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When the Lights Went Out: Electricity in North Korea and Dependency on Moscow

Benjamin R. Young*

The division of the Korean Peninsula has been symbolized by electricity. While South Korea lights up on satellite images, North Korea is dark. Using archival documents from North Korea's former communist allies and Pyongyang's state-run media, the author argues that the DPRK's electricity shortages were not a result of the regime's Juche ideology but rather an outcome of overreliance on Soviet assistance. This analysis disputes the notion of North Korea's Juche ideology as a totalizing phenomenon within the DPRK's political structure. By presenting a multifaceted history of North Korea's electricity sector, the author highlights the ways in which Pyongyang engaged with Soviet electrification aid and global energy trends generally.

Keywords: North Korea, Kim Il Sung, Electricity, Russia, Kim Jong Un

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On December 22, 1920, Soviet leader Vladimir Lenin announced in a report on the work of the Council of People's Commissars, "Communism is Soviet power plus the electrification of the whole country. Otherwise the country will remain a small-peasant country, and we must clearly realize that."¹ As the founder of the first self-proclaimed workers' state, Lenin's emphasis on electricity as the basis of communism would have reverberations throughout the Eastern Bloc for decades to come. After the division of the Korean Peninsula in 1945 between the Soviet-controlled North and the U.S.-controlled South, electricity would become a symbol of North Korean power. Founded in 1948, the government of the Democratic People's Republic of Korea (the official title of North Korea, hereafter DPRK) featured a coat of arms, which positioned a hydroelectric power plant in the middle. Lenin's expression of electricity as communism was alive and well in the nascent DPRK.

However, as most outside observers are aware, North Korea is a country that currently lacks sufficient electricity. The famous satellite image of a dark North Korea contrasted with a well-lit South Korea (officially known as the Republic of Korea, hereafter ROK) makes the division all the more tangible. In 2002, U.S. Secretary of State Donald Rumsfeld said, "If you look at a picture from the sky of the Korean Peninsula at night, South Korea is filled with lights and energy and vitality and a booming economy; North Korea is dark." Rumsfeld concludes, "It is a tragedy what is being done in that country."² The regular blackouts in the DPRK, especially in the rural provinces, have seemingly become the ultimate symbol of North Korea's backwardness and its dysfunctional economy. While scholars of North Korea often emphasize the regime's *Juche* ideology as the reason for the country's

1 Vladimir Lenin, Report on the Work of the Council of People's Commissars, December 22, 1920. Original Source: *Polnoe sobranie sochinenii*, 5th ed. (Moscow, 1975-79), vol. 36, pp. 15-16, <<http://soviethistory.msu.edu/1921-2/electrification-campaign/communism-is-soviet-power-electrification-of-the-whole-country/>> (date accessed December 17, 2019).

2 Donald H. Rumsfeld, Defense Department Briefing Transcript, December 23, 2002, <<https://www.globalsecurity.org/military/library/news/2002/12/mil-021223-usia01.htm>> (date accessed December 17, 2019).

electricity shortages, little systematic research has actually been done on the history of North Korea's electricity. One of the primary reasons for this lack of research is due to the fact that the DPRK government does not publish reliable economic data. Despite regular blackouts throughout the country, North Korean state-run media regularly boasts about the well-lit streets of Pyongyang and the robust industrial production of the DPRK's factories. In North Korea's state-controlled media landscape, it is hard to discern reality from propaganda. However, with the help of archival documents from North Korea's former communist allies and a critical analysis of the Kim family regime's state-run media, I piece together a qualitative history of North Korea's electricity. In so doing, I argue that North Korea's electricity shortages were not a consequence of the regime's Juche ideology but rather a result of the DPRK's overreliance on Soviet aid.

Analysts of North Korea often cite Juche ideology as a reason for the country's economic troubles and electricity blackouts. For example, Chae-Jin Lee said, "Aside from the structural deficiencies of its centrally planned economic system, North Korea suffered from the constraints of the Juche (self-reliance) ideology and the heavy burden of defense expenditures."³ Ian Rinehart explains, "Juche-inspired policies severely limited North Korea's economic growth by allocating scarce resources to unproductive industries for the sake of self-reliance."⁴ Valentin I. Moiseyev wrote that "considering North Korea's Juche tenets and, fearing a raw material dependence on the Soviet Union (adding to the existing technological dependence), Kim Il Sung insisted on using domestic coal as fuel for the thermal power plants."⁵ While the costs of North Korea's excessive militarization surely deepened the country's economic issues,

3 Chae-Jin Lee, *A Troubled Peace: U.S. Policy and the Two Koreas* (Baltimore: Johns Hopkins University Press, 2006), pp. 283-284.

4 Ian Rinehart, "Nothing to be Afraid Of? North Korean Political Economy and Economic Reform," *Korea Economic Institute, Joint U.S.-Korea Academic Studies Emerging Voices Working Paper*, vol. 22 (2011), p. 8.

5 Valentin I. Moiseyev, "The North Korean Energy Sector," in *The North Korean Nuclear Program Security, Strategy and New Perspectives from Russia*, ed. James Moltz Clay and Alexandre Y. Mansourov (New York: Routledge, 1999), p. 53.

Pyongyang's adherence to Juche ideology as an economic model and electrification strategy seems to be based on mere assumption.

In order to dig deeper into this assumption, it is important to discuss Juche ideology. In 1955, Kim Il Sung first promoted the idea of Juche within the DPRK. He said, "What is Juche in our Party's ideological work? What are we doing? We are not engaged in any other country's revolution, but precisely in the Korean revolution.... Therefore, all ideological work must be subordinated to the interests of the Korean revolution."⁶ This ideology, which champions self-reliance and self-sufficiency, has continued to inform official DPRK rhetoric since 1955. However, as this article explains, North Korea's dependence on Soviet aid for electricity stands in stark contrast to the nationalistic character of the Juche ideology. So what does Juche mean? Bruce Cumings explains, "The term is really untranslatable; the closer one gets to its meaning, the more the meaning slips away."⁷ Bradley K. Martin explains that the broader meaning of Juche is "putting Korea first."⁸ Alzo David-West contends that "Juche is not a philosophy, but an ideology of political justification for the dictatorship of Kim Il Sung."⁹ Perhaps the one characteristic of Juche that all of these scholars can agree upon is that the ideology was designed to signify North Korean autonomy, whether real or perceived. "Self-reliance" is the general definition fixed upon Juche by North Korea scholars and many of these analysts grasp for a deeper meaning beyond this simple phrase. However, what has been missed in most analyses of Juche is the extent to which it represents the DPRK's utopian motivations.

6 Kim Il Sung, "On eliminating dogmatism and formalism and establishing Juche in ideological work," *Kim Il Sung: Selected Works* 1 (1955), p. 582-606, <<https://www.marxists.org/archive/kim-il-sung/1955/12/28.htm>> (date accessed May 17, 2020).

