Center for Security Studies

# STRATEGIC TRENDS 2018

## Key Developments in Global Affairs

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# Acknowledgments

*Strategic Trends* is an annual publication of the Center for Security Studies (CSS) at ETH Zurich. It aims to offer a concise analysis of major developments in world affairs, with a primary focus on international security. Providing interpretations of key trends rather than a comprehensive survey of events, *Strategic Trends* targets a broad audience ranging from policy-makers to the media, academics, and the general public. *Strategic Trends 2018* is the ninth issue in the series.

The publication series is available for download at the website of the Center for Security Studies (www.css.ethz.ch/publikationen/strategic-trends.html).

As always, we would like to thank this year's authors, Jack Thompson, Brian Carlson, Severin Fischer, and Tim Prior. In addition, a large part of the burden fell on the CSS' Miriam Dahinden-Ganzoni (graphic design and layout) and Céline Barmet (data collection, graphic design and proofreading). They worked exceptionally well, independently, reliable, and made our job thereby much, much easier. Last but not least, the quality of this book was ensured through the language editing by Christopher Findlay.

Many believe that the world is an ever more dangerous place today. Indeed, the relationships between the three big actors USA, Russia and China are becoming more complicated. At the same time, new technologies may make energy resources more easily available, however resulting in significant changes for energy markets. While there are still many conflicts to be resolved, resilience can offer a response in the highly complex threat environment. Hence, the picture is not necessarily as dark as it is often portrayed.

We hope you enjoy reading *Strategic Trends 2018.*

Should you have any feedback, please do not hesitate to contact us at oliver.thraenert@sipo.gess.ethz.ch and zapfem@ethz.ch.

With best regards from Zurich,

*Oliver Thränert*
Head of Think Tank at CSS

*Martin Zapfe*
Head of the Global Security Team

# A Fragmenting World – Does the West Have Any Answers?

As has been the trend in recent years, 2017 was characterized by significant changes in international politics, highlighting the growing complexity of the world we live in. It seems increasingly difficult for Western policy-makers to find the right mix of foreign and domestic policies to deal effectively with a fragmented world order. Further complicating matters are growing differences within the Western world regarding security, trade, and global (sustainable) development. The conflicts in Syria, Afghanistan, and Eastern Ukraine do not appear close to resolution, and the situation in Iraq remains fragile. The intensification of the North Korean nuclear crisis was another worrisome development. There were also major developments in cross-cutting areas such as trade and energy relations. The US is beginning to take advantage of its role as the world's largest hydrocarbon producer, and OPEC is desperately looking for partners and a new mission within a rapidly changing international energy landscape.

Although this general view gives us some reason to worry about the state of the world, we also see some signs of consolidation. The world is starting to accept US President Donald Trump as the new normal in the White House, although the full effect of the new administration's agenda will not be clear for some time. Trump's calls for other NATO members to increase their material contributions to the alliance have set the tone in this respect. At the same time, Trump's White House continues to send conflicting signals. The president frequently suggests that the US will pursue a more unilateralist and nationalist agenda, even as many other officials signal a desire for continuity in most areas. This mixed

message can be seen in the new "National Security Strategy" of December 2017, which promises to put "America First" even as it reiterates the importance of alliances and trade agreements.

An extended period of uncertainty about the US role in the world gave China an opening to present itself as a new stabilizing force in the international system. China enjoyed continuity in its domestic affairs, with President Xi Jinping beginning his second five-year term in office and, with the elimination of constitutional provisions limiting him to two presidential terms, showing every intention of remaining in power much longer. One year ago, during the 2017 World Economic Forum in Davos, Xi portrayed his country as a leader in global governance that would strive to uphold the international trading order and the Paris Agreement on climate change. Although these claims were somewhat exaggerated, they underscored the opportunity that the Chinese leadership perceives in the West's turmoil. Reflections on all these developments can be found, in one way or another, in the contributions to this year's *"Strategic Trends 2018".*

In the first chapter, *Jack Thompson* looks at the new foreign policy of the US under President Trump. In his view, the US will remain the most important player in global affairs, but is struggling to adapt to the evolution of the international system and will be more vulnerable than ever to changes in the geopolitical landscape. At the same time, the new administration has expressed ambivalence when it comes to playing its traditional role in leading the Liberal World Order and shows little willingness to engage in questions of international governance, which poses new security questions for the Europeans.

Managing relations with Russia and China will be among the main challenges that the West will face in the coming years. *Brian Carlson* examines the China-Russia relationship and its effects on world politics. The two countries have built an increasingly close relationship, which is apparent in arms sales, energy, and cooperation in addressing the North Korean nuclear issue. This trend is likely to continue, though the relationship will be increasingly tilted in China's favor.

China is also an important factor in *Severin Fischer's* chapter on the impacts of technological change in the energy sector. In his view, China will be the dominant player in the world of new and clean technologies, notably solar and batteries. This could be good for development goals and limiting global warming,

but not necessarily for the influence of the Western world in other regions. At the same time, the US is re-entering the hydrocarbon markets as a supplier due to increased hydraulic fracturing and mixing up existing power relations. In this context, the role of infrastructure will massively change in the coming decades.

Within this changing, and increasingly complex, international system, calls for improving national resilience across different sectors in states and economies are becoming louder. *Tim Prior's* chapter examines the growing focus on resilience in Western security policy, particularly with respect to deterring asymmetric threats. He explores how systemic changes in governance arrangements, embodying networked approaches that match the nature of the 21st-century threat landscape, could present advantages in addressing security issues in the international system.

CHAPTER 1

# Superpower Constrained

*Jack Thompson*

The US' longstanding role of international leadership is under threat. It is struggling to manage external challenges, including great power competition and globalization, and domestic constraints, such as underfunding and mismanagement of the military and diplomatic corps. Unfortunately, prospects for reform are uncertain given the dysfunctionality of the US political system. This should worry European policymakers and will hopefully hasten their efforts to develop a more robust and independent Common Security and Defense Policy.

US President Donald Trump returns to the White House after addressing the Republican Congressional Retreat, 1 February 2018. *Yuri Gripas / Reuters*

**Introduction**

The United States enjoys an unrivaled ability to shape world affairs. Thanks in large part to its leadership of and participation in the liberal world order (LWO), US military might is unequalled, its economy is the largest in the world, and the US dollar's status as the most important reserve currency provides enormous benefits. Soft power is another area of advantage, with US culture in particular commanding global influence.

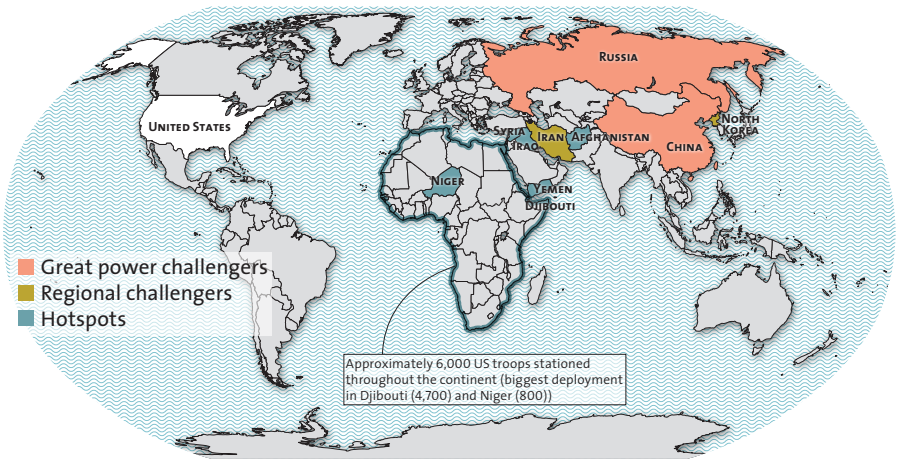
However, this favorable state of affairs is under threat. Partly, this is due to structural changes in the international system. With the rise of persistent global and regional challengers, the post-Cold War "unipolar moment" has ended, and US military and economic predominance are no longer assured. Globalization and technological change have accelerated the process, fragmenting power, diffusing information, and weakening support for international trade and democratic values. Even its soft power could be at risk, as political and economic dysfunction undermine the US' image abroad.

If the US is to reverse these trends, to retain a position of unquestioned leadership in world affairs, and to preserve the LWO, it will need to get its house in order. There is little policymakers can do to reverse the structural changes to the international system, but they have the power to deploy US troops more carefully, to manage the military and diplomatic corps more intelligently, and to address the underlying causes of opposition to international trade and declining attachment to democratic norms.

Unfortunately, a vigorous reassertion of US leadership appears to be unlikely. Demanding deployments and – in light of its many commitments – inadequate budgets have left the military in a state of crisis. The diplomatic corps is also struggling under the weight of poor leadership, a sharp reduction in numbers, sinking morale, and the prospect of reduced funding. Some of these problems are specific to Donald Trump's presidency, but the problems go much deeper than the current administration.

In other words, reform is unlikely. There is little indication that the political will exists, or that the system is equipped to accommodate the sweeping changes that would be necessary to turn things around. Washington remains hamstrung by gridlock, which reflects the polarization that has divided society in recent decades. It seems likely that the US will continue to face significant constraints for the foreseeable future. In the meantime, its rivals are gaining ground, and the

**The Return of Geopolitics from a US Perspective**




Sources: Kathryn Watson, "Where does the U.S. have troops in Africa, and why?", in: *CBS News* (21.10.2017); International Institute for Strategic Studies (IISS), *The Military Balance 2018* (Routledge, 2018), 59.

world is becoming less conducive to liberal internationalist values such as democracy, free trade, and the rule of law. This state of affairs should worry Europeans, as their foreign and security policy relies upon vigorous international engagement by the US.

## The Return of Geopolitics and the Forever War

The apparent post-Cold War triumph of the LWO has proven illusory. Instead, the US and its allies face a fractured, multipolar system that is rife with threats, especially from revisionist powers. What Walter Russell Mead dubbed the "return of geopolitics" represents – as the Department of Defense's 2018 National Defense Strategy acknowledges – "the primary concern in U.S. national security".

Two nations, China and Russia, have not reconciled themselves to the current international order and constitute the foremost threat to US leadership and the future of the LWO. China resents US predominance and is positioning itself as a rival superpower. Though Beijing is challenging US interests across the globe, its priority is to upend the status quo in East Asia, where the US has long served as the fulcrum for the region's power structure. Much as the US asserted itself in the Western Hemisphere in the early 20th century by forcing European nations to acknowledge its

preeminent role, China seeks to replace the US as the leading power in its neighborhood.

Though the US position remains strong, recent political and economic developments have drawn attention to Beijing's growing influence. President Trump's decision to withdraw the US from the Trans-Pacific Partnership trade agreement – which excluded China, and which the administration of Barack Obama viewed as a way to reinforce its standing in East Asia – represented a setback. China quickly moved to fill the vacuum by redoubling efforts to promote an alternative arrangement, the Regional Comprehensive Economic Partnership. This dovetails with a desire to link Eurasia under Chinese economic leadership, embodied in the Belt and Road Initiative, and a long-term goal of establishing footholds in Europe, Latin America, and Africa.

Beijing is also challenging the US and its allies on military, strategic, and technological fronts. It is executing a steady campaign of pressing a long list of territorial claims in the region, including a dispute with Japan over the Senkaku Islands. Even more noteworthy is China's project of creating artificial islands in the South China Sea, several of which it is equipping for military purposes. Their development also serves the broader goal of buttressing Beijing's claim to sovereignty over most of the South China Sea, the world's most important shipping zone. The US contests this claim by regularly conducting freedom of navigation exercises, but has been unable to do anything to slow the reclamation and fortification project. China's development of anti-ship ballistic missiles, which are designed to destroy aircraft carriers, also threatens the ability of the US to intervene in the region. China's nuclear arsenal, though still small when compared to those of the US or Russia, is slowly increasing in size and in terms of its capabilities.[1]

China has moved aggressively to close the gap with the US in the realm of advanced technology, with considerable success. When it comes to artificial intelligence, for instance, China has announced a goal of becoming the global leader by 2030, and is already closing in on the US. China is also a powerful player in the cyber domain and is using its influence to shape the global development of the internet in ways that are conducive to its own interests, but not necessarily to those of the West.[2]

Like China, Russia seeks to undermine US leadership, which it views as the foremost hurdle to its return

to superpower status. Vladimir Putin's campaign to revivify Russian power has enjoyed considerable success, even if the economic resources at his disposal are more modest than China's, and much of his progress has come at the expense of the US and its allies. Military interventions in Georgia and Ukraine – nations that harbored ambitions of drawing closer to the European Union (EU) and/or the North Atlantic Treaty Organization (NATO) – elicited condemnation and economic sanctions from the West. However, these have done nothing to impair Moscow's aggressiveness, which includes frequent violations of NATO airspace. Even Moscow's interference in the 2016 US elections, the full extent of which remains unclear, has yet to elicit an effective US response.

Russia's intervention in the Syrian civil war appears to have been a decisive factor in the resurgence of Bashir al-Assad's regime and should give Moscow a foothold in the Middle East for the foreseeable future. Meanwhile, in spite of the virtual defeat of the Islamic State, the return on Washington's investment of money and troops in Syria has been more modest. Nevertheless, former Secretary of State Rex Tillerson recently announced that US forces will remain in Syria for the foreseeable future, thereby adding further strain to an overstretched military.

The US is also confronted by regional powers that resent the status quo. The speed with which North Korea has developed intercontinental ballistic missiles that might already be able to reach the US mainland, and Pyongyang's unwillingness to trade its nuclear weapons program for relief from economic sanctions, has left policymakers with a series of unappealing choices. They could accept North Korea as a nuclear power and rely on deterrence. However, Kim Jong-un's regime is particularly brutal and regularly transgresses international laws and norms. It views a nuclear arsenal as more than merely a defensive investment. Rather, it has a history of engaging in brinkmanship to extract concessions from the US and the rest of the international community.

One alternative to deterrence would be an attack designed to destroy most or all of the North Korean nuclear arsenal. The Trump administration is currently considering such a "bloody nose" strike. However, even if a military raid achieved its objectives – and the chances of success would be low – Pyongyang also has extensive conventional armaments at its disposal. These includes a large array of artillery that potentially could inflict catastrophic damage upon Seoul.[3] A third option, relying on North Korea's only close ally, China, to force Pyongyang

to denuclearize has also failed. There are limits to Beijing's ability to dictate to North Korea and it is unwilling to impose conditions that would lead the Kim regime to collapse, as the most likely outcome would be a united Korea closely allied to the US.

Policymakers are also uncertain how to handle the emergence of Iran as a regional power. The 2015 Joint Comprehensive Plan of Action (JCPOA) appears to have halted Iran's nuclear weapons program. However, the president and some of his key advisors have taken initial steps to undermine the JCPOA, and there are indications that they will withdraw from it altogether.[4] Meanwhile, Iranian influence in the Middle East continues to increase. Tehran's expansion has been enabled, in large part, by ineffective US policy over the last 15 years, including the invasion of Iraq in 2003 and the indecisive response to the Syrian civil war.

There are no appealing options when it comes to restraining Iran. The Trump administration complains that the JCPOA, by ignoring the non-nuclear aspects of Iranian expansionism, is worse than no deal. However, withdrawing from the JCPOA would alienate the other signatories – especially the Europeans, who consider the deal to be effective – and allow Iran to restart its nuclear weapons program. The preferred alternative of some hawks – airstrikes on Iran's nuclear facilities – would further destabilize the region. It would also be difficult to hit all of the targets, and even a successful operation would only retard Tehran's nuclear program for a few years.[5]

The Trump administration's attempt to balance Tehran by reinvigorating the long-standing alliance with Saudi Arabia and moving even closer to Israel also brings risks. By siding so decisively with Riyadh and Tel Aviv, the US further undermines its previous status as an honest broker and makes a broader peace agreement in the region between Israel and its neighbors more unlikely. This strategy also ties the US more closely to Saudi Arabia's disastrous intervention in Yemen, which will do nothing to improve the US' image in the region.

US troops have been involved in combat in the Middle East and South/Central Asia for more than 15 years, and the recent announcement of the Trump administration that it is planning for an open-ended commitment of forces in Syria confirms that there is no end in sight to the "Forever War" against terrorism and hostile regimes. The length of this conflict, which constitutes the longest in US history, does not indicate resolve. Instead, it

underlines the inability of the US to obtain its political and military objectives, or even to formulate a coherent strategy for doing so. The prosecution of the Forever War has led to an unsustainable dynamic: The US is fighting on too many fronts and lacks the resources and political will to maintain the present situation. It is a textbook example of imperial overstretch.

If anything, the situation is worsening. Military involvement in Africa is a case in point. It has notably escalated over the last 15 years and now affects almost every nation on the continent. Many soldiers – at least 6,000, according to the Department of Defense – are participating in ill-defined activities such as training or advising, which often entangle them in combat.

