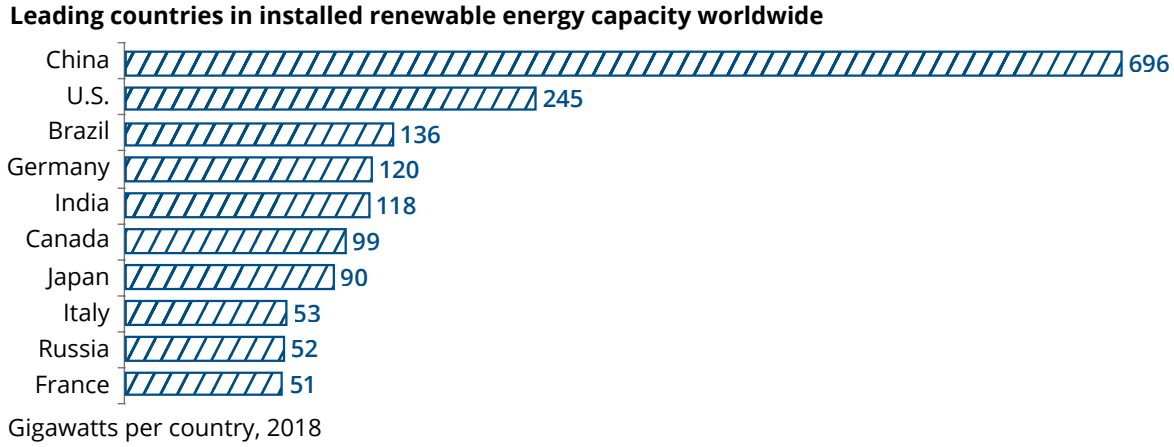


Fig 6.1. Chart showing the leading countries in installed renewable energy capacity worldwide in 2018. Source IEA

6.2. The Impacts of the U.S.-China Trade Conflict

Expert insights: The impacts of the U.S. – China trade conflict on China

The evidence of the impacts of the trade conflict on China can be observed, particularly by manufacturing companies whose primary market was the U.S., though these impacts may be less severe than those on the U.S. economy according to the "U.S. manufacturing purchasing managers' index" which fell more sharply than its Chinese counterpart.[19] Although China's economy in 2019 experienced the slowest growth rate in 27 years, the experts noted that a large part of this can be attributed to domestic factors such as reduced consumer spending and a slower growth of expenditure on infrastructure, rather than the impacts of the trade conflict which have had a limited comparative effect on the Chinese economy. This is supported by the findings of an International Monetary Fund working paper that suggests that the negative impacts of the trade conflict were incurred more severely by U.S. businesses and consumers than by Chinese businesses and consumers.[20] Despite this, there are potential significant impacts on the Chinese energy sector from this trade conflict, as will be discussed in this chapter.

[19] The Purchasing Managers' Index (PMI) is an indicator of the economic health of the manufacturing sector, and is based on five major indicators: new orders, inventory levels, production, supplier deliveries and the employment environment.

[20] Gopinath, G., Calvallo, A., Neiman, B., & Tang, J. (2019). Tariff Passthrough at the Border and at the Store: Evidence from US Trade Policy.

China has seen direct effects on its energy sector, with tariffs on crude oil, methanol, polyethylene, LNG and propane leading to a reduction in the imports of these commodities. Imports of LNG from the U.S., which were beneficial to both the U.S. and China and were rising at the end of 2017 began to fall and eventually stopped entirely in early 2019 (Fig 6.2.)

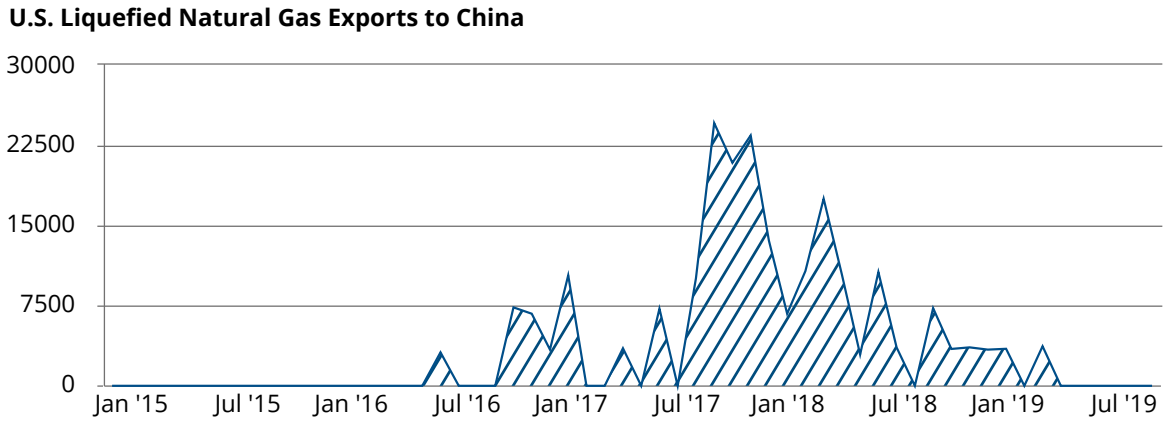


Fig 6.2. Chart showing U.S. natural gas exports to China over a three-year period and the resulting decline as a result of the tariffs imposed by the trade conflict. Source U.S. Energy Information Administration

Expert insights: The impacts of the U.S.-China trade conflict on energy security and energy exports in China

The experts noted that China has been working on diversifying its import partners and becoming more self-reliant on its domestic energy to enhance its energy security. This has been the country's strategy since before the trade conflict began and will continue when an agreement is reached. They note that, despite the magnitude of the current trade conflict, the impacts on China's energy security will be limited. The main topics of concern regarding energy security in China are oil and gas-related, because coal and renewable energy are domestically produced. China imports around 70 per cent of its oil, but because of the diversity of its oil trading partners and the bilateral agreements that the country prefers to make, the experts believe that this sector has not experienced major disruptions as a whole as a result of the trade conflict.

"Looking very simplistically at the hard patterns of flow, I don't see why this should make any difference to China's import strategy. China can stop imports from the U.S., and this would not be a problem. There is an abundance of cheap gas available at the moment so it wouldn't be an issue. Currently, China's gas storage is quite full, so LNG traders don't see a big bounce in gas." – Principal Research Fellow

China's reliance on the U.S. for energy is limited, with only about 3 per cent of its energy coming from its rival superpower and the experts therefore do not see the loss of the U.S. as an energy trading partner as a major disruption. Although China imports some resources from the U.S., the U.S. is not its main source for any natural resource. China's imports of LNG from the U.S., previously a burgeoning trade flow, has been hindered greatly by the current conflict. However, one of the experts noted that because the importing of U.S. LNG was a

recent development, China had not become reliant on the U.S. as a source and can find LNG elsewhere without difficulty, especially with new pipelines coming into operation such as the Power of Siberia pipeline from eastern Siberia.[21] S/he believes that China is also not affected by an energy shortage because it is using more advanced technologies to reduce its energy intensity and therefore uses less energy to produce more.

While many of the material impacts on China's energy security might be limited, the experts believe that the trade conflict could have a significant effect on the psychology of the government in China, and could use this to justify or amend its political agenda. In September 2018, President Xi noted that "internationally, it's becoming more and more difficult to obtain advanced technologies and key know-how. Unilateralism and trade protectionism are rising, forcing us to adopt a self-reliant approach." There has been a recent resurgence in the desire for self-sufficiency in China's energy sector, and the experts believe that this may in part be spurred on by the trade conflict. This conflict and the desire for energy security may have also influenced China's decision to increase its focus on overland gas and oil imports, instead of relying on maritime imports to remain stable. One of the experts described this as purely psychological in response to the dominance of the American military and the perceived threat to China's shipping lanes, which they described as an overreaction. In this regard, the trade conflict could accelerate China's drive for diversification, but was not the cause of it.

"I think psychologically it probably has made a difference. It has exacerbated president Xi Jinping's desire for state control over the energy sector and for self-reliance, which, as a purely economic decision does not make sense because digging up coalbed methane and shale gas is going to be more expensive than importing LNG." – Principal Research Fellow

One outcome of this trade conflict-driven desire for self-sufficiency, according to one of the experts, is that China is encouraging inward foreign investment into oil and gas exploration to enhance its energy security, despite the fact that the country does not have any known reserves of oil and gas that can be mined cheaply. This process, however, is made more difficult because national oil companies have all of the best land for oil and gas, and do not want to relinquish these rights. Allowing foreign companies to invest significantly in their energy sector would, as one of the experts noted, require China to "push through radical changes in the way that onshore resources are managed for foreign investment." As China continues to diversify its energy import partners, the trade conflict has encouraged the country to look toward geographically closer options for energy resources. This has led to China strengthening its ties with other Asian countries and developing closer relations with Russia, especially for its gas imports. However, the experts noted that these ties were already being forged before the trade conflict and that China will not want to rely too heavily on Russia for its energy. While it may feed into China's decisions for its import partners, it will not dramatically change the outcome of these decisions.

[21] Krutikhin, M. (2019) Power of Siberia or power of China? Retrieved from https://www.aljazeera.com/indepth/opinion/power-siberia-powerchina-191218112035197.html.

Expert insights: The impacts of the U.S.-China trade conflict on Decarbonisation in China

China's decarbonisation journey, as with its energy security, is moving in several directions simultaneously. Between "clean coal", China's dominance in renewable energy technology, the continuing switch to gas and the slow growth of nuclear power, the experts believe that China's plans for a low-carbon economy have been progressing in spite of changes in both China's and the global economy. One of the experts mentioned that the withdrawal of the U.S. from the Paris Agreement will have a greater influence on China's decarbonisation journey than a trade conflict, as China will not feel as obligated to reduce its carbon emissions. Another expert noted that China is now a more active collaborator with the E.U. than the U.S., and therefore the U.S.'s influence on China's decarbonisation will be minimal. For these reasons, the experts do not see the current trade conflict as having a large impact on China's decarbonisation journey. There are, however, some ways in which the experts believe that the outcomes of the trade conflict could affect this trajectory.

