BOOK REVIEWS

The Rise and Fall of OPEC in the Twentieth Century, Giuliano Garavini (Oxford University Press, 2019) 420 pages, ISBN 978-019-883283-6.

Rightly or wrongly, the Organization of Petroleum Exporting Countries (OPEC) is often cited as an example of an economic cartel. OPEC remains salient in contemporary discussions of the global oil market. Yet academic research on whether OPEC actually operates as a cartel largely finds that alternative models better explain observed behavior (e.g., Griffin 1985, Smith 2005, Bremond et al. 2012). Along comes Giuliano Garavini's history of OPEC, tracing the arc of the waxing and waning of OPEC over the course of the 20th century. Garavini is an historian who has laid claim to writing the first complete and professional history of OPEC. He relies almost exclusively on secondary sources, but access to OPEC archival material richens the narrative substantially and fortifies his claims to an initial professional account. Building on his expertise studying global North-South issues, Garavini provides a comprehensive account of OPEC until about 1990. The reader will not confuse Garavini for a professional economist, but his perspective precipitates consideration of the validity of an alternative view of OPEC as an entity other than an economic cartel. He is sympathetic with resource states and antagonistic towards international oil companies and western governments, which certainly took advantage of early arrangements in a way that may have predestined the creation of OPEC or a similar organization.

The chapter-length prologue traces the rise of the "petrostate" in countries around the world. It is clear that Garavini has a particular affinity for and expertise about the case of Venezuela, which serves him very well through the initial formation of OPEC. The important developments in the creation of the international oil industry receive less detailed coverage than one might expect. Though sections on developments in 1928 – the Red Line Agreement in the Middle East and the "As-Is" or Achnacarry Agreement that promoted anti-competitive practices – are included, Garavini never identifies the period of domination by the "Seven Sisters" international oil companies as a cartel outcome. From an economic perspective, the parallels in this early period of cartelization and later efforts to nationalize both production and cartel power are clear. This forewarns the reader of Garavini's sympathy for the sovereign governments of oil exporters. There is nothing wrong with that choice of perspective, though it is a bit overplayed when it comes at the cost of bashing alternative perspectives (including a bizarre sideswipe at Daniel Yergin's *The Prize*, which is relatively strong in this epoch of history). The upshot is that the pre-WWII period receives short shrift, even as it laid seeds that matured into pro-OPEC forces in later years.

The rise of nationalist bargaining power consumes the following chapters, which cover the postwar years through the 1950s. Here Garavini's strengths shine through, as discontent with international oil companies and nationalist sentiments fomented efforts to keep a greater share of rents in the countries exporting oil. The first manifestation of this was the rise of "fifty-fifty" agreements led by Venezuela. These postwar agreements (cf.1948 in Venezuela, 1951 in Saudi Arabia) substantially increased government take in exporting countries. Strong demand growth proved to be a rising tide to lift all ships, but the issues of control and sovereignty did not fade away. The years of the Great Depression and war had suppressed these smoldering sentiments. The remnants of the interwar commercial order seemed anachronistic in a period when the vestiges of colonialism were crumbling around the globe. Economic renegotiation against the backdrop of rising nationalism and a deeper philosophical struggle between capitalism and socialism makes for many intriguing sideshows, and Garavini colorfully follows the twisting plots.

Nationalist notions boiled through the 1950s, leading directly to the formation of OPEC in 1960. Garavini spills little ink on the Suez Crisis and the subsequent turmoil in global oil markets.

Instead, he focuses on the first International Petroleum Congress in 1951 that brought producing nations together to discuss common issues. Following this initial meeting, he traces the flood tide of Arab nationalism in 1958.

