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# Embracing the “Atomic Future” in Post–World War II Austria

FLORIAN BAYER and ULRIKE FELT

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**ABSTRACT:** Mentioning nuclear energy and Austria simultaneously usually alludes to the rejection of nuclear power as a hallmark of Austria’s technopolitical identity. This quasi-mythical anti-nuclear positioning came at the price of wiping out the memory of nuclear optimism following WWII until the 1970s. Reconstructing Austria’s pro-nuclear phase, we investigate the construction of the institutional infrastructure of pro-nuclearity and the embrace of the “atomic age” as part of a progress-oriented reimagining of the Austrian nation; we show how the nuclear was appropriated; and we elaborate on the creation of a robust sociotechnical imaginary of a trajectory linking Austria’s technoscientific past to a bright nuclear future. This allows us to understand how the political and the nuclear were entangled, to grasp the difference in what it takes to create a pro- or anti-nuclear position, and to see how building this sociotechnical imaginary needed specific assemblages of institutional actors, technical elements, values, and futures.

Florian Bayer studied history and science and technology studies at the University of Vienna. His research covers nuclear politics in the Austrian context in the postwar period up to the 1980s. This article draws on research performed for his master’s thesis written in the Department of Science and Technology Studies at the University of Vienna. Ulrike Felt is professor of science and technology studies (STS) at the University of Vienna. Her research focuses on governance, democracy, and public participation, on shifting research cultures and on the role of time and the future at the interface of research and society. Areas of study cover life science and (bio)medicine, nanotechnology and material sciences, nuclear energy, and sustainability research. From 2002 to 2007, she was editor-in-chief of *Science, Technology, & Human Values* and was one of the editors of the most recent *Handbook of Science and Technology Studies* (MIT Press, 2017). Since 2017 she has been president of European Association for the Study of Science and Technology (EASST). The authors would like to thank the two anonymous reviewers for their careful reading, insightful comments, and constructive critique, which greatly helped us in sharpening our argument. Our thanks also go to the editor for the support and feedback throughout the process. Finally, we would like to thank the staff of the archives, who supported us when collecting the relevant materials for the article.

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## Introduction

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Mentioning nuclear energy and Austria in one and the same discursive strand is typically interpreted as a reference to a clear rejection of nuclear power as a hallmark of Austria's technopolitical identity. In people's memory, the formation of this position can be dated to the late 1970s, when 50.4 percent of Austrians participating in a referendum—the first of its kind in postwar Austria—expressed their anti-nuclear position.<sup>1</sup> Not only did this political voicing manage to establish a legally binding shutdown of Austria's first reactor near Vienna, which had been ready to go online, but it was also a first step in a process that would later set a definitive end to the entire Austrian nuclear energy program, even though nuclear energy had been central to the nation's post-World War II (WWII) repositioning work. A major nuclear disaster in Chernobyl in 1986 and further debates resulted in a constitutional law with the telling name "For an Atom-free Austria," passed in 1999. This law was meant to ensure an even stronger resistance to any potential nuclear revival and to "forbid the construction of installations for the purpose of energy production through nuclear fission. Insofar as such installations already exist, they must not be put in operation."<sup>2</sup> Between the 1978 referendum, in which an extremely thin majority decided against nuclear energy, and the 1999 constitutional law, Austria's anti-nuclear imaginary managed to gradually stabilize, solidify, and gain a quasi-mythical status, with a clear "operational value": Being anti-nuclear could be described as a "timeless" element of being Austrian and could be used to "explain the present and the past as well as the future."<sup>3</sup>

In March 2011, when reports on the Fukushima Daiichi disaster hit the Austrian news, this was a privileged moment to observe the myth at work. During the debate of the Austrian National Assembly on "Current Perspectives on Austrian and European Energy Politics after Fukushima," the then Austrian chancellor affirmed without contradiction "that probably nobody in the Austrian parliament would give a speech in favor of nuclear technology." Thus, he could easily give life to a vision in which Austria would have the role and obligation to continue "stand[ing] up against the nuclear lobbies."<sup>4</sup> This meant in the same move making a choice for a specific type of energy future, a future that would need to be without nuclear technologies. This is not only a strong anti-nuclearity position—the state of not wanting to be associated with nuclear energy—but also a sign that the sociotechnical imaginary of needing and being able to "keep the nuclear out" was easy to mobilize and strong as ever.<sup>5</sup>

1. Ulrike Felt, "Keeping Technologies Out."

2. Bundesverfassungsgesetz für ein atomfreies Österreich, *Bundesgesetzblatt*. Quoted publications and sources referenced in German have been translated by the authors.