One of the experts believes that the trade conflict could affect Chinese companies' ability to switch to renewable energy in the short term for cost reasons. However, this will not affect China's overall policies or the direction in which it is progressing; it may just affect the pace at which the country is able to achieve its energy transition.

"Cost is always a company's top concern so this kind of conflict could affect companies' abilities to use cleaner energy to reduce emissions." – Professor

Although the U.S. economy is felt by some to be harder hit by the trade conflict than the Chinese economy, China's economy is slowing in part due to these tensions with its largest trading partner.[22] The reinvigoration of the coal industry by the Chinese government was seen by one of the experts as being "as much about politics, employment, social stability, and economic growth as it is about energy policy," and believes that these issues have taken precedence over clean energy in the current economic climate. A protracted trade conflict, and the associated economic fallout from this, would therefore hinder China in its transition to low-carbon energy as the country increases its coal production for economic reasons. China's renewed focus on energy security could also see more emphasis put on coal as an abundant domestic natural resource, but as renewable energy also offers energy security, these concerns may also see growth in this sector. However, it is important to note that the trade conflict is not the sole cause of this economic slowdown or the desire for energy security but is instead only one factor.

[22] Smialek Swanson (2019) American Consumers, Not China, Are Paying for Trump's Tariffs. Retrieved from https://www.nytimes.com/2020/01/06/business/economy/trade-war-tariffs.html.

Another factor that was proposed by one of the experts as potentially influencing China's shift to cleaner energy is the reform of its financial markets, which is attributed to the country's desire to manage the impacts of the trade conflict.[23] With the opening up of this market, even if it remains enveloped by the state, s/he believes that, with more actors, "China will not have the same force on clean energy developments as the past carbon command and control and financial instruments had," and will therefore not be able to direct the change to low-carbon alternatives with the same efficacy as it has in the past.

One way in which China may slow down its decarbonisation journey is through the transfer of technologies. According to one of the experts, the U.S. and China enjoyed a significant exchange of renewable energy technology before the U.S. changed their relationship, saying that "today, the current climate is not favourable toward these kinds of collaborations." The experts believe that this will be more damaging to the U.S. renewable energy sector than the Chinese energy sector, but that it is a lose-lose situation overall. As a result, the trade conflict may foster closer collaboration with the E.U. for energy efficiency and renewable technologies.

"The trade conflict could be an obstacle in upgrading China's energy technology. China is in collaboration with a lot of U.S. firms and with some European firms for improving energy efficiency. This process could be interrupted by the trade conflict." – Senior Fellow

Although the above-mentioned points indicate that there is potential for the trade conflict to affect China's decarbonisation journey, one of the experts believes that China has progressed past the point at which it would be dramatically affected by this conflict.

"If you consider ten years ago, when the economy experienced a slowdown, the government would deprioritise decarbonisation and focus more on the economy. But I think now, especially since the trade conflict, the government has recognised that you cannot force the recovery of the economy with the previous model of always building infrastructure and using a lot of energy that pollutes the environment. I strongly believe that that is the key thing we have learned from the trade conflict."– Executive Vice President

[24] U.S. Energy Information Administration Statistics.

Expert insights: How can China react to the current climate of instability?

Expert consensus on China's future actions to mitigate the threats to the energy sector from the trade conflict is to continue with the actions it is already taking: diversify its import partners; enhance cooperation with these countries through bilateral agreements; continue to develop its renewable energy industry; and continue to develop and implement technologies surrounding coal and hydrogen. One path for China to achieve self-reliance, as mentioned by one of the experts, could be to continue building a lot of capacity in nuclear power, offshore wind, and solar, which would boost those industries while simultaneously reducing coal dependency. Even in a scenario in which the trade conflict extends and worsens, the experts do not believe that the energy sector will be dramatically hit because it is a relatively small factor in a situation with larger issues, and because it does not represent an "economic weapon" (something that is used to weaken the economy of another country) for the U.S. against China.

One of the experts believes that the energy sector must try to remain outside of the trade conflict and rebuild its ties with the U.S. for trade. China will still be a good market for U.S. energy exports as the U.S. moves toward being a consistent net exporter in all energy types (the U.S. became a net exporter of crude oil and petroleum products for the first time in October 2019).[24]

"The U.S. is not a main energy import partner for China and will not be in the future, so I think we should allow the U.S. to increase its share in China's energy market. We should not limit it for fear that China will become 100 per cent dependent on the U.S., given that the U.S. currently represents less than a 5 per cent share of China's energy import partners." – Senior Associate

India

7. India

India – overview	
Key background points	• Carbon emissions per capita are only 40 per cent of the global average but are set to increase drastically as the economy continues to grow. • One of the largest coal producers in the world but also one of the largest coal importers. • Promoting the switch to renewable energy, especially solar, to meet its carbon reduction targets but lagging behind in other areas such as Carbon Capture Storage. • Not as closely tied to the U.S. or China as the other countries in this study.
Key expert insights	• Has not been, and is unlikely to be, greatly affected by the trade conflict. • India is promoting imported gas as an area for future growth and could capitalise on U.S. shale gas that is not going to China because of tariffs. • Could capitalise on cheap available solar panels that are not being sent from China to the U.S. • The government is imposing quotas on Indian-made solar cells to react to the influx of Chinese-made solar panels. • Could try to fulfil a niche left by China in solar demand from the U.S.

7.1. Background - Energy Security and Decarbonisation

As in China, India has seen significant economic development since the 1980s and a corresponding increase in its energy consumption as tens of millions of its citizens have joined the middle class and electricity is being made available to the wider population.[25] India's energy demand increased by 4 per cent in 2018 compared to a global increase of 2 per cent, and it is expected to surpass China as the world's largest energy growth market by 2030.

India is heavily reliant on coal and oil (Fig 2.1.). In 2018, the country accounted for 70 per cent of the global total increase in coal consumption.[26] Although India is the second-largest producer of coal in the world after China, 87 per cent of India's proven coal reserves are lower-quality noncoking coal with a high ash content and are therefore only suitable for thermal power plants.[27] Because of this, India is still one of the largest importers of coal, predominantly from Australia, though India's dependence on Australian coal is declining.[28] For oil, India relies

[25] Leatherby, L., Martin, C. (2019). How Each Country Contributed to the Explosion in Energy Consumption. Retrieved from https://www.bloomberg.com/graphics/2019-international-energy-use-renewables-coal-oil/.

[26] BP Statistical Review – 2019: India's energy market in 2018. Retrieved from https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-india-insights.pdf.

[27] Seetharaman, G. (2019). Coal here to stay despite India's ambitious goals for renewable energy. Retrieved from https://economictimes.indiatimes.com/industry/energy/power/india-will-not-be-able-to-achieve-its-renewable-energy-targets-anytime-soon/articleshow/69286279.cms.

almost exclusively on imports, traditionally from the Middle East. Natural gas consumption is growing, with LNG imports having tripled over the 2008–2018 period. Among major economies, however, India has one of the lowest shares of gas consumption due to low levels of domestic production and the high price of imported gas.

India is transitioning to renewable energy as it becomes more affordable and widespread. However, according to the Central Electricity Authority, renewable energy accounts for 23 per cent of India's installed power capacity, but comprised only one tenth of the total electricity generated in 2018–2019.[29] India is largely self-sufficient with regard to production capacity for wind energy equipment, but relies heavily on imports for its solar modules (at around 90%). Although there is a push toward renewable energy, due to India's developing economy and its high energy needs, there will be an increase in the consumption of all of India's main forms of energy in the medium term.

With the economic growth rate fluctuating between 6 and 8 per cent in recent years, the country is projected to experience a major rise in energy demand due to demographic expansion, increasing urbanisation, and rising demands for mobility. This will put an additional strain on India's energy security, which is already relatively low, with tens of millions of people without access to electricity. Energy security in India is compromised by poor infrastructure and a cultural reluctance to pay for electricity, which is seen as a basic human right.[30] This leads to electricity being an economic drain on the government, which then has to limit the supply.

Although India is now the third-largest emitter of carbon dioxide (behind China and the U.S.), its emissions per capita are only 40 per cent per capita of the global average. As a developing country with over 1.3 billion people, there is the potential for a significant increase in CO_2 emissions which are predicted to double by 2040 as its economy continues to grow.[31]

The central government in India has been promoting the use of clean energy, and demand is increasingly being met through cleaner energy sources. In order to change from its heavily carbon-based economy, in line with the country's commitment under the Paris Agreement on climate change, India has invested heavily in renewable energy and the country's installed renewable capacity has risen six-fold over the past decade. In the past five years, solar power, the dominant type of renewable energy in India, has also seen its capacity grow around 12 times[32] and there has been a move toward rooftop solar. This has been promoted by the government with viability gap funding[33] and reverse-auction bidding[34] which have driven down the price of installation and the cost of energy generated from renewable energy.

[28] Varadhan, S. (2019). Canada, U.S. gain as India cuts dependence on Australian coking coal. Retrieved from https://www.reuters.com/article/us-indiacoal-imports/canada-u-s-gain-as-india-cuts-dependence-on-australian-coking-coal-idUSKCN1TQ234.

[29] Seetharaman, G. (2019). Why India may not achieve its 2022 clean energy target. Retrieved from https://economictimes.indiatimes.com/industry/energy/power/why-india-may-not-achieve-its-2022-clean-energy-target/articleshow/71869684.cms?from=mdr%20https://energytransition.org/2018/02/indias-energy-transition-potential-and-prospects/.

[30] Greenstone, M., Sudarshan, A. (2019). Electrifying India May Require Convincing People Power Is Something Worth Paying For. https://www.forbes.com/sites/ucenergy/2019/12/12/electrifying-india-is-as-simple-as-convincing-people-power-is-something-worth-paying-for/#3af1371e1f0e.

[31] BP Energy Outlook – 2019: Insights from the Evolving transition scenario – India. Retrieved fromhttps://www.bp.com/content/dam/bp/businesssites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2019-country-insight-india.pdf.