The proper formation of OPEC started at the Arab Petroleum Congress in Cairo in April 1959. While the Congress was a step toward increasing recognition of shared economic interests and similar issues facing petrostates, the most important action was on the sidelines. A small clutch of representatives for the United Arab Republic (Egypt and Syria), Saudi Arabia, Kuwait, Iran, and Venezuela, with an informal representative of Iraq, met daily at the Maadi Yacht Club. The resulting pact targeted increasing government take beyond 50:50, creating domestic production and price regulation agencies, creating national oil companies, seeking to recoup profits from foreign firms, and seeking to retain posted prices. This agreement leaned heavily on the Venezuelan experience. The subsequent meeting was in Baghdad in September 1960, and is generally recognized as the founding of OPEC. The parties to the Maadi Pact, except the United Arab Republic, agreed to form OPEC, with stated objectives of maintaining stable prices above recently-reduced levels, show solidarity with countries boycotted by the international oil companies, and to introduce international production regulation subject to members' concerns. This was the first strategic defeat for the Venezuelans, who pushed hard for prorationing but were opposed by Arabs with greater reserves. Garavini correctly identifies this initial alliance as political rather than economic, and focuses on the failure to reach a consensus in favor of prorationing as a crucial shortcoming.

One of the strengths of this new account is that the author had access to the official OPEC archives, including notes from the meetings. Garavini uses these proceedings to narrate the story through the 1960s, which he dubs the "consumer's decade," in part because exporting countries struggled to figure out what to do with their new organization. The first four OPEC meetings, which occurred into 1962, formalized the creation of this novel political institution. But it did not yet have influence, and efforts in that direction were undermined by at least two opposing forces. One was internal, where the interests of the OPEC members were exposed to be not just unaligned, but at times even contradictory. At the same time, rapid expansion of production outside the bloc reduced the potential influence, and diluted the focus on international oil companies as the antagonists of oil exporters' interests. As an example, the focus of royalty negotiations in 1963-64 exposed the differences in concession agreements, some of which relied on posted prices and others that did not. While all OPEC members had an interest in increasing their take, there was not a consensus about how to approach the negotiations.

The development of additional resources had an unintended consequence, because it eventually led to more members, including Qatar (1961), Indonesia and Libya (1962), Abu Dhabi (1967), Algeria (1969), and Nigeria (1971). After the 1967 Six Day War, Arabist sentiments were aflame and led to the creation of the Organization of Arab Petroleum Exporting Countries, a sort of mini-OPEC unified around a set of anti-Israel notions. At the same time, the British were withdrawing from the last vestiges of colonialism, notably in the Persian Gulf. Because the differing economic interests and national identities were so important to later developments (continuing to this day), this chapter of the book is a quilt of national and postcolonial histories reminiscent of a global history text.

The chapter titled "The Energy Crisis" covers events starting with the 1968 and 1969 coups in Iraq and Libya through early 1973. As a point of history, this period precedes the period usually thought of as the "energy shock." The tightening of the global market, including production peaks in the United States and Venezuela, created conditions that allowed OPEC to begin dictating policies, particularly around issues of participation and eventually nationalization. This contrasted starkly with the negotiations between OPEC and oil companies in the 1960s, when developing leverage was challenging. While this created more favorable conditions for OPEC and its members, the title oversells the events of the period.

For a book titled *The Rise and Fall of OPEC*, the historical arc of OPEC is not always clear. At one point (p. 282), Garavini refers to 1974 to 1979 as the golden age of OPEC. Two chapters seem to capture the zenith. First, the period from October 1973 until the March 1975 Algiers Conference represents the period most associated with the oil shock. The tripling of the official price of Arabian Light in late 1973 might seem like the focal event of this period, but Garavini offers a deeper analysis: "The Arab embargo and production cuts, however significant, are not the events we commonly associate with the term 'oil shock.' The shock that would still be remembered to this day was the 'price revolution' that followed the embargo." (p. 221) The chapter dives into detail about efforts to increase total government take, in part by increasing prices, but also by changing price formation. The political struggles between OPEC members and oil majors, between OPEC members and one another, and between consumer countries and OPEC are all examined in some detail. The chapter culminates with a long section about efforts by OPEC and its members to have a greater impact on global development than through oil production alone. Garavini draws on his expertise from his 2012 book in relating development and North-South issues into the political fabric of the time, best epitomized by the eclectic crossroads of Arabists and revolutionaries in Algiers in the mid-1970s.