3. Claude Lévi-Strauss, *Structural Anthropology*, 209.

4. Stenographisches Protokoll des Österreichischen Nationalrates, XXIV/98.

5. Gabrielle Hecht, *Being Nuclear*; Sheila Jasanoff, "Futures Imperfect"; Felt, "Keeping Technologies Out."

Much has been written—in popular media and beyond—about the rejection of nuclear energy in the Austrian context: while much amazement has been expressed about the fact that a nuclear power plant was constructed and ready to go online (as the start of a larger nuclear energy program) but ultimately never did, much amusement was triggered by Austria’s becoming “the Gallic village,” resisting the pressure of an “international nuclear lobby” simultaneously as other countries expanded their nuclear program. However, much less is known about Austria’s energy visions and, more specifically, nuclear energy visions in the period before the referendum. A number of questions appear in this context. What occurred before the nation’s “we”—as an imagined community—embraced “rejecting the nuclear” as an important identity-forming element?<sup>6</sup> If the immediate period before the 1978 referendum was the moment when this position could take form and later gradually become more robust, what was before? What place did “the nuclear” occupy in Austria’s post-WWII energy futures, and how did it relate to the other national prestige projects in this sector, hydropower? What were the futures to be realized through the nuclear project, and whose future imaginaries were they?

Thus, the purpose of this article is to trace Austria’s two decades of strong nuclear optimism that characterized the post-WWII period until the mid-1970s and to create a better understanding of how this optimism related to the reconstruction of an Austrian technopolitical identity. Following the principle of symmetry in science and technology studies, for a moment, we will “forget” that in the time around the referendum, the pro-nuclear position crumbled and gradually faded away. Forgetting the eventual outcome will allow us to fully engage with the formation of a pro-nuclear position. We can then reflect on the differences needed to create a pro-nuclear or an anti-nuclear position and how they differ in the technical and material elements, values, and futures that must be assembled to build a robust sociotechnical imaginary. How did each position create “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology?”<sup>7</sup> The aim of this article is thus to carefully show how this *pro-nuclearity* was built up in terms of a “technopolitical regime,” attempting to create a new self-understanding for Austria in the immediate post-WWII period.<sup>8</sup> Using the notion of the technopolitical regime sensitizes us to investigate “the institutions, the people who run them, their guiding myths and ideologies, the artefacts they produce, and the technopolitics they pursue.” It further alerts us to the prescriptive nature of technopolitics in imposing “not just policies and practices but also broader visions of the sociopolitical order.” This notion also gives space to capturing the always

6. Benedict Anderson, *Imagined Communities*.

7. Jasanoff, “Futures Imperfect,” 4.

8. Gabrielle Hecht, “Technology, Politics and National Identity in France,” 258.

“contested nature of power” and thus keeps us alert to “varying forms of dissent or resistance, both from outside and from within the institutions they governed,” and reminds us that regimes are “neither static nor permanent.”<sup>9</sup>

To capture the making of such a technopolitical regime in the early post-WWII period in the Austrian context, we proceed in three steps. In the first step, we offer an analysis of the early phase in which Austria built up the institutional infrastructure of pro-nuclearity, elaborating the institutional embrace of the “atomic age” as part of a progress-oriented scientific reimagining of an Austrian nation eager to rebuild its (technoscientific) identity after WWII. Drawing on the notion of technopolitical culture, we will address the specific relations between science and politics in this early formation period.<sup>10</sup> The second step is then devoted to studying how the nuclear was appropriated and inscribed into the Austrian context—in short and to paraphrase Hecht, how nuclear energy production was made Austrian. This also entails reflecting on the creation and performance of adequate narratives that would accompany the effort to build a technopolitical environment supportive of nuclear power in and for Austria. In the third and final step, we then examine how the institutionalization and this *coproduction of nuclearity and Austrianness* also needed the creation of an imagined sociotechnical trajectory that may link Austria’s technoscientific past to a bright future that could be realized through embracing the nuclear. We thus trace how in different moments, efforts were made to create, rehearse, and stabilize a sociotechnical imaginary of the nuclear that would allow progress and development for society and at the scientific level.

### Institutional Embrace of the Atomic Age

The first activities to foster nuclear research and development in Austria after WWII can be identified in the attempts by physicists and industrialists to rally the relevant national actors to establish the necessary research and development structures. Hans Thirring, an internationally renowned physicist at the University of Vienna, was among the first to argue for the constitution of an Austrian Atomic Energy Commission. After resuming his position as head of the Department of Theoretical Physics—he had been forced out of office in 1938—Thirring argued for a broader institutionalization of nuclear research to secure additional financial resources beyond notoriously small budgets.<sup>11</sup> Similarly, the Austrian Electrotechnical Association (EVÖ) was promoting atomic energy. EVÖ

9. Ibid.

10. Ulrike Felt, Maximilian Fochler, and Peter Winkler, “Coming to Terms with Biomedical Technologies.”

11. Thirring an Karlik, 30. August 1954, Karton 49, Fiche 706, in AÖAW; Wolfgang L. Reiter and Manfred Schurawitzki, “Über Brüche hinweg Kontinuität”; Daniela Angetter and Michael Martischinig, *Biographien österreichischer PhysikerInnen*.

organized lectures and visits to the Institute for Radium Research of the Austrian Academy of Sciences (ÖAW), an institution of international prestige founded in the early twentieth century.<sup>12</sup> In 1954, the EVÖ formed a research committee bringing together Austrian nuclear scientists, policy makers, and representatives of Austrian industry to support nuclear research.<sup>13</sup> Austrian efforts to join the European Organization of Nuclear Research (CERN) can also be interpreted as part of this repositioning work.