7 Bruce Cumings, *Korea's Place in the Sun: A Modern History* (New York: W.W. Norton & Co., 1997), p. 404.

8 Bradley K. Martin, *Under the Loving Care of the Fatherly Leader* (New York: Thomas Dunne Books, 2004), p. 363.

9 Alzo David-West, "Between Confucianism and Marxism-Leninism: *Juche* and the Case of Chong Tasan," *Korean Studies*, vol. 35 (2011), p. 107.

The North Korean leadership hoped to build a staunchly independent economy based on Juche's utopian principles of self-reliance, self-strengthening, and self-sufficiency. As with most Marxist states, utopianism was a central component of the state's future-oriented political culture. Lenin wrote in *What Is To Be Done?* that communists "should dream."¹⁰ Utopian thought was a way to construct a shared value system, revolutionary society, and new collective consciousness. Robert Winstanley-Chesters writes, "Juche has been the vessel through which utopian possibility has filtered into the more conventional forms of developmental and institutional approach and governmental function in North Korea as well as in its narratives of presentation, support, and legitimacy."¹¹ Despite this Juche rhetoric, North Korea was heavily dependent on the Communist Bloc for aid throughout the Cold War era. According to the U.S. Library of Congress's official book *North Korea: A Country Study*, "Estimates vary, but it is likely that the equivalent of U.S. \$4.75 billion of aid was accepted [by North Korea] between 1946 and 1984. Almost 46 percent of the assistance came from the Soviet Union, followed by China with about 18 percent, and the rest from East European communist countries."¹² Liudmila Zakharova explains, "By the early 1990s, the facilities built in the DPRK with Soviet help produced up to 70% of electricity, 50% of chemical fertilisers, and about 40% of ferrous metals. The aluminum industry was created entirely by Soviet specialists. Approximately, 70 large industrial enterprises in North Korea were built with the assistance of the USSR."¹³ Therefore, Juche was not an economic blueprint for North Korea but a form of

10 Vladimir Ilyich Lenin, "What Is To Be Done?," *Lenin's Selected Works*, vol. 1, first published as a separate work in March 1902, <<https://www.marxists.org/archive/lenin/works/1901/witbd/v.htm>> (date accessed May 17, 2020).

11 Robert Winstanley-Chesters, *Environment, Politics, and Ideology in North Korea: Landscape as Political Project* (Lanham, MD: Lexington Books, 2014), p. 5.

12 Andrea Matles Savada, ed., *North Korea: A Country Study* (Washington: GPO for the Library of Congress, 1993), <<http://countrystudies.us/north-korea/54.htm>> (date accessed May 17, 2020).

13 Liudmila Zakharova, "Economic Cooperation between Russia and North Korea: New Goals and New Approaches," *Journal of Eurasian Studies*, vol. 7, no. 2 (July 2016), p. 152.

utopianism that the Kim family regime sought to achieve one day. North Korea's electricity shortages were not a result of the leadership's strict adherence to Juche ideology as they never strictly followed a policy of economic self-sufficiency.

While the DPRK and the Soviet Union sometimes disagreed with each other's policies, Pyongyang depended on Moscow for technical assistance and financial aid.¹⁴ In the same 1955 speech where Kim Il Sung first promoted Juche, he also praised Soviet internationalism. He said, "For the victory of the Korean revolution and for the great cause of the international working class, we should strengthen solidarity with the Soviet people, our liberator and helper, and with the peoples of all the socialist countries."¹⁵ Without Moscow's help, the DPRK most likely would not have survived as a nation-state during the Cold War era. Despite officially promoting self-reliance in public discourse, the North Korean leadership depended heavily on Soviet technical expertise for electric power. Whether it was the construction of the Supung Power Plant or the delivery of fuel, the Soviet Union invested heavily in the DPRK's electrification. By relying so heavily on Soviet assistance, the North Korean leadership was unprepared for the Soviet Union's sudden dissolution in the 1990s.

While the North Korean government imposes a strict information blockade on international news and events, electricity is one of the few areas where the average North Korean can tangibly see the opaque party-state's difficulties. As journalist Barbara Demick explains, "North Koreans complain bitterly about the darkness, which they still blame on the U.S. sanctions. They can't read at night. They can't watch television. 'We have no culture without electricity,' a burly North Korean security guard once told me accusingly."¹⁶ In addition with satellite imagery, the

14 Harry Gelman and Norman D. Levin, "The Future of Soviet-North Korean Relations," Rand Corporation - A Project Air Force Report Prepared for the United States Air Force (October 1984), pp. 1-52.

15 Kim Il Sung, "On eliminating dogmatism and formalism and establishing Juche in ideological work."

16 Barbara Demick, *Nothing to Envy: Ordinary Lives in North Korea* (New York:

outside world now sees the glaring inefficiencies of the DPRK's power grid. However, outside of Demick's journalistic account of North Korea in the mid-1990s, few scholars have qualitatively examined the history of the DPRK's electricity sector and the ways in which the leadership in Pyongyang addressed electricity scarcity in the country. The notable exception here is Alex S. Forster's 2014 paper, entitled "Electrifying North Korea," which focuses more on contemporary energy issues in the DPRK and how to address them.¹⁷ Scholars have not systematically investigated the transition of postcolonial North Korea with its mighty hydroelectric power plants to a candle-lit nation that now deals with regular blackouts. Using qualitative data analysis from Communist Bloc archives and declassified U.S. government documents, I argue that in order to better understand the DPRK's electricity shortages, we must look at the history of the Soviet Union's electrification aid to North Korea.

From Postcolonialism to Postwar: North Korea, 1945-1959

While the Japanese colonialists exploited the natural resources and labor of the Korean people, they did leave one benefit behind in their destructive wake: large-scale hydroelectric power plants. According to Andrei Lankov, the northern part of Korea produced 85% of all of the peninsula's electricity in 1940.¹⁸ These large-scale facilities, which were primarily concentrated in northern Korea due to its mountainous terrain, became massively useful for Kim Il Sung's nascent regime. In fact, immediately after the collapse of the Japanese Empire in 1945, North Korea started selling electric power to their southern brethren. In January 1947, the Colonel-General of Soviet forces in North Korea, Terenty Fomich Shtykov, sent a letter to the U.S. General-Lieutenant in South Korea, John

Random House, 2010), p. 4.

17 Alex S. Forster, "Electrifying North Korea: Bringing Power to Underserved Marginal Populations in the DPRK," *East-West Center Working Papers*, no. 69 (April 2014), pp. 1-24.

18 Andrei Lankov, *The Real North Korea: Life and Politics in the Failed Stalinist Utopia* (Oxford: Oxford University Press, 2013), p. 72.