The subsequent chapter begins with an account of Carlos the Jackal and sympathizers taking hostages at the December 1975 OPEC meeting in Vienna, but goes on to illustrate the strain of political compromises and broader geopolitical developments in the last half of the 1970s. A second oil crunch took center stage of the economic events of that time, but Garavini focuses on the political positioning. Much of this draws heavily on other accounts of primary actors (e.g., Robinson 1988), but also the OPEC archives.

These were delicate times despite higher oil revenues. By the end of the chapter, two of the founding members of OPEC were engaged in a shooting war with one another (Iran and Iraq). The Iranian Revolution arrived as OPEC was trying to plot a long-term strategy. The 1980 meeting in Bali offers a rather clear case of a cartel failing to reach an economic agreement due to diverging interests, calcifying the "Doha split" in oil pricing that took shape in 1976.

The inevitable fall comes in the early 1980s when "petrostates finally attempted to transform OPEC into a real cartel" (p. 326). In this chapter Garavini's economics are sharper than through much of the rest of the book. The introduction of production quotas in 1982 represented a shift in OPEC's role towards trying to support higher prices. Rising non-OPEC production and financialization of oil beyond the reach of members both eroded the position of OPEC by eroding market share and rendering reference prices obsolete. The divergent interests of the members proved the undoing of efforts to support prices and reduce production, exactly as economic theory predicts: "The entire effort to prop up global oil prices thus fell on the shoulders of OPEC, which had failed, however, to definitively resolve its own internal problems." (p. 340) The recognition of the fall is fairly easy to identify, when, in 1986, the members agreed to production cuts that had been resisted and even flaunted. "[T]he real miracle is that OPEC, however weakened, did not disappear" (p. 360) nicely summarizes the predicament of the chapter "The Failed Cartel."

The epilogue is mostly denouement after the failure to control production and prices in the mid-1980s. A literary flourish provides a soft landing for the reader, as Garavini focuses on two divergent threats in the late 1980s and early 1990s. First is the Iraqi invasion of Kuwait, and subsequent expulsion by a U.S.-led coalition of international forces. This represented an external threat to the OPEC goal of internal governance. The second is the *apertura* in Venezuela, which was an internal repudiation of cooperation and a resolution to forge ahead alone, characterized as an internal threat to continued relevance of OPEC. The book's conclusion is that OPEC failed to effectively advance the interests of petrostates. Instead, the interests of rich consumer countries—in shorthand represented by OECD—held sway at the end of the 20th century, as they had when OPEC formed.

How does this historical account inform us about OPEC in the 21st century? Since the 1990s, there have been substantial changes in the oil outlook with the rise of China as a major consumer and a greater global consciousness about climate issues. OPEC has responded by trying to recruit sympathetic exporting countries, notably Russia and Mexico, in an effort to shore up its market supply. These states only compound old problems of heterogeneous states trying to coordinate decisions. Simultaneously, the specter of expanding independent production has resurfaced, illustrated most poignantly by the United States becoming a net exporter for the first time in decades. As policymakers struggle with these and other novel issues, a good grounding in history cannot hurt.

The most surprising thing about this book is its sloppiness, all the more surprising given the reputation of Oxford University Press. Expect dozens of typos, syntactical and grammar errors, and misquotes *in each chapter*. These persistent errors detract from, but do not completely undermine, the scholarliness of the book. It does seem to be a relevant volume for anyone interested in the functioning of OPEC or the relationship of oil to other resource cartel or broader development efforts.