Obama was anxious to avoid worsening the problem of overstretch, and Trump, albeit inconsistently, has also criticized the Bush administration's overuse of the military. Yet neither has explained how to prevent it. This suggests that the US is caught in a vicious cycle. Policymakers recognize that they need to use force more intelligently in order to husband finite resources and revitalize an exhausted military, but struggle to extricate the US from its existing obligations. Furthermore, the temptation to intervene in new hotspots is ever-present.

**The Downsides of Economic Interdependence and Globalization**

In the decades following World War Two, the US did more than any other nation to create the foundations of the modern era. It encouraged free trade and the lowering of barriers to the flow of capital; US corporations penetrated new markets, taking knowledge and technology with them; and millions embraced US popular culture. The results appeared to be unequivocally positive. Many Americans attained unprecedented standards of living as a result of greater interdependence, and the US economy remains the world's largest and arguably most dynamic.

Nevertheless, in the years since the financial crisis of 2007–2008 the downsides of globalization have become apparent. Indeed, even as the US appears to be thriving, it is also increasingly constrained by many of the forces it was instrumental in unleashing. In spite of strong headline numbers – including an unemployment rate of approximately 4 per cent and an economic expansion of 2.3 per cent in 2017 – there is ample reason for concern. Partly, this can be ascribed to ineffective policymaking at home. Inequality has reached historic levels, and legislators appear to be more concerned with placating wealthy donors than with the need

to rebuild crumbling infrastructure or make university education more affordable.[6]

Changes in the structure of the global economy also present long-term obstacles. The rise of China – facilitated in part by the interdependence pursued by the US – is particularly problematic. In and of itself, the emergence of a strong economic counterweight is not necessarily cause for concern. The economic clout of allies such as Germany, Japan, or the EU – in spite of occasional alarmist headlines – does not generate widespread alarm. However, the threat posed by China is more profound: it is expected to surpass the US as the world's largest economy in the near future, and its ability to influence the global system dwarfs that of other trade competitors.

The scale of China's influence can be seen in the consequences of its rapid growth. The "China Shock"[7] – the inability of labor markets to adjust to competition from China – and other manifestations of interdependence, such as the North American Free Trade Agreement (NAFTA), have led to the loss of millions of jobs, the long-term decline of regions most vulnerable to increased competition, and an increase in political populism, including calls for protectionism.

The nature of the Chinese regime and its geopolitical ambitions also make its status as an economic superpower problematic. In spite of occasional friction between the US and Germany or Japan over trade practices, the fact that they are close allies that hold free elections and embrace the rule of law means that they pose no threat to core US interests – a point that is lost on President Trump. China, by contrast, has failed to democratize. This has confounded many analysts, who argued that accession to the World Trade Organization in 2001 and a long-term program of economic liberalization would force Beijing to reform its political system. If anything, the opposite has occurred, and President Xi Jinping has redoubled the grip of the Communist Party, as well as his own, on the Chinese political system.

This combination of economic power and resilient authoritarianism gives Beijing considerable global sway.[8] China is now Africa's largest trading partner and, in spite of Beijing's official policy of "non-interference" in the internal affairs of other countries, it has gradually expanded its influence throughout the continent. In doing so, it has pursued strategic aims – such as garnering support for its "One China" policy and its model of non-democratic governance – as well

as economic growth.[9] Similar efforts in Latin America pair economic and strategic objectives, such as counterbalancing the strong position of the US in East Asia.[10]

Most worrying is China's growing influence in Europe. It has used promises of investment in the "16+1" group of Central and Eastern/Southeastern European countries to engender closer ties and more sympathy on issues such as human rights.[11] While China's influence is still modest in comparison to that of the US – and is generating opposition in some corners of Europe – its efforts underscore the sweeping scale of Beijing's vision. Furthermore, China's emergence as an alternative to the US when it comes to leading the international community on pressing global challenges, such as trade liberalization or combating global warming, underscores the fact that the US can no longer take predominance for granted.

Regional powers have also harnessed aspects of globalization to increase their ability to frustrate the US. North Korea and Iran have used technology first developed in the West in their quest to attempt to develop nuclear arsenals. North Korea has developed sophisticated cyber capabilities and used them to carry out cybercrime, to infiltrate the political and military infrastructure of adversaries such as South Korea, and to undermine the dissemination of what it views as hostile cultural products. The US has yet to develop an effective response.[12] Because its economy is relatively primitive, retaliatory attacks are of limited value, and until recently, the US has been reluctant to respond with conventional military force for fear of sparking a broader conflict.

Hostile powers and non-state actors alike have discovered that some of the longstanding strengths of the US, such as its democratic form of government and the ability to develop and integrate advanced technology into its economy, render it vulnerable to cyber attacks. Russia's interference in the 2016 election relied on a combination of cyber espionage and collaboration with US citizens. WikiLeaks has caused considerable damage by releasing a large number of sensitive government documents. These data dumps, which have relied on leaks from inside the US national security community and intelligence acquired by state actors such as Russia, have angered allies and damaged US soft power.

As the example of WikiLeaks indicates, globalization has enabled some non-state actors to accrue disproportionate influence. The ability of

terrorist groups such as al-Qaida or the Islamic State to confront the US would not have been possible in the era before modern international travel, mass immigration, and wider access to information about weapons and military tactics. The tendency of the US to overreact, and to pay correspondingly less attention to more acute problems such as global warming, only compounds the problem.

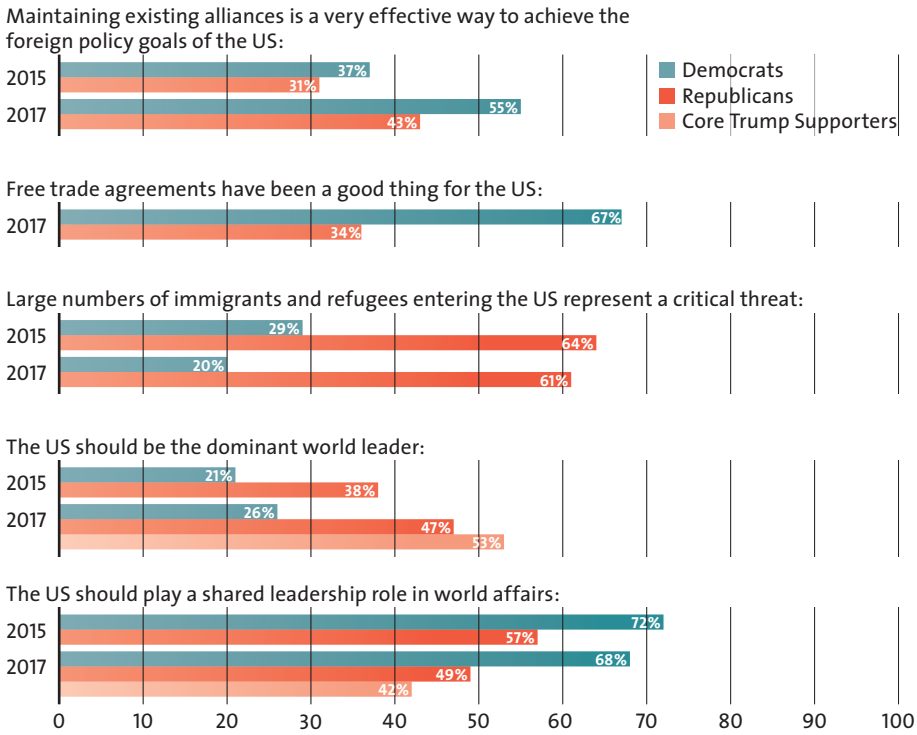
**Domestic Constraints**

Trade liberalization and advances in technology have had a profound impact on US political culture. Political polarization, for instance, has increased in areas that are exposed to increased international trade. Over the last 15 years, congressional districts represented by moderates have tended to replace them with more liberal Democrats or more conservative Republicans. In presidential races, these areas have become more likely to vote for Republican candidates.[13] The results at the national level are striking, as polarization has reached historically high levels and the Republican Party (GOP) is more conservative than at any point in its history.[14]

Related to this increase in partisanship is the tendency of voters who have suffered economically as a result of free trade and/or technological change to embrace radical political views. Many working-class white voters feel that they have lost economic and political status and power.[15] This perception has been amplified by the growing diversity in the US – at some point in the mid-21st century, whites will no longer constitute of a majority of the population – and has fueled support for extremist political ideas and figures, with several notable consequences.

One is decreased enthusiasm for democratic politics and norms – which correlate closely with support for internationalism. This phenomenon is particularly notable among younger Americans, but can be seen throughout the US body politic.[16] The rise in authoritarian values – a preference for order and conformity, especially in times of crisis – and the growing tendency of authoritarians to vote for the GOP, is a manifestation of this tendency.[17] Another is the radicalization of border politics, as a majority of white Americans have come to view immigration as a burden and/or threat.[18] Opposition to free trade has become an important feature of US politics, especially among culturally conservative whites.[19] Support for international alliances is shaky and notably weak among Republicans (though support for NATO remains strong). Even when it comes to broad attitudes

## Public Attitudes Toward International Engagement




Sources: Dina Smeltz et al., "What Americans Think about America First", in: *2017 Chicago Council Survey, The Chicago Council on Global Affairs* (2017), p. 3, 5, 9; Dina Smeltz et al., "America Divided: Political Partisanship and US Foreign Policy", in: *2015 Chicago Council Survey, The Chicago Council on Global Affairs* (2015), p. 12; Bradley Jones, "Support for free trade agreements rebounds modestly, but wide partisan differences remain", *Pew Research Center* (2017).

toward international engagement, which a large majority of Republicans advocate, many in the party – and a majority of Trump supporters – prefer a dominant position rather than a shared leadership role.[20]

When viewed in this light, the election of Donald Trump is not surprising. His withdrawal from the Trans-Pacific Partnership trade agreement; his promise to renegotiate or withdraw from NAFTA and to get tough on Chinese trade practices; his attempts to reduce the number of immigrants, legal and undocumented alike; his ambivalence about NATO; his enthusiasm for illiberal leaders; and his reluctance to condemn white supremacists – all of these policies are acceptable to millions of Americans, and in some instances enjoy the

support of a majority of Republican voters. Many in the GOP political establishment have quickly embraced the Trumpification of Republican foreign policy. (It is also worth noting that in regard to some aspects of international engagement, such as free trade, a large minority of Democratic voters also express skepticism.)

Overstretch, polarization, political dysfunction, and skepticism about internationalist policies have contributed to a crisis in funding and readiness for the military. The problem began with the conflicts in Afghanistan and Iraq, which led to frequent and lengthy deployments for many soldiers and a corresponding drop in morale. This problem has been compounded by certain provisions in the Budget Control Act of 2011 – commonly referred to as sequestration – which was opposed by most members of Congress, but was nevertheless implemented because no agreement could be reached to fund the government. Sequestration has required substantial spending cuts and led to uncertainty about long-term funding streams.[21]

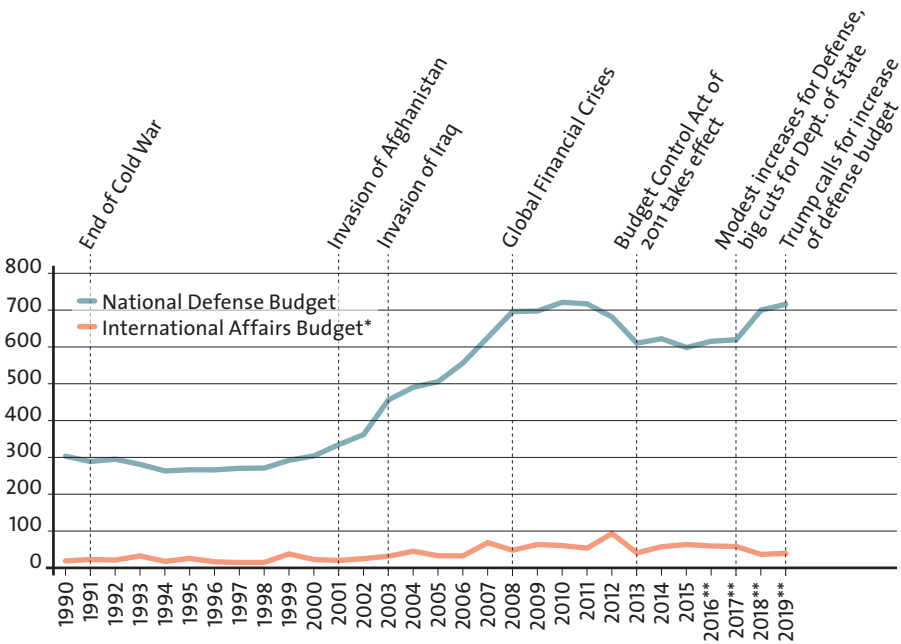
President Trump has called for a sustained increase in military spending, including an upgrade and expansion of the nuclear arsenal that will cost at least 1.2 trillion USD. Although Congress recently agreed to a spending deal that would increase funding for the military over the next two years by 160 billion USD, this is unlikely to include nuclear weapons. Furthermore, though the additional funding is a necessary first step, it will still take time to undo the damage wrought by sequestration. For instance, in the event of a conflict, the Army would only be able to field an estimated three brigade combat teams out of more than 50.[22]

The diplomatic corps is also in a state of crisis. At one per cent of the federal budget, funding for the Department of State and the Agency for International Development is already modest. To make matters worse, the Trump administration has proposed sweeping cuts to these departments – though Congress is unlikely to approve these reductions in full. This indifference to the importance of diplomacy and development, along with mismanagement by former Secretary of State Tillerson, has resulted in a steep decline in morale and a mass exodus of senior diplomats. Meanwhile, a hiring freeze by Tillerson has dramatically lowered the number of incoming Foreign Service Officers.[23]

With the exception of the ongoing disaster at the State Department, it would be a mistake to blame Trump for these developments. Rather, the

**The US National Defense and International Affairs Budget**

1990 – 2019 (in billion USD)




* International Affairs Budget consists of International Development and Humanitarian Assistance, International Security Assistance, Conduct of Foreign Affairs, Foreign Information and Exchange Activities, International Financial Programs

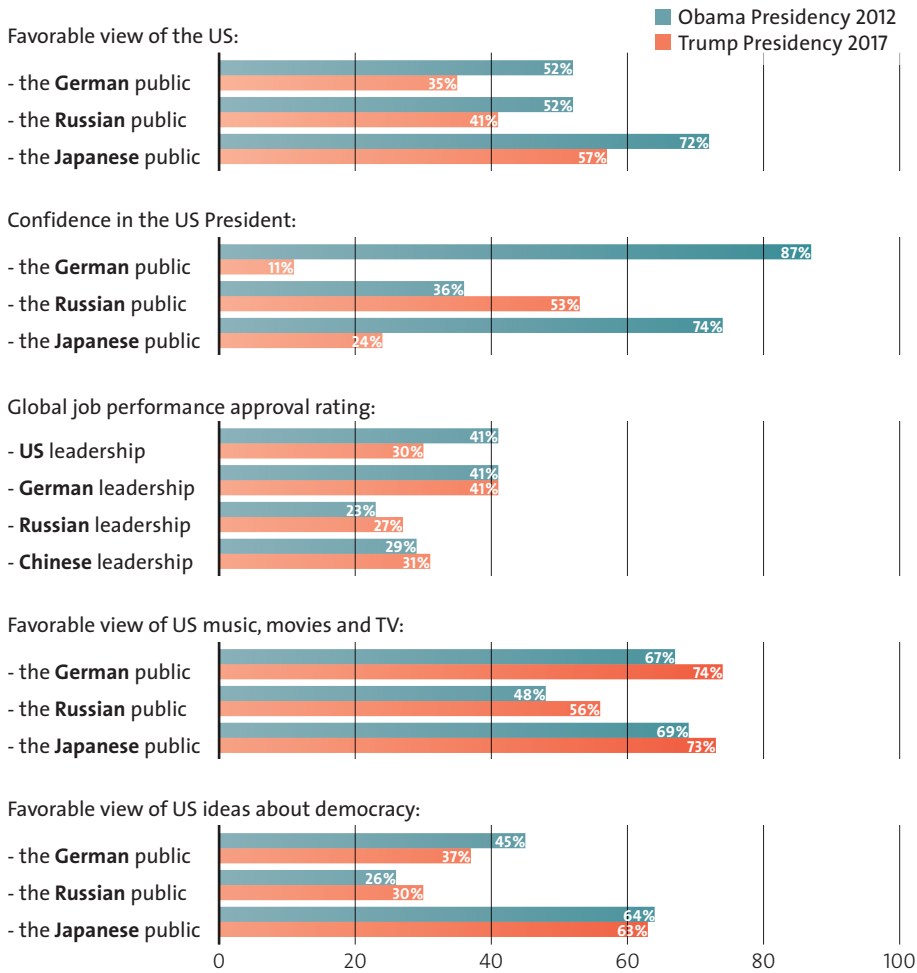
** Estimate

Sources: U.S. Government Publishing Office; Paul Singer, "What's in the senate budget deal? Billions for defense, infrastructure, disasters and more", in: *USA Today* (7.2.2018).

president embodies an evolving political culture in which actual or perceived threats assume disproportionate importance for many. This imposes additional constraints on foreign as well as domestic policy making and makes it more difficult to sustain internationalist policies such as admitting immigrants, promoting trade deals, maintaining alliances, and upholding democratic values.