Foreign stimuli mattered considerably in this process of re-forming Austrian nuclear research and development, including the U.S. Atoms for Peace and President Eisenhower’s speech to the United Nations General Assembly in 1953. Austrian nuclearity actually gained momentum after the UN resolution on International Cooperation in Developing the Peaceful Uses of Atomic Energy in late 1954, which launched eager and enthusiastic activities throughout the world—including Austria. Along with activities through the UN, the United States also sought active cooperation in science and technology on a bilateral level: governments all over Europe were actively approached to cooperate in nuclear research and development. In Austria, the Department of Foreign Affairs of the Federal Chancellors Office (BKA-AA) received an Aide Memoire by the U.S. government, offering both help in the construction of a research reactor, in cooperation with the U.S. Atomic Energy Commission, and open scientific cooperation through training courses and programs in various fields.<sup>14</sup> Within days, the Department of Foreign Affairs gathered representatives of the several ministries concerned by these developments to discuss the situation with Berta Karlik.

Karlik was the leading figure in the field of experimental nuclear physics in Austria. Her very successful career in nuclear physics started in the interwar period and led to research visits to England, France, and Sweden, enabling her to work with some of the most prominent physicists of the time. In 1945, she became head of the Institute for Radium Research and was the first female full professor in Austria when she was appointed a professor of experimental nuclear physics in 1956.<sup>15</sup>

The unanimous interest by the representatives of science and politics resulted in the decision to form an official commission to advise the Austrian government on all nuclear-related issues: The body typically referred to as the Austrian Atomic Energy Commission (AAEC) was headed by the

12. EVÖ, Der Elektrotechnische Verein Österreichs (1883–1953), Schriftwechsel Karlik-Saic, Jänner-März 1953, Karton 50, Fiche 750, in AÖAW. In reference to archive material, “Atomenergie” is translated/referred to as “atomic energy,” while “Kernenergie” is translated/referred to as “nuclear energy.”

13. Protokoll der Gründungssitzung der Studiengruppe im EVÖ am 16. Dezember 1954, Karton 50, Fiche 751, in AÖAW; Koci an BMU/Hoyer, Karton 63, GZ: 78418/I/1,55, in ÖStA AdR Atom.

14. Aide-mémoire, Karton 50, Fiche 726-727, in AÖAW.

15. Maria Rentetzi, “Berta Karlik (1904–1990).”

Department of Foreign Affairs, with further permanent positions assigned to policy makers from six federal ministries: Education (BMU), Social Care (BMSV), Finance (BMF), Traffic and Nationalized Enterprises (BMVVB), Commerce and Reconstruction (BMHW), and Agriculture and Forestry (BMLF).<sup>16</sup> Berta Karlik would be the only scientist in this commission.

The commission was entrusted with preparing for the International Conference on the Peaceful Uses of Atomic Energy in Geneva in August 1955, developing a position on the acquisition of a research reactor, and deciding on the participation of Austrian scientists in U.S. training programs. Accompanied by frenetic celebrations in the media, Austria was characterized as entering “the atomic age.”<sup>17</sup> In the following three years, the AAEC not only successfully coordinated Austria’s participation in the Geneva Conference in 1955 but also, in the aftermath of the conference, made arrangements for the constitution of the Austrian Foundation for Atomic Energy Research (ÖSGAE), followed by the signing of an agreement to cooperate with the U.S. Atomic Energy Commission, including the acquisition of a research reactor and the participation of Austrian experts in U.S. training programs. Throughout its realization, the ÖSGAE itself was increasingly dominated by industrial interests. Consequently in 1959, an inter-university institute (“Atominstitut, ATI”) was established to acquire a second research reactor from the United States for academic nuclear research.<sup>18</sup>

This institutionalization process in the nuclear energy domain went very smoothly, as Austria could profit from the wave of international developments. What is specific to the Austrian situation, however, is the fact that the first institutional body, the AAEC, consisted of mainly policy makers with only one scientist, Berta Karlik, participating. This fact must be understood in reference to the Austrian political culture in the immediate post-WWII era. Institutionally reconciling the political cleavages—dating back to the Austrian Civil War in the interwar period—between the two main parties, the social democratic party (SPÖ) and the conservative Austrian people’s party (ÖVP), was viewed as crucial. After WWII, proportional representation became the means of preventing conflict not only

16. Einladung, Protokoll und Anhänge zur ersten, vorbereitenden Sitzung der ÖAEK im BKA-AA am 21. Dezember 1954, Karton 50, Fiche 726, in AÖAW; Protokoll des 75. Ministerrats am 11. Jänner 1955, Konvolut 132, ÖStA AdR MR. The commission’s official name, “Beratende Regierungskommission zu Fragen der Atomenergie,” translates to “Advisory commission to the government on questions related to atomic energy.”