Timothy Fitzgerald
Texas Tech University

REFERENCES

Brémond, V., E. Hache, and V. Mignon (2012). "Does OPEC still exist as a cartel? An empirical investigation." *Energy Economics*, 34(1): 125–131. https://doi.org/10.1016/j.eneco.2011.03.010.

Garavini, G. (2012). *After empires: European integration, decolonization, and the challenge from the global South 1957-1986*. Oxford University Press.

Griffin, J.M. (1985). "OPEC behavior: a test of alternative hypotheses." *The American Economic Review* 75(5): 954–963.

Robinson, J. (1988). *Yamani: The inside story*. Simon & Schuster.

Smith, J.L. (2005). "Inscrutable OPEC? Behavioral tests of the cartel hypothesis." *The Energy Journal* 26(1). https://doi.org/10.5547/ISSN0195-6574-EJ-Vol26-No1-3.

Yergin, D. (1991). *The Prize: The epic quest for oil, money & power*. Simon and Schuster. New York, NY.

* * *

Globalization of Clean Energy Technology: Lessons from China, by Kelly Sims Gallagher (MIT Press, 2014), 278 pages, ISBN 9780262026987 (hardcover) ISBN 9780262533737 (paperback).

Technology will undoubtably play a crucial role in the global transition to clean energy. More and better technology that diffuses faster will improve our chances of meeting global clean energy targets. Kelly Sims Gallagher's overarching target in this book is to investigate the barriers and incentives to such technology transfer for four technologies, drawing on the experience of China. At the time of publication, she was purely an academic, but subsequently gained direct policy experience in both the White House and State Department.

This well-researched, well-argued, and well-documented book is now seven years old. Thus, some of the cost and technology discussion are dated in these rather rapidly evolving markets. Nevertheless, I found it a worthwhile read for its challenge to some of our conventional views and a foundation to further explore clean energy technology transfer with China. It presents another and earlier point of view for some selected energy technology transfer in the ongoing contentious debate on unfair Chinese technology transfer (see for example, Office of the United States Trade Representative (2018)).

Economists looking for detailed policy recommendations are likely to find the policy discussion simplistic and repetitive. They are also likely to find that no mention of the potential advantages of market-based policies is a missed opportunity. However, readers looking for a discussion of the four clean energy cases studies, historical and institutional information on Chinese environmental and property rights laws and institutions, and a comparison of clean energy technology transfer from both Chinese and non-Chinese points of view will be well rewarded.

The usual justifications for clean energy are provided at the outset – environmental issues, energy security, and jobs and economic growth. Less familiar and more interesting to me was the delineation of mechanisms for international transfer of clean technologies, the main focus of the book. Technology may be begged, borrowed (stolen), or bought in a variety of ways. Exports and imports of final goods may have clean technology embedded in them. Firms may contract with a foreign firm, purchase a technology license, or even purchase the whole firm. Alternatively, alliances may be formed including international joint ventures along with collaborations among firms, universities, government organizations, and international research organizations. Human international migration for work and study may transfer technology as well. Other information transfer mechanisms include conferences, workshops, books, papers, patents, and technology agreements between governments.

Four case studies on gas turbines, solar photovoltaics (PV), advanced vehicle batteries, and coal gasification are based on interviews with Chinese and foreign firms dealing with China. The cases yield four main findings. The barriers to clean energy technology transfer are not as large as generally believed. Nor is intellectual property or lack of access to technology in emerging markets a serious barrier. Lack of finance has not been a barrier in China, but is more so elsewhere, even in rich countries. Fourth, the biggest barrier to global commercialization of cleaner energy technology is the lack of consistent and effective government policy.

Chapter 2 starts with an overview of Chinese economic and energy development, which will be a good introduction for some. Because of China's success in clean energy, Gallagher suggests it makes a good laboratory for the study of clean energy diffusion. Further, the uniqueness of China and opposing opinions of China's clean energy industry as a threat or as an opportunity make for an interesting exploration.