The rest of the world has noticed. Although there is still widespread admiration for some aspects of the US, such as popular culture, there is widespread unease about its political system and opposition to the spread of its ideas and customs. Partly, these attitudes can be linked to the election of Trump, who is unpopular in all but a few countries.[24] It is also evidence of a wider sense of disquiet about the

## US Soft Power Since 2012




Sources: Andrew Kohut et al., "Global Opinion of Obama Slips, International Policies Faulted", *Pew Research Center* (2012), p. 3, 5, 22–23; Richard Wike et al., "U.S. Image suffers as Public Around World Question Trumps Leadership", *Pew Research Center* (2017), p. 22, 28, 34, 93–94; Gallup (2018), *Rating World Leaders: 2018*, p.2.

future of US global engagement. Approval of US leadership worldwide rose between 2008 and 2016, but has since returned to the low levels that prevailed during the Bush administration. It now ranks on par with China, a troubling omen for those who consider US soft power to be an advantage

in its rivalry with Beijing. Also worrying is that only one-quarter of Europeans approve of US leadership.[25]

**Conclusion: the Consequences of Constraint**

Policymakers face a different geopolitical landscape than their post-World War Two predecessors. The US remains the world's most powerful nation, but its influence is undermined by foreign and domestic constraints that are unlikely to dissipate. Great power competitors such as China and Russia will remain antagonistic – though China, given its economic strength, has a much better chance of sustaining its challenge over the long term.

The downsides of globalization will also endure. Economic interdependence, a source of considerable strength for the US economy, will also continue to fuel inequality and – in combination with cultural conservatism – political radicalization. There is little reason to expect that the political will exists to address this paradox, or that the system is even capable of accommodating the type of changes that would be necessary. On the contrary, the situation appears set to worsen, as key arms of the US foreign policy and national security apparatus – its military and diplomatic corps – are in the midst of crises that could leave them hobbled for years.

Aspects of soft power, such as popular culture and the reputation of its leading universities, will continue to be a strength, but the longer the US is plagued by political dysfunction and radicalization the more difficult it will be to attract talented foreigners and influence other nations. One worrying sign is that after years of steady growth, enrollments by international students at US universities declined in 2016 and 2017.[26]

Meanwhile, the diffusion of information and technology will continue to empower regional competitors and non-state actors. Here, too, policymakers remain at a loss as to how to respond. The nature of the US economic and political system, with its reliance on the rule of law, advanced technology, and the free flow of information and people, leaves it uniquely vulnerable to asymmetric attacks from weaker and authoritarian foes. Partisanship further complicates matters by making it difficult to assess the impact of previous attacks and to implement effective countermeasures.

What does all of this mean for the future of US foreign policy? Sweeping predictions are unwise in the era of Trump, but the evidence suggests several trends. Fears that the US will embrace a form of neo-isolationism are unjustified. However, we can

expect more extreme swings in behavior, based partly on which party holds power. The GOP has fused comfortably with Trumpism, leaving it more nationalist and unilateralist than was previously the case – a fact which is highlighted by the administration's decision to continue using the unsavory phrase "America First", which appears numerous times in the recently released National Security Strategy. This means it will be prone to bouts of protectionism, nativism, xenophobia, and illiberalism. This will hamper efforts to sustain an internationalist grand strategy in the coming years. The Democratic Party, meanwhile, continues to be more committed to engagement, multilateralism, and democratic values. However, a vocal minority of the party firmly opposes trade liberalization and favors further cuts in military spending – tendencies which bode poorly for revitalizing US leadership.

In the worst-case scenario, extremist nationalism combined with an inability to satisfactorily counter asymmetric threats could lead to a more dangerous, unpredictable foreign policy. One hint of this troubling possibility can be found in the 2018 Nuclear Posture Review (NPR). It expands the category of threats that could elicit a nuclear response and calls for placing more emphasis on low-yield devices. Obama's 2010 NPR called for modernizing the nation's nuclear arsenal, but also sought to lead the way on arms control. In keeping with his skepticism regarding the value of international cooperation, Trump shows no such interest.[27]

European policymakers are understandably concerned about the direction of US foreign policy. It is more aggressive but less effective, and more demanding of its allies but unwilling to provide leadership. This state of affairs presents potential opportunities and pitfalls. The return of geopolitics will focus US attention on Africa, the Middle East, and East Asia, leaving limited time and resources for assisting allies across the Atlantic. This could encourage Europe to accelerate the development of a robust Common Security and Defense Policy (CSDP) and, in the best-case scenario, lead to a more equal and fruitful US-European relationship.

However, if the US continues to struggle to adapt to the evolution of global politics and to address its most pressing domestic challenges, the transatlantic alliance will suffer accordingly. This would be dangerous for both sides – and for the entire international system.

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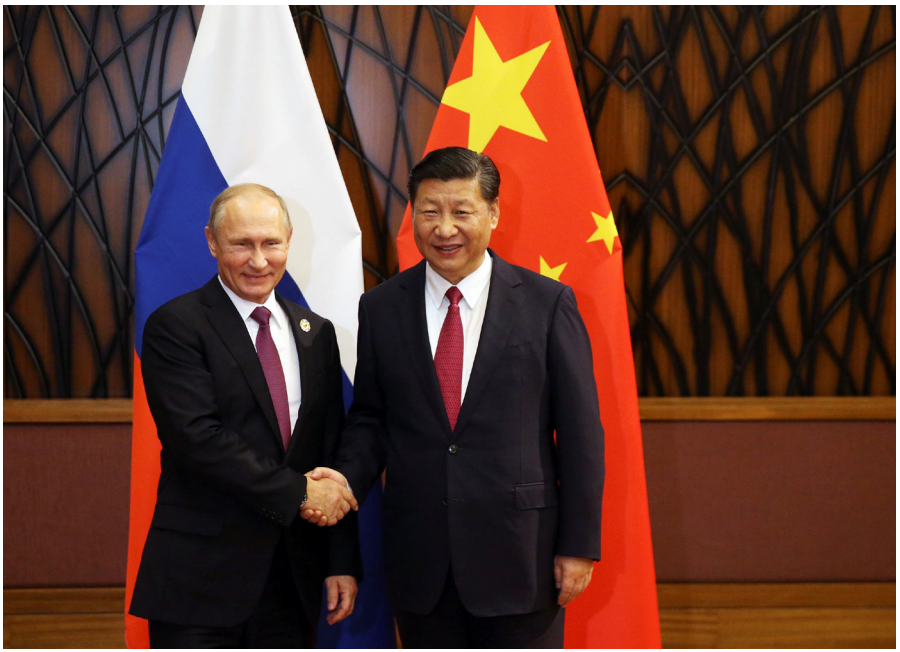
CHAPTER 2

# Room for Maneuver: China and Russia Strengthen Their Relations

*Brian G. Carlson*

At a time of turmoil in the West, China and Russia pose growing challenges to the liberal international order. The China-Russia relationship has grown stronger in recent years, as the two countries have increased coordination on North Korea and other issues. China and Russia are not about to form an alliance, but neither are they likely to drift apart in the near future. Their shared concerns about US power and resistance to liberal norms provide a strong basis for a continued close relationship, albeit one increasingly tilted in China's favor.



Russian President Vladimir Putin and Chinese President Xi Jinping shake hands during a meeting in Danang, Vietnam, 10 November 2017. *Sputnik, Konstantin; Zavrazhin, Kremlin / Reuters*

As US President Donald J. Trump's first year in office drew to a close, his administration increasingly pointed to the national security challenges posed by China and Russia. The new National Security Strategy of the United States, issued in December 2017, named China and Russia as "revisionist powers" that "challenge American power, influence, and interests, attempting to erode American security and prosperity."[1] The summary of the 2018 National Defense Strategy, unveiled in January 2018, identified the "central challenge to U.S. prosperity and security as the *reemergence of long-term, strategic competition*" by these revisionist powers.[2]

These policy declarations represented a shift from one year earlier, when Trump entered office amid speculation that he would pursue a rapprochement with Russia. One of the purported goals of such a policy was to wrest Russia away from China's embrace, using a strengthened US-Russia relationship as leverage over China. Such an attempt at triangular diplomacy would have been straight out of the playbook of former secretary of state Henry Kissinger, with the roles of Moscow and Beijing reversed this time.[3]

Bipartisan domestic opposition, based partly on concerns about Russia's interference in the 2016 presidential election, hindered Trump's ability to conduct diplomatic outreach toward Russia. Regardless of domestic political constraints, however, attempts to pry Russia away from China were never likely to succeed. The Cold War context that gave rise to Kissinger's strategy is long gone. Russian leaders, having absorbed the painful lessons of the Sino-Soviet split, recognize that their country's security and prosperity depend on maintaining friendly relations with their increasingly powerful neighbor, regardless of the state of relations with the US. For its part, China needs friendly relations with Russia in order to assure itself of a "strategic rear" to the north, given its tense relations with several other neighboring countries. Moreover, the common positions that China and Russia hold on many international issues, including their discomfort with US power, objections to an international order reflecting liberal norms and values, and shared desire to resist perceived threats to their forms of domestic governance, provide ample reason for them to maintain close relations.

As Jack Thompson argues in this volume, a series of factors both foreign and domestic are placing US foreign policy under stress. In the coming years, the challenge that China and

Russia pose to the liberal international order will be one such factor. For both the US and Europe, the extent of coordination between China and Russia deserves close watching. In recent years, this coordination has grown stronger. A think tank report published in 2016, co-authored by Russian and Chinese experts, argued that "Russia-China rapprochement in security is special in that the two countries have come close to the line that distinguishes partnership from a military and political alliance," though neither state wished to cross this line.[4] That same year, in an article aimed at Western audiences, a former vice foreign minister of China argued that the two countries, despite having no intention to form an alliance, nevertheless shared sufficiently close interests and values to ensure that their partnership would remain durable.[5]

China and Russia have gradually strengthened their relationship over the past quarter-century. Vladimir Putin's return to the Russian presidency in 2012 and Xi Jinping's accession to power in China that same year were important stimulants to the bilateral relationship. The onset of the Ukraine crisis strengthened relations further by driving Russia into China's arms. Facing Western sanctions for its annexation of Crimea and its support for insurgents in eastern Ukraine, Russia sought both an economic lifeline and a diplomatic partner to reduce its isolation. China was the obvious candidate. Subsequent developments, including the continued stalemate in Ukraine, Russia's intervention in the Syrian civil war, and allegations of Russian meddling in US and European elections have ensured continued friction in relations between Russia and the West. China, meanwhile, perceives growing pressure from the US as its rise to power gathers force. These tensions, in turn, lay the groundwork for sustained cooperation between China and Russia.

The growing strength of the China-Russia relationship has belied the expectations of many Western analysts. The two countries remain unlikely to form an alliance, partly because neither wishes to be dragged into the other's regional conflicts. Moreover, the balance of power within the relationship is shifting rapidly in China's favor, which could eventually become a major concern for Russia. To date, however, the two countries have set aside their differences in order to pursue common interests. Their "strategic partnership", though subject to limitations, is not likely to break down in the near future. Under this arrangement, which is looser than an alliance, the two countries offer each

other a measure of diplomatic support on a range of issues and at least "friendly neutrality" in each other's regional disputes. In 2018 and beyond, the China-Russia relationship will continue to exert significant influence on issues of international concern, unfolding at the bilateral, regional, and global levels.

**The Bilateral Level: Economics, Energy, and Arms**

In the face of Western sanctions following the onset of the Ukraine crisis, Russia attempted a pivot to China in order to compensate, at least partially, for the resulting economic losses. The chief result, however, was that China increased its bargaining leverage in the two strongest sectors of the bilateral economic relationship, namely energy and arms sales. In both sectors, negotiations on important deals had begun before the Ukraine crisis but had failed to reach conclusion. After the outbreak of the crisis, the two countries achieved important breakthroughs in these negotiations, with results that were especially advantageous for China.

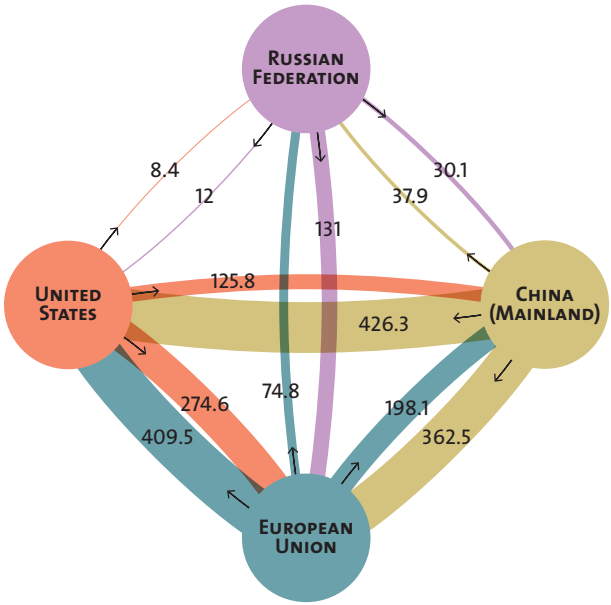
The benefits that Russia hoped to achieve from its economic outreach to China have been slow to materialize. This should not have been surprising, considering that bilateral economic ties have been a weak link in the China-Russia relationship throughout the post-Soviet era. The volume of bilateral trade consistently pales in comparison to China-US, China-EU, and Russia-EU bilateral trade volumes. Russia has also relied primarily on Western financial markets for access to credit.

In 2014, the year that the West began to impose sanctions, the volume of China-Russia bilateral trade reached an all-time high of 95 billion USD. However, this figure fell to 68 billion USD in 2015, largely because of a sharp drop in energy prices.[6] The trade volume remained flat in 2016 and remains well short of the 2014 peak. Some Russian critics concluded that Russia's attempted pivot to Asia, which in practice focused heavily on China, had been largely a failure in economic terms.[7] The most significant results of bilateral economic diplomacy have been major agreements on natural gas and weapons sales.

During Putin's visit to China in May 2014, China and Russia struck a 400 billion USD gas supply deal, with Russia's Gazprom agreeing to supply the China National Petroleum Corporation (CNPC) with up to 38 billion cubic meters of gas per year for 30 years, starting in 2018. Analysts estimated that the price China would pay for the gas, which was not disclosed

**Economic Ties between Russia, China, the US and the EU in 2016**

Volume of trade (in billion USD)



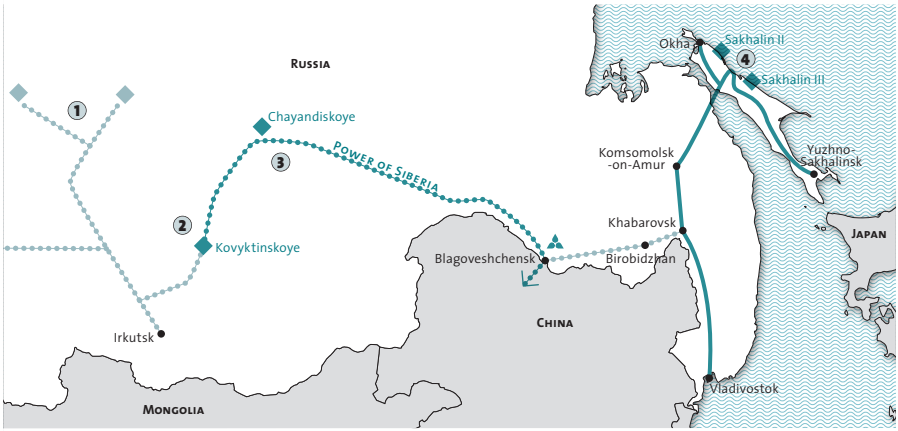

Note: When a disparity existed between data reporting the same movement of trade in a different way – for example, US exports to China versus Chinese imports from the US – this graphic uses the average of the two figures.
Source: IMF Data, *Direction of Trade Statistics (DOTS)*

publicly, would be comparable to the price that European customers were paying for supplies from Gazprom.[8] Initially, Gazprom expected that China would invest 25 billion USD in the construction of the pipeline, known as Power of Siberia. However, this arrangement fell apart, and Gazprom is now financing the pipeline's construction by itself. In July 2017, CNPC announced that it would receive the first supplies from the Power of Siberia pipeline in December 2019, about one year behind schedule.[9]

The gas deal allowed Putin to demonstrate that Russia enjoyed alternative economic and diplomatic options in the face of Western sanctions. However, the terms of the negotiations largely favored China. The gas supplies for the Power of Siberia pipeline will come from fields in Eastern Siberia, which Russia can supply only to Asian countries because they remain unconnected by pipeline to European markets. The western Altai route remains Russia's preferred option for a gas pipeline to China. This proposed

**The Gas Transmission System in Russia's East**

As of May 2017




Gas pipelines in operation
Ongoin projects
Prospective gas pipelines
Fields / Prospective Fields
Amur Gas Processing Plant

Gas production centers:
1 Krasnoyarsk
2 Irkutsk
3 Yakutia
4 Sakhalin

Source: PJSC Gazprom (18.5.2017)

pipeline, which would pass through the two countries' short western border between Kazakhstan and Mongolia, would draw its supplies from gas fields in Western Siberia that are already connected by pipeline to Europe. Under this option, Russia would be able to play China off against its European customers, thereby gaining bargaining leverage. China has expressed little interest in the Altai pipeline, however, largely because it has a multitude of other options for gas supply, including imports of gas by pipeline from Central Asia and of liquefied natural gas (LNG) from a variety of suppliers.[10] As a result, Russia has assumed the financial burden for Power of Siberia, an expensive project, without gaining much ability to play the "China card" in gas negotiations with Europe.