[32] Central Electricity Authority.

[33] Viability Gap Funding (VGF) is a government grant designed to support projects that are economically justified but not financially viable. Such a grant under VGF is provided as a capital subsidy to attract the private sector players to participate in PPP projects that are otherwise financially unviable.

[34] A reverse auction is a type of auction in which sellers bid for the prices at which they are willing to sell their goods and services. In a reverse auction, the buyer puts up a request for required goods or services. Sellers then place bids for the amount they are willing to be paid for the goods or services, and at the end of the auction the seller with the lowest amount wins.

7.2. The Impacts of the U.S.-China Trade Conflict

Expert insights: The impacts of the U.S-China trade conflict on India

For the majority of countries assessed in this study, the experts identified the majority of potential or actual impacts (where present) of the U.S.-China trade conflict as negative. For India, however, the experts interviewed for this study see the country as being only minimally affected by the trade conflict and even identify potential opportunities for India to benefit in the wake of poorer relations between the two largest global superpowers. India's direct exports to the U.S. and China are modest compared to its regional peers, with only 21 per cent of its exports going to these two countries compared to 40 per cent of South Korea's exports going to these two countries. To take advantage of the opportunities presented by the trade conflict, India needs to increase its trade footprint to include the goods on which the U.S. has imposed tariffs for China, such as the pharmaceutical, chemical, and engineering sectors.[35] Although the experts believe that there is an opportunity for India to try and fill the gap that is left by China in terms of manufacturing goods for the U.S., it is difficult to match the scale of Chinese manufacturing in the short to medium term and India would need to enact land and labour law reforms if it is to achieve this.

Expert insights: The impacts of the U.S.–China trade conflict on energy security and energy exports in India

While India imports a substantial amount of oil and coal from countries such as Australia, Indonesia, and Iraq, its energy supplies have been predominantly stable in the past. One expert believes that "any disturbance in terms of the U.S. relationship with other countries impacts India because Iraq, Saudi Arabia, and the US are the key countries from which we have been importing oil," but the prevailing view among the experts is that because India's energy trade with the U.S. and China is minimal, energy security in the country has not been, and is unlikely to be, affected by the trade conflict. Additionally, India's energy imports from these countries do not cross over – it imports oil from the U.S. and renewable energy technology and infrastructure from China, so there is less likely to be disruption in this trade flow.

"Unless the U.S.–China trade dispute spills over into a larger dispute involving more countries, for example the U.S. starts sanctioning countries which do not impose tariffs on China, I don't see any impacts on India's energy sector, trade partners, nor energy security at the moment." – Senior Research Fellow

[35] Soon, S. (2019). India could be a winner in the US-China trade war. Retrieved from https://www.cnbc.com/2019/09/19/india-could-be-a-winner-inthe- us-china-trade-war.html.

India's traditional approach to energy security has been to sign long-term contracts to protect itself from global energy market price fluctuations. Although this makes the country less able to benefit from short-term price drops, it provides a buffer in situations where international politics (such as the U.S.–China trade conflict) cause volatility in the energy market.

After promising but ultimately unsuccessful efforts to find more commercially viable indigenous gas deposits, India is promoting gas for future growth through imports. In a situation where the U.S. delivers on its targets of shale gas for export but is not selling to China as previously anticipated, the experts believe that the resultant abundance of gas on the market could be advantageous to India as the country looks to import cheap gas. This would be beneficial to India in the short term by diversifying its energy imports at a time when the country is emerging as a major demand centre for gas and is planning to create a gas trading platform by March 2020 to promote the use of this resource.[36] The American multinational oil and gas corporation, ExxonMobil, agreed to explore "new models of delivering cost-effective natural gas in India."[37] The flexibility provided by gas will enhance energy security in India and benefit the abandoned gas power plants that were set up in the hope of finding indigenous gas.

Expert insights: The impacts of the U.S.-China trade conflict on decarbonisation in India

As a rapidly developing nation, India has been reliant on coal and other fossil fuels in its energy mix to fuel its growth. Recognising the imminent need for decarbonisation, the Indian government has demonstrated a strong commitment to decarbonise its economy with energy-use reduction targets and by investing in cleaner energy sources. The experts had varied insights into the possibilities of knock-on effects from the trade conflict impacting India's decarbonisation, but generally believe that the country would be largely unaffected.

"Globally, economies are definitely experiencing negative economic consequences because of these trade restrictions and, as a result, India is indirectly impacted but I do not believe it is affecting the country's path to decarbonisation."
– Energy Economist

[36] Singh, K. R., Chakraborty, D. (2019). India's First Natural Gas Exchange to Be Unveiled by March. Retrieved from https://www.bloomberg.com/news/articles/2019-11-27/gas-trading-in-india-targeted-by-march-amid-regulatory-hurdles.

[37] Verma, N., Mukherjee, P. (2019) Global oil majors see surge in Indian demand for natural gas. Retrieved from https://www.reuters.com/article/usenergy-india-gas/global-oil-majors-see-surge-in-indian-demand-for-natural-gas-idUSKBN1WT1QI.

Some of the experts speculated that India's renewable energy sector could be impacted by the U.S.–China trade conflict. India focuses primarily on solar energy as a renewable resource and imports the vast majority of its solar infrastructure. Because of this, the country has become reliant on China, the world's largest manufacturer of solar cells. The impacts of the trade conflict on Chinese production and distribution of solar cells is unclear. The experts suggested that the U.S. tariffs on solar cells could lead to an increase of cheap solar cells on the market which India could take advantage of. This may be beneficial for India's decarbonisation goals in the short term but could hamper the development of the Indian solar panel production sector, which the government is promoting. Conversely, a significant drop in U.S. imports of solar cells from China could be a gap in the market that India could look to fill, thus bolstering the overall solar sector in India.

Another consideration raised by some of the experts is that the downturn of the Chinese economy as a result of the trade conflict could lead to more expensive or less-reliable solar technologies on which India depends, thereby reducing the speed at which the country is able to transition. While these outcomes are posited by the experts interviewed, they believe that these impacts will be limited overall.

"I think the current U.S. – China trade dispute is likely to have minimal impact on India's energy sector, other than possible secondary or tertiary impacts to our solar module supply and I do not believe that is a big issue right now." – Senior Research Fellow

The experts believe that one of the outcomes of the U.S.–China trade conflict has been a push toward protectionism in the Indian solar sector. In order to become more self-reliant on its solar supply and to create jobs, the Indian government has imposed requirements on solar power developers and investors (e.g., restricting tariffs, price caps on solar energy) in the hopes of accelerating domestic development of cleaner sources of energy. However, the same experts noted that the shift away from China's exports to domestic supply is costly both in time and money as India cannot reach the same economies of scale as China. Moreover, government policy has not provided enough incentives, and renewable energy developers are holding back their investments. As a result, recent solar power development auctions have not received enough interest.

"While India has been promoting more domestic manufacturing of renewable energy equipment such as solar energy, we are not competitive yet. We are still importing a huge amount of equipment from other countries for developing our solar power plants in India, so any impacts from the U.S.–China trade conflict, which makes China's supply unreliable, will have a huge bearing on India." – Energy Economist

Expert insights: How can India react to the current climate of instability?

Although the impacts of the U.S.–China trade conflict on India's energy security and decarbonisation appear to be limited, the experts suggested both short- and long-term measures that India could adopt to mitigate the threats of rising instability from trade disputes, protectionism, and unilateralism.

From an energy security and decarbonisation standpoint, the experts believe that the government should continue to heavily promote the transition to renewable energy, but that there is a need for India to diversify its sources of solar panels in order to avoid over-reliance on a particular country, i.e., China.

"If something is working well, the government should not roll it back, which happened with capping of prices and the reverse auction mechanism. The government has also introduced a tax on Chinese solar panels, and this had the undesirable effect of increasing the cost, so this type of policy uncertainty needs to be avoided in order for India to achieve its decarbonisation goals." – Energy Economist

One of the experts stressed the need for India to explicitly acknowledge that it will put green industry at the forefront of its future energy development to attract investment in the face of a potential economic downturn.

Another expert pointed to increasing energy efficiency as a way to effectively decarbonise. As a developing tropical nation, the Indian economy will continue to grow, and its energy use will continue to increase. Targeting energy efficiency for technology such as air conditioners will greatly facilitate the country's ability to manage this increase in energy use.

Indonesia

8. Indonesia

India – overview	
Key background points	• Resource-rich nation with domestic supplies of coal, natural gas and oil. • Increased its use of coal over the past 10 years and sees this as an important strategy for economic development. • Strongly promotes the growth of 'New Renewable Energy', including renewable energy, nuclear energy and developing energies such as hydrogen.
Key expert insights	• Indonesia is unlikely to have energy security concerns from the trade conflict because of the country's fossil fuel reserves. • The Government is strongly hoping that there will be business opportunities from the trade conflict, but they are going to Vietnam, Thailand or Myanmar because of their relatively greater ease of doing business. • Indonesia may experience a reduction in investment in renewable energy as a result of the trade conflict. The country relies on this investment for the decarbonisation of its economy. • It does not take advantage of an abundance of solar panels that are no longer going from China to the U.S. because of protectionist policies. • Indonesia may react to reduced coal exports to China by increasing domestic use. • There is no strong need to change its policies to mitigate threats from the trade conflict.

Indonesia has the fourth-largest population in the world, with more than 260 million people spread across 6,000 - 8,000 inhabited islands and it is the largest economy in Southeast Asia. It therefore presents unique challenges for energy security. As a decentralised, fossil fuel-dependent country that is mostly supported by rich deposits of native coal and gas, it also faces a myriad of challenges in the decarbonisation of its economy.

The U.S. was one of the first countries to establish diplomatic relations with Indonesia when it gained independence in 1949 and they have maintained close ties ever since. At the same time, China is Indonesia's largest import and export partner, and despite diplomatic relations being suspended between 1967 and 1990, Indonesia's economy depends heavily on China.