R. Hodge, in which he alerted the Americans that South Korea had not paid for any electricity that was provided by the north. According to the letter, the bill in U.S. dollars was \$4,240,261. Shtykov explained, "This arrangement has led to the economic downfall of North Korean power stations. Due to the balance deficit, major repairs and equipment maintenance are not taking place, and there are great delays in the salary of the maintenance personnel."¹⁹ This image of an energy-deficient South Korea and a high-powered North Korea in the post-liberation period stands in stark contrast to the present-day electricity situations of the two Koreas. With substantial rainfall, North Korea's hydroelectric stations were producing large amounts of power in the post-liberation era.

American journalist Anna Louse Strong visited the DPRK in 1948 and remarked, "The great power stations on the Yalu River were built by the Japanese. The Russians seized them as war booty and promptly gave them 'to the Korean people' in the summer of 1946." In fact, Soviet engineers hoped to replicate the design of the Yalu River hydroelectric power plant's generators for their own country's energy sector. According to a declassified U.S. Central Intelligence Agency (CIA) document, Soviet specialists dismantled two generators and two transformers in December 1945 from the DPRK's Supung power plant and transported them to the Soviet Union.²⁰ On March 5, 1949, Kim Il Sung told Stalin "that after the liberation of Korea by Soviet troops, the Soviet Government and the Soviet Army rendered aid to Korea in the matter of economic development." Kim continued, "The assistance of the Soviet Union is required for the further development of the Korean economy and culture."²¹ Strong explained that the U.S. forces in South

19 "Letter to General-Lieutenant Hodge on Northern Korea Providing Electricity to Southern Korea," January 01, 1947, History and Public Policy Program Digital Archive, TsAMO, Fond not listed, Opis 480c, Delo 25, listi 22-23. Obtained by Kim Dong-gil and translated by Aleksandr Gorokhov and James Person, <<https://digitalarchive.wilsoncenter.org/document/114896>> (date accessed May 17, 2020).

20 Central Intelligence Agency (CIA), "Report on the Electrical Industry in North Korea," Information Report, January 1957, p. 16.

21 "Notes of the Conversation between Comrade I.V. Stalin and a Governmental

Korea were not paying their electric bills to Pyongyang as the North Korean government demanded payment in electric equipment, not U.S. dollars or goods. Strong added, "The Americans offered nylon stockings and tobacco and Hollywood movies. But the North Koreans stood pat on getting electric equipment." Strong continued, "The reason was plain: so much electric development was going on in all the farming villages of North Korea that they simply could not spare power for South Korea unless they got more equipment. It was as simple as that."²² In May 1948, the North Koreans shut off the power to South Korea altogether.

The situation for North Korea's energy infrastructure predictably deteriorated during the Korean War. According to Cheehyung Harrison Kim, "In June 1950, 90 percent of North Korea's electric power potential was wiped out."²³ Due to U.S. aerial bombardment, a majority of the hydroelectric power plants were out of commission from 1950 to 1953. In an August 1952 report, the Polish embassy in the DPRK commented, "The bombing of four large hydro-electric power stations on Yalu on 20-23 June of this year deprived all of North Korea and a part of North-Eastern China of electric energy, that is, industry stopped almost completely, some rice fields that were artificially irrigated and cities remained without water." The report continued, "Electrification is universal in Korea, and therefore a shortage of electric energy is felt so strongly." The Korean War devastated North Korea's electric output, and this wreaked havoc on the entire country's economy.

Less than a year later, the Polish embassy explained, "The bombarding of the electric power plant in Supung in July 1952, and the subsequent

Delegation from the Democratic People's Republic of Korea headed by Kim Il Sung," March 05, 1949, History and Public Policy Program Digital Archive, AVP RF, fond 059a, opis 5a, delo 3, papka 11, listy 10-20, and RGASPI, f. 558, op. 11, d. 346, ll. 0013-0023, <<https://digitalarchive.wilsoncenter.org/document/112127>> (date accessed May 17, 2020).

22 Anna Louise Strong, "In North Korea: First Eye-Witness Report," <<https://www.marxists.org/reference/archive/strong-anna-louise/1949/in-north-korea/ch07.htm>> (date accessed May 17, 2020).

23 Cheehyung Harrison Kim, *Heroes and Toilers: Work as Life in Postwar North Korea* (New York: Columbia University Press, 2018), p. 76.

destruction of other electric power plants, has largely made the execution of plans for industry and agriculture difficult, since the basic sources of energy were destroyed or damaged." The report added, "Not only industry but also rice paddies, which are artificially watered by electric pumps, have been endangered."²⁴ As the Polish diplomatic reports explain, electricity from hydroelectric power plants also fueled agricultural pumps on North Korean farms. This overreliance on hydroelectricity would later have devastating effects for the North Korean people during periods of drought.

After the war, the Korean Workers' Party immediately established a five-year plan for rebuilding the country's economy. Due to assistance from the Communist Bloc, especially the Soviet Union, North Korea's postwar development was rapid. The postwar reconstruction plan stressed "the production of electric turbines, which are indispensable to equipping the rebuilt power plants."²⁵ With Soviet assistance, the North Koreans emphasized the rebuilding of the Supung power plant. The Japanese colonialists originally built the Supung power plant in 1943, which was the largest hydroelectric facility of its kind in Asia at the time.²⁶ On one hand, North Korea depended on Soviet aid in the postwar period but on the other hand, Kim Il Sung started to promote an independent line. Kim Il Sung's 1955 Juche speech to North Korean propagandists was the first clear expression of Korean nationalism. In 1959, Juche started to appear widely in internal Korean Workers' Party reports and lectures. Pak Deok-hwan, a Soviet-Korean and counselor in

24 "Note from the Embassy of the Polish Republic in Korea," January 27, 1953, History and Public Policy Program Digital Archive, Polish Foreign Ministry Archive. Obtained for NKIDP by Jakub Poprocki and translated for NKIDP by Maya Latynski, <<https://digitalarchive.wilsoncenter.org/document/114945>> (date accessed May 17, 2020).

25 "Report no. 5 of the Embassy of the People's Republic of Poland in the Democratic Republic of Korea for the Period of 1 August 1953 to 30 September 1953," September 30, 1953, History and Public Policy Program Digital Archive, Polish Foreign Ministry Archive. Obtained for NKIDP by Jakub Poprocki and translated for NKIDP by Maya Latynski, <<http://digitalarchive.wilsoncenter.org/document/114958>> (date accessed May 17, 2020).