Chinese investors also gained opportunities to invest in Russia's energy sector, a sphere in which they had long faced restrictions. China's Silk Road Fund, which was established to finance projects that are part of the Belt and Road Initiative, purchased a 9.9 per cent stake in the Yamal LNG project.[11] The Silk Road Fund also purchased a 10 per cent stake in

Sibur, Russia's largest petrochemicals group, whose investors include Gennady Timchenko, a friend of Putin's who is under Western sanctions.[12] In September 2017, the Chinese energy conglomerate CEFC purchased a stake of more than 14 per cent in Rosneft, Russia's largest oil company, from Glencore and the Qatar Investment Authority, which had acquired a 19.5 per cent stake in the company less than one year earlier. The purpose of the Rosneft deals, apparently, was to close holes in Russia's state budget.[13] The Chinese company's acquisition of this stake in Rosneft suggested, however, that the balance of power in the energy relationship was tilting further in China's favor.[14]

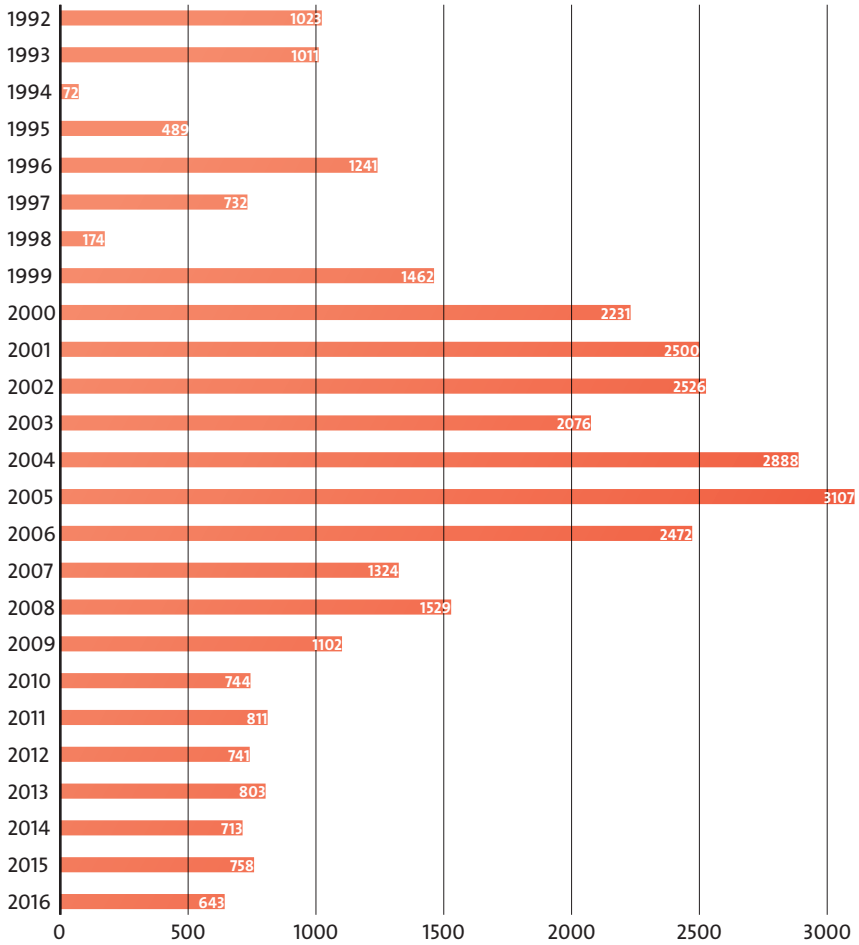
In early 2018, rising oil prices offered hope for the Russian economy. The collapse in oil prices that began in 2014, in combination with Western sanctions, struck a heavy blow to the Russian economy and to the government's budget. With oil prices once again rising, however, Goldman Sachs projected 3.3 per cent economic growth for Russia this year.[15] Russia also edged out Saudi Arabia as China's leading oil supplier for the second consecutive year in 2017, accounting for more than 14 per cent of China's oil imports.[16] For China, Russia serves as an important source of diversity of supply. As with deliveries from Central Asia, oil supplies from Russia arrive in China through an overland pipeline, reducing China's vulnerability to naval blockade in a potential conflict with the US.

China also seized opportunities to gain access to advanced Russian weaponry. Although Russia has been China's largest foreign arms supplier throughout the post-Cold War era, Russian officials were reluctant for many years to supply China with their most sophisticated weapons technology. From the mid-2000s until recent years, Russian arms sales to China contracted sharply. Russian officials had grown frustrated with Chinese copying of their weapons technology, while China focused on domestic production. Starting around 2012, China once again turned to Russia for military technology, first aircraft engines and later advanced weaponry that would enhance its anti-access/area denial capabilities in the Asia-Pacific region. Following the onset of the Ukraine crisis, China succeeded in purchasing top-flight Russian weapons for this purpose. The two most important purchases were the S-400 air defense system and 24 Su-35 fighter jets.

The S-400 system of anti-aircraft missiles can strike aircraft, unmanned aerial vehicles (UAVs), and cruise

**Russian Arms Exports to China, 1992–2016**

Volume of arms exports (SIPRI Trend Indicator Values (TIVs*), expressed in millions)




* "SIPRI statistical data on arms transfers relates to actual deliveries of major conventional weapons. [...] The TIV is based on the known unit production costs of a core set of weapons and is intended to represent the transfer of military resources rather than the financial value of the transfer" (see SIPRI Arms Transfers Database – Methodology).

Note: Recent sales are projected to increase volumes of export deliveries back to levels approaching the peak of the mid-2000s.

Source: SIPRI Arms Transfers Database

missiles at a range of up to 380 kilometers. China plans to deploy the system along its coastline, giving the PLA the capability to contest significant amounts of the airspace near Taiwan and the Paracel and Senkaku Islands, all of which the US could be called upon to defend in a crisis. The Su-35

fighter jets enjoy advantages in range and maneuverability over China's existing fighter force. These Russian arms sales to China, therefore, significantly complicate the US military's task of defending its allies and providing security in the Asia-Pacific region.[17]

For China, these sales represented an opportunity to gain access to systems in which Russia maintains a technological edge. Russia's decision to sell these advanced systems to China, on the other hand, was informed by a series of considerations. The sales offer an opportunity to strengthen political and military relations with China, which Russia views as a crucial partner at a time of strained relations with the West. Russia had already completed research and development on these weapons systems, and sales to China offered an opportunity to maximize profits from existing technologies. Russian officials believed that China was likely to gain access to these technologies in any case, so Russia might as well earn revenues from their sale. Russia remained concerned about the possibility of Chinese copying of Russian designs, but the length of time needed for such efforts partly assuaged these worries. For example, Russia calculated that by the time China succeeded in producing its own version of the S-400, Russia's defense sector would already have produced the next-generation air defense system, the S-500.[18]

The major weapons systems that Russia has sold to China recently are well suited for maritime contingencies, not for a potential land invasion of Russia. By strengthening China's military capabilities in a potential conflict with the US and its allies in the Asia-Pacific region, Russia diverts US strategic focus toward Asia and away from Europe. In this way, these Russian arms sales complicate European security policies. With US resources and strategic attention increasingly stretched thin, NATO's European members might face increased pressure, in the coming years, to increase their own military spending and contributions to European security.

### The Regional Level: Spheres of Influence

The challenges that China and Russia pose to the international order take shape primarily at the regional level. Although both countries are seeking to increase their influence on the international stage, with China's capabilities in this respect rising rapidly, they have the greatest capacity to pursue their respective goals close to home. Both countries are effectively seeking spheres of influence in their respective regions – Russia in the post-Soviet territories, and China in

the Asia-Pacific. Both countries have engaged in "probing" to test the limits of US power and commitment to regional allies.[19]

Neither country fully supports the other's regional objectives, which is one reason why they are unlikely to form an alliance. For example, China expressed measured support for Russia's war in Georgia in 2008, but declined to join Russia in recognizing the sovereignty of two breakaway regions from that country. Similarly, China sympathized with Russia's view that the West had fomented the revolution in Ukraine and that further expansion of Euro-Atlantic institutions to the east was unacceptable. Yet China could not support Russia's annexation of Crimea because it violated core principles of Chinese foreign policy, including support for state sovereignty and territorial integrity. Russia, in turn, remains officially neutral on China's maritime disputes in the South China Sea and the East China Sea. In essence, both countries observe a "friendly neutrality" regarding the other's regional affairs.[20] This arrangement enhances both countries' strategic room for maneuver.

Central Asia is one region in which the interests of China and Russia could clash. Russia still regards the region as its backyard, but China's regional influence has grown rapidly. Xi Jinping's announcement in September 2013 of China's plans for the Silk Road Economic Belt, which later became one component of the Belt and Road Initiative, heightened Russia's concerns. China's plans to finance infrastructure projects through Central Asia and onward to Europe and the Middle East threatened to marginalize Russia further in the region. To date, however, China and Russia have avoided a clash in Central Asia and have sought to reach an accommodation. Symbolic of these efforts was a May 2015 bilateral agreement to link up the Silk Road Economic Belt with the Eurasian Economic Union, the Russian-led regional integration project. Although the fulfillment of this aspiration will require concrete projects, a prospect that remains uncertain, this agreement expressed the two countries' political desire to accommodate each other's regional interests.

Several factors help to explain efforts by China and Russia to achieve cooperation in Central Asia. For Russia, ceding regional influence to China is undesirable, but also virtually unavoidable. Russia lacks the economic and financial weight to compete with China in promoting regional economic development. The Ukraine crisis, which erupted just a few months after Xi announced his initiative,

caused a sharp downturn in Russia's relations with the West, underscoring China's importance in Russia's foreign policy. Russia was unwilling to risk a rupture in this crucial relationship by aggressively challenging China's growing presence in Central Asia.

For its part, China recognized that its ambitious Silk Road plans would be far more likely to succeed with Russia's support than in the face of Russian opposition. China sought to reassure Russia by emphasizing that its goal was to promote regional economic development, not to strengthen its political influence or security presence in the region. Some analysts, particularly on the Russian side, have proposed a "division of labor" in which China would serve as the primary engine of regional economic development, while Russia would maintain its role as the region's main security provider. The long-term prospects for such an arrangement remain uncertain, however. China's growing economic influence in the region will inevitably lead to increased political influence, and the need to protect its investments in the region may eventually lead China to consider expanding its security presence there as well.

In the face of China's relentless expansion of influence in Central Asia, Russia has sought to make the best of the situation by encouraging China to invest in infrastructure projects in Russia. One concern among Russian policymakers and analysts is that the Belt and Road Initiative could end up largely bypassing Russia, focusing instead on Central Asian infrastructure projects and port facilities in Europe. Russia hopes to entice Chinese investment in a transport corridor passing through Russian territory and onward to Europe. At a time when China is investing in infrastructure projects in multiple directions, Russia also hopes to attract China's interest in the Russian Far East. Russian scholars have proposed linking centers of production in China's Northeast by rail to ports in the Russian Far East, which are in many cases closer than China's own ports. Russian leaders also hope that China's interest in Arctic Sea shipping will generate investment in Russian port facilities along this route, though they will balance this desire against concerns about China's expanding influence in the Arctic.[21]

In the Asia-Pacific region, the interests of China and Russia do not fully coincide. China is an emerging superpower that aims to gain primacy in Asia, while Russia's influence in the region has dwindled. Russia would prefer to maintain a diverse portfolio of relationships in Asia, rather than risk becoming overly dependent on

China. Partly for this reason, Russia has resisted China's calls to form a united front in their respective territorial disputes with Japan and to offer increased support for China's positions on other maritime disputes. In the period leading up to the Ukraine crisis, Russia and Japan energized bilateral diplomacy with the goal of resolving their dispute over the Kuril Islands. Just as Russia sought balance in its Asian diplomacy, Japan sought to improve relations with Russia as a hedge against the rise of China. These talks broke down when Japan joined Western sanctions against Russia, and efforts to revive them have been unsuccessful. Russia's close relations with Vietnam, which is involved in maritime territorial disputes with China in the South China Sea, also cause tension in China-Russia relations.

Although Russia officially maintains neutrality on China's territorial disputes in the South China Sea, it appears to have edged closer to China's position. In July 2016, the Permanent Court of Arbitration in The Hague ruled that China's sweeping claims to control over waters encompassing around 90 per cent of the South China Sea were in violation of the UN Convention on the Law of the Sea (UNCLOS), of which China was a signatory. China rejected the court's ruling, which had no means of enforcement, and vowed not to abide by it. A few weeks later, while attending the G-20 conference in Hangzhou, China, Putin declared his support for China's rejection of the ruling. He also backed China's position that outside powers such as the US should stay out of these disputes. That same month, Russia and China held joint naval exercises in the South China Sea. Through these exercises, China appeared determined to signal both its defiance of the court's ruling and its ability to turn to Russia for diplomatic support.

In regions such as Central Asia and the Asia-Pacific, as in bilateral relations, the growing imbalance of power in China's favor has pushed Russia to adopt positions that are increasingly favorable to China. This trend is also visible at the global level.

**The Global Level: An Increasingly Close Partnership**

China-Russia relations have gained momentum at the global level, particularly since the onset of the Ukraine crisis. This has been especially apparent in the two countries' handling of the North Korean nuclear crisis, as they have maintained solidarity in opposing most forms of US pressure on the regime in Pyongyang. The two countries stood together in opposing the deployment of the Terminal High

Altitude Area Defense (THAAD) system in South Korea, insisting that this system would threaten their own nuclear deterrent capabilities. In 2017, as the crisis over North Korea's nuclear program intensified, China and Russia issued a joint declaration calling for a "dual freeze" in which North Korea would cease conducting nuclear and missile tests in return for a suspension of joint military exercises by the US and South Korea. During the fall of 2017, they worked together in the UN Security Council to water down proposed sanctions on the North Korean regime, most importantly by opposing an oil embargo. China and Russia demonstrated that they would make serious efforts to restrain the North Korean regime only in exchange for strategic concessions that would reduce the US political and security presence in Northeast Asia.[22]

In Northeast Asia, Russia has deferred to China's leadership. In the Middle East, by contrast, China has been content to let Russia play a leading role. Russia is sure to be outspoken in opposing efforts by the Trump administration to renegotiate or discard the nuclear deal with Iran, an issue on which it can count on China's support. In this case, Russia and China are likely to find considerable support for their position among European countries as well. On issues concerning the Middle East more broadly, China's inclination is to remain above the fray. For example, China attempts to maintain a balance in its relations with Iran and Saudi Arabia, hoping to enjoy the economic benefits of relations with both of these rivals. China is largely content to stand aside as Russia pursues its own interests in Syria and elsewhere in the region.

China and Russia are likely to maintain solidarity on several other international issues as well. Both countries oppose US plans for missile defense, asserting that such plans could erode their nuclear deterrent capabilities. In December 2017, for the second time, the two countries conducted a joint, computer-simulated missile defense exercise. China and Russia also hold similar views on issues relating to cyberspace, often in ways that clash with Western notions. In particular, they support the right of governments to exert considerable control in this domain as a natural extension of state sovereignty.[23] At the same time, both countries appear to be stepping up efforts to use a variety of methods, including social media, to increase their influence in Western countries, in some cases seeking to foment chaos within these societies and undermine confidence in democracy. Western countries will continue to be alert to threats from this kind of "sharp power".[24]

As this overview demonstrates, China and Russia have expanded their cooperation across a range of issues. The prospect of a geopolitically significant China-Russia bloc, possibly even a quasi-alliance involving close political coordination, seems more plausible than it did even a few years ago. Some prominent analysts in China have called for an alliance with Russia, calling this an essential step for resisting US strategic pressure as their country continues to rise.[25] However, this remains a minority view among Chinese leaders and strategists. In both China and Russia, the political consensus holds that an alliance would unduly restrict diplomatic flexibility and incur unnecessary risk. The leadership in both countries views the current, looser arrangement as the best way to maximize the value of the bilateral relationship.