Indonesia is a resource-rich nation and is the world's fourth-largest producer of coal with domestic supplies of natural gas and oil. Indonesia is still fossil fuel-dependent and has been gaining great economic benefits from exporting oil but has recently been having difficulties with its domestic demand due to declining production rates. Because of its large coal reserves, Indonesia's issues relating to energy security come more from energy security – providing affordable, accessible, reliable energy to the population – than from import security, though dependence on foreign oil is growing as it has been a net importer of oil since 2004 and new prospects for exploiting oil fields are very limited. Reaching its large, dispersed population with affordable energy is a major challenge for Indonesia, and for this reason, the country still provides subsidies for solar, diesel, coal and liquefied petroleum gas to ensure that its residents in remote, underdeveloped areas have access to affordable, reliable energy. As a result of this, energy throughout Indonesia is cheap, which causes problems for Indonesia's decarbonisation strategy and investment in the energy sector. Additionally, tax revenues from energy resources are limited, which are often a major source of income for other countries.

The country has increased its use of coal over the past 10 years and sees this as an important strategy for economic development, given that it has large coal reserves. Indonesia strongly promotes the growth of New Renewable Energy (NRE),[38] which includes renewable energy, nuclear energy and other forms of developing energies such as hydrogen. Indonesia has been researching the feasibility of nuclear power in the country since the late 1980s and the government has announced plans to build nuclear reactors, though these have been delayed. Currently no nuclear power plants are in operation, though there are experimental nuclear reactors in three provinces.

The share of renewable energy in Indonesia has been stagnant for around a decade, though it is in the spotlight as a potential solution to Indonesia's growing dependence on imported fossil fuels. Indonesia is currently set to achieve its targets according to the Paris Agreement, though these targets are described as "highly insufficient" by the independent scientific analytical tool, "Climate Action Tracker"[39] and the IIEE believe that the current estimate of 23 per cent of the energy mix being renewable in 2023 is too optimistic, partly based on the economic growth slowdown from the estimated 6 – 7 per cent per year to roughly 5 per cent per year. There was a very strong push at the beginning of President Joko Widodo's term in 2014 towards renewable energy, but there has been a lack of follow up on this push and most policies that will drive this energy transition have not been implemented. The IIEE believe that the knowledge of the need to switch to renewable energy is in place in government and academia in Indonesia, but not the willingness to change.

[38] Renewable energy in Indonesia includes geothermal, hydro, wind, solar, tidal, and biomass energy. New energy includes nuclear, hydrogen, coal bed methane, liquefied coal and gasified coal energy.

[39] Climate tracker (2019) https://climateactiontracker.org/countries/indonesia/.

Coal in Indonesia is not only plentiful but cheap which makes it difficult for renewable energy to compete, especially in Java where the price of coal is very low. Coal has been heavily subsidised in Indonesia for a long time to provide energy to underprivileged people at an affordable rate and increase purchasing power in the country, causing problems in moving away from this resource.

8.2 The Impacts of the U.S.-China Trade Conflict

Expert insights: The impacts of the U.S.–China trade conflict on Indonesia

With exports to the U.S. and China representing almost one quarter of Indonesia's total exports, the experts interviewed for this study note that the country has concerns in light of the U.S.-China trade conflict, if its two largest export partners experience economic slowdowns. However, they believe that there is also optimism at a governmental level that the country can benefit from a relocation of supply chains from China because of its large population and favourable demographic trends, with a projected median age in 2030 of just 31 years old compared to 40 in China, 47 in South Korea and 51 in Japan.[40] This may allow Indonesia to promote itself as an alternative to China for labour-intensive manufacturing. Thus far, the experts do not see this potential benefit as having materialised in Indonesia because of difficult business practices in the country.

"I think the Government is strongly hoping that there will be business opportunities from this trade conflict coming to Indonesia, but we have seen that they are going to Vietnam or Thailand or Myanmar because of their ease of doing business." - Senior Manager

Indonesia's energy consumption has been largely self-dependent and secure because of the country's domestic fossil fuel reserves and the experts believe that its decarbonisation efforts are largely influenced by domestic issues rather than international ones. Indonesia's recent (as of December 2018) transition to a net importer of oil means that it will feel the effects of price fluctuations on this commodity, but overall, the experts expect the impacts of the U.S.–China trade conflict on Indonesia to be minor.

Expert insights: The impacts of the U.S.-China trade conflict on energy security and energy exports in Indonesia

One way in which the experts observed that the Indonesian energy sector may be affected by the U.S.–China trade conflict is in the inflow of investment. Indonesia's economy and energy sector rely on foreign investments and a global economic slowdown brought about by the U.S.-China trade conflict would affect the stability of investments from other countries, thereby limiting the development of the energy sector of Indonesia. Indonesia's swelling state budget deficit of over USD-26 billion has increased the country's development dependent on foreign investment significantly.

[40] https://www.ft.com/content/cade2aaa-ddd6-11e9-b112-9624ec9edc59.

"The Indonesian energy sector is dependent on foreign investment because of the limitations of the State budget investment capacity of Indonesian State-owned enterprises. Therefore, private and foreign investments are important for Indonesia." – Indonesia Country Coordinator

The experts mentioned that Indonesia's energy sector, especially for renewable energy, is already a difficult landscape for investment by foreign companies due to solar panel import tariffs, local content requirements, and mandatory handover of solar projects to state control at the end of a contract. These deterrents to investment hamper Indonesia's renewable energy sector development and make it difficult for the country to capitalise on a restructuring of the global supply chain that may result from the trade conflict. This stunting of the Indonesian energy sector, especially for renewable energy affects the country's ability to diversify and domesticise its energy generation and therefore affects its energy security as well as slows down the country's transition to a lower carbon economy.

However, some of the experts reported increases in investment from foreign companies, especially from China, into the country's renewable energy sector, particularly in hydropower. Any decrease in foreign investment as a result of the trade conflict, these experts suggested, would not be seen as a major barrier for energy development projects and will not impact Indonesia's energy security.

Expert insights: The impacts of the U.S.–China trade conflict on decarbonisation in Indonesia

One result of the U.S.–China trade conflict that was identified by the experts was that China, the largest manufacturer of solar components, is expected to have an oversupply of solar PV components which are no longer being sent to its largest importer, the U.S. Indonesia, like many other countries, relies on Chinese solar panels to achieve its decarbonisation goals. A supply surplus and corresponding lower price of these components could benefit Indonesia's sourcing of solar components and hence assist the country's energy transition and decarbonisation.

"I think the trade conflict between the US and China will have some impacts on PV components as there will be an oversupply. This will lead to a decline in the price of solar PV components which will greatly benefit Indonesia in setting up solar farms." – Senior Researcher

However, another expert believed that despite the supply of cheaper PV components and panels being available from China, Indonesia's local content requirements hinder the country in its ability to take full advantage of cheaper components. Indonesia's policy on local content requirements encourages the use of locally produced goods. Solar energy, for example, is capped at USD-0.25/kWh for installations with less than 40 per cent local content and USD-0.30/kWh for installations with more than 40 per cent local content, meaning that the energy generated using local components can be charged at a higher rate. The incentives for using locally produced goods vary by industry but in the case of solar, limit the country's ability to greatly increase their import of cheaper solar PV, as has been done in India. Therefore, while there are implications for Indonesia's energy sector from the trade conflict, it is not expected that the country's solar industry will greatly benefit from it.

"India is taking full advantage of now unsaleable Chinese solar PV panels and they are buying them at scale, whereas for Indonesia since we have a national policy to ensure that the imports do not dominate national content, it is very difficult for us to buy solar PV panels from China on a very large scale." – Energy & Climate Manager

Another aspect of Indonesia's decarbonisation that may be affected by the U.S.–China trade conflict is the move away from coal as an energy source. A global economic slowdown would affect Indonesia's exports of coal as countries such as China would not be buying as much. The experts noted that the Indonesian government has responded to the reduction in coal exports by increasing domestic use of coal. This measure by the government in response to the instability brought on by the U.S.–China trade conflict came at the expense of efforts to reform Indonesia's energy mix and the long-term decarbonisation of the country.

"Our President is very inward looking in the sense that if he sees that our export commodities or raw resources cannot be shipped to their usual markets, he will create an immediate policy to ensure that the domestic market could capture the excess. This means that the State Electricity Company (PLN) will create and build more coal power plants to capture all this excess coal that cannot be shipped to countries such as China." – Energy & Climate Manager

"I think increasing the domestic coal market has heightened tension in the Indonesian renewable energy development sector since the government thinks it is necessary for Indonesia to save the coal industry, which is the second largest contributor to Indonesian GDP. Therefore, decarbonisation will suffer, and the country may not reach its decarbonisation goals." – Indonesia Country Coordinator

Another expert expressed, however, that the shrinking global demand for coal could trigger higher awareness for Indonesia to prepare for its energy transition to cleaner and renewable energy sources and put greater emphasis on Indonesia's decarbonisation.

Expert insights: How can Indonesia react to the current climate of instability?

The Indonesian experts interviewed do not see a significant need for Indonesia to change its policies to mitigate threats from the U.S.–China trade conflict, because the impacts are thought to be limited.

The experts stated that the government needs to focus on the development of its regulatory instruments to attract and accommodate more investment into its energy and renewable sectors. While this may be in the spotlight because of the trade conflict, the experts noted that these reforms are necessary, independently of the conflict. Some of the experts also promoted more trade cooperation between Southeast Asian countries especially around their energy industries. This could reduce potential risks posed by an intensifying trade conflict between the U.S. and China.

Most of the experts believe that there is a need for the Indonesian government to reform its energy policy and fairer pricing between coal and renewable energy sources, to developing more investment-friendly opportunities for renewable energies.