26 Hy-Sang Lee, *North Korea: A Strange Socialist Fortress* (Westport, Connecticut: Praeger Publishers, 2000), p. 102.

the DPRK's Foreign Ministry, explained that the substance of Juche "was that everything Korean is better compared to [anything] foreign."²⁷

Despite Kim's promotion of Juche in 1955, the Supung power plant on the Yalu River, also known as the Amnok River, became a symbol of Soviet-DPRK comradeship during the mid to late 1950s. The KWP's Central Committee explained in their August 1953 plenum, "Thanks to the enormous technical and material assistance from the Soviet Union, the DPRK government has begun to rebuild the largest power plant on the river Amnok in Supung, which was damaged during the war." The committee announced, "This year still, the Supung power plant is to produce three times more electrical energy than it does currently. Right now, thanks to the evacuation in the war of its valuable equipment, the workers are completing the assembly and restoration of one of the largest generators in that power plant." As this Polish report mentions, much of the "valuable" equipment from the Supung power plant was evacuated during the Korean War. As Cheehyung Harrison Kim explains, "The wartime production regime involved the relocation of production sites (sogae) – the tremendous project of dismantling vital factories, evacuating them to safe locations, often underground or in caves, and reassembling them to resume production."²⁸ The North Koreans used their mountainous landscape to their advantage during wartime and hid their most valuable industrial equipment from U.S. air bombing in this rugged terrain.

It was in the immediate postwar period when the Kim family regime decided to focus its energy resources on the capital city, Pyongyang. As the showcase capital and home of the most loyal KWP members, the residents of Pyongyang have historically enjoyed longer bouts of electricity than their countrymen in the provinces. According to Kim Il Sung himself, 36% of the North Korean countryside had no access

27 "From the Journal of N. Ye. Torbenkov, Record of a Conversation with DPRK MFA Counselor Pak Deok-hwan," June 01, 1960, History and Public Policy Program Digital Archive, Translated for CWIHP by Gary Goldberg. AVPRF fond 0102, opis 16, delo 6, <<http://digitalarchive.wilsoncenter.org/document/121622>> (date accessed May 17, 2020).

28 Kim, *Heroes and Toilers*, p.30.

to electricity in 1958.²⁹ As explained in his first five-year plan, Kim Il Sung intended to build a thermal power station in Pyongyang in order to give those residents central heating. In 1957, the Soviet ambassador to the DPRK, A.M Puzanov, remarked in his journal, "An important task of the heat and power station will be to supply the housing facilities of the capital with heat for central heating. This heat and power station will also yield electrical power and improve the republic's energy mix during low loads due to a shortage of water for hydroelectric power plants."³⁰ While Pyongyang residents enjoyed central heating during the winter months, those in rural areas dealt with inconsistent electricity or complete blackouts.

The North Korea electrical grid was heavily dependent on rainfall in the Yalu River area. Thus, Kim Il Sung intended to diversify the electrical grid of the DPRK away from large-scale hydroelectric power plants on the Yalu River. In 1958, Kim told China's Premier Zhou Enlai about severe droughts in North Korea and the problems this caused for the country's electric output. Kim explained, "This year has had the least amount of rain water [on record]. The elderly say that this is the worst it has been in 100 years... At present, we have started an electricity conservation campaign [because] in the past [electricity] was wasted."³¹ Kim suggested the construction of small-scale hydroelectric plants, rather than the large-scale facilities originally built by the Japanese, for

29 "Record of Conversation from the Premier's Reception of the Korean Government Delegation," November 22, 1958, History and Public Policy Program Digital Archive, PRC FMA 204-00064-02, 9-25. Translated by Jeffrey Wang and Charles Kraus, <<https://digitalarchive.wilsoncenter.org/document/114176>> (date accessed May 17, 2020).

30 "Journal of Soviet Ambassador to the DPRK A.M. Puzanov for 8 June 1957," June 08, 1957, History and Public Policy Program Digital Archive, AVPRF F. 0102, Op. 13, P. 72, Delo 5, Listy 114-130. Translated by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/115624>> (date accessed May 17, 2020).

31 "Record of Conversation from the Premier's Reception of the Korean Government Delegation," November 22, 1958, History and Public Policy Program Digital Archive, PRC FMA 204-00064-02, 9-25. Translated by Jeffrey Wang and Charles Kraus, <<https://digitalarchive.wilsoncenter.org/document/114176>> (date accessed May 17, 2020).

rural areas. Kim explained, "We have already established some small-scale hydroelectric power stations in rural areas, and we estimate that by next year all rural areas will have electricity."³² While Kim's energy plan for all of rural North Korea obviously did not come to fruition, his focus on electricity in his nation-building program was in line with Lenin's original motif that "Communism is Soviet power plus the electrification of the whole country."

One of the major reasons for North Korea's poor electric output was its overreliance on these outdated large-scale hydroelectric power plants. In May 1964, Kim Il Sung vented his frustrations to his Chinese counterparts, "The Japanese constructed Supung Dam is of poor quality and requires repairs every year. It is really bad. It took the Japanese nine years to build the Supung Dam."³³ Electricity and industry were intimately linked in the DPRK due to the country's reliance on hydropower. As Hy-Sang Lee explains, "Though very low in operating costs, hydropower plants required the highest investment cost per unit of generating capacity created."³⁴ In June 1960, the Soviet Foreign Ministry's Far East Department commented, "As the past year showed, electric power is the bottleneck in industry. In 1959 the electric power industry produced 7.8 billion kilowatt-hours against the 9.7 billion kilowatt-hours planned for the next year of the five-year plan."³⁵

32 "Record of Conversation from the Premier's Reception of the Korean Government Delegation," November 22, 1958, History and Public Policy Program Digital Archive, PRC FMA 204-00064-02, 9-25. Translated by Jeffrey Wang and Charles Kraus, <<https://digitalarchive.wilsoncenter.org/document/114176>> (date accessed May 17, 2020).

33 "Cable from the Jilin Provincial Party Committee, 'Report on Comrade Kim Il Sung's Report'," May 09, 1964, History and Public Policy Program Digital Archive, PRC FMA 106-00767-02, 14-18. Obtained by Shen Zhihua and translated by Jeffrey Wang and Charles Kraus, <<https://digitalarchive.wilsoncenter.org/document/116547>> (date accessed May 17, 2020).

34 Lee, *North Korea*, p. 102.

35 "The Economic and Political Situation of the DPRK," June 12, 1960, History and Public Policy Program Digital Archive, AVPRF fond 0102, opis 16, papka 87, delo 27. Translated for NKIDP by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/116389>> (date accessed May 17, 2020).