Many superlatives come to mind when describing China: largest energy consumer, largest coal consumer, largest clean energy market, and largest investor in renewable energy. With an almost 50 percent national saving rate, investment capital for clean energy has not been the limiting factor it has been in other places. What I found most interesting in the chapter was the overview of Chinese energy and environmental targets, laws, and programs along with the key actors, investment amounts, and trends in China's energy innovation systems. An important issue with Chinese environmental laws is that although national laws may be stringent, the laws must be implemented at the local level, where there may not exist the capability or will to enforce laws detrimental to local growth.

Chapter 3, contains the four case studies on green energy technology transfer and is the heart of the book delivering most of the major and surprising takeaways. I expect it will be the most interesting chapter for many readers. The outcomes for these four cases are different. Each provides interesting lessons about barriers and incentives for technology transfer as noted in the later part of the chapter. The case studies were based on close to 100 interviews with Chinese and non-Chinese in companies, academia, and government as listed in an appendix. The non-Chinese points of view were mostly based on interviews in Germany and the United States. These case studies were supplemented with results from a clean energy technology workshop and dozens of case studies on clean energy and other types of technology transfers, which are each briefly described in an appendix.

For gas turbines, large international companies, most notably General Electric and Siemens, controlled advanced technologies and were hesitant to transfer these technologies to China. If willing to license technology, they charged quite high prices or transferred older technologies. Consequently, Gallagher did not consider advanced gas turbine technology transfer to be very successful and also noted additional barriers included export controls in foreign countries, weak adaptive capabilities in China, and government policy that either thwarted or did not support the transfer.

Technology transfer for electric vehicle batteries also encountered some barriers. Pollution policy and efficiency standards were only implemented in the early 2000s. More recently, given the strong patent protection for Japanese hybrid vehicle technology, the workaround was to target a leapfrog directly to electric vehicles. Gallagher acknowledges that electric vehicles will only be clean if China can transition out of coal-generated power.

Solar PV is quite another story. Although there was not a local market, the Chinese industry has been wildly successful. It was driven by an abundance of financing from local governments, Chinese ability to acquire, improve, and reduce manufacturing costs for the technology, coupled with an export market created largely by foreign government policy (e. g., feed-in tariffs in Germany and renewable portfolio standards in some U.S. states). A more recent book supports Gallagher's conclusions and also outlines how important human capital transfers and industry-university collaborations have been in this success story (Han and Niosi, 2018)(For more recent information on industrial policy and funding of the Chinese solar industry, see Office of the United States Trade Representative (2017), For more information on Chinese illegal or unfair acquisition of solar and other technology see Office of the United States Trade Representative (2018).

Coal gasification is a fourth case with a slightly different outcome. Initial coal gasification projects were built using foreign licensing to be used for chemical products and liquid fuels. But the foreign technology did not work well with Chinese coal. There were constant breakdowns with poor after installation service support. This led the Chinese government to support a workaround that promoted their own technology, which was better suited to Chinese grades of coal. The result is that the Chinese have emerged as global leaders in the technology, even licensing it to firms in the United States. In conjunction, integrated gas combined cycle power generation (IGCC) is being researched in China, though it is more expensive than the best single cycle coal plants. Post-publication information also suggests that IGCC is still not at the commercial stage in China (Peng, 2021, Asian Development Bank, 2017).

Although intellectual property right transfers were more challenging barriers in a couple of these cases, work arounds were found -- for coal gasification the Chinese developed their own technology and the Chinese government has targeted electric rather than hybrid vehicles. The remainder of the chapter 3 considers barriers and incentives for technology transfer. Gallagher compares the foreign and Chinese perspectives. Some interesting takeaways are that there was widespread agreement between both Chinese and foreign experts that policy, especially clear targets, lack of trade barriers, foreign direct investment, innovation policy, and policy alignment are important incentives. However, Chinese and foreigners did not agree on policy barriers. Foreigners complained of lack of access to the Chinese market for both advanced batteries and solar PV. The Chinese observed more barriers in the form of transfer of intellectual property of foreign technology than did foreign firms. Chinese firms did not find financing a barrier, whereas foreign firms considered it to be a major barrier. The author indicates that finance seemed abundant in China, but did not go into any detail on the sources of the funds.