17. “Ein Atomreaktor für Österreich in Erwägung,” *Die Presse*, 12. Jänner 1955; “Österreich baut Atommeiler?” *Bildtelegraf*, 12. Jänner 1955; “Österreich und das Atomzeitalter,” *Die Presse*, 12. Jänner 1955; “Atomreaktor für Österreich,” *Neue Wiener Tageszeitung*, 12. Jänner 1955; all sources in ÖNB.

18. Christian Forstner, “Zur Geschichte der österreichischen Kernenergieprogramme,” 169–70.

within the Austrian government but also within the state and related institutions and actors, an arrangement which came to be known as “austro-corporatism.” As a result, avoiding conflict became a structuring element in post-WWII Austrian politics, allowing for the widespread political support (or at least acceptance) of the broader population.<sup>19</sup> The formation of the Austrian Atomic Energy Commission therefore enabled the full-fledged mobilization of the Austrian two-party state and its distinctive institutions for nuclear research and development, while the orchestration of Austria’s participation in the “atomic age” was transformed into a political endeavor. Understood as an “austro-corporatist nuclear regime,” the AAEC allowed the mobilization of both material resources and Austrian society at large, granting scientists substantial room for planning and decision-making.

Scrutinizing the technopolitical dimension of this austro-corporatist nuclear regime, we must take a closer look at the role of the single scientist within the AAEC. Indeed, Berta Karlik was granted a great deal of authority within the commission and its activities. In the second session of the AAEC in January 1955, she was tasked with coordinating the preparation of a memorandum on past and present uses of atomic energy in Austria with the purpose of showing “the world that Austria has been using atomic energy for peaceful purposes for years and is among the leading European nations in the field.”<sup>20</sup> Austrian use of radioactive isotopes had started at the beginning of the 1950s, after Karlik and her team at the Institute of Radium Research managed to import isotopes from Harwell, the key British Atomic Energy Research Establishment.<sup>21</sup> An internal report to the AAEC by theoretical physicist Ferdinand Cap, a former student and employee of Thirring’s who was now based at the University of Innsbruck, discussed present and future applications across a great variety of fields.<sup>22</sup> Karlik used the opportunity to stage applications of atomic energy as widespread in Austria, stressing the contemporary use of radioactive isotopes for medical, scientific, and industrial purposes in approximately sixty Austrian institutions.<sup>23</sup> She argued that based on the then rapid increase in applications, an even larger number was to be expected in the future.

Consequently, the AAEC was instructed to assess the suitability of the construction of a research reactor in Austria for purposes of nuclear re-

19. Anton Pelinka and Sieglinde Rosenberger, *Österreichische Politik*; Emmerich Tálós and Bernhard Kittel, “Sozialpartnerschaft.”

20. Protokoll der 2. Sitzung der ÖAEK am 24. Jänner 1955, Karton 50, Fiche 727, in AÖAW.

21. Traude Bernert, “Verwendung von Radioisotopen in Österreich.”

22. Exposé über die friedliche Verwendung der Atomenergie, Karton 50, Fiche 727-728, in AÖAW.

23. Memorandum über die friedliche Verwendung der Atomenergie in Österreich: Anhang zum Protokoll der 4. Sitzung der ÖAEK am 14. April 1955, Karton 50, Fiche 728, in AÖAW.



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search. Based on her own suggestions, Karlik was authorized to form a subgroup of several nuclear experts.<sup>24</sup> To clarify the potential societal and economic role of nuclear power production, the subgroup was consequently enlarged by policy makers of the Ministry of Commerce and Reconstruction, the Ministry of Traffic and Nationalized Enterprises, and the Department of Foreign Affairs.<sup>25</sup> The final report argued for the construction of a small, lower-cost research reactor that would fit the needs of research, for example through the production of isotopes of fast decay (while others would still be imported), and serve training purposes for science and industry, including the possible training of operational staff for future nuclear power reactors. Therefore, a joint project with all relevant ministries, nationalized enterprises, and industry was suggested. Scientific cooperation with the United States was to be formalized and intensified by a contract in the near future.<sup>26</sup> With the AAEC unanimously following Karlik's judgment, she managed to position herself as a scientific gatekeeper to the Austrian Atomic Energy Commission. As the only scientist at the top level of the commission, it was her responsibility to bring in all relevant actors of Austrian nuclear science and to negotiate a position between them. She was also responsible for final judgments as well as translations and explanations of expert reports to policy makers.<sup>27</sup> In other words, through the AAEC, Karlik was granted far-reaching authority over what counted as the expert vision of Austrian technologists.