Japan

9. Japan

Japan – overview	
Key background points	• The energy landscape has been one of upheaval since the 2011 Fukushima disaster. • Relies on imported energy for more than 90 per cent of its primary energy supply. • Mountainous, densely populated terrain causes challenges for renewable energy generation. • Closely economically linked with the U.S. and China, which combined make up a 40 per cent share of Japan's export partners and a 35 per cent share of its import partners.
Key expert insights	• Long-term energy contracts signed with trade partners, such as Australia, Qatar, and Saudi Arabia, will alleviate energy security concerns brought on by the trade conflict. • Japan can benefit from more Chinese solar panels on the international market that are not going to the U.S., but this dependency reduces its overall energy security. • It may import more gas from the U.S. that was previously destined for China once the current contracts are completed. • Japan's decarbonisation efforts will not be greatly affected by the trade conflict, though the country's energy transition ambitions are influenced by the U.S. and China. • Should focus on improving energy efficiency, transitioning to renewable energy including green hydrogen and, some argue, returning to nuclear.

9.1. Background - Energy Security and Decarbonisation

The energy landscape in Japan is one that is undoubtedly still recovering from the upheaval caused by the 2011 Fukushima disaster, making it a unique and interesting case study in Asia Pacific. The effects of this disaster have dominated Japan's energy security and decarbonisation efforts in the intervening years and will continue to do so for years to come.

Japan is closely economically linked with both the U.S. and China, which combined make up a 40 per cent share of Japan's export partners and a 35 per cent share of its import partners, with China being the largest trading partner overall.[41] These economic ties mean that the trade conflict between Japan's two largest trading partners represents a threat to the Japanese economy.

[41] World Bank World Integrated Trade Solution (WITS) Trade Data.

As a highly industrialised country, Japan has long been a major consumer of energy and a leader in energy technology development.[42] With few natural resources of its own, and in part due to the shutdown of nuclear power plants in the wake of the Fukushima disaster, Japan relies on imported energy for more than 90 per cent of its primary energy supply, especially for fossil fuels, which make up 91 per cent of Japan's TPES. Japan imports roughly 80 per cent of its oil from the Middle East and 60 per cent of its coal from Australia, but has a more diverse natural gas portfolio, importing from Australia, elsewhere in Asia, and North America. Prior to the Fukushima disaster, nuclear power comprised 30 per cent of Japan's electricity production, and had been expected to increase to 40 per cent by 2017.[43] In 2011 and 2012, Japan's nuclear reactors were shut down and most remained inactive until 2018; although 37 reactors in Japan are currently operable, only nine are active, due in large part to public concerns over the safety of nuclear power. Japan has a target of 20–22 per cent of electricity generation from nuclear energy by 2030, but it is not clear how the country intends to proceed with nuclear energy after this time.[44]

The 2011 Fukushima nuclear disaster

On 11th March 2011, a magnitude nine earthquake occurred off the east coast of Japan, generating a tsunami that resulted in almost 16,000 deaths. The earthquake caused severe damage to the Fukushima Daiichi Nuclear Power Station, just under 300km from Tokyo that was rated as the most severe nuclear accident since the April 1986 Chernobyl disaster in the Ukraine and was ultimately judged to have been foreseeable, and that basic safety requirements such as risk assessment, preparing for containing collateral damage, and developing evacuation plans had not been met.

When Japan reverted to a more fossil fuel-heavy energy mix after Fukushima, the country has faced four major challenges that compromise its energy security: lower energy sufficiency,[45] higher import costs of fossil fuels, a lower diversity of energy generation methods, and high electricity prices. However, Japan's shrinking population and advances in energy efficiency mean that energy demand in the country peaked in 2007 and has been declining in recent years.[46]

Japan has been criticised for its unambitious 2016 Paris Agreement targets, which have been labelled as "highly insufficient" by the independent scientific analytical tool, Climate Action Tracker, though the country's commitments in the transport sector are noted to be strong.[47] The uncertainty surrounding Japan's future regarding nuclear power and the technical difficulties that come with renewable energy on such a densely inhabited island pose difficulties for Japan's decarbonisation journey.

The mountainous, densely populated terrain of Japan causes challenges for renewable energy generation in Japan, though the country is importing solar panels from China to expand this sector. Because of these obstacles to a lower carbon economy, Japan plans to be at the forefront of hydrogen as a primary source and a carrier of energy. Prime Minister Shinzo Abe said in January 2019, "My government is aiming to reduce the production cost of hydrogen by at least 90 per cent by the year 2050, to make it cheaper than natural gas." To do this, Japan plans to import brown hydrogen (hydrogen produced from fossil fuels such as coal) from Australia, and when the infrastructure is in place, to switch to green hydrogen (hydrogen produced from renewable energy).[48]

[42] IEA Japan Country Profile. Retrieved from https://www.iea.org/countries/japan.

[43] World Nuclear Association (2019). Nuclear Power in Japan. Retrieved from https://www.world-nuclear.org/information-library/country-profiles/countries-g-n/japan-nuclear-power.aspx.

[44] https://www.eia.gov/beta/international/analysis.php?iso=JPN.

[45] Ministry of Economy, Trade and Industry, Agency for Natural resources and Energy (2018) Japan's Energy 2018. Retrieved from https://www.enecho.meti.go.jp/en/category/brochures/pdf/japan_energy_2018.pdf.

[46] https://www.eia.gov/beta/international/analysis_includes/countries_long/Japan/japan.pdf.

[47] Climate Action Tracker (2019). Japan Country Summary. Retrieved from https://climateactiontracker.org/countries/japan/.

[48] Gronewold, N. (2019). Momentum Builds for Hydrogen Fuel in Japan, Australia. Retrieved from https://www.scientificamerican.com/article/momentum-builds-for-hydrogen-fuel-in-japan-australia/.

9.2. The Impacts of the U.S.-China Trade Conflict

Expert insights: The impacts of the U.S.-China trade conflict on Japan

Japan's economy relies heavily on both the U.S. and China, with roughly 20 per cent of the country's exports going to each country. As a result, any trade conflict between the two economic superpowers will inevitably have negative effects on Japan's economy. However, Japan has the potential to occupy export niches that may be vacated by U.S. tariffs, effectively barring some Chinese goods from being imported in the U.S. Although Japan is more closely linked overall with the U.S. and China has often been viewed as an adversary, the country is trying to maintain neutrality in the current conflict so as to maintain its economic ties with both the U.S. and China. Japan's primary decarbonisation plans are centred around domestic policies, and the experts interviewed for this study believe that the impacts of the trade conflict between the U.S. and China will be limited.

Expert insights: The impacts of the U.S.-China trade conflict on energy security and energy exports in Japan

Since the Fukushima nuclear accident in 2011 there has been a resurgence in the reliance on fossil fuels, especially natural gas, for power generation in Japan as a replacement for lost nuclear energy output. The experts noted that this reliance on imported energy, especially oil, which has seen price fluctuations as a result of the trade conflict, reduces Japan's overall energy security. Although this higher reliance on energy imports poses risks to Japan's energy security, the experts believe that long-term energy contracts signed with trade partners, such as Australia, Qatar, and Saudi Arabia, will prevent major negative impacts brought on by the U.S.–China trade conflict to Japan's energy security. However, these experts identified some areas that could experience indirect impacts from the trade conflict.

In Japan, solar PV used to be a domestic resource as the components were manufactured locally and the technology used was Japanese. As China progressed with developing cheaper solar panels on a large scale, Japan has become reliant on imports for its solar transformation to the point where it cannot compete with China in the manufacture of solar modules. The experts cautioned that solar is the primary area of growth into which Japan is moving for renewable energy, and that it is still reliant on imports in this sector. This reduces the associated energy security benefits of transitioning to renewable energy as Japan's fastest-growing domestically produced energy sector continues to rely on foreign trade. Any upheaval in China's solar PV or battery production as a result of the U.S.–China trade conflict therefore threatens Japan's energy security. Japan may experience short-term benefits from such an upheaval as China's solar PV manufacturers look for alternative markets in light of losing access to the U.S. market, but as one of the experts noted, this will only further threaten Japan's energy security in the long run as it maintains its reliance on imports.

"If Japan becomes too dependent on batteries imported from China, because our batteries needed are using a lot of lithium which is largely produced in China, this heavy dependence could raise concerns in Japan under the uncertainty due to the trade conflict." – Economic Research Institute

If the current trade conflict were to escalate, one of the experts noted that any sanctions on the infrastructure related to solar technology such as Huawei solar inverters and batteries could also be caught in the crossfire as the technology company remains a source of contention between the two countries over its 5G technology. Trade tensions could cause the U.S. to impose stricter restrictions on not only Huawei's 5G technology but also on its renewable technologies. Given Japan's close ties with the U.S., a trade ban such as this from the U.S. on cheaper and high-quality solar equipment could cause some impacts and repercussions for Japan's renewable energy development and its energy security.

With U.S. shale gas no longer going to China because of high tariffs, the U.S. is looking for new markets with which to trade. Japan currently has long-term contracts with Qatar and Australia for their LNG, but with these contracts set to expire in the coming years, the U.S. may look to capitalise on its relationship with Japan and push for contracts involving U.S. LNG that was otherwise destined for China, but has been displaced by the current trade conflict. This trade conflict would therefore contribute to the outcome of significantly changing Japan's import partners.

"Geopolitically, it means something to sign a longer-term contract, especially when Qatar and Australian contracts for LNG provision are coming to a close in the next couple of years. U.S. companies are really targeting those contracts." – Political Economist

However, another expert mentioned that China's gas imports are increasing irrespective of the current trade conflict, and that any benefits that Japan may experience from lower-priced displaced U.S. shale gas on the market will be offset by the rise in price prompted by China importing from other sources.

Expert insights: The impacts of the U.S.–China trade conflict on decarbonisation in Japan

Most of the experts interviewed for this study do not believe that Japan's decarbonisation efforts will be greatly affected by the U.S.–China trade conflict, though some believe that the conflict may have some bearing on Japan's ambitious goals around decarbonisation if the U.S. and China are unable to come to an agreement on trade. These experts gave several scenarios in which Japan's decarbonisation could experience secondary impacts as a result of the trade conflict but believe that the trade conflict will have only limited impacts because Japan's hurdles to achieve a lower carbon economy are primarily domestic.