The next three chapters rely strongly on the case studies. In chapter 4, the role of policy is considered. There is a reiteration of the reasons for policies, a discussion of the types of policies (industrial policy, innovation policy, trade policy, and market formation policy) and cases where policies helped or hindered technology diffusion. As these policies had been referred to repeatedly throughout the earlier chapters, it would have been helpful to have had some of this discussion earlier in the book.

Chapter 5 considers the role of intellectual property rights and is another chapter that I expect will intrigue many readers. Gallagher lays out the two opposing viewpoints to intellectual property. Owners of intellectual property fear it may be stolen. Potential purchasers fear they may have restricted access because owners are unwilling to transfer technology at any price, or only at prohibitively high prices. She considers the literature on intellectually property and technology transfer and outlines the changing landscape of the intellectual property regimes in China. There is an interesting discussion on how firms in these four industries protected themselves from infringement (e. g., not allowing any employee to understand the whole process and not manufacturing parts but only assembling in the purchasing country). Evidence from the case studies, an investigation of court cases, and a quantitative analysis of patenting by clean energy source in China did not find strong evidence of major intellectual property infringement for these case studies. (For more recent debate on this contentious issue and its cost the U.S. economy compare Commission on the Theft of American Intellectual Property (2017) with Takash (2019)).

I find the most surprising take away from the case studies is that interviewees indicated that access to these clean energy technologies and property rights infringements have been lower barriers than popular sentiment and experience in other markets would lead one to expect. Gallagher concludes IP had been less of an issue for these clean energy technologies because the technologies were more complicated and harder to steal than other areas where theft is a huge issue (media, chemicals, pharmaceutical), many foreign companies had been good at protecting their IP, and the Chinese IP legal institutions had improved since China joined the WTO.

Chapter 6 considers the difficulties that new clean energy players have competing against dirty incumbents, which fail to pay their full social cost and sometimes even get subsidies. Such market failures require government intervention. Gallagher notes that although most of these clean technology costs have consistently fallen over time, cost is still one of the most important barriers to diffusion. However, even in the seven years since publication of the book, some of these costs have fallen further (e.g. solar PV module cost fell from steadily from $1.96 in 2010 to $0.26/W in 2019, Glenk, Meier, and Reichelstein, 2021, Figure 2, Table A1 and IRENA, 2020).

Throughout the chapters, diffusion theories are explored for consistency with the Chinese case studies. In the last chapter, Gallagher reiterates and expands on some of the earlier conclusions. A theoretical contribution of the book is that technology transfer is not only from industrial to emerging markets. With globalization of capital and labor, the transfers are bidirectional both within and across these groups. She suggests that Chinese entrance to the World Trade Organization (WTO) may have also contributed to technology diffusion as China made numerous reforms to its intellectual property laws before and after it joined the WTO in 2001.

The two national and local drivers of technology transfer were the Chinese willingness to heavily fund clean energy technologies and market creation policies outside of China. It is hard to imagine the progress in some of these cleaner energy sources, especially solar, wind, and cleaner vehicles, without policy incentives. She suggests that policy will still be required to create markets in renewables, international coordination of policies would be helpful, and cost, though a barrier, is not insurmountable.