Furthermore, the austro-corporatist nature of the regime made it possible to manage relations between science, politics, and society at large. In this sense, the notion of austro-corporatism captures not only the institutionalization of the Austrian two-party state over various policy fields but also the resulting relationship of obedient citizens, servile to public authorities. On one hand, this phenomenon manifested itself in media reports in the mid-1950s, which resembled the ambivalent character prevailing in the German context.<sup>28</sup> Although the fear of nuclear weapons was somewhat present, the media simultaneously celebrated the constitution of the AAEC and published several series of articles on nuclear science and its applications.<sup>29</sup> Because of the very enthusiastic media reactions, the AAEC de-

24. Karlik an BKA-AA/Matsch, 22. Jänner 1955, Karton 50, Fiche 724; Karlik an BMU/Hoyer am 22. Jänner 1955, Karton 50, Fiche 829, both in AÖAW.

25. Protokoll der 2. Sitzung der ÖAEK am 24. Jänner 1955, Karton 50, Fiche 727, in AÖAW.

26. Memorandum über die Zweckmäßigkeit der Errichtung eines Forschungsreaktors in Österreich, Beilage zum 1. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, Karton 50, Fiche 730, in AÖAW.

27. Karlik an BMU/Hoyer, 23. Mai 1955, Karton 50, Fiche 830, in AÖAW.

28. Ilona Stölken-Fitschen, "Bombe und Kultur."

29. "Cadillac im Feuer der Atombombe," *Die Presse*, 14. November 1953; "Im Zeichen der Atombombe," *Die Presse*, 3. April 1954, both sources in ÖNB; "Plakat: Wird das Wetter durch Atomexplosionen beeinflusst?" *Sonntag*, 5. Dezember 1954, 10 Uhr., BPA-014707-12, in ATMW; "Energiequelle Atom," *Wiener Kurier am Sonntag*, 1. Teil,

cided to only cautiously release details to prevent the institutions involved from being overwhelmed by requests from the public.<sup>30</sup> On the other hand, occasional protests and early warnings received careful attention from the regime: For example, in Upper Austria, an engineer started publishing on the risks of nuclear power reactors and informing the head of the regional government of the challenges and risks regarding nuclear power production.<sup>31</sup> The engineer’s letters were forwarded to the AAEC, which considered it advisable to have respective experts publish corrections in these newspapers to “prevent the local population from worries based on false assumptions.”<sup>32</sup> Consequently, Karlik was given the opportunity to disperse the arguments at the scientific level and thus to delegitimize the concerns based on expert authority, while the Federal Ministry of Interior performed a background check on the protester’s career and activities.<sup>33</sup>

These examples illustrate how the institutionalization of nuclear research and development in the form of an austro-corporatist nuclear regime reflected the specific configurations, practices, structures, and mechanisms of Austrian technopolitical culture in the immediate post-WWII era, enabling the orchestration of relations between science, politics, and society at large. These arrangements would be challenged from the 1970s onward, when—for the first time after WWII—the socialist party managed to hold the absolute majority and the nuclear could become a gradually debated issue within the conservative party.

## Making Austria Nuclear and Making the Nuclear Austrian

Beyond the institutional dimensions considered above, the key elements in any technopolitical regime are the myths and ideologies that they create and perform, as well as the visions and sociopolitical orders that they express. In the words of Gabrielle Hecht, we must understand them as “strategic practice[s] of designing or using technology to constitute, embody, or enact political goals.”<sup>34</sup> The political goals and imaginaries of nuclearity in the mid-1950s were, on one hand, very much structured by U.S.

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22. Jänner 1955; 2. Teil, 29. Jänner 1955; 3. Teil, 5. Februar 1955; 4. Teil, 12. Februar 1955; 5. Teil, 19. Februar 1955; 6. Teil, 26. Februar 1955, all in ÖNB.

30. 1. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, 8, Karton 50, Fiche 730, in AÖAW; “Die Wiener haben ‘Atomfieber,’ Seit der Atomausstellung: Massenverkehr im Institut für Radiumforschung,” *Die Presse*, 8. April 1955, in ÖNB.

31. “Des Zauberlehrlings Besen,” *Die Furche*, 30. Juni 1955, in ÖNB; Heinz Hofmann an Landeshauptmann Gleißner, 8. September 1955, Karton 63, 106632/I/1/55, in ÖStA AdR Atom.