Although the strategic partnership has grown increasingly close, Russia continues to harbor long-term concerns. China's growing advantage in what its strategists call "comprehensive national power" could eventually cause Russian leaders to reevaluate their strategic priorities, possibly in ways that would undermine the relationship. Although concerns about Chinese immigration to the Russian Far East have subsided since the 1990s, a glaring demographic imbalance still exists between Russia's sparsely populated, underdeveloped eastern regions and China's populous bordering regions. Russian leaders worry that China eventually could dominate the Russian Far East economically. Russia's strategy to resist a threatened Chinese invasion of Russian territory, admittedly a scenario that Russian strategists consider extremely unlikely, appears to rely ultimately on nuclear deterrence, based partly on the threat to use tactical nuclear weapons in the early stages of a conflict. In the view of many analysts, a major driving force behind Russia's alleged violations of the Intermediate-Range Nuclear Forces (INF) Treaty is the desire of Russian military planners to establish an effective counter to China's growing arsenal of missiles, many of which are of the intermediate ranges prohibited by the treaty.[26]

Despite such lingering concerns, the two countries have formed a close partnership that is likely to prove resilient for the immediate future. The last quarter-century of interactions has revealed some inherent limitations in the China-Russia relationship, but this partnership has also proven more resilient than many predicted. Similarities in the two countries' national identities, especially their discomfort with US primacy, opposition to an international order dominated by liberal values, and sensitivity to criticism

of their own domestic governance and human rights records, are crucial factors.[27] Some Russian analysts, while acknowledging that the initial economic benefits of Russia's pivot to China had been disappointing, nevertheless argued that a convergence of political interests, not economics, provided the essential foundation for the China-Russia relationship.[28]

The current arrangement offers both China and Russia some strategic room for maneuver, but China is the main beneficiary. A report by US analysts in 2017 argued that the US position in the "strategic triangle" had deteriorated because of tension in US relations with both China and Russia, allowing China to occupy the "hinge".[29] This advantageous position gives a further boost to the rise of China, which already poses a major challenge to US foreign policy. The rise of China, in turn, will divert US attention to Asia, heightening the challenges of ensuring European security.

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CHAPTER 3

# Technological Innovation and the Geopolitics of Energy

*Severin Fischer*

Technological change has a tremendous impact on societies in general, including international politics. This chapter discusses the most important recent and upcoming technological advancements in energy – horizontal drilling with hydraulic fracturing, photovoltaics, and batteries – and their possible influence on geopolitical dynamics. For different reasons, China and the US will have the biggest impact on the way we will discuss the geopolitics of energy in the future.

Employees row a boat as they examine solar panel boards at a pond in Lianyungang, Jiangsu Province, China. *China Stringer Network / Reuters*

The public pressure caused by livestream pictures from Tahrir Square during the Arab Spring, the propaganda machinery of the so-called "Islamic State", and US President Donald J. Trump's public communication on foreign policy via social media have one thing in common: All three examples show that technological change and international politics are closely linked. While new communication technologies are certainly among the more obvious examples for the fundamental impact of rapid technological change, other sectors are also seeing shifts of similar magnitude.

In the energy sector, technological progress used to unfold over decades rather than months. In some cases, change was accelerated by political decisions. When Winston Churchill, as First Lord of the British Admiralty, urged his government to use oil instead of domestic coal to fuel the Royal Navy in the run-up to World War I, this not only impacted the outcome of the war and therefore the course of history, but also revolutionized maritime transport in the years to come.[1] In other cases, exploration and technological progress in drilling techniques turned the Middle East, which had been a relatively poor region during the early 20th century, into a geopolitical hotspot in the 1960s and 1970s. Technological innovations, though enthusiastically embraced, did not always become the global success stories their proponents had anticipated. This is true for nuclear energy, a technology that was celebrated as a source of cheap and clean electricity for everyone, but has not lived up to projections.

Changes in the energy sector may have an impact on various dimensions of international politics, such as security, trade, or environmental policies. However, it is difficult to project their range and impact beforehand. In this sense, this study is exploratory and describes trends in technological developments in the energy sector by examining three technological developments at different stages of readiness and deployment. The first is a set of technologies that can be summarized under the title "hydraulic fracturing", which has influenced the position of the US in global energy markets and will do so in the coming years. The second technology trend is the use of solar energy from photovoltaic cells, also commonly referred to as "solar panels". With rapidly decreasing costs and a massive extension of industrial production, solar energy is in the process of revolutionizing energy systems around the globe. The third part concentrates on the effects of the upcoming wide-scale distribution of batteries, not only for the use of electric vehicles, but also

for application in microgrids and for other uses. These three technologies have been chosen for analysis based on the remarkable gains in economic efficiency and productivity that they offer, their potential for bringing structural change to the energy sector, and various specific endogenic dynamics such as cross-cutting effects or market design features, e.g., the possibility to apply solar arrays and batteries on individual small-scale level. Analyzing three technological developments does not provide an exhaustive picture, of course. But they offer the biggest potential for disruption due to the way they are changing the mode of thinking about energy. All three technological developments are already influencing the role of energy in international politics today, or will do so in the future, and should therefore be watched closely.

### The Fracking Revolution: The Emergence of US "Energy Dominance"

Hydraulic fracturing ("fracking") in oil and gas extraction is not a specifically new technology in itself, but did not prove cost-efficient when the first trials were made in the early 1950s. During the first years of the 2000s, oil and gas firms in the US started to experiment with the combination of hydraulic fracturing – the use of high pressure and fracturing stimulation– and horizontal drilling, in order to access oil and gas reserves in shale and other formations. By pressing water, sand, and other materials into promising geological layers and rocks, small fractures emerge through which oil and gas are released and can be pumped to the surface. Initially, the technology was only used to "stimulate" existing reservoirs. Only recently have companies tried to access completely new formations by using this technology, with the resulting products now commonly referred to as "shale gas" and "tight oil".

Initially, fracking was largely neglected by the big international oil and gas companies. Then, some independent firms experimenting in the Texan Barnett field were successful in reducing costs and made shale gas economically viable. Today's major shale gas fields (Marcellus, Eagle Ford, and Hayneville) have been developed since 2008. With know-how gained from the experiences with shale gas production, the extraction of tight oil started to kick off around 2011 in the Permian Basin and the Bakken field. By 2016, the total US production of natural gas was approximately one-third higher than in 2005, while half of today's production stems from shale formations, or is a by-product of tight oil extraction. By late 2017, US oil production had

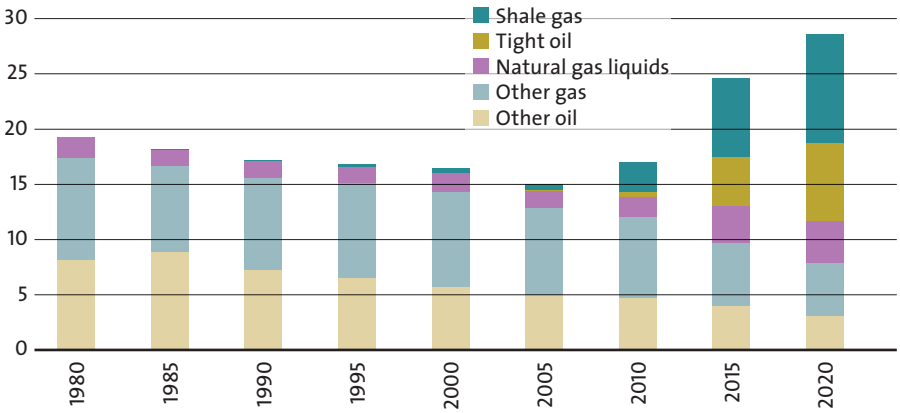
doubled compared to 2008, hitting the 1970s maximum production level of just above 10 million barrels per day, half of which is supplied by tight oil. The US is set to surpass Saudi Arabia's production levels in 2018, closing the gap to the world's number one oil producer, Russia.

The important change that hydraulic fracturing brought to the market not only consists in the additional quantities available, but also concerns the structure and dynamic of this new oil and gas business segment. While large corporations are used to planning long-term investments in conventional fields onshore and offshore, including decade-long preparation and operation, shale gas and tight oil extraction has proven to be a very flexible and mobile business oriented toward short-term gains. Typically, tight oil wells decline by about 60 per cent in the first year, followed by another 25 per cent in the second year.[2] Consequently, the fracking industry is under constant pressure to discover and drill new wells on a yearly basis. At the same time, the operational efficiency of individual wells has been improved tremendously during the last couple of years. While the industry's main focus in the first years was on developing new wells, more recently, the productivity of the individual wells has gained more attention. In the Bakken field, the productivity of an individual rig increased by a factor of six between 2011 and 2016.[3] Rig productivity was also the key factor that helped the industry to survive the oil price crash of the years 2014–2016.

One interesting aspect concerning the development of hydraulic fracturing is the remarkable fact that deployment of these technologies has so far been limited geographically to North America. Certainly, the geological conditions in the different oil- and gas-producing regions of the US are favorable. However, they are clearly not unique. In certain regions of China, Europe, North Africa, or South America, shale formations look promising as well. There are three primary reasons for the reluctance to move into fracking in other parts of the world: First, the regulatory framework is an essential factor. While in the US, private landowners had an economic interest in allowing the extraction of resources, taxation and environmental regulation have slowed the deployment of these technologies in Europe. Second, the current low price environment for oil and gas has limited the willingness to invest in unknown territories with uncertain results. Third, and most importantly, one main reason for the concentration of fracking companies in the US is the availability of various services and materials related to

**US Oil and Gas Production from 1980 – 2020**

Million barrels of oil equivalents per day




Source: © OECD/IEA *2017 World Energy Outlook*, IEA Publishing, modified by CSS

the industry. The whole value chain around the industry is a crucial factor, ranging from geological exploration and the availability of fracking material to the ability to transport oil and gas to market. Of course, none of these factors precludes a future extension of fracking beyond the US. It just hasn't happened yet on a relevant scale. Should fracking technologies be used in other places around the globe as well and bring revenue streams to governments, the age of abundance for hydrocarbons could last much longer than most people think.

Looking at the effects of extended oil and gas production in the US, it is notable that the dynamics of the two commodity markets are quite different. In the traditionally rather regionally-oriented gas markets, studies expected the US to become a significant importer of Liquefied Natural Gas (LNG) from the year 2010 onwards. This projection had to be reversed fundamentally with the US fracking boom, which made additional volumes of LNG available for other consumers, caused oil and gas prices to become de-linked, and led to a price drop that affected gas markets on a global scale. With the installation of export LNG terminals in the US, even more gas will be available in the years to come. Asian consumers in particular are already betting on the import of relatively cheap LNG cargos, which would allow them to satisfy a growing energy demand with less polluting fuels.

While LNG was a niche market in the past and has only recently started to grow, oil has been a global commodity for many decades. With the growth of tight oil production in the US in the range of some 5 per cent of global oil output, supply has outpaced demand by far, resulting in a remarkable fall of prices from over 100 USD to 30 USD per barrel within just two years between 2014 and 2016. While OPEC, the major group of oil exporters, initially decided to leave its own output untouched, hoping to squeeze out the new competitors from the US, it changed course at the end of 2016. Together with Russia and other oil exporters, OPEC agreed on a production cut in order to rebalance supply and demand. After the so-called "OPEC+" deal proved stable for more than one year, oil prices have come back to a level of around 70 USD per barrel.[4] Although tight-oil producers in the US were troubled and saw some economic hardship, the abovementioned productivity gains kept them in the market. In the future, the global oil market will continue to be affected by this new group of suppliers, who are relatively free from political influence and highly flexible. This structural difference compared to the state-controlled oil and gas companies of Saudi Arabia or Russia and to the traditional Western companies with their long-term projects and investment plans will fundamentally change the dynamics of hydrocarbon markets.

Looking at the level of politics and especially the international arena, the oil and gas boom has first and foremost influenced the self-perception of the US. The oil crises of the 1970s and 1980s had a long-term effect on the role of energy in the analysis of security threats and the foreign policy domain of the country. The struggle for "energy independence" seemed to have been lost in the early 2000s, when projections showed energy imports from foreign sources apparently predestined to go up. A constant dialog with Saudi Arabia on market liquidity, the demand for open markets in general, the protection of maritime shipping lanes, and safeguards through the International Energy Agency's (IEA) inventory system were central instruments for dealing with threats to energy security. While the administration of Barack Obama already witnessed and domestically supported the turnaround in the energy landscape initiated by the fracking industry, the change in rhetoric has only happened recently under President Donald J. Trump and his energy secretary, Rick Perry. What used to be the desire to become "energy independent" has shifted to the new paradigm of "energy dominance". During the course of 2017,

the administration elaborated on the meaning of this proposition: While two aspects of the concept – the creation of jobs for US workers in the field of energy and the availability of cheap energy for US families – might be of lesser significance for international relations, the aim "to be no longer vulnerable to foreign regimes that use energy as an economic weapon" could lead to different conclusions.[5]

Based on this proposition, one critical conclusion might be that the administration will ask itself sooner or later why US taxpayers should invest in the functioning of the global oil trade by guaranteeing the safe passage of maritime transports. As in the context of NATO, President Trump might be tempted to ask allies to contribute their fair share to the military protection of transport routes for global oil trade. As has become obvious in the recent Saudi-Qatari dispute, the US government's willingness and capacity to solve crises with an energy dimension seem to be less developed than would have been the case some years ago.

Another worrisome effect of the new strategy could be the use of energy as an instrument of US foreign policy. Urging allies to buy US LNG in order to diversify away from other suppliers (and reduce the nation's trade deficit) runs contrary to the plea for open markets repeatedly heard from US administrations over the past decades. The vocal concerns about Europe's energy security, which were referenced in the case of the new unilateral sanctions regime against Russia, now dovetail with the economic interests of the US fracking industry. If Washington is willing to use energy as a means of foreign policy, it will be difficult to explain to others why this would be the wrong approach to global cooperation.[6] Nevertheless, it will be difficult for the administration to force private actors such as LNG suppliers or tight oil producers to follow state orders about where to export their products. If Asian buyers are willing to pay a higher price than their European counterparts, LNG will be delivered to Asia, not to Europe.

While the US foreign policy strategy on energy is still in the process of development, the effects on other suppliers and their behavior are already visible. For OPEC as well as for Russia, the drop in prices and the availability of additional supplies on world markets constitutes first and foremost a price problem, and consequently a revenue problem. The production cuts and the low price environment threaten state budgets and necessitate domestic spending cuts. At the

same time, they also make reforms and the development of new business models, as in the case of Saudi Arabia's transformative "Vision 2030", more difficult. Since the US role as the world's biggest hydrocarbon producer is expected to evolve over the coming years, the world will have to get used to this new unexpected situation, which was brought about by the experiments of a few small drilling firms in the Midwest.

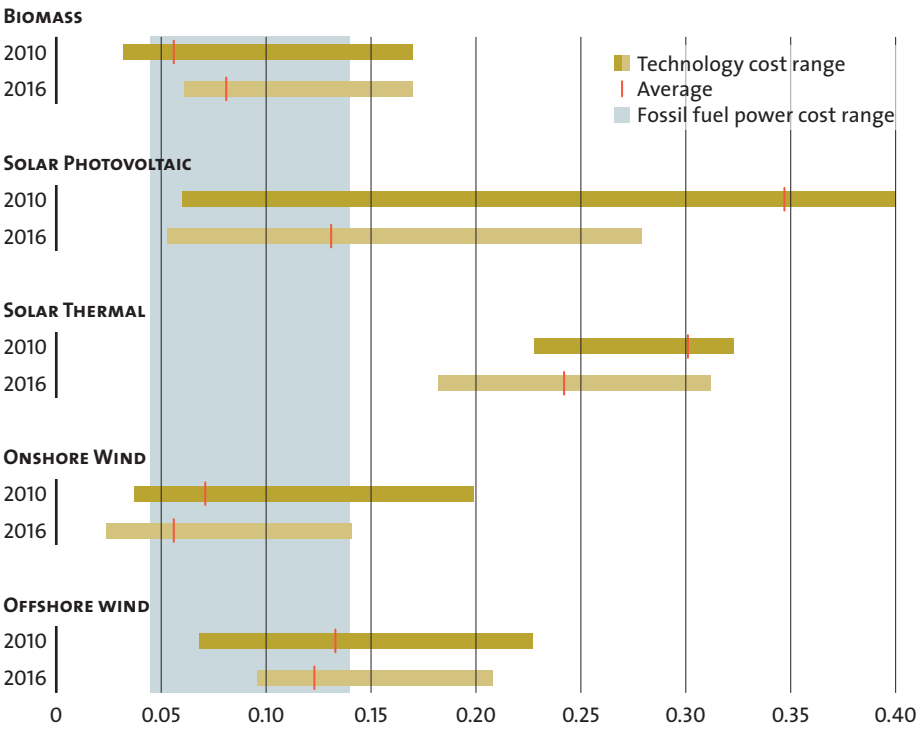
**The Solar Revolution: It Has Only Started**

As in the case of hydraulic fracturing, the use of solar energy, specifically photovoltaics (PV), is not a recent invention, but has been around for decades. There were even solar panels installed on the roof of the White House during the late 1970s. The energy crisis of the 1970s forced governments to consider alternatives to oil, one being solar energy. Although many early attempts can be noted, the economics and the lack of political support prevented solar energy from playing a role in the world's energy system. In fact, it was research and development in Japan as well as the decision of the German federal parliament to support renewable energies with a feed-in tariff from the year 2000 onwards that helped the small niche of PV producers to grow in size, prove their viability, and make impressive progress on economic efficiency. Germany, later joined by some North American and European states, invested billions of euros of public or electricity consumers' money into the large-scale demonstration of the viability of exploiting solar energy, both on private houses and as large-scale power plants in the countryside. However, without public support via feed-in tariffs and other mechanisms to enable investments, PV electricity production was not able to compete on electricity markets. This situation has changed.