Electricity Conservation in North Korea from the 1960s to the Early 1990s

In 1960, the DPRK government formally asked the Soviet Union for technical assistance in building a large-capacity thermal power station and hydroelectric facilities. Due to a lack of technical expertise within the country, the North Korean leadership depended on Soviet specialists for assistance. In March 1960, the North Korean government sent “a request to the Soviet government to provide technical help by sending skilled specialists to assist in the planning and manufacture of turbine generators (60 Hz, 6-25,000 kilovolt-amperes), turbines, boilers, etc.”³⁶ Despite this dependence on Soviet aid, the year 1960 was actually a period of high electric output for the North Korean people due to above average rainfall. In August 1960, Kim Il Sung told the Soviet ambassador to the DPRK, “In particular, there is so much water on the Yalu [Amnok-gang] River that a surplus of it in enormous quantities was thrown over the reserve sluices of the Supung Hydroelectric Station and there was even a danger of flooding Sinuiju. At the present time Pyongyang is receiving electricity without restrictions.”³⁷ However, the DPRK’s dependence on rainfall in the Yalu River basin for electricity meant the countryside was extremely susceptible to irregular rainfall and subsequent blackouts.

In addition, since the Yalu River borders China and North Korea, coownership of the body of water was negotiable. In 1955, the two sides agreed in principle to share the energy generated by the river. The Supung power station on the Yalu River was actually joint managed by

36 "Journal of Soviet Ambassador in the DPRK A.M. Puzanov for 30 March 1960," March 30, 1960, History and Public Policy Program Digital Archive, AVPRF fond 0102, opis 16, delo 6, p.129-146. Translated for NKIDP by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/116168>> (date accessed May 17, 2020).

37 "Journal of Soviet Ambassador in the DPRK A.M. Puzanov for 16 August 1960," August 16, 1960, History and Public Policy Program Digital Archive, AVPRF fond 0102, opis 16, delo 7, p.43-71. Translated for NKIDP by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/119446>> (date accessed May 17, 2020).

Beijing and Pyongyang. However, Kim Il Sung complained that the DPRK received a lower share of the power generated from Supung station.³⁸ It was during China's Cultural Revolution that relations between the two neighboring countries quickly soured and border river usage became heavily politicized. In the late 1960s, the Yalu River in particular became an ideological battleground between China's zealous Maoist sycophants, better known as the Red Guards, and North Korea's state security services. In January 1969, the Soviet embassy in the DPRK commented, "According to the testimony of eyewitnesses, a sort of propaganda duel is being waged on the Korean-Chinese border passing along the Yalu River: enormous portraits of the leaders, billboards with political content, and loudspeakers directed at the opposite bank have been set up on both sides of the river."³⁹ In the late 1960s, relations between the PRC and DPRK were not "as close as lips to teeth," which was the traditional expression of revolutionary solidarity between the two neighboring Asian communist governments.

In the late 1960s and early 1970s, the Chinese government started building dikes on PRC-DPRK border rivers without approaching the North Korean leadership first. Thus, the North Korean leadership held talks with the PRC government in 1970 regarding joint utilization of the border waters. The Soviet Ambassador to the DPRK, Nikolay Georgievich Sudarikov, explained to his Hungarian counterparts that the North Korean Deputy Foreign Minister Kim Jae-bong was particularly unhappy about Chinese construction on border rivers. The North Korean official explained, "Some of the dikes which the Chinese side recently built on the border rivers deprive Korea of the natural water output of the rivers and thus hinder the utilization of the latter, while the other dikes, during heavy raining, expose the Korean villages and areas to flooding and inundation; at the same time, both types of the

38 Lee, *North Korea*, p. 102.

39 "First Secretary of the Soviet Embassy in North Korea, 'Korean-Chinese Relations in the Second Half of 1968'," January 06, 1969, History and Public Policy Program Digital Archive, RGANI, fond 5, opis 61, delo 466, listy 1-14. Obtained by Sergey Radchenko and translated by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/134218>> (date accessed May 17, 2020).

Chinese dike systems hinder shipping on the border rivers."⁴⁰ While the Soviet Union greatly assisted their North Korean comrades in constructing their energy sector, the People's Republic of China oftentimes made life worse for their energy-deficient neighbors.

From the mid-1960s to the early 1970s, energy problems within the DPRK came to a head and the North Korean government started nationwide energy conservation drives. In 1966, the North Korean magazine *Chollima* published an article, entitled "Electricity and Life," in which the author Cho Ch'ŏn-ho explained, "The easiest thing we can do is to conserve electricity and the best thing to do for the nation is to conserve electricity." He continued, "Those who produce electricity will try hard to produce more power and those who consume will conserve."⁴¹ In March 1969, the Soviet Foreign Ministry's Far East Department said, "The difficulties caused by drought in a number of regions of the country has also had an effect on the operation of industry. The shortage of water in reservoirs has led to a reduction of the production of electrical power, as a result of which in the first half of 1968 production capacity in the chemical, foundry, and other energy-intensive industries was [3]0-[6]0 % used."⁴² In April 1968, Dr. Ervin Jávör, the Chairman of the Hungarian-Korean Commission of Technical and Scientific Cooperation, explained, "Although by now they have built a great number of hydroelectric power plants [...], the DPRK is struggling with considerable energy problems. For the sake of conserving energy, workers in the production plants take their day off

40 "Report, Embassy of Hungary in North Korea to the Hungarian Foreign Ministry," May 05, 1970, History and Public Policy Program Digital Archive, MOL, XIX-J-1-j Korea, 1970, 54. doboz, 81, 00843/7/1970. Obtained and translated for NKIDP by Balázs Szalontai, <<https://digitalarchive.wilsoncenter.org/document/116578>> (date accessed May 17, 2020).

41 Cho Ch'ŏn-ho, "Ch'ŏn'gi wa uri saenghwal," *Chollima* (April 1966), pp. 27-29.

42 "Far East Department, Ministry of Foreign Affairs, 'The Domestic Situation and the Foreign Policy of the Korean People's Democratic Republic,'" March 28, 1969, History and Public Policy Program Digital Archive, RGANI, fond 5, opis 61, delo 466, listy 71-81. Obtained by Sergey Radchenko and translated by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/134226>> (date accessed May 17, 2020).

on a staggered schedule rather than on the same day of the week."⁴³ Even communist allies of the North Korean socialist system noticed how dire the energy situation was in the country during the late 1960s.

North Korea's electricity shortages in the 1960s and 1970s correlated with an increase in Pyongyang's public promotion of Juche. For example, in 1965, Kim Il Sung gave a speech in Indonesia where he outlined the main principles of Juche and in 1972 Juche was cemented as the Party's guiding ideological force in the DPRK's Constitution. During a visit to Jakarta in 1965, Kim Il Sung emphasized that "our Party consistently sticks to self-reliance in ideology, sovereignty in politics, independence in economy, and self-protection in national defense."⁴⁴ Seven years later, Juche was enshrined in North Korea's political culture. Ironically, at the same time as Kim Il Sung depended on Soviet energy assistance, the DPRK's Constitution underwent a Juche-inspired revision in 1972. Article Four of the North Korea's revised 1972 Constitution stated, "The Democratic People's Republic of Korea is guided in its activity by the Juche idea of the Workers' Party of Korea, a creative application of Marxism-Leninism to the conditions of our country."⁴⁵ Instead of reaffirming Marxism-Leninism as the ideological foundation of the Korean Workers' Party, the DPRK government positioned Juche as a uniquely Korean approach to Marxism-Leninism.