32. BKA- AA/Matsch an das BMU, 15. Oktober 1955, Karton 63, 106632/I/1/55, in ÖStA AdR Atom.

33. Karlik an BMU/Hoyer, 5. Jänner 1956; BMI/Mayer an BMU/Hoyer, 14. Dezember 1955; both in Karton 63, 106632/I/1/55, ÖStA AdR Atom.

34. Gabrielle Hecht, *The Radiance of France*, 14.

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interventions in the context of the Cold War. They defined in important ways what would be part of this new imaginary: what would shape the assemblages of the material technological infrastructure, the social meaning that it should acquire, and the moral orders performed through it. Therefore, the U.S. nuclear imaginary was partly staged and perceived in universal ways and propagated through international institutions such as the United Nations and bilateral negotiations all over the industrialized world.<sup>35</sup> On the other hand, U.S. political goals had to meet the respective national interests for European actors to commit.<sup>36</sup> European societies had to actively appropriate these nuclear imaginaries and visions within a specific national setting and thus make them fit locally.

Therefore, throughout this section, we discuss the coproduction of the Austrian nation state, Austrian national identity, and nuclearity in terms of multiple technopolitical agendas, which were realized through addressing nuclear issues in post-WWII Austria. First, we show how cooperation in nuclear research and development allowed Austrian elites to assume an active role regarding the re-formation of the Austrian nation state and to position Austria in the international arena in the context of the Cold War. Second, we analyze how Austrian national identity was performed and practiced in relation to the nuclear within post-WWII Austria. Finally, we trace these moments of coproduction in the reverse direction by explicating how the appropriation of nuclear power production enabled actors to imagine nuclear technologies as Austrian.

Engaging with nuclear issues played a particular role in the re-formation of the Austrian state after WWII. For political elites, embracing the nuclear in the mid-1950s was also directed toward the establishment and practice of Austria as a sovereign and internationally acknowledged nation state. By the time international developments in the application of nuclear technologies gained momentum through Atoms for Peace, Austria was under the control of the Allied powers and striving for a state treaty. In this regard, cooperation in nuclear science and technology offered opportunities for aligning Austria with “the West,” despite the contrasting interests of the Soviet Union and an increasing demand for neutrality.<sup>37</sup> Consequently, U.S. president Eisenhower was extensively quoted in Austrian newspapers when he addressed the UN General Assembly in 1953, particularly his remarks on the willingness of the United States to negotiate a state treaty for Austria.<sup>38</sup>

In late 1954, the AAEC was formed under leadership of the Department of Foreign Affairs, explicitly because of the importance of the matter

35. Sheila Jasanoff and Sang-Hyun Kim, “Containing the Atom.”

36. John Krige, *American Hegemony*.

37. See also Oliver Rathkolb, *Die Paradoxe Republik*.

38. “Atomkraft für den Frieden, nicht für den Krieg,” *Arbeiter-Zeitung*, 10. Dezember 1953, in ÖNB.

in terms of positioning Austria on the international level. It was the Austrian Minister of Foreign Affairs that would publicly announce strategic and programmatic decisions to underline both importance and commitment. Throughout late 1954 and early 1955 the AAEC undertook preparations for the Geneva conference based on Austria’s membership in UNESCO.<sup>39</sup> Although Austria was neither a sovereign nation state nor a full member of the United Nations, activities related to nuclear research provided an excellent possibility for Austrian representatives to nevertheless actively participate in the international arena. The importance of scientific and technological cooperation in positioning Austria as a sovereign, well-networked nation state in Western Europe can also be observed in relation to the ongoing negotiations of Austria’s CERN membership. In 1953, after the Austrian government missed several opportunities to finalize CERN membership due to hesitant actions, the Federal Minister of Education warned the Council of Ministers, the most important institution for collective decision-making within the Austrian government, that a “rejection of participation [in CERN] could be interpreted as a lack of interest in European cooperation.”<sup>40</sup>

Since the process of embracing the nuclear was very much driven by the actions of the U.S. government, actors of the austro-corporatist nuclear regime almost exclusively sought cooperation with the United States from the very beginning. However, Austrian actions had to be taken cautiously: Before the Austrian State Treaty was signed by the Allied powers, it was considered to “be favorable to cooperate with US institutions without a contract between the two governments” to avoid risking political objections or diplomatic reactions by the Soviet Union.<sup>41</sup> After the treaty was signed, actions to establish a respective contract were taken without further delay. Austrian actors also repeatedly sought to increase their leeway by exploiting international tensions, for example recommending that uranium purchases should not necessarily be restricted to one single country, after the Soviet Union had signaled interest in cooperation.<sup>42</sup> Overall, scientific cooperation in nuclear research allowed the integration of Austria into “the West”: Scientists, policy makers, political representatives, and the press assumed an active role in what John Krige termed the co-production of U.S. hegemony in the context of the Cold War, and in doing so, they rearticulated the nuclear imaginary in the Austrian context.<sup>43</sup>

39. Einladung, Protokoll und Anhänge zur interministeriellen Besprechung im BKA-AA am 21. Dezember 1954, Karton 50, Fiche 726, in AÖAW.