The year 2016 marked an important waypoint for solar energy. As the International Energy Agency (IEA) confirmed in a report, with more than 74 GW in 2016 alone, PV constituted the largest part of all additional electricity generation, easily surpassing coal, wind, and natural gas.[7] At the same time, prices in recent auctions dropped to less than 0.05 USD per kWh in some world regions, and levelized costs can now compete with those of electricity generated by burning fossil fuels. Even under conservative estimates, solar power will be the largest renewable energy growth factor over the coming years in a world that is in fact betting more and more on clean energy. In an optimistic scenario, PV will even contribute an additional 1,150 GW by 2022 globally, which would equal nearly six times

**Price Range of Electricity Costs by Source, 2010 and 2016**

In USD/kWh




Source: International Renewable Energy Agency (IRENA), "Levelised Cost of Electricity 2010–2016", *resourceirena.irena.org/gateway* (2017).

the already installed electricity generation capacity of Germany in 2016 – from all energy sources.

Installed capacity is not the same as generated electricity, of course. Compared to fossil or nuclear power plants, solar power plants have less operating time and feature greater discrepancies between capacity and actual electricity generation. Therefore, the share of solar as a part of global electricity consumption will not increase as quickly as the installed capacity. Nevertheless, as a new player in electricity production, solar energy will significantly change the overall structural picture in many countries. Especially in certain regions of the developing world that previously had no electricity supply at all, temporary access to electricity will be a vast improvement over the present situation of having no access to electricity at all.

While the development of solar energy effectively started in Europe and the US, China is the biggest player on the market today. About half of all new solar power plants installed in 2016 were in China. At the same time, 60 per cent of global solar manufacturing capacity is located in China, up from just 4 per cent in 2009.[8] This development was no accident. The Chinese government has massively supported the building up of a PV manufacturing industry, protected the market, and concentrated global production in the region. When solar energy changed from a relatively expensive niche product into a mass consumption product, many European and US producers could not follow the price drop initiated by Chinese producers and went into bankruptcy. Even the recently imposed US trade tariffs on solar imports will not change the market structure, but rather will briefly slow down the installation of solar panels in the US.[9]

The effects of the solar boom on international politics are just beginning to emerge and can only be roughly sketched. However, a few preliminary conclusions can be drawn:

First, the availability of PV as an alternative to electricity generated by diesel engines could give a big push to development policies, especially in Africa and Asia. Today, only 30 per cent of Africans have reliable access to electricity.[10] Electrifying rural areas, which now seems possible, would make many other development goals easier to achieve: access to clean water, independent economic activity, the use of electric appliances in general, or access to independent information via communication technologies.[11] The emancipation of poorer social classes could fundamentally change the political landscape in many developing states, leading to a redistribution of political and economic power. In the future, it will be more difficult than ever to control the media and access to information, as the example of the "Arab Spring" has demonstrated quite clearly. The effects of such a development can hardly be predicted from today's perspective and might be very different from country to country.

Second, the dominance of Chinese producers in PV manufacturing will not only bring economic benefits to the country. China will also be able to offer integrated clean energy solutions as part of its foreign policy, as is already the case with respect to other infrastructural developments, such as transport infrastructure. One of the crucial questions in this context is whether other manufacturers will be able to compete in the mass production of PV for the world market

in the long run, given the competitive advantage and strong government support that Chinese suppliers enjoy today. With integrated supply chains for raw materials in the manufacturing process of PV, Chinese manufacturers might also have an advantage. The worries about conflicts over raw materials such as silver, copper, or some of the rare earths might be exaggerated in the sense that there will necessarily be a scarcity-led securitization of such resources. However, it is also clear that the Chinese government supports companies in accessing reserves, while creating political and economic pressure on countries with such resources. In addition, a high degree of local availability within China is also a clear advantage on global markets.[12] Certainly, no material is without alternative; however, it will take years to develop technologies for producing PV hardware without some of the crucial raw materials used today and to scale production up for global mass distribution. The advantage enjoyed by the Chinese solar manufacturing industry will be very hard to beat for a long time, making the shift to solar good business for the country.

Third, the integration of ever more solar energy into the electricity systems all over the world will put grid operators and national electricity companies under stress. On the one hand, they will be forced to invest in additional measures to maintain high levels of system stability. On the other hand, they will lose revenues if they do not own solar capacities themselves. In some economically more developed states, this will eat into the revenue streams of electricity suppliers and force them to either charge customers more in order to finance their fossil investments or take political measures to keep solar off the grid. Especially in the case of state-owned utilities, this conflict is only now beginning to appear on the political scene.

So far, the development of solar energy has been very heterogeneous on a global scale, with only very few countries generating more than five per cent of their electricity from solar. China is, however, leading in absolute terms when it comes to producing and installing solar energy. Especially in developing countries and emerging economies, additional solar investments might only cover additional electricity demand, but not compete directly with incumbents on existing market shares. This also means that the challenges will be different in different world regions and on different scales of economic prosperity. It is clear, however, that global commitments to limiting global warming will not be met without a massive expansion of investments in solar all over

the world. With the ability of individual consumers to buy solar installations and use them in many different circumstances and for different purposes, the traditional model of state-controlled electricity supply is likely soon to become obsolete. The solar revolution has just began.

**The Battery Revolution: Ready for Take-off**

The ability to store electricity on a large scale has long been one of the big dreams of mankind. Storage options would make the complex balancing of supply and demand in electricity systems easier and advance the use of electricity as an energy source for more applications in everyday life. Of course, in some places, electricity storage is already far developed. Switzerland's hydropower infrastructure with its fleet of pump-storage installations is one example. So far, many states have relied on storing fossil fuels in large quantities instead of expansive storing of electricity. This situation is likely going to change.

This change is already becoming apparent on a smaller scale when we look at the battery technology of the smartphones in our pockets. However, first promising changes are visible on a larger scale too. In the case of electric vehicles, whose main innovation is the battery technology installed, battery costs have decreased remarkably over the last years. Since 2010, the price for a battery pack has declined by 80 per cent, mainly due to productivity gains achieved by Chinese manufacturers, reaching 227 USD per kWh in 2017, according to a recent McKinsey study.[13] So far, public attention has mainly focused on lithium-ion batteries, but other battery or storage technologies could become prominent as well in the future. Up to now, the race to find the best technology for electricity storage has not yet been decided, but lithium-ion is clearly in the lead when looking at costs, efficiency, and today's production levels for all different purposes – in IT, but also in the automotive industry.

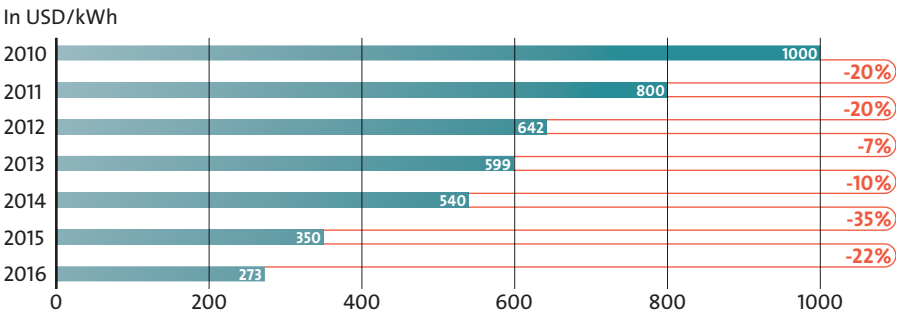
One common fallacy is the firm conviction that the rise of clean energy and the emergence of batteries must take place in a synchronous fashion. It is clear that in a world based on renewable energies only, electricity storage would necessarily have to play an important role. Without storage options, extraordinarily high capacities of intermittent renewable energy would be required and large-scale cross-country trade would be inevitable. At the same time, batteries could start to gain market share even with zero or only moderate development of clean energy, as a way of meeting within-day changes in demand. This

independent development can also again be demonstrated in the case of electromobility, one example being Poland, where the government is making great efforts to extend electromobility, while at the same time, the electricity mix will be dominated by coal for the foreseeable future.[14] Therefore, deployment of electric mobility is not necessarily coupled with clean energy development, but could also happen in a fossil- or nuclear-dominated world.

At the same time, the issue of batteries is not limited to transformation in the transport sector only. The use of batteries in microgrid systems is at least as important. These systems could either be communal or industrial facilities that see an opportunity in organizing their energy system individually, independent of state electricity suppliers. A recent Navigant study estimates that investments in microgrids will reach up to 100 billion USD over the next decade.[15] This again shows that there is in fact a business case for the solar revolution to go hand-in-hand with a battery revolution. Independent deployment, however, is a plausible scenario as well.

So far, industrial battery development is primarily enforced by only a couple of states. Again, China plays a dominant role. Only recently, China's battery company CATL announced a huge 2 billion USD investment in the world's largest battery factory.[16] South Korea has also joined the group of early movers. For the production of batteries, access to raw materials will be even more essential than for PV. Especially lithium carbonate and cobalt could be crucial in that respect. The crux of the matter is their geographical concentration within just a few countries. African states such as the Democratic Republic of the Congo with its large cobalt reserves are among the key staging grounds for the competition around cobalt and other raw materials. On this level, China has already worked on finalizing long-term trade deals, guaranteeing steady supplies.[17] While in the coming years, the efficiency in the production of batteries could be slowed down due to a massive increase in raw material costs, as is already the case with cobalt, which experienced a price increase of 129 per cent in 2017, the real challenge is a different one. Again, when we consider the market for electric mobility, China's dominance becomes apparent. China represents half of the global market for electric cars. The development of batteries and the construction of appliances with storage elements is part of China's industrial strategy, with highly successful implementation in the first stages. Chinese companies

**The Steep Decrease in Prices of Lithium-Ion Batteries**




Source: Claire Curry, "Lithium-ion Battery Costs and Market", in: *Bloomberg New Energy Finance* (2017), 2.

are engaged in every segment of the supply and value chain for batteries and electric vehicles, making it very difficult for outsiders to access this market.[18]

To be clear: The widespread use of batteries is not a reality yet and has only started. Electric cars are still a marginal product on a global scale, and microgrid systems are in an early stage of deployment. However, there are many signals indicating that the next decade will see an extended use of different storage options and a massive increase in investments, first and foremost in batteries. This will individualize electricity supply to a high degree, especially in combination with renewable energies. At the same time, a proliferation of storage devices would reduce investments in electricity generation capacity, since peak load would be satisfied with storage and demand side management, rather than with additional generation capacity. All of this will also have implications for international politics.

First, the transport sector will be affected by the technological advancement of battery use for e-mobility. The market shares of European and US car manufacturers, which form an important part of the economies on both continents, are being challenged by cheap Chinese alternatives. In the next step, buses will also switch to electric power, although it will be difficult to produce sufficient storage elements for an increasingly electrified transport sector. The changes in the manufacturing of transport vehicles in general will massively impact the economic balance on a global scale and most likely hurt employment in the Western world. If the industrialized countries of Europe and

North America fail to develop a way to compete with Chinese dominance, the battle for batteries will be lost, just as the battle for solar has already been lost. However, in this case, the impact will be much more drastic.

Second, not only in the case of PV, but also in the case of battery technology, Chinese competitive dominance will become apparent. Chinese companies will be able to offer integrated solutions for micro-grids and other storage options, including batteries. They could generate particularly attractive business cases through cooperation with solar manufacturers, offering one-size-fits-all solutions to countries. There is a great risk that China will monopolize investment in the transition to clean energy, especially in the developing world. This could also have an impact on political dependencies and strengthen China's influence in the world.

Third, the spread of batteries and storage options will have an impact on the relationship between citizens, communities, and regions within states and even at the transnational level. Unlike in the 20th century, when the government controlled its citizens' and regional entities' access to energy, decentralized systems will make these actors become more independent. In this scenario, the state loses control, which could, for example, benefit separatist movements politically and militarily. Also, in future conflicts, energy independence will be a strong asset for all parties that will be enforced by a technological gain in autonomy, a hot topic in military technology research for years. Under these circumstances, warfare too might change due to the combined introduction of solar and battery technologies.

**Political Implications**

In the past, the role of energy in international politics was predominantly a hydrocarbon issue. Control over, access to, and prices for oil and natural gas were considered important factors in international relations. This period is most likely ending, for several reasons. One is the abundance in the hydrocarbon sector; another is the increasing role of renewable energies. When considering global investments in the energy sector, hydrocarbons have already taken a back seat. Industrial policy, trade, and environmental issues are becoming more important for geopolitics as well. However, there are some important caveats to this observation.

First, global energy demand is still rising and will continue to rise years, if not decades to come. The most recent BP Energy Outlook 2018 predicts an increase by one-third by 2040.[19]

Emerging economies and developing countries in particular have growing populations that are increasing their consumption of goods, products, and services. If no drastic energy efficiency and climate policy measures are introduced on a global scale, the hydrocarbon world will stay. Second, the electricity sector will be the first to be affected by massive changes. Already today, there are more and more renewable energies being introduced into the electricity system, where they compete with coal, gas, and nuclear for market shares. As we can see in China, however, growing electricity demand means that all energy sources will be needed, limiting controversial competition between fuels. Nevertheless, China is serious about integrating renewable energies in order to limit environmental damage and pollution, but also in order to slow down the increase of its massive energy trade deficit. Third, although the transport sector is changing, this will not fundamentally affect oil consumption in the short to medium term, at best leading to a slight abatement of still growing demand. Individual mobility only accounts for around a third of the world's thirst for oil. With electromobility gaining some percentage points in market shares here, the overall picture for oil consumption is not going to change quickly. Overall, this means: Technologies are swiftly entering markets, and progress is accelerating quicker than most people would have thought, but fundamental changes on a global scale will only happen if global energy demand remains steady or begins to decline.

When considering the effects of the three breakthrough technologies, we need to take a sectoral and regional approach. The emergence of hydraulic fracturing had mainly an impact on the hydrocarbon side of the global energy system. Thanks to the US "energy dominance" paradigm, global commodity markets for oil and natural gas are flooded with cheap North American products. This has caught many fossil fuel suppliers by surprise and forced them to cut back on investments and public spending. The trend has also emphasized that the hydrocarbon age is most likely not going to end because of limitations to the availability of oil and gas. Its demise will rather be a process driven by technological substitution, economic efficiency, and environmental considerations in the long run. As some fuel-exporting states are already trying to change their business models, growing production is likely to keep prices and revenues at low levels for the foreseeable future, also constraining the states' ability to finance transformations. However, with the emergence of relatively small private

producers from liberal economies with a technology that has the potential to spread further internationally, global commodity markets will be less dependent on single suppliers and generally more flexible. This might also bring some degree of volatility.

While the hydrocarbon world is still dominant in the global energy system, the growth of renewable energies that has already been underway for years recently reached an important benchmark: comparable cost levels in electricity production. The most impressive development in terms of cost-efficiency, productivity, and learning curves in general has been in the case of solar energy, most notably PV. The fact that PV is easy to install and can be bought by individuals has contributed to its success. Together with the development of batteries in an integrated system, this technology offers a great chance to boost development in the peripheries of Sub-Saharan Africa and Asia. In general, the development of solar (with or without storage options) will help decentralize energy supply structures, with economic and/or political effects for the centralized state and its domestic interests in many regions of the world.

The US and China are thus the political winners in two different games in town, confirming a trend towards a bipolar world order that we can also observe in other policy areas. The US wins because the battle for resources is not as relevant anymore (if it ever really was) and the trade deficit can be lowered massively by exporting oil and gas in the future. While political discussions around energy studies usually focus on the effects on the overall system and the end-consumer of energy services, the development of PV and batteries will mainly be driven by factors such as technology access, competition, and industrial policies. Clearly, based on investments and market shares, China is trying to dominate the market for both products. If the US, Russia, and the Middle East are the resource centers of the hydrocarbon world, China is on its way to becoming the monopolist of the future clean energy world. Despite the positive impact of making technologies available on a global scale, the implications for competition, access to these technologies, and the supply of raw materials will be important issues for future discussions on the geopolitics of energy. In this context, it seems that Europe is straddling both worlds: It is largely import-dependent on fossil fuels, while at the same time pioneering a revolution in the energy system, but unable to keep large shares in a clean energy market that is more and more dominated by China.

1 Daniel Yergin, *The Price. The Epic Quest for Oil, Money and Power* (New York: Simon and Schuster, 1991), 11–15.

2 R.L. Kleinberg et al., *Tight oil market dynamics: Benchmarks, breakeven points, and inelasticities* (Energy Economics 70, 2018), 70–83.