One of the experts pointed to Japan's already high energy costs and suggested that an economy that is so heavily reliant on both the U.S. and China could easily experience an economic slowdown as a result. S/he suggested that in this event, the Japanese government would be unlikely to promote the transition to renewable energy as this would have associated energy costs, thereby slowing the country's decarbonisation journey.

"We have to survive economically, and climate change mitigation entails costs. If these measures put too high a cost on the energy sector, that will raise the already high energy costs; therefore, Japan will become more resistant to pursuing expensive policies for decarbonisation and will look for low-hanging fruits in energy efficiency instead." – Economic Research Institute

While some of the experts believe that Japan's decarbonisation plans will remain fixed in the face of a possible escalation of tensions, one of the experts believes that Japan is influenced extensively by foreign actors with regard to its decarbonisation ambitions, and especially by the U.S. and China. If the trade conflict affects their decarbonisation journeys because of economic slowdown or other factors, and these countries become less ambitious with their goals, this expert believes there will be negative knock-on effects on Japan's goals.

Expert insights: How can Japan react to the current climate of instability?

The experts suggested a number of ways in which Japan can mitigate the threats associated with the trade conflict and potential economic issues. One of the experts noted the success of Japan's Top Runner Programme[49] which has been improving the energy efficiency of energy-intensive products, such as home appliances and motor vehicles, since 2009. S/he remarked that there was still room for improvement and expansion of this programme, and that the associated energy savings will have a significant impact on reducing energy demands.

"Energy-efficient technology or energy savings have to be more vigorously considered and treated as a kind of a virtual domestic energy resource." – Professor

Several of the experts mentioned the return to nuclear power as a potentially important energy source in Japan's decarbonisation strategy. One of the experts believed that abandoning nuclear entirely would be "completely absurd" given the capacity in Japan and the Japanese technology that has been developed around nuclear. The experts noted that any talks around restarting the nuclear programme in Japan will have to be approached sensitively as there is still a significant lack of trust in nuclear technology in Japan.

The experts believe that hydrogen fuel cells offer a way for Japan to rely more heavily on fuel generated via green technologies, and that Japan should continue to invest in research, development, and testing of hydrogen as a viable alternative to current energy sources with the aim of reducing the cost needed to produce hydrogen for use in the next ten years.

Kazakhstan

10.Kazakhstan

Kazakhstan – overview	
Key background points	• One of the world's largest sources of primary energy resources including oil, gas, coal, and uranium and a net exporter of energy. • Significantly more closely economically tied to China than the U.S. • A regional driver of renewable energy despite an abundance of fossil fuels.
Key expert insights	• Unlikely to be affected by the trade conflict due to its high self-reliance. • Negatively affected by changing oil prices as a result of fluctuations caused by the trade conflict. • The trade conflict could allow Kazakhstan to increase energy exports to China. • Strategy for decarbonisation is unlikely to be affected by the trade conflict. • Should not become too reliant on Chinese solar panel imports that are abundant in the market as a result of the trade conflict as this will impact long-term security in this sector.

10.1. Background - Energy Security and Decarbonisation

Kazakhstan has ample fossil fuel reserves and is one of the world's largest sources of primary energy resources including oil, gas, coal, and uranium. Although the country has the largest land area in Central Asia, its low population poses many challenges for the country in providing reliable, affordable energy to its citizens, especially with the high concentrations of people in the south of the country compared to the hotspots of energy generation in the north. On the back of its hydrocarbon resources, Kazakhstan has become the largest economy in Central Asia, but is still only 16 per cent the size of the next smallest economy in this study (Indonesia) and just over 1 per cent the size of the economy of China. Given the close proximity and shared land border, Kazakhstan is more economically tied to China than the U.S., with China being the second-most influential import market (after Russia) and export market (after Italy). The trade flow from the U.S. to Kazakhstan is 27 per cent the size of the trade flow from China, and exports to the U.S. are only 7 per cent of those to China.[50]

Kazakhstan is one of the most energy-intense countries in the world.[51] Like Australia, Kazakhstan has a large natural resource endowment of coal, uranium, and natural gas, and is a net exporter of energy; in 2018, Kazakhstan's energy production covered more than twice its energy demand.[52] Kazakhstan exports uranium but does not currently have

[50] World Bank: World Integrated Trade Solution (WITS) data.

[51] Energy intensity is a measure of the energy inefficiency of an economy. High energy intensity indicates a high price to convert energy into GDP.

[52] IEA World Energy Statistics and Balances 2017.

a nuclear power generator. Although nuclear is something which is being considered by the government for future growth, it is not experiencing widespread support. Kazakhstan is a net exporter of oil and is the 10th-largest exporter of crude oil in the world.[53] Kazakhstan has high yet currently underutilised potential for renewable energy but is taking the lead in Central Asia in the development of its renewableenergy sector.

Because of the wealth and diversity of its natural resource endowment, Kazakhstan is very energy secure. Energy tariffs are very low because of the abundance of these natural resources and because there are still subsidies in place, meaning that energy is very affordable in the country, a bonus for energy security. However, because the energy grid system in Kazakhstan comprises three grids that are not well interconnected, the North and East of the country produce an excess of energy which it then exports, and the South and West of the country have an energy deficit and rely on imports from Kyrgyzstan, Turkmenistan, and Russia. Although it has large natural reserves of gas and high potential for renewable energy, Kazakhstan relies heavily on coal, especially for heat generation, and recognises the need to diversify its energy mix in the future. In its 2050 strategic plan, Kazakhstan aims to increase "efficiency in resources utilisation, proposes measures for modernization of existing infrastructure, and protection of the environment [to enhance] the energy security of Kazakhstan."[54] As part of this same plan, the country also intends to keep a reserve of hydrocarbon raw materials as a basis for future energy security.[55]

Kazakhstan is heavily dependent on fossil fuels, with crude oil representing 45 per cent of its total exports and fossil fuels representing 99 per cent of the country's total primary energy supply (TPES).[56] Because of this, there is the potential for Kazakhstan's economy to be negatively impacted by a global move towards renewable energy as the adoption of greener energy practices in line with the SDGs could lead to a 40 per cent drop in Kazakhstan's fiscal revenues.[57] Currently, Kazakhstan has only a small percentage of its energy mix made up of renewable energy, and the renewable energy sector is dominated by ageing hydropower plants from the Soviet era.[58] Although the current energy situation makes Kazakhstan an unlikely proponent of the renewable energy agenda, the country is a leader in Central Asia in the push for decarbonisation, with very ambitious targets under the Paris Agreement. This is in part driven by concerns over air quality in the country, with the public increasingly frustrated over recurring instances of black snow in the winter.[59] Kazakhstan now has both solar farms[60] and wind farms,[61] and is partnering with Russia to build a solar farm in the northern part of the country.[62]

[53] Central Intelligence Agency: The World Factbook – Crude oil exports.

[54] Concept for the Development of the Fuel and Energy sector until 2030 (2014).

[55] Abildayev, A. (2018). The problem of energy security in politics of Kazakhstan. Retrieved from https://cyberleninka.ru/article/n/the-problem-of-energysecurity-in-politics-of-kazakhstan/viewer.

[56] IEA Data and Statistics 2017.

[57] Bishop et al. (2018). The fiscal implications for Kazakhstan of worldwide transition to a greener global economy. European Bank for Reconstruction and Development.

[58] Reuters (2018). Central Asia's unlikely green champion. Retrieved from https://www.reuters.com/sponsored/article/central-asias-unlikely-greenchampion.

[59] Cohen, A. (2019). Oil-Rich Kazakhstan Begins The Long March Towards Renewables. Retrieved from https://www.forbes.com/sites/arielcohen/2019/10/18/oil-rich-kazakhstan-begins-the-long-march-towards-renewables/#7fd0e37835c6.

[60] Kazinform (2018). Biggest solar farm in CIS built in Kazakhstan. Retrieved from https://www.inform.kz/en/biggest-solar-farm-in-cis-built-inkazakhstan_a3477048.

[61] Samruk Energy (2018). The wind power plant in Ereymentau city produced over 500 mln.kWh. Retrieved from https://www.samruk-energy.kz/en/press/news/i3888.

[62] Renewables Now (2017). Russia's Hevel begins building 100-MW PV farm in Kazakhstan. Retrieved from https://renewablesnow.com/news/russiashevel-begins-building-100-mw-pv-farm-in-kazakhstan-658252/.

10.2. The Impacts of the U.S.-China Trade Conflict

Expert insights: The impacts of the U.S.-China trade conflict on Kazakhstan

As an oil exporter, the economy of Kazakhstan stands to suffer from a reduction in oil prices, as brought about by political uncertainty as is occurring in the U.S.–China trade conflict. A protracted conflict that could drive an economic slowdown in China and elsewhere would also affect Kazakhstan's ability to grow its economy through fossil fuel exports, as the price and demand for energy would decrease. This could be particularly damaging to Kazakhstan as oil revenue represents 30 per cent of the country's GDP (2017). However, a move toward protectionism is not likely to harm Kazakhstan as much as it would other countries because so many of their exports are commodities and countries such as China will still need them.

Kazakhstan aims to remain neutral in the trade conflict between the U.S. and China as it has ties with both countries. There may be direct impacts to the Kazakhstani economy from the trade conflict because of fluctuating oil prices and because China is a large trading partner for the country, but Kazakhstan is more likely to be influenced by the Russian than Chinese economy. The Kazakhstani economy is closely linked with the Russian economy and any significant changes in Russia will also affect Kazakhstan. If Russia uses the trade conflict to foster close ties with China, this could be of benefit to the Kazakhstan economy.

Expert insights: The impacts of the U.S.-China trade conflict on energy security and energy exports in Kazakhstan

Because Kazakhstan is so reliant on its own domestic resources, the experts interviewed for this research do not feel that energy security in Kazakhstan is at risk from a trade conflict between the U.S. and China.

"Nothing really affects the Kazakhstani energy sector because we are self-reliant on our oil, gas, and coal. We basically have everything that we need, and we are not too closely tied to China or the U.S. so a trade conflict between these two countries would not impact us." – Government Centre Researcher

Furthermore, the experts appear confident in the relations between Kazakhstan and Russia, and believe that Kazakhstan could turn to Russia to import energy if there are issues with Kazakhstani energy security.