Behind the public Juche discourse, North Korea continued to ask Moscow for assistance in improving the country's electrical grid. In 1969, the North Korean leadership attached "great importance to accelerating the construction of the Bukchang [Pukchang] thermal power station

43 "Report on the 27 March-2 April 1968 session of the Hungarian-Korean Commission of Technical and Scientific Cooperation," April 16, 1968, History and Public Policy Program Digital Archive, MOL, XIX-J-1-j Korea, 1968, 58. doboz, 5, 001364/3/1968. Obtained and translated for NKIDP by Balazs Szalontai, <<https://digitalarchive.wilsoncenter.org/document/110629>> (date accessed May 17, 2020).

44 Seong-Chang Cheong, "Stalinism and Kimilsungism: A Comparative Analysis of Ideology and Power," *Asian Perspective*, vol. 24, no. 1 (2000), p. 142.

45 Christopher Hale, "Multifunctional Juche: A Study of the Changing Dynamic between Juche and the State Constitution in North Korea," *Korea Journal*, vol. 42, no. 3 (Autumn 2002), p. 296.

being built with the technical assistance of the Soviet Union." On December 2, 1969, Kim Il, a North Korean Politburo member, told the Soviet embassy in Pyongyang, "We need three units with a total capacity of 300,000 kwt to be in operation at this station by the end of 1969 and a fourth unit in the first quarter of 1970." Kim Il admitted, "Even considering the putting of this additional capacity in operation, the country's economy will nevertheless experience a shortage of a supply of electric power." The North Korean official added "that everything possible [must] be done to accelerate the installation of equipment at the Bukchang thermal power station. While he said this he stressed that the Soviet specialists at Bukchang are working very well."⁴⁶ It was increasingly clear that Pyongyang promoted Juche in public-oriented rhetoric but when it came to actual practice, Kim Il Sung's regime depended heavily on Soviet electrification aid.

In the early 1970s, North Korea's energy sector continued to suffer from its unreliable hydroelectric power plants. In a June 28, 1972 conversation with I.T Novikov, the Deputy Chairman of the USSR Council of Ministers, Kim Il Sung said, "The Pyongyang TEhTs [thermal power plant] and the Bukchang TEhS [thermal power station], built with the aid of the Soviet Union, have helped during this difficult period, as a result of which the chronic shortage of electrical power was overcome to a considerable degree." Kim continued, "However, this has nevertheless been insufficient."⁴⁷ This contradiction between state ideology and

46 "From the Journal of N.G. Sudarikov, 'Record of a Conversation with Kim Il, Member of the KWP CC Politburo and First Deputy Chairman of the DPRK Cabinet of Ministers,'" December 02, 1969, History and Public Policy Program Digital Archive, RGANI, fond 5, opis 61, delo 463, listy 267-272. Contributed by Sergey Radchenko and translated by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/134266>> (date accessed May 17, 2020).

47 "From the Journal of Y.D. Fadeev, 'Record of Conversation between I.T. Novikov, Deputy Chairman of the USSR Council of Ministers, and Kim Il Sung, General Secretary of the KWP CC and Chairman of the DPRK Cabinet of Ministers, 28 June 1972,'" July 03, 1972, History and Public Policy Program Digital Archive, RGANI, f. 5, op. 64, d. 423, ll. 20-32. Contributed by Sergey Radchenko and translated by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/134136>> (date accessed May 17, 2020).

action suggests that North Korea's electrification strategy depended on Soviet aid, not the Juche idea.

In the 1970s, South Korea built its first nuclear power plant in Gori, a village on the outskirts of Busan, which exacerbated concerns in the DPRK that the Republic of Korea (the official title of South Korea, ROK) was quickly becoming the dominant economic power on the peninsula. Kim Il Sung admitted to Soviet officials in 1972 that North Korea was "experiencing those difficulties which for Soviet people are a past stage, that is, we are behind you."⁴⁸ The North Korean leader understood that his country was underdeveloped vis-à-vis the Soviet Union. Despite his public-facing Juche rhetoric, Kim was never shy about requesting energy assistance from his Soviet comrades. In 1979, the Hungarian ambassador to the DPRK explained, "With the nuclear power plant in Gori included, the output of electric power generation in South Korea reached 6.59 million kW. With the completion and activation of the sixth nuclear power plant, in 1986 its output will reach 20 million kW." He continued, "By the end of 1986 they want to complete and operate 7 nuclear power plants, 5 hydroelectric power stations, 24 thermal power stations, and an ebb and flow power plant. 26 nuclear power plants will be built by 2000." With South Korea's nuclear development, Kim Il Sung increasingly felt that the DPRK would be left behind in this inter-Korean competition.

Faced with the idea of a more prosperous and electrified ROK, the leadership in Pyongyang "strongly urged the socialist countries—for instance, Czechoslovakia, the Soviet Union, Yugoslavia, and China—to provide it with equipment for nuclear power plants or even to build a nuclear power plant." The Hungarian ambassador then concluded, "It tries to make up for its lag behind South Korea in this way, with the hidden intention that later it may become capable of producing an

48 "From the Journal of N.G. Sudarikov, 'Record of a Conversation with Kim Il Sung, General Secretary of the KWP CC and Chairman of the DPRK Cabinet of Ministers, 9 October 1972,'" November 16, 1972, History and Public Policy Program Digital Archive, RGANI, f. 5, op. 64, d. 423, ll. 38-53. Contributed by Sergey Radchenko and translated by Gary Goldberg, <<https://digitalarchive.wilsoncenter.org/document/134145>> (date accessed May 17, 2020).

atomic bomb." While North Korea's electricity problems were most likely not the primary cause for the Kim family regime's pursuit of nuclear technology, it seems that it played a small role in the construction of the DPRK's nuclear program.