3 Kleinberg et al. (2018), 76.

4 Severin Fischer, "OPEC and Strategic Questions in the Oil Market", in: *CSS Analysis in Security Policy,* No. 216, 11.2017.

5 Cf. Sarah Ladislaw, *Dissecting the idea of US energy dominance* (The Oxford Institute for Energy Studies, forum No. 111, 11.2017), 5–8.

6 Cf. Meghan L. O'Sullivan, *Windfall: How the New Energy Abundance Upends Global Politics and Strengthens America's Power (New York: Simon and Schuster, 2017); Meghan L. O'Sullivan, US energy diplomacy in an age of energy abundance* (The Oxford Institute for Energy Studies, forum No. 111, 11.2017), 8–11.

7 International Energy Agency, *Renewables 2017. Analysis and Forecast to 2022* (Paris 2017).

8 Cf. IEA 2017.

9 Salvador Rizzo, "Trump says solar tariff will create 'a lot of jobs.' But it could wipe out many more", in: *The Washington Post,* 29.01.2018.

10 Charlotte Auban, "Accelerating Africa's Energy Transition" in: *Project Syndicate: The World's Opinion Page,* 11.01.2018).

11 Jatin Nathwani, "Empowering the powerless: Let's end energy poverty", in: *The Conversation,* 29.01.2018.

12 Meghan O'Sullivan/Indra Overland/David Sandalow, *The Geopolitics of Renewable Energy* (Working Paper, Columbia SIPA/Belfer Center/NUPI, 06.2017).

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17 Thomas Wilson/Thomas Biesheuvel, "Electric Cars and Niche Metals Lure Cash to Africa's Mines", in: *Bloomberg,* 02.02.2018.

18 Scoot Patterson/Russell Gold, "There's a Global Race to Control Batteries – and China Is Winning --- It's locking up the supply chain for cobalt, essential to lithium-ion batteries", in: *Wall Street Journal,* 11.02.2018.

19 BP, *BP Energy Outlook 2018* (London 2018).

CHAPTER 4

# Resilience: The 'Fifth Wave' in the Evolution of Deterrence

*Tim Prior*

The concept of resilience is becoming more relevant for current deterrence debates at a time of evolving threats. The fifth wave of deterrence development is rising at a point when established international security practices are fumbling to respond effectively to security challenges. Resilience can increase the ability of security institutions to cope with and respond to complex threats in a deliberative manner. Security policy decision-making processes must match the complex threat environment they seek to govern by being flexible, proactive, and distributed.

Jordanian soldiers take part in "Eager Lion", a multi-national military exercise focusing on facing irregular warfare, terrorism and national security threats. *Muhammad Hamed / Reuters*

Deterrence is relevant again. Twenty-eight years after the end of the Cold War, and four years after the annexation of Crimea, NATO and its member states have to re-learn many lessons that previous generations knew by heart. However, nothing could be more dangerous than just re-applying old recipes to new challenges. As the threat evolves, so must the answer to deter those who threaten.

An important part of any answer has to be resilience. The concept has swept across multiple and diverse policy spaces since the turn of the 21st century. It is neither a "silver bullet" nor a buzzword that will fade with a new publication cycle of the think tank bubble. Resilience offers a unique paradigm for managing "predictable unpredictability".[1]

What, then, is resilience? For example, we know that, unfortunately, terrorists will strike again in 2018. In an ideal world, using previous experience, with appropriate planning, and with the ability to adapt the way we proactively deal with the possibility of such horror, the impact, or even the occurrence, of a terrorist strike where we last expect can be minimized. In the context of security, this is what resilience means: that we establish socio-technical systems with the dynamic ability to anticipate and respond proactively to potential threats by learning and adapting.

This chapter reflects on the rise of resilience in security policy over at least the last ten years. It focuses in particular on the more recent trend towards the view that the successful product of over a decade of resilience thinking and action, is the benefit it offers policy-makers. Resilience, argues this chapter, can bolster deterrence. Of course, as the new denial kid on the block, resilience will not supersede other approaches (especially deterrence by punishment), but this chapter explores ways that resilience might complement existing deterrence tactics.

Naturally, any deterrence debate in Europe focuses first and foremost on NATO and its deteriorated relationship with Russia. Indeed, it is NATO that is primarily responsible for defending its member states and deterring existential threats – both as a nuclear alliance and as the still most effective framework for collective military action. And the alliance faces new challenges: As Russia appears to be leaning towards a broader and deeper understanding of deterrence in the form of "cross-domain coercion", emphasizing non-military means, subversion, and information warfare besides an aggressive and ambiguous

communication of its nuclear might, NATO has to adapt. In the mix of necessary answers, resilience will play an important role.

NATO has stated that it is committed to finding this mixture:[2] *"We […] stand united in our resolve to maintain and further develop our individual and collective capacity to resist any form of armed attack. In this context, we are today making a commitment to continue to enhance our resilience against the full spectrum of threats, including hybrid threats, from any direction."*

Still, while NATO will retain primacy in the deterrence realm, other actors will face similar challenges. In its Global Strategy on Foreign and Security Policy, the EU is explicit:[3] *"The EU will foster the resilience of its democracies. Consistently living up to our values will determine our external credibility and influence."*

And that: *"It is in the interests of our citizens to invest in the resilience of states and societies to the east stretching into Central Asia, and to the south down to Central Africa."*

Even "hard security allies" like the US and the UK have embraced resilience as part of their agenda. As laid down in the US National Security Strategy:[4] *"We must build a culture of preparedness and resilience across our governmental functions, critical infrastructure, and economic and political systems."*

Noting that: *"A stronger and more resilient critical infrastructure will strengthen deterrence by creating doubt in our adversaries that they can achieve their objectives."*

The UK's National Security Strategy offers similar wording: *"We will strengthen our domestic resilience and law enforcement capabilities against global challenges which increasingly affect our people, communities and businesses."*[5]

While some commentators argue that this strategic, and aspirational, language is too vague to be useful,[6] in fact resilience is a practical tool in a complex risk and threat landscape where preventing threat is less successful than establishing coping mechanisms. This chapter examines where resilience has arisen within deterrence discussions, and explores how the process of building resilience is relevant and useful in the context of credible threat deterrence. Often, strategic aspirations are just that: aspirations. But there are excellent reasons to think about deterrence from a resilience perspective – like embracing complexity and transformation in uncertain contexts – and the chapter explores these.

The chapter highlights where opportunities must be taken to embrace new approaches to managing security in complex security systems. In this respect, it explores the practicality of resilience in the current deterrence discussion, but at the same time acknowledges that resilience is a new element that will complement existing approaches.

**Modern Challenges in Deterrence**

Sun Tzu told us the most artful skill in war was subduing the foe without resorting to fighting. Deterrence, whether by denial or punishment, is premised on the notion that an actor can disrupt an adversary's strategy. In essence, deterrence is thus a psychological means of altering the cost-benefit interaction between actor and adversary that is influenced by assumptions about power, and the ability to meet the goals of one's strategy.[7] To understand why and how resilience can bolster deterrence, it is helpful to examine how deterrence theory evolved - and where we stand now.

An actor's deterrence strategy must be seen as credible by an adversary. In order to be credible, the deterring actor must communicate both capability and commitment. In the dyadic deterrence situation during the Cold War, achieving these criteria was complicated, but manageable. This was because the deterrence relationship between the USSR and NATO at the time was essentially based on a shared normative framework. Presumably, the classical deterrence formula of "assured destruction" worked because it was clearly understood by both sides.

Today, deterrence has become more complex. There are more actors, including non-states actors, underscoring the need for the communication aspect of deterrence to be strengthened. Exactly because of the increasingly complex deterrence atmosphere, there is a risk of failure when an actor does not understand their adversary.[8] The inability to understand the adversary might be associated with cultural, religious, political, or historical differences between actor and adversary. It may also occur if the actor does not keep abreast of the adversary's developments in capability or approach. In any event, many believe that the likelihood of deterrence failure has increased.

Deterrence, in theory and practice, has evolved in four waves[9] – from the end of the Second World War until after the collapse of the USSR. Importantly, the concept and practice of deterrence has been closely linked to the development of nuclear weapons and the threat of nuclear war.

Prior to the introduction of nuclear weapons into conflict, the application of deterrence in policy was limited – war was assumed, and the key strategy was to win. With nuclear weapons available to states, international security relations shifted towards the imperative of deterring conflict because the potential consequences of a nuclear war would be too great. During this second wave, deterrence was mainly a matter between NATO and the Warsaw Pact, based on the assumption of "assured destruction", which would dissuade conflict on the basis of punishment. Slowly, deterrence by punishment began to be differentiated from deterrence by denial. Where punishment was seen to add costs into the deterrence relationship, denial was focused on preventing an adversary's goals from being met, thereby removing benefits.

During the third wave of the development of deterrence, leading up to the breakup of the USSR, practical evidence demonstrated the importance of the goals at stake in influencing the success of deterrence. This was especially due to the disruption brought by new technologies and non-state actors that have increasingly complicated the actor-adversary relationship. The cost-benefit nature of classical deterrence was also disturbed by the inclusion of incentives into the deterrent formula. The idea of "tailor-made deterrence" established the need for the application of flexible and adaptive deterrence strategies, especially because of the recognition that deterrence could fail. This also helped to shift the focus of deterrence from punishment to denial.

The fourth wave has been underway since the end of the Cold War and the breakup of the USSR. It has been characterized by asymmetric threats, unclear actor relationships, and the activities of states whose actions were perceived as irrational, among other complications. These changes in the international security policy sphere have led to an increasingly unpredictable and uncertain strategic operating environment.

For example, the effectiveness of modern US deterrence strategy has been frustrated by the actions of adversaries who have exploited technological advancements and the spread of cheap but accurate weapons, and the use of cyber tools.[10] More concretely, Russia's ability to hack the electronic voting systems of the US in 2016[11] suggests US security policy, action, and the identification of the adversary's goals, lagged behind Russian intent and capability. Merely thinking a system is secure is not an assurance of security, or the basis of a deterrent

posture; nor is a system invulnerable to attack by an adversary if its inherent vulnerabilities are unknown to the actor. Implementing resilience can be a means of addressing these issues.

As a form of denial, resilience is useful in complex interactions where actors are unfamiliar with each other's strategies. Complexity complicates familiarity – with actors and with situations. When applying deterrence approaches under these conditions, it can appear that adversaries are beyond deterrence because they simply don't respond in an expected manner.[12] However, the goal-oriented nature of emergent terrorist, hybrid, and cyber-threats,[13] for example, can be more effectively dealt with using deterrence by denial. Because the goal focus in these contexts is so strong, the inability to achieve these goals has negative higher order consequences with respect to the success of an adversary's cause.[14]

**The Rise of Resilience in a Diverse Threat Environment.**

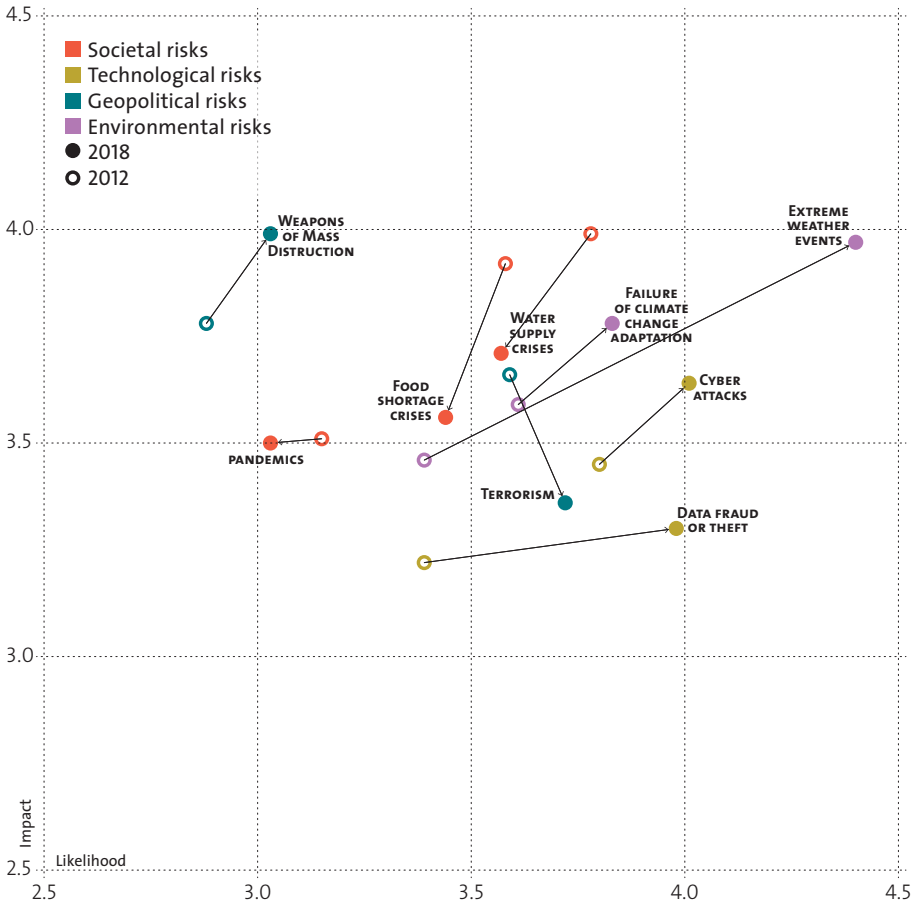
The word "resilience" is derived from the Latin *resilire*, meaning to spring or bounce back. At the most basic level, resilience implies the ability of an entity or system to return to normal functioning or a normal state quickly following a disturbance: an entity "bounces back". Since its early application (in the context of engineering resilience, for instance), a more nuanced conception of resilience, beyond the ideas of stasis or a single equilibrium, has found traction. Here, flexibility and change are considered to contribute to a positive process of learning and adaptation. Resilience is not necessarily about "robustness", but about transformation. Transformation and flexibility are system characteristics that permit a system to persist under challenging conditions with the same components and much the same (or better) function.

The pervasiveness of resilience in the context of national and international crisis and security policy is evidenced by the growing number of states having identified the resilience of technical and social systems as a goal in their security strategies. The desire to become resilient is, on the one hand, likely a popular response, but on the other, also reflects national and international insights and experiences that suggest complete security is impossible to guarantee, and that threat prevention is imperfect.

"Resilience thinking" must be differentiated from "being resilient". Resilience thinking involves decision processes that involve anticipation, adaptation, being flexible, and focusing on the inclusivity of diverse

## The Changing Risk Landscape

The perceived likelihood and impact of a range of risks and threats is in constant flux




Sources: World Economic Forum (2012 and 2018), *Global Risks 2012 Seventh Edition and The Global Risks Report 2018 13th Edition*

decision-makers.[15] Resilience thinking is neither hierarchical nor deterministic, but rather networked and distributed. Resilience thinking is useful in the context of complex systems, where interactions within relationships yield uncertain and unpredictable consequences, and where linear decision processes are sub-optimal. Being resilient can be thought of as the outcome of resilience thinking. Resilience thinking should influence the ability of populations, structures, organizations, and institutions to withstand,

or recover quickly from disturbances. Entities that are resilient are typically less vulnerable to disturbance, and the ability to demonstrate reduced vulnerability is the key element that being resilient lends to discussions about threat deterrence.

Resilience thinking accepts that even the best planning and organization cannot prevent security breaches. Resilience thinking acknowledges the inherent difficulty of attempting to identify and address all vulnerabilities and threats, and that actions and responses create positive and negative feedback loops that influence the transformation and evolution of problems and solutions. Resilience thinking actively links adaptation and learning to the ability to anticipate threats, thereby creating a basis on which to mitigate the consequences of 'predictably unpredictable' threats.

Finding a catch-all resilience thinking approach is next to impossible,[16] which is important in the context of security, because no two threat situations can be dealt with in the same way. In part, this is where more traditional risk management approaches have proven insufficient. Risk management portrays an illusion of top-down controllability, being a hierarchical and deterministic means of stepping through a systematic process of risk identification, assessment, prevention or control, and review. Risk management is a good way of dealing with complicated problems in a top-down manner. Unfortunately, it's not so easy to corral the 21st century threat landscape into this formulaic process. Resilience thinking lends itself more appropriately to dealing with complex problems in a bottom-up, or non-hierarchical manner.

One commonality of national and supra-national resilience policies is that they point to the importance of lower-scale actors and actions in contributing to resilience, making clear that citizens, communities, organizations, and institutions all share responsibility for national security. Several factors have driven this shared assumption, including recurring experiences with security threats, limited or insufficient higher-level responses, difficulty predicting and preventing security threats, critical infrastructure privatization, and the simple desire of the public to be more engaged in decisions that affect them. Resilience thinking has become the model of choice for a more distributed approach to security, where self-organization of actors is seen as the foundation of more sustainable and diffuse responses to identifying and addressing diverse threats. This is important because contemporary

threats are themselves distributed and networked.