The experts proposed that Kazakhstan's energy export trade could be affected by the U.S.–China trade conflict. They believe that worsening relations between the U.S. and China could open up markets in China for energy, as the U.S. faces tariffs on its LNG and oil that make it unfeasible to export these commodities to China. This gap in the market could be filled by Kazakhstan as China looks elsewhere for its resources, which could have long-term positive impacts on Kazakhstan's energy exports.

Expert insights: The impacts of the U.S.–China trade conflict on decarbonisation in Kazakhstan

According to the experts interviewed for this study, the U.S.–China trade conflict is not expected to significantly impact Kazakhstan's decarbonisation plans. The Kazakhstani government has high levels of fossil fuels in its energy mix, especially coal which accounts for 70 per cent of the country's electricity generation. This coupled with growing frustration among the public about a deteriorating environment has raised decarbonisation to a high priority in the country. Despite the global trade and economic uncertainty caused by the U.S.–China trade friction, experts believed that the long-term climate targets in Kazakhstan and the strategy for reaching them will remain unchanged and will not be affected by external factors such as the trade conflict.

"The trade conflict has no impact; Kazakhstan's decarbonisation is a separate issue which is driven in part by climate agreements and in part by local concerns about environmental quality." – Sustainability and International Development Expert

"The commitments that we have made are based on the international treaties that were established five years ago and they have not changed. We are moving toward those goals and we are not changing this." – Government Centre Researcher

If the Chinese economy and/or the global economy experience a slowdown, experts believe that Kazakhstan's decarbonisation journey could be indirectly affected. As the Kazakhstani economy is heavily dependent on oil, it may be particularly susceptible to a reduction in oil prices caused by the U.S.–China trade conflict. According to one of the experts, this may help limit the addition of coalfired power plants in the country. S/he proposed that when the economy is growing quickly, there are plans for new coal-fired plants which, when the economy slows, will no longer be necessary. S/he believes that modest economic growth in line with the population growth will provide the best conditions for an uptake of renewable energy. A slowdown of the Chinese economy could result in China purchasing less fossil fuel from Kazakhstan, but one of the experts noted that the small size of the Kazakhstani economy in comparison to that of China and the share of energy resources flowing to China are minimal so that the impact would likely be limited.

Kazakhstan has increased its imports of Chinese solar panels. With market volatility caused by the trade conflict, the experts suggested that the implications of this could be seen in the decarbonisation of Kazakhstan as availability and prices could be unsteady, which affects the country's imports of Chinese solar components and its energy transition.

Expert insights: How can Kazakhstan react to the current climate of instability?

The experts believe that in order to mitigate threats to Kazakhstan's energy security and decarbonisation, the country should continue on its current path. Trade tensions should be monitored because Kazakhstan's GDP is dominated by energy trade and would be affected by dramatic changes, especially in the price of oil. The experts also mentioned that Kazakhstan should closely monitor the impacts that the trade conflict is having on Russia, as the Kazakhstani economy is closely linked with the Russian economy. Continuing to cooperate with Russia can help alleviate possible energy security or energy export concerns for Kazakhstan.

In terms of Kazakhstan's renewable energy development, as reliance on exports from China for its renewable components is growing in order to facilitate Kazakhstan's energy transition, the experts see the need to diversify its sources, especially of solar PV, in case there are issues with a lack of availability or an upsurge in the prices of these materials from China.

11

South Korea

11. South Korea

South Korea – overview	
Key background points	• One of the most import-reliant countries in the world for its energy. • Has a sufficiently diverse range of countries from which it imports energy. • The current government has prioritised energy transition and decarbonisation. • Has enjoyed military protection from the U.S. for decades but has very close economic links with China.
Key expert insights	• The effects of the trade conflict are not as strong as domestic influences on energy security and decarbonisation. • It does not appear that the government has implemented adaptive or cautionary measures to increase energy security in response to the trade conflict. • The U.S. may push South Korea to import U.S. LNG at the end of long-term contracts to account for China importing less U.S. LNG. • Transition to renewable energy could be accelerated by cheap Chinese solar panels that are no longer going to the U.S. • An economic slowdown as the result of the trade conflict could slow down the transition to renewable energy. • Proponents of nuclear energy may use the trade conflict as proof of the need to further energy security by expanding this sector.

11.1. Background - Energy Security and Decarbonisation

South Korea is Asia's fourth-largest economy after China, Japan and India, and the 11th largest in the world. With limited commercially viable raw materials for energy and a slow transition to renewable energy, it is one of the most import-reliant countries in the world for its energy. The country has enjoyed military protection from the U.S. for decades but has very close economic links with China, which is the country's largest import and export partner. China represents a trading partner twice the size of the U.S. for both imports and exports, and Chinese tourism is an important contributor to the South Korean economy despite historical tensions.[63]

South Korea has a very poor natural resource endowment; coal deposits in the country are too expensive to be mined commercially compared to imported coal, there are no proven oil reserves in the country, and it has very little gas reserves left. The country therefore relies heavily on

[63] Brauer, R., Badenheim, A. (2019). Trump, China, and Europe: What Remains of the "Pivot to Asia". Konrad-Adenauer-Stiftung.

imports of oil, coal, and natural gas, as well as having a comparatively large nuclear power programme. It ranks among the world's top five importers of coal, crude oil, liquefied natural gas (LNG), and refined products.[64]

South Korea is one of the most prominent users of nuclear energy in the world and exports its technology widely. After the 2011 Fukushima disaster and an incident in 2012, South Korea has reduced its ambitions regarding nuclear power and the current government has brought in a plan to phase out nuclear power over a 40-year period.[65] The decline in nuclear power as an energy source is set to be replaced by gas and renewable energy, as coal is also predicted to decline in line with government measures. Although the government's stated objective is to phase out nuclear power as an energy generation source, some of the experts interviewed for this study, however, noted that nuclear is being reconsidered.

To increase the country's energy security, South Korea's is promoting the creation of an "Asia Super Grid (ASG)" - a grid aimed at interconnecting the electric power systems of Asian countries to exchange natural renewable energy resources.[66] This pan-Asia energy scheme, which aims to build a power grid connecting South Korea, China, Russia, Mongolia, and Japan has been proposed to resolve concerns over the stability of the power supply to complement the intermittent energy grid system under the energy transformation policy. The ambitious plan, however, is still far from being put into effect as it needs massive investment to build the infrastructure and would involve coordination with North Korea, which is a significant challenge due to heavy international sanctions.

With its reliance on traditional energy sources, South Korea is ranked as the 7th largest carbon dioxide emitter in the world.[67] Unlike previous government administrations, President Moon Jaein, who came to power in 2017, has emphasised the importance of South Korea's energy transition and decarbonisation. Recognising the need to reduce the energy reliance on conventional sources, President Moon has put in place energy transition plans that promote a major shift from the current primary energy sources, specifically coal and nuclear, to gas and renewable energy sources. South Korea has a good natural resource endowment for wind, especially offshore wind, and an average capability for solar, although renewable energy resources currently only account for roughly 3 per cent of the country's energy mix, placing South Korea among the last of the 36 OECD countries with regard to its share of renewable energy in the energy mix.[68]

However, South Korea's energy policy shift is not yielding significant results in the short term. One of the major barriers the country has with reforming its energy sector is KEPCO, which has a virtual monopoly on power generation and distribution in South Korea, despite attempts to unbundle the sector.[69] If South Korea's decarbonisation and energy transition plans come to fruition, the effect may not be seen until the mid-2020s. This leads to growing concerns of the possibility of energy supply shortages during this energy transition, as the installation of new and renewable energy sources might not be completed in time to offset the anticipated electricity shortages.

[64] IEA Key World Energy Statistics 2019 Report.

[65] World Nuclear Association (2019). Nuclear Power in South Korea. Retrieved from https://www.world-nuclear.org/information-library/country-profiles/countries-o-s/south-korea.aspx.

[66] Renewable Energy Institute (2018). About "Asia Super Grid (ASG)". Retrieved from https://www.renewable-ei.org/en/asg/about/.

[67] IEA World Energy Balances 2019.

[68] OECD (2017). OECD Environmental Performance Reviews: Korea 2017.

[69] Kim, B., Lee (2018). Electricity Regulation in South Korea. Retrieved from https://www.lexology.com/library/detail.aspx?g=4a7f6594-b6b4-4249-a928-a0e02ed683e5.

11.2. The Impacts of the U.S.-China Trade Conflict

Expert insights: The impacts of the U.S.-China trade conflict on South Korea

With nearly 40 per cent of the country's exports going to either China or the U.S., South Korea is one of the countries that has been most heavily affected by the trade conflict as a significant downturn in the stock market has caused lower investment rates and a sharp drop in exports from the country.[70] With such high rates of imported energy resources, the experts noted that energy security is of great importance in South Korea and any energy security concerns, such as potential threats from the U.S. – China trade conflict, may be amplified by their energy dependence. As an emerging market for renewable energy, the experts believe that South Korea's decarbonisation policies may not be as firmly rooted in government plans as those of countries with mature, low-carbon markets, and energy transition plans could therefore suffer from an economic slowdown or political upheaval that could come from a protracted trade conflict between the world's two largest economies. Although the U.S.–China trade conflict is negatively affecting South Korea's economy as a whole, the experts believe that the country's energy trade, energy security, and decarbonisation have seen limited direct impacts and that overall, South Korean energy security and decarbonisation will see an adjustment rather than a dramatic impact. However, the experts believe that an economic slowdown as a result of the trade conflict, to which South Korea is particularly susceptible, could be somewhat influential.

Expert insights: The impacts of the U.S.–China trade conflict on energy security in South Korea

In contrast to the other countries in this study such as Australia or Kazakhstan, the experts advise that South Korea's low natural resource endowment leaves it more susceptible to fluctuations in the international energy market. With over 95 per cent import dependence, South Korea's extremely high reliance on foreign energy resources remains its most pressing concern with regard to energy security. Despite this seemingly unstable energy security situation, the experts noted that the government does not appear to have implemented adaptive or cautionary measures to increase energy security in the time since the trade conflict began. South Korea has maintained a diverse group of energy trading partners, and the experts believe that this is the reason why South Korea has been able to maintain its energy security throughout the trade conflict so far.