In the 1980s, Kim Il Sung faced a dilemma: continue his emphasis on hydroelectric power or foster the development of coal-powered thermal power stations. At the Sixth Party Congress in 1980, the North Korean leader stated, "Together with the construction of hydropower plants it is necessary to widen the construction of thermal power plants (TPPs)... To start a wide construction of TPPs performing on low-calorie coals, as well as that of medium and small TPPs using the radiating and excessive heats."⁴⁹ Hydroelectric power stations were too dependent on rainfall while thermal power stations depended on the DPRK's scanty coal reserves. As Hy-Sang Lee explains, "Behind the emergent shortage of coal was everything that was wrong with Juche socialism – the technical obsolescence, shortages of equipment and supplies, shortage of manpower, etc., all of which applied not just to the coal industry but to others as well except ordnance."⁵⁰ However, a third possibility for solving North Korea's electricity scarcity problem was nuclear energy. In his Sixth Party Congress speech, Kim acknowledged, "In order to sharply increase electric energy production, it is necessary to build an atomic power plant and other plants using new energy resources."⁵¹

In the early 1980s, Pyongyang asked the Communist Bloc for assistance in starting its nuclear energy program. For example, the DPRK government sent students to Czechoslovakia and East Germany to study nuclear physics. The Hungarian embassy in Pyongyang explained that the North Korean students "are concerned mainly about the subject of nuclear energy and they are interested in every question related to it. This interest is not a recent one."⁵² In 1983, the leadership in Pyongyang asked

49 Moiseyev, "The North Korean Energy Sector," p. 53.

50 Lee, *North Korea*, p. 103.

51 Moiseyev, "The North Korean Energy Sector," p. 53.

52 "Report, Embassy of Hungary in North Korea to the Hungarian Foreign Ministry," April 30, 1981, History and Public Policy Program Digital Archive,

Hungary for technical expertise in nuclear development “since the DPRK will soon start building its first nuclear power plant.”⁵³ Initially, Kim Il Sung explained his desire for nuclear power plants as a way to alleviate the DPRK’s chronic energy shortage. Kim told East German leader Erich Honecker in May 1984, “During my visit to the Soviet Union, I also made agreements with our Soviet comrades to build nuclear power plants. We are convinced that when we have accomplished this task, we will certainly be able to produce 100 billion kWh of energy. And once we have done this, developing agriculture is no longer a problem. Once we have solved the industry problem, nothing else will be an issue.”⁵⁴ Was the construction of nuclear energy power plants in the DPRK a Trojan horse for the regime’s development of nuclear weapons? Perhaps, but I believe Kim Il Sung initially wanted to use nuclear facilities for energy production within the DPRK.

In February 1985, the Soviet Union entered into negotiations with the Kim family regime regarding the construction of the DPRK’s first nuclear power plant. North Korea’s Premier Kang Seongsan “emphasized to the deputation that the project to be built was not only of economic but also of political importance.” As the Hungarian embassy in Pyongyang commented on the North Korean mindset concerning nuclear energy, “On the one hand, they would like to offset the fact that a nuclear power plant is already in operation in South Korea; on the other hand, [the project] is to enhance the DPRK’s

MOL, XIX-J-1-j Korea, 1981, 86. doboz, 72, 003729/1981. Obtained and translated for NKIDP by Balazs Szalontai, <<https://digitalarchive.wilsoncenter.org/document/110137>> (date accessed May 17, 2020).

53 "Memorandum, Hungarian Academy of Sciences to the Hungarian Foreign Ministry," March 07, 1983, History and Public Policy Program Digital Archive, MOL, XIX-J-1-k Korea, 1983, 73. doboz, 81-73, 2856/1983. Obtained and translated for NKIDP by Balazs Szalontai, <<https://digitalarchive.wilsoncenter.org/document/110138>> (date accessed May 17, 2020).

54 "Stenographic Record of Conversation between Erich Honecker and Kim Il Sung," May 30, 1984, History and Public Policy Program Digital Archive, SAPMO-BA, DY 30, 2460. Translated by Grace Leonard, <<https://digitalarchive.wilsoncenter.org/document/113197>> (date accessed May 17, 2020).

economic prestige in foreign eyes.”⁵⁵ According to a declassified document from the CIA, “In December 1985, the Soviets also agreed to help the North build its first nuclear power plant, which reportedly will have a capacity of about 1.4 million kilowatts...This project would be a boon to the North because it would allow for diversification of energy sources and provide relatively stable supplies.”⁵⁶ Thus, Kim Il Sung’s pursuit of nuclear energy may have been economically-motivated rather than solely military-focused.

In addition, at the same time as the DPRK government covertly pursued nuclear energy, Kim Il Sung publicly advocated a nuclear-free zone on the Korean Peninsula. During Erich Honecker’s 1986 visit to North Korea, Kim Il Sung told his East German counterpart that he favored Soviet leader Mikhail Gorbachev’s proposal of turning the Asia-Pacific region into a “peace zone” and was also “in favor of the proposed halt to the nuclear arms race and averting the danger of a nuclear inferno.”⁵⁷ Kim Il Sung particularly detested the presence of U.S. nuclear weapons on South Korean soil. In July 1988, the North Korean leader told a visiting East German military delegation, “The Democratic People’s Republic of Korea is confronted with many nuclear weapons in South Korea that belong to the U.S.” Kim continued, “This is why the leadership of the Democratic People’s Republic of Korea has also already made numerous proposals for the withdrawal of U.S. troops and their nuclear weapons, for ending the arms race, and for reducing the armed

55 “Report, Embassy of Hungary in North Korea to the Hungarian Foreign Ministry,” March 09, 1985, History and Public Policy Program Digital Archive, MOL, XIX-J-1-k Korea, 1985, 76. doboz, 81-532, 2745/1985. Obtained and translated for NKIDP by Balazs Szalontai, <<https://digitalarchive.wilsoncenter.org/document/110142>> (date accessed May 17, 2020).

56 CIA Research Paper, “North Korea: Energy Scene,” Directorate of Intelligence, July 1987, <<https://www.cia.gov/library/readingroom/docs/CIA-RDP88T00539R000500760002-1.pdf>> (date accessed May 17, 2020).

57 “Report on Erich Honecker’s visit to North Korea, October 1986,” October 18, 1986, History and Public Policy Program Digital Archive, Foundation Archive of the Parties and Mass Organizations in the Federal Archive [Berlin] (SAPMO-BA), DY 30, 2460. Translated by Grace Leonard, <<http://digitalarchive.wilsoncenter.org/document/110758>> (date accessed May 17, 2020).

forces on the Korean Peninsula in stages in order to transform it into a nuclear-free zone of peace.”⁵⁸ The U.S. nuclear arsenal in the ROK greatly worried the security-conscious North Korean leader and made him into an unlikely champion of nuclear nonproliferation during the mid to late 1980s.

North Korean Electricity from the 1990s to the Present Day

The 1990s were a tumultuous period for the North Korean leadership. From Kim Il Sung’s death in 1994 to the nuclear crisis with the U.S. government, the Kim family regime faced many challenges. For North Korea’s energy sector, the dissolution of the Soviet Union and the collapse of the Warsaw Pact meant Pyongyang was increasingly isolated economically and diplomatically on the global stage. With the end of energy subsidies and aid from the Soviet Union, the North Korean people encountered even more electricity shortages in the 1990s. With no Soviet assistance, the energy situation in the DPRK during the 1990s deteriorated from bad to horrendous and the country’s economy stalled to a halt.⁵⁹ As a way to guarantee regime stability, North Korea eventually prioritized nuclear weapons development over all domestic sectors, including electricity. During the 1990s, the leadership in Pyongyang clung even tighter to militarism. Under Kim Jong Il’s rule, the nuclear program in the DPRK was to be solely dedicated to military needs, not electricity shortages. Kim Jong Il also shifted North Korea’s ideological priorities to *Songun* (military-first politics). Kim Il Sung’s balancing act of Juche rhetoric and Soviet dependency in the energy sector was replaced by Kim Jong Il’s sole focus on militarization.