40. Notizen über einen Vortrag von Bundesminister für Unterricht, Ernst Kolb, im Ministerrat am 30. Juni 1953, Karton 63, GZ: 95.957/I, in ÖStA AdR Atom.

41. Protokoll der 2. Sitzung der ÖAEK am 27. Jänner 1955, Karton 50, Fiche 727, in AÖAW.

42. Protokoll der 10. Sitzung der ÖAEK am 24. November 1955, Karton 50, Fiche 730, in AÖAW.

43. Krige, *American Hegemony*.

In addition to this international positioning of Austria as a country eagerly participating in nuclear research and development, the nuclear gained technopolitical importance within Austrian society: The Austrian nation was increasingly imagined as being involved in and associated with the nuclear. After WWII, the compliance of Austrians and the active participation of the majority of Austrians in National Socialism were officially mythologized and denied in terms of the so-called “*Opfermythos*” (victimization thesis). In reference to the Moscow Declaration of 1943, the Austrian state and its population were portrayed as victims of expansionist national socialist Germany. In light of the lost war, traditions of German nationalism and agitation for uniting Austria with Germany were camouflaged, and a new beginning was announced, referred to as “*die Stunde Null*” (zero hour). Consequently, opportunities to cultivate an explicitly Austrian nationalism were more than welcome. This phenomenon played a role in promoting Austria as a “cultural super power.”<sup>44</sup> Austrian nuclear physicists actively participated in the invention of such a tradition.<sup>45</sup> Personal correspondence from Thirring to Karlik concerning one of the first drafts of the memorandum on the suitability of a research reactor bears witness to this tendency to associate nuclear research and development with national prowess:

If at all, I would criticize some aspects that seem to be a little too cautious and reserved. . . . At some point, we should say that it is in accordance with Austria’s status as a nation of culture and self-evident that we should participate in the field of nuclear physics like other countries of the same size.<sup>46</sup>

Not only was Austria’s status as a nation of culture referenced within this line of argumentation, but careful attention was also paid to developments in neighboring countries. The final report elaborated on the respective programs in France, Norway, the Netherlands, Sweden, Italy, Switzerland, Belgium, West Germany, East Germany, and Great Britain.<sup>47</sup> These reflections about foreign nuclear programs were meant to create a sense of urgency to take steps in Austria.

U.S. and Austrian actors also orchestrated the means and occasions for appropriating the nuclear imaginary. In March 1955, Vienna’s Künstlerhaus hosted a traveling exhibition on the peaceful uses of atomic energy in a cooperative effort by the U.S. Information Service and the Austrian League for the United Nations. Within three weeks, more than 99,000 peo-

44. Susanne Breuss, Karin Liebhart, and Andreas Pribersky, *Inszenierungen*, 172–76.

45. Eric Hobsbawm and Terence Ranger, *The Invention of Tradition*.

46. Thirring an Karlik, 15. April 1955, Karton 49, Fiche 706, in AÖAW.

47. Memorandum über die Zweckmäßigkeit der Errichtung eines Forschungsreaktors in Österreich, 3-10, Beilage zum 1. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, Karton 50, Fiche 730, in AÖAW.

ple came to see exhibits ranging from a model of a nuclear reactor to an isotope laboratory, including robotic arms (“magic hands”).<sup>48</sup> Seizing the occasion, the Institute for Radium Research arranged a section on the use of radioactive isotopes in Austria. Austrian political leaders would not miss the chance to publicly embrace nuclear science and technology. Opening the exhibition, the Minister of Foreign Affairs closed his statement: “I am convinced that Austrian scientists, who have been and are groundbreaking in so many fields, will also make their contribution to this collective effort of international scientists.”<sup>49</sup> The federal chancellor more explicitly addressed the role of Austrian nuclear physics and the Austrian people in the opening statement of the brochure that was distributed to visitors:

For the development of atomic physics, the groundwork of Austrian researchers was of crucial importance in many fields, and one can be certain that the Austrian people will be following the further development of atomic energy for peaceful purposes with great attention.<sup>50</sup>

However, the coproduction of national identity and nuclearity also involved the imagination of nuclear technologies and their mastering as something increasingly Austrian. Within the AAEC, nuclear research and development were framed as promising because of the expected economic potential from the very outset. Opportunities for Austrian industry were undoubtedly observed in the “production of devices in the area of precision engineering and materials.”<sup>51</sup> However, the key aspect receiving careful attention from early on was the potential for nuclear power production and the resulting effects on the Austrian hydropower industry. Because the development of hydropower capacities had been key to the immediate post-WWII reconstruction period, the ambivalence and potential tension between these two large-scale technological endeavors became palpable.