"We import energy from countries such as the U.S., Australia, Indonesia, and many Middle Eastern countries, so I think in that regard, our trade is diversified. I do not think that the trade conflict between the U.S. and China will directly negatively affect our energy security at this time." – Professor

The experts identified some potential indirect outcomes of the trade conflict on South Korea's import partners and energy security. In the long term, South Korea could shift its energy trading partners, as the U.S. promotes relations with its allies amid its dispute with China. The experts point to the completion of long-term contracts for

[70] Preiss, M. R. (2019). South Korea gets caught in the crossfire of the U.S. – China Trade War. Retrieved from https://www.forbes.com/sitesrainermichaelpreiss/2019/05/31/south-korea-gets-caught-in-the-crossfire-of-the-u-s-china-trade-war/#22079c114d80.

energy between South Korea and countries such as Australia and the energy that would otherwise be going to China from the U.S. arriving on the market, especially LNG. They believe that the U.S. may push for countries such as South Korea and Japan to import more U.S. energy. This could change South Korea's import partners in the long run, but the impacts on energy security would be limited according to the experts.

One of the experts noted that the plan for the ASG, which would provide stability and energy security for South Korea, relies heavily on cooperation and a stable political environment. A trade conflict of this magnitude hinders multilateral cooperation, though another expert noted that the collaboration with North Korea would be an almost insurmountable obstacle to this development, and thus the trade conflict would not have any material effect.

Expert insights: The impacts of the U.S.–China trade conflict on decarbonisation in South Korea

Energy transition is a focal point for the current government, and the experts noted that the transition to renewable energy, especially wind and solar energy, could be affected in several different ways as a result of the U.S.–China trade conflict.

From one perspective, renewable energy is seen as a potential measure that South Korea can take to increase its energy security and the economy as a whole in a time of uncertainty. In the light of an economic slowdown as a result of the U.S.–China trade conflict, the renewable energy sector is being promoted as a way to boost the country's economy as a domestic industry that can provide more jobs to South Koreans.

"The faster the country reduces its dependency on energy imports, the faster it will develop the renewable energy sector, and especially distribute renewable energy, throughout the country." – Council Coordinator

The experts believe that the move to renewable energy could be further facilitated by a glut in cheap Chinese solar panels on the market as a result of U.S. safeguarding policies and tariffs. However, some of the experts argued that the long-term fallout from the government's use of foreign solar panels will be a stagnation of the South Korean solar panel sector. One of the experts noted that this stagnation is exacerbated by South Korean renewable energy companies, such as Hanwha Q Cells relocating to the U.S. to ensure that they are not affected by tariffs.[71]

"We are wiping out our own solar panel industries in the long term in response to the trade conflict. President Moon wants to push for it during his term and because he needs to do it at such an accelerated speed, he is not really looking into what we are losing in the same endeavour." – Political Economist

From another perspective, some of the experts believe that an economic slowdown will hinder the transition to renewable energy and a low-carbon economy as the government could consider decarbonisation to be of lower priority and revert to its default energy type, i.e., fossil fuels. This may be especially true for South Korea because of KEPCO's virtual monopoly on the energy market: if the company decides that renewable energy is not in its best interest at this time because it is too costly, they might retain the status quo of fossil fuels. In addition, the slower growth of the economy and associated

[71] Flessner, D. (2019) America's largest solar panel plant opens in the Carpet Capital of the World. Retrieved from https://www.timesfreepress.com/news/breakingnews/story/2019/sep/20/solar-panel-plant-dalton-georgia/504030/.

reduction in energy requirements leaves less room for expansion and development of new energy technologies because there is less need for investment to expand capacity, which may be especially true for a country that has recently adopted this technology.

Nuclear energy was promoted heavily in South Korea as a low-carbon option. With the reversal of this trend, South Korea's already volatile discussions on nuclear energy may be amplified by concerns surrounding the trade conflict, according to the experts. Pro-nuclear parties, industry experts, and academics are already lobbying the government to drop its nuclear energy phaseout plan and could use the trade conflict and the associated energy security risks as an argument for rejuvenating this industry. The experts believe that there may be a renewed push from the nuclear lobby in their criticism of president Moon's anti-nuclear agenda if energy security in South Korea appears more unstable because of international politics.

One of the experts noted that increasing protectionism and uncertainty from trade disputes do not seem to affect South Korea's commitment to the Paris agreement and its contribution to the global climate agenda, nor are changes expected due to the existing global trade environment. As long as Moon's policies on energy transition are still in effect, South Korea will be moving closer to a decarbonised society.

Expert insights: How can South Korea react to the current climate of instability?

In order to mitigate the risks surrounding South Korea's high reliance on energy imports, the experts perceive developing domestic energy sources such as renewable energy as crucial in order to diversify the country's energy sources for its energy demand. Aside from renewable energy, domestic nuclear energy production in South Korea could be another viable energy source to further enhance energy security and decarbonisation, as South Korea's nuclear development is among the most advanced in the world. However, controversies and debates around its safety and sustainability in the country would need to be considered.

Seoul has been upgrading the efficiency of its buildings through its Building Retrofit Program and although this has had a positive effect, one of the experts described these major upgrades, which s/he saw as extremely effective thus far, as absolutely fundamental so that South Korea can opt for fossil fuel use, rather than simply offsetting increased energy usage. This would have the added advantage of providing energy security.

"To the extent that South Korea can build out renewable energy and increase energy efficiency, they can cut down on their imports of gas and coal and oil because they could also work on electrification of the transport sector which is the major user of oil and make themselves more energy secure by having lower requirements." – Senior Associate

12

Expert insights: Conclusions

12. Expert insights: Conclusions

There was a consensus among the experts interviewed for this study that the U.S.–China trade conflict is having minor direct impacts and more indirect impacts on the energy security or decarbonisation of the seven key countries assessed in this report. There are a number of reasons why such a major global event is not being perceived as dramatically impacting these countries' energy sectors directly:

- The long-term nature of energy contracts shields countries from volatility caused by changes to commodity availability over a relatively short timeframe.
- Decarbonisation strategies are set out on a timeframe of decades rather than years. Accounting for changes in global politics can require alterations to these strategies but does not generally affect their trajectory.
- Diversification of energy sources has been on the agenda of all of the target countries for many years, as it is perceived as important to continued development. The experts do not believe that the U.S.–China trade conflict is likely to prompt countries to greatly aim to further increase their energy security as this was already so high on their political agendas.
- The trade conflict is about more than just trade, and the attempts by both countries to dominate in various sectors was happening before the trade conflict and will continue in spite of the Phase One trade deal. The trade conflict itself is therefore perceived as causing some adjustments, but not changing the overall direction in which U.S.–China relations are moving.
- For most countries, maintaining good relations with the U.S. and China is a very high priority, as these two countries represent major trading partners. Countries will therefore aim to limit the impacts of the trade conflict by maintaining neutrality.
- Countries are generally driven by their own natural resource endowment, so the issues they face in terms of energy security and decarbonisation are primarily domestic. Although energy security is especially linked to international trade for many resource-poor countries, the interactions between two other countries have less of an effect than their own contracts.

There are, however, secondary impacts that the experts felt would affect some or all of the countries:

A changing market landscape – The restriction of trade caused by tariffs causes a restructuring of the international trade market.

1. With Chinese tariffs reducing the amount of LNG being exported from the U.S. to China, this commodity is available on the market. Long-term contracts for LNG and an abundance of LNG currently on the market limit the immediate effects of this change but as contracts are up for renewal, particularly in Japan and South Korea, the U.S. may make more of an effort to take these contracts from Australia. It remains to be seen how China's commitments to import more energy from the U.S. as part of the Phase One trade deal will affect LNG, but with the 25 per cent tariffs remaining, it will be difficult for China to greatly increase its imports.

2. The effects of the 30 per cent tariffs on Chinese-made solar panels are already being expressed in the abundance of solar panels on the market that are no longer being sent to the U.S. and the experts mentioned that they are cheaper on the international market now than they had previously been. Some countries, such as Indonesia and India have the potential to benefit from this and increase their imports of Chinese solar panels. However, protectionist measures in Indonesia mean that the country does not fully capitalise on the increased and cheaper supply. Additionally, each country's own energy security could be negatively affected by increasing dependence on Chinese imports of energy resources.

3. A reduction in trade caused by tariffs leaves other countries with opportunities to exploit the gap in the market. India was mentioned as a country that could benefit from the U.S. looking elsewhere for solar panels if it can occupy the niche vacated by China, but this would require a major increase in production capability.

The trade conflict may have psychological effects – although countries are always striving towards energy security and the experts in this study do not feel that the trade conflict is having a primary effect on countries' energy security or decarbonisation plans, they note that in the long term, proponents of protectionism or of certain energies may use the trade conflict as a reason to promote their agenda.

1. Nuclear energy is in global decline and in Asia Pacific it has been affected greatly by the 2011 Fukushima disaster. However, advocates continue to promote its use as an energy secure, low-carbon energy. Pro-nuclear commentators, in South Korea for example, can use the trade conflict as an argument to move back towards this form of energy generation. Similarly, the trade conflict can feed into arguments by China to return to coal generation.

Uncertainty does not foster energy transition – in a more volatile, uncertain world, with a greater degree of protectionism and unilateralism, transitioning to renewable energy is more difficult.

1. The advances needed for creating technologies to improve the efficiency, affordability and reliability of renewable energy are hampered by a lack of collaboration brought on by a protracted trade conflict.

2. A greater need to focus on energy security reduces the options available for countries to implement new energy generation methods and makes countries more likely to fall back on traditional carbon-intensive methods.

3. Uncertainty swings between parties and divisive politics hurt long-term planning. This affects investment in renewable technologies and development because investors don't know what the political landscape will look like in the future.