**Complexity and Resilience**

*"Deterrence today is significantly more complex to achieve than during the Cold War."*[17]

In a diverse and complex threat environment, guaranteeing security is difficult. The statement above, from the US National Security Strategy, couches this problematic as a future strategic challenge. In practice, most national governments retain a traditional preventative and territorial approach to security[18] that is less suited to this new threat environment characterized by complexity, transformation, and "massive uncertainty."[19] Meeting the challenges of an uncertain and unpredictable future, characterized by novel and asymmetric threats, requires a phase shift in policymaking: "When war changes, so must defense."[20]

To understand why a resilience approach presents advantages in future deterrence, it's necessary to discuss what complexity means, and to think about deterrence and international security as two interacting systems.

In describing the modern threat environment, we must distinguish between *complex* and *complicated systems*. A complicated system has many parts, which interact in a well-defined and predictable manner. By contrast, a complex system is organized not as a hierarchy, but as a series of interconnected sub-systems whose relationships are unpredictable, and where these unpredictable relationships can influence the way the broader system changes. Whereas changes in a complicated system are predictable, changes in a complex system are nonlinear and emergent.

Two examples can illustrate the differences. An aircraft is a good example of a complicated system. While there are many interdependent parts in the aircraft, the pilot controls the plane with known and predictable operations. If something goes wrong, a checklist is often enough to narrow down the source of the issue.

The ongoing campaign to subdue international terrorist organizations is an example of a complex system. Again, there are many elements in the system, but exerting pressure on one element has unpredictable implications or feedbacks for other elements, and the system as a whole. Arguably, the US response to the 9/11 attacks, and the threat from al-Qaida in Afghanistan, was conducted in a traditional way, hoping military might would subdue the threat. To the chagrin of several commanders, the

complexity of the situation illustrated how important a detailed understanding of the various interactions between adversaries, with the geography, local civil populations, technologies, etc., could be for achieving a positive outcome in the complex security situation.

International security, to the extent that it involves deterrence, can also be thought of as a complex adaptive system. The nature of the relationships between the sub-systems that make up the international security system bestow a capacity for proactive and reactive adaptive learning. In actual fact, complex adaptive systems do not change through learning, but emerge from the interactions with other connected complex adaptive systems – if the US military acts one way, al-Qaida quickly reacts. Based on these interactions, the system evolves. Under such circumstances, reductionist approaches, like traditional hierarchical risk management, represent sub-optimal coping tools.

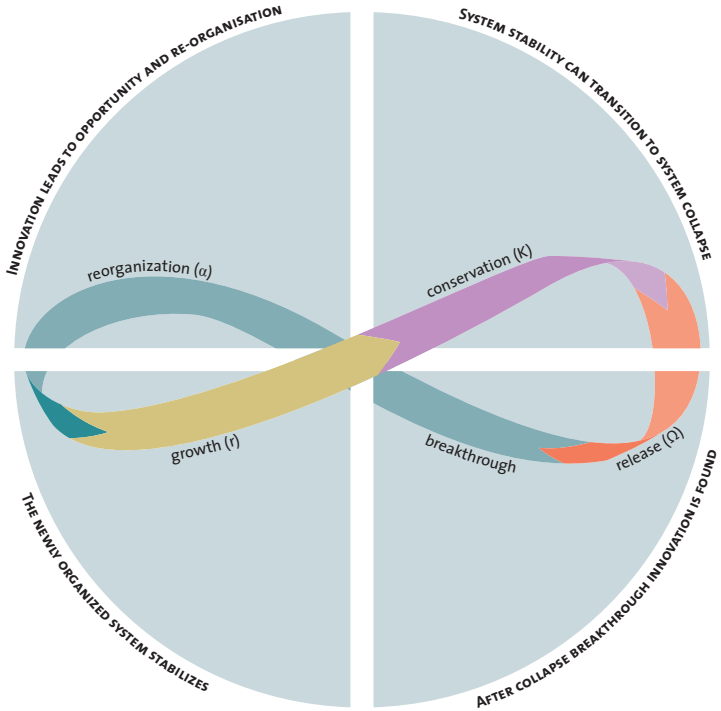
The nature of deterrence is facing a phase shift, driven by the multifaceted and complex nature of the modern threat landscape. Realistically, deterrence must be a flexible and proactive occupation, composed of elements that should suit the nature of the threat. The notion of "tailor-made" deterrence begins to address the complexity of modern threat by attempting to introduce a more detailed understanding of the complex threat situation in order to direct a customized response.[21]

Resilience thinking can be a powerful means of guiding the development of an adaptive tailor-made deterrence approach. The national-international security landscape is illustrated as two interacting "Complex Adaptive Systems" on page 73. The international and national systems interact and respond to one another as they develop and change.[22] Within this system, information and control is multi-directional, flowing between the systems – a state of affairs that has been described as "panarchy".[23] This is in contrast to a typical hierarchical system, where control is exerted in a uni-directional manner. Complex human, socio-technical, and human-ecological systems are arranged as panarchies – as systems that feature nested components, open information flow, and constant change. No element in these systems can be thought of as the ultimate point of control.[24]

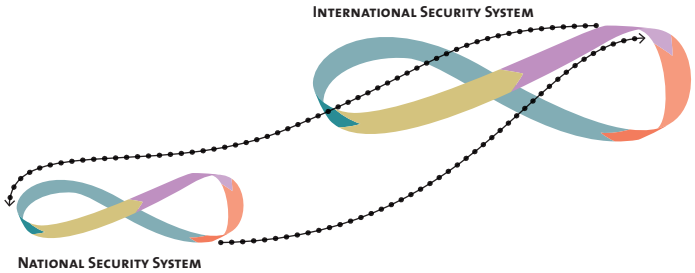
Given the complex threat environment, non-hierarchical decision-making processes, like resilience thinking, are particularly suitable because they match the non-hierarchical nature of

## Complex Adaptive Systems

Interdependencies within complex systems, like national and international security systems, determine how these systems change.




An adaptive cycle, represented here, consists of four stages of stabilization (r), conservation (K), destruction (Ω), and reorganization (α). Periodic phases of destruction (release) give opportunities for reorganization.




All complex systems interact with other systems on multiple scales. The national security system is hierarchically smaller in scale than the international system, and changes more quickly. Both systems are interdependent with multiple feedbacks and connections. These two interacting systems are termed a Panarchy.

Sources: Concept based on Lance H. Gunderson, Crawford S. Holling, *Panarchy: Understanding Transformations in Human and Natural Systems* (Island Press, 2002); Image adapted from Daniel Christian Wahl, *Designing Regenerative Cultures* (Triarchy Press, 2016) and Daniel Christian Wahl, "The adaptive cycle as a dynamic map for resilience thinking" and "Panarchy: a scale-linking perspective of systemic transformation", in: *medium.com* (15.4.2017 and 9.9.2017).

the challenge to be solved. The ability of decision-makers to embrace emergent opportunities and adapt quickly is imperative. While this ability has always been important, it is the diversity in the current threat landscape that is currently pushing the deterrence phase shift from a hierarchical and deterministic mindset to a networked, non-linear, and deliberative mindset.

**Resilience as a Credible Form of Deterrence?**

The credibility of resilience as a deterrent option is closely connected to the utility of resilience thinking in the context of complex threats. Resilience is practical under these circumstances because it shifts the focus from preventing complex and diverse threats to mitigating the consequences of these threats through proactive anticipation, preparation, and adaptation. The new complexity of threats (including terrorist, hybrid, and cyber-threats) is disrupting traditional deterrence approaches.

These points speak to the utility of resilience as a deterrent option in complex threat situations. However, like any other deterrent option, resilience must be credible. Given the nature of deterrence as a psychological strategy disruptor, for resilience to be a credible option it must meet three criteria that are typical of all forms of deterrence: commitment, capability, and communication.

The trend towards committing to resilience in security policy is a strong one. Given that there has already been a reasonably long focus on resilience at national and sub-national scales in the contexts of civil protection, critical infrastructure protection, disaster risk management, public preparedness, and risk communication,[25] systematically scaling up resilience as a national or international security policy priority will clearly demonstrate a real commitment to resilience in deterrence.

Capability can be established through coherent and systemic development of the practical actions that together contribute to building resilience. These might include establishing comprehensive and multi-thematic vulnerability assessments; describing resilience in multiple contexts, finding commonalities; establishing measurement tools and processes; encouraging flexibility within security organizations to improve the ability to learn, adapt, and respond; and investing in developing coherent practices across security themes and sectors.

In the EU, resilience-building in security policy has been established

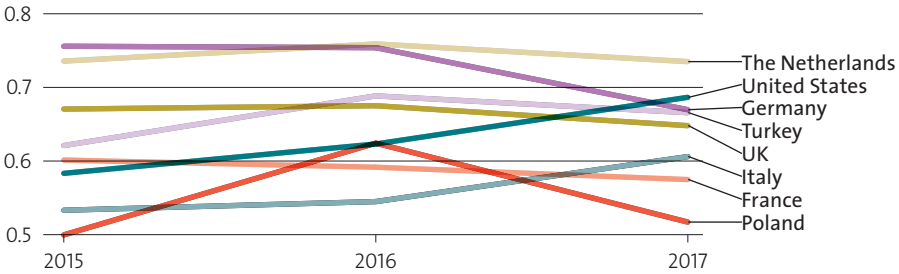
largely as an outward-looking activity in external action. Building up the resilience of neighbors and partners beyond the central territory is seen as a key means of protecting the core. The EU's focus on outward resilience is predicated on the importance of addressing the fragility of neighbor states (as a root of instability and conflict) to the east and south through humanitarian and development activities. It highlights that such action can minimize potential threats to vital interests within the union. In order to demonstrate capability, the EU Global Strategy suggests that a resilient society is one that "features democracy, trust in institutions, and sustainable development."[26] This is a reasonably limited conception, and a hypothetical means of demonstrating resilience capability that presumably seeks to highlight the importance of resilience in the context of social-institutional settings.

As an experiment, it's possible to create an "EU Global Strategy Resilience Index" to track changes in the EU and beyond. Drawing on open-source data for the indicators "democracy", "trust in government", and "sustainable development", a resilience score is charted on page 76. It covers the last three years across several EU, non-EU countries, and the UK and US. This basic index of national (social-institutional) resilience suggests some surprising winners and losers. Of the countries included, only the US, Japan, and Italy seem to display rising societal resilience. Perhaps unsurprisingly given the long process through which Germany has gone in forming a coalition government (from mid-2017 to early 2018), and government delegitimization associated with the refugee "crisis" (2015), Germany's resilience (predicated on trust in government and democratic values) has fallen dramatically. Likewise, Poland's resilience has also shown a dramatic turn for the worse, perhaps related to the government's attempts to undermine the rule of law in 2017,[27] and the implications for democracy in that country. These (very simple) results suggest that actions to build, maintain, or demonstrate capability in societal resilience should be implemented not just in external activities in peripheral (more fragile, less stable) states, but also on the EU's home turf. The latter is a less typical action because of a bias in the perceived external origin of threats to the EU (from the east and south), which reflects an EU-centric power asymmetry.[28]

Communication is the third criterion of credibility, and possibly the most difficult to achieve. Demonstrating that a critical infrastructure, or society as a whole, is resilient (or becoming resilient as a result of national

### The EU Global Strategy Resilience Index

Using the EU's definition of resilience to chart changes in resilience since 2015




Note: The resilience index used in this figure was calculated using open-source data for the indicators "democracy", "trust in government", and "sustainable development". This is a narrow conception of what might be meant by societal resilience, and the index is used merely as a tool to communicate resilience as a measured characteristic in this article. Data was unavailable for all countries, and the selection included here is therefore limited. Patterns are interpreted loosely.

Sources: Jeffrey Sachs et al. (2017 and 2016): *SDG Index and Dashboards Report 2017,* p. 10, and *SDG Index and Dashboards – Global Report,* p. 37, (New York: Bertelsmann Stiftung and Sustainable Development Solutions Network); Christian Kroll (2015): *Sustainable Development Goals: Are the rich countries ready?,* (Sustainable Governance Indicators, Sustainable Development Solutions Network, Bertelsmann Stiftung), p. 6; The Economist Intelligence Unit, "The Economist Intelligence Unit's Democracy Index", in: *infographics.economist.com/2018/DemocracyIndex;* Andrea Silenzi (Twitter, 7.4.2017), "Confidence in #governments in many OECD countries is still lower than before the financial crisis" referring to: "Trust and public policy", in: OECD (2017), *Trust and Public Policy* (Paris: OECD Publishing), p. 20, based on Gallup World Poll; OECD (2017), *Government at a Glance 2017* (Paris, OECD Publishing), StatLink p. 215, based on Gallup World Poll; Edelman trustbarometer and Edelman, "2017 Edelman Trust Barometer" in: *edelman.com/research/2017-trust-barometer-global-results,* p. 12.

measures) requires that resilience be measureable and measured. Clear communication relies on a demonstration of capability – as a resilience index could potentially do. For instance, only with concrete evidence that people or structures are becoming more resilient will the assertions of the US National Security Strategy that a "stronger and more resilient critical infrastructure […] strengthen deterrence by creating doubt in our adversaries that they can achieve their objectives"[29] be borne out.

NATO's push for resilience is naturally focused on member states. Problematically, though, NATO has no mandate to build national resilience directly. Nevertheless, the alliance is keenly interested in building resilience and has established a technical focus predicated on the need to build civil preparedness of critical infrastructures as a basis for the delivery of military forces and capabilities in upholding collective defense. Given the (geographic, political, technical, and social) connections between NATO members, neighbors, and partners, the desire to build resilience in the alliance will also require engagement with non-typical associates that might share borders, infrastructures, or interests.[30] Whether these actions have direct or indirect implications for deterring

threats on EU or NATO territory will only become evident in the future.

The very context-specificity of resilience that is one of its advantages can be interpreted as ambiguity. This can be a problem in the aspirational context of national security strategies. In commenting on discussions about cybersecurity in the US National Security Strategy, Ben Buchanan criticizes the vagary of discussions about resilience in deterrence. Rightly, he points out that "Adversaries can employ the same tactics again and again with success. And, until U.S. strategy recognizes that and stops them, they will."[31] Here lies the point: if the US, or any country with an active focus on resilience building, continues to pursue measures of vulnerability reduction, agile anticipation, resilience monitoring, assessment, evaluation, and adaptive learning in a systematic manner, then it can address these problems, and not just in the context of cyberspace, but also with respect to hybrid threats and terror.

**Resilience: Guiding the 'Fifth Wave' of Deterrence?**

*"In the highly complex and dynamic international environment of the twenty-first century, policymakers […] deal with multiple actors, asymmetric relationships, and transnationally networked threats."*[32]

Resilience thinking and being resilient can offer concrete advantages in security policy, and specifically in deterrence. Applied resilience is becoming the cornerstone of security policy, and represents the fifth wave of deterrence.

Modern threats are complex, multi-actor, cross-scale problems, which must be met with agile, resilience thinking-style institutional decision-making that fits the nature of the problems. Proactively countering complex threats with equally networked and distributed policy responses, guided by resilience, will improve the effectiveness of those security policies. In this context, the increasing resilience of society, critical infrastructure, and organizations – the product of a decade of resilience promotion in security policies – and the concomitant reductions in vulnerability will deter asymmetric threats by denying threatening actors suitable targets for their attacks.

Where classical (nuclear) deterrence was hierarchical and deterministic, based on the known relationships between the actors, and on the simple and well-understood principle of assured destruction, which held the actors in check, modern deterrence is altogether different. Threats are uncertain, and unpredictable; actors

are unknown, as are the vulnerabilities they target. As threats have become less state-centered, and more likely to originate from distributed networks, the means of addressing these threats must also change.

The fifth wave of deterrence development is rising at a point when established international security practices are fumbling to respond effectively to security challenges. Resilience thinking presents a potential breakthrough that can increase the ability of established security institutions to improve their links and address complex threats deliberatively. If institutions can accept the current shift toward resilience as an important and practical one, then the "complex adaptive system" of international security is more likely to meet future system changes or disruption in a more prepared state. The fifth wave of deterrence will be characterized by the network-driven, tailor-made solution.

Deterrence is an uncertain art, not a science, and if the decision-making processes that determine deterrence actions do not match the problems, it is unlikely that practical deterrence solutions commensurate to modern threats can be identified and deployed.

Modern approaches to national and international security are already built on networks, but control tends to remain hierarchical and linear. Dealing with complex threats highlights the necessity to move away from traditional reductionist and hierarchical approaches to problem governance, and to engage existing networks with distributed and deliberative approaches.

To a certain degree, policy failures must be accepted as inevitable in a complex, uncertain, and unpredictable security environment. But policy failures will be more likely if policy-making processes are not suited to this current security environment. If policy processes are deterministic, reductionist, and hierarchical, then they are not suited to governing systems that are characterized by non-linearity, unpredictability of interactions, and uncertain feedbacks. By contrast, if policy processes are designed to match the complex systems and problems they are attempting to govern – i.e., if they are flexible, reactive, and distributed – then they are likely to be more successful.

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