Scientists at the Technical University of Vienna and representatives of the Austrian electric power industry had already been expressing their hopes in this direction within the EVÖ, while reports and discussions within the AAEC show a great level of anxiety regarding negative consequences for Austrian hydropower production. Therefore, it was most welcome that U.S. experts had been framing nuclear power production as a necessary add-on rather than a competitor to preexisting energy technologies. Indeed, in late 1954, it was considered unlikely “in the American opinion” that electricity produced through the utilization of atomic energy would be competitive in the near future.<sup>52</sup> Statements and activities within the U.S. power industry

48. Wladimir Aichelburg, *150 Jahre Künstlerhaus Wien 1861–2011*.

49. “Ing. Figl: Friedliche Atomnutzung eine Hoffnung,” *Neues Österreich*, 6. März 1955, in ÖNB.

50. Österreichische Liga für die Vereinten Nationen, *Atom*, 2.

51. 1. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, 4, Karton 50, Fiche 730, in AÖAW.

52. Protokoll zum vorbereitenden Treffen im BMU am 18. Dezember 1954, Karton 63, GZ: 95.957/I, in ÖStA AdR Atom.

suggested that nuclear power production would enter the market only within ten to twenty years, even though, simultaneously, nuclear energy was being publicized as “too cheap to meter” for the next generation.<sup>53</sup> Some Austrian nuclear experts also openly favored the expansion of the Austrian hydropower industry over nuclear power production.<sup>54</sup>

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A non-conflicting position between the two energy-providing technologies would be established in the months before the Geneva Conference, easing tensions. Nuclear power plants would be a necessary addition in the near future, due to the expected increases in energy consumption, rather than a danger to the existing national energy market.<sup>55</sup> This argument of non-competition in the energy market was raised regularly. For example, Ambassador Gruber reported on a speech given by U.S. diplomat Morehead Patterson in San Francisco in which he had stressed how nuclear power plants would not drive modern hydropower plants out of the energy market—a report that was attentively received within the AAEC.<sup>56</sup>

However, by mid-1955 it was clear: Nuclear power production was expected to “doubtlessly influence the future planning and constructing of hydro power plants”; hence it was necessary for Austria to keep pace with international developments “independent of the fact of when the production of nuclear power is put into practice in Austria.”<sup>57</sup> In this regard, the 1955 Geneva conference had particularly catalyzing effects, making

clear that nuclear energy will play an increasing role, predominantly in the economy, within the next 10 years. . . . For Austria, this reveals the question of whether we should—encouraged by the electric power industry—set about building a reactor for the training of staff oriented toward aspects of energy production. . . . Regarding this issue, it is to be noted that the use of hydro power, which can still be increased economically, will not lose its significance in the future and preserve its value for Austria and interested customers in neighboring countries.<sup>58</sup>

Carefully relating nuclear power production to Austria’s developments in hydropower was of strategic technopolitical importance. In the years after 1945, efforts to reconstruct the Austrian economy “also served the

53. Lewis L. Strauss, “Remarks Prepared by Lewis L. Strauss.”

54. Ferdinand Cap, *Exposé über die friedliche Verwendung der Atomenergie*, 34–36, Karton 50, Fiche 727–728, in AÖAW.

55. Protokoll zum vorbereitenden Treffen im BMU am 18. Dezember 1954, Karton 63, GZ: 95.957/I, in ÖStA AdR Atom.

56. Brief von Botschafter Gruber an das BKA-AA, 15. April 1955, Karton 63, GZ: 53.225/I/1/55, in ÖStA AdR Atom.

57. I. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, 4, Karton 50, Fiche 730, in AÖAW.

58. BKA-AA, Runderlass an alle Botschaften: Internationale Konferenz für die friedliche Nutzung der Atomenergie; Information, 29. August 1955, GZ: 335.038-INT/55, Karton 50, Fiche 729, in AÖAW.

aim of creating an ideology of national community.” These efforts became “a political program beyond actual reconstruction. . . . ‘*The trust of Austrians in their nation state’s ability to live*’ should be expressed in the collective efforts of reconstruction.”<sup>59</sup> In this context, Austrian hydropower projects such as Kaprun were mythologized as heroic national efforts, demonstrating how Austria was regaining economic and technological prowess.<sup>60</sup> Therefore, situating nuclear power production in the context of Austrian hydropower production was also a crucial element to ensure the embrace of nuclear technologies. Aligning nuclear power with hydropower allowed the visions, imaginaries, and sociotechnical orders revolving around nuclear technologies to be rearticulated, reimagined, and reconstructed in relation to Austrian national identity. Nuclear power could be increasingly appropriated as