What I most strongly recommend and expect *Energy Journal* readers will most appreciate are the case studies and the implications drawn from them. A most ambitious undertaking built on first-hand knowledge of the Chinese market, they present a different slant on China and technology transfer. They show the opposing sides of the contentious debate on intellectual property rights, ways in which companies in these four industries have protected themselves in order to take advantage of the huge Chinese market for clean energy, and changes in intellectual property protection law and resulting court challenges implemented in China. She found most of the court cases were between Chinese companies suggesting that as their intellectual property increases, they will also want protections in place. She found the general perception among foreign firms seemed to be that these protections have and continue to improve, and the courts were not unduly biased against foreign firms in these industries. This lack of perceived bias against foreign firms was supported in Love, Helmers, and Eberhardt (2016) who found patent court cases were found in favor of foreign firms against domestic Chinese firms about 70% of the time, which was about the same rate as the findings for domestic firms against foreign firms.

Some may find the appendix on the innovation case studies a useful start that can be updated and built upon. I appreciated the good discussions on the history of energy and innovation policy and law in China as well as Appendix D, which includes a timeline of major national clean energy forming policies beginning in 1970 with the U.S. Clean Air Act and culminating in early 2012 with different acts in multiple countries.

Her methodology is mostly verbal but she does present numerous hypothesis and argues their merits based on the case study interviews and collecting data on court cases and patenting. The book is accessible to a general audience and parts would provide good background reading for courses dealing with Chinese energy markets, environmental laws and IP institutions. More careful editing to remove redundancies would have made the book read more smoothly.

Carol Dahl
Colorado School of Mines

REFERENCES

Asian Development Bank (2017). “People’s Republic of China: Tianjin Integrated Gasification Combined Cycle Power Plant Project.” https://www.adb.org/sites/default/files/project-documents/42117/42117-013-pcr-en.pdf

Commission on the Theft of American Intellectual Property (2013). *U. S. Commission on the Theft of American Intellectual Property IP Commission Report.* https://www.nbr.org/wp-content/uploads/pdfs/publications/IP_Commission_Report.pdf, Updated in 2017. https://www.nbr.org/wp-content/uploads/pdfs/publications/IP_Commission_Report_Update.pdf.

Glenk, Gunther, Rebecca Meier, and Stefan Reichelstein (2021). “Clean Energy Technologies: Dynamics of Cost and Price.” https://law.stanford.edu/wp-content/uploads/2021/05/CostandPriceDynamics.pdf. https://doi.org/10.2139/ssrn.3889531.

Han, Xue and Jorge Niosi (2018). *The Revolution in Energy Technology: Innovation and the Economics of the Solar Photovoltaic Industry*, Edward Elgar Publishing. https://doi.org/10.4337/9781788115667.

IRENA (2020). “Renewable Energy Costs.” https://infogram.com/renewable-costs-2020-infographic-1h7k230d0vdeg2x-?live

Love, Brian, Christine Helmers, and Markus Eberhardt (2016). “Patent Litigation in China: Protecting Rights or the Local Economy?” http://digitalcommons.law.scu.edu/facpubs/918.

Office of the United States Trade Representative, Executive Office of the President (2017). “Section 201 Cases: Imported Large Residential Washing Machines and Imported Solar Cells and Modules.” https://ustr.gov/sites/default/files/files/Press/fs/201%20Cases%20Fact%20Sheet.pdf.

Office of the United States Trade Representative, Executive Office of the President (2018). “Findings of the Investigation into China’s Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation Under Section 301 of the Trade Act Of 1974.” https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF.

Peng, S. (2021). “Current Status of National Integrated Gasification Fuel Cell Projects China.” *International Journal of Coal Science and Technology* 8: 327–334. https://doi.org/10.1007/s40789-021-00443-3.

Takash, Daniel (2019). “Bad Math on Chinese IP Theft is Used to Justify Trade War” https://capturedeconomy.com/chinaip-math/

U.S. Department of Justice (2018). “Court Imposes Maximum Fine on Sinovel Wind Group for Theft of Trade Secrets.” https://www.justice.gov/opa/pr/court-imposes-maximum-fine-sinovel-wind-group-theft-trade-secrets.