Known in official DPRK rhetoric as the “Arduous March,” the 1990s

58 “Report on Visit of East German Military Delegation to North Korea,” July 19, 1988, History and Public Policy Program Digital Archive, SAPMO-BA, DY 30, 2508. Translated by Grace Leonard, <<http://digitalarchive.wilsoncenter.org/document/113202>> (date accessed May 17, 2020).

59 Demick, *Nothing to Envy*.

were a period of great suffering and famine for most North Korean people. Much of this was exacerbated by the lack of electricity. According to the U.S. Energy Information Administration, “During North Korea’s economic downturn in the early 1990s, the country’s electricity consumption dropped by more than half from 33 billion kilowatthours (BkWh) in 1990 to 16 BkWh by 2000. The country experiences chronic electricity shortages and a deteriorating industrial sector.”⁶⁰ According to data from the International Energy Agency (IEA), North Korea’s “per capita electricity consumption in 2008 remained just 819kWh, substantially lower than the 919kWh recorded in 1971.”⁶¹ This significant drop in electricity consumption suggests that Soviet tutelage essentially prevented mass blackouts in North Korea. Without Soviet aid, Kim Jong Il’s regime was unable to prevent constant electricity shortages around the country.

In addition, testimony from high-level defector Hwang Jang Yop suggests that Kim Jong Il personally approved electricity requests from the DPRK’s “power organizations,” such as the military. Hwang said, “All power organizations directly requested Kim Jong Il to provide electricity to those organizations and he approved the requests... it was revealed that Kim approved as many as 190 counts of electricity-concerned requests the power organizations raised.”⁶² Thus, Kim Jong Il prioritized certain sectors, such as the military and the police, when it came to electricity supply. Kim Jong Il exerted personal control over the DPRK’s scant electricity resources. This energy strategy also pitted the DPRK’s power organizations against one another and further consolidated Kim Jong Il’s iron rule. Despite the country’s unstable electrical grid and Kim Jong Il’s oppressive policies, the North Korean

60 “North Korea: Overview,” *U.S. Energy Information Administration*, June 2018, <<https://www.eia.gov/beta/international/analysis.php?iso=PRK>> (date accessed May 17, 2020).

61 Kim Tae Hong, “Economic Collapse Reflected in Scarce Electricity,” *DailyNK*, August 6, 2012, <<https://www.dailynk.com/english/economic-collapse-reflected-in-sca/>> (date accessed May 17, 2020).

62 Jae-Cheon Lim, *Kim Jong-il’s Leadership of North Korea* (New York: Routledge, 2008).

people persevered and participated in local black markets in order to survive. These black markets became spaces of grassroots capitalism in the DPRK. Chinese-made solar panels began to be sold in these North Korean markets.

After Kim Jong Il's death in 2011, Kim Jong Un took power in the DPRK and struggled to increase his nation's electricity supply. However, Kim Jong Un took a page from his grandfather's book and enlisted the help of Russian energy specialists. In 2019, the DPRK and Russian governments "agreed to continue cooperation in the field of experience exchange and training specialists for the design, construction and operation of the 500-kilowatt energy grid."⁶³ In addition, there have been talks between Moscow and Pyongyang regarding the construction of an "electric energy bridge." In January 2015, Russia's largest-power generating company, RusHydro, "signed a memorandum of understanding with the South Korean company K-water where they agreed to start preparing a feasibility study for creating an energy bridge from Russia to the Republic of Korea through the territory of the DPRK."⁶⁴ While no concrete results have yet been yielded from this energy bridge idea, it does suggest that Kim Jong Un's electrification strategy resembles his grandfather's dependency on Moscow for energy assistance.

Under Kim Jong Un's reign, renewable energy and improving the country's electric output has been a domestic priority. Currently, around 55% of North Korean households are equipped with solar panels.⁶⁵ In October 2018, DPRK state-run media featured a documentary on domestic renewable energy products, such as high voltage inverters. The

63 Vusala Abbasova, "Russia Helps North Korea Modernize Its Energy Sector," *Caspian News*, December 11, 2019, <<https://caspiannews.com/news-detail/russia-helps-north-korea-modernize-its-energy-sector-2019-12-11-55/>> (date accessed May 17, 2020).

64 Zakharova, "Economic cooperation between Russia and North Korea," p. 158.

65 Hyonhee Shin, "Cheap solar panels power consumer appliance boom in North Korea," *Reuters*, April 17, 2019, <<https://www.reuters.com/article/us-northkorea-solar-feature/cheap-solar-panels-power-consumer-appliance-boom-in-north-korea-idUSKCN1RT2P1>> (date accessed May 17, 2020).

documentary narrator said, “Electricity was the biggest problem but we achieved such a highly advanced, cutting-edge technology ourselves from scratch, which was once monopolized by developed nations.”⁶⁶ In addition, Kim Jong Un hopes to expand the state’s alternative energy resources by investing in “huge sea barriers with electricity-generating turbines to harness the power of the ocean’s tides.” The North Korean leader may also be interested in “transforming coal into synthetic fuels that can serve as substitutes for liquid petroleum fuels like gasoline and diesel.”⁶⁷ While the state still mostly depends on hydroelectric and coal-fired power plants, this newfound emphasis on renewable energy fits with global environmentalist trends.

In summation, I aimed to show that North Korea’s electricity shortages stemmed from an overreliance on Moscow. Despite numerous setbacks, the North Korean people persisted and remained resilient in the post-Cold War era. Using solar energy as a way to overcome the nation’s electricity shortages, the North Korean people are on the cutting edge of green energy trends and asserted their own agency in solving their energy scarcity. New evidence suggests that Kim Jong Un is resurrecting Kim Il Sung’s dependency on Moscow for electrification aid, which may lead to economic trade imbalances for the DPRK. As I explained in this paper, North Korea’s electricity issues did not result from the regime’s Juche ideology. The legacy of Soviet energy dependency left the North Korean government unprepared for the post-Cold War world.

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66 Shin, “Cheap solar panels power consumer appliance boom in North Korea,” *Reuters*.

67 Heesun Wee, “Kim Jong Un is skirting sanctions and pursuing this energy strategy to keep North Korea afloat,” *CNBC*, April 11, 2019, <<https://www.cnbc.com/2019/04/11/kim-jong-un-pursues-this-energy-strategy-to-keep-north-korea-afloat.html>> (date accessed June 1, 2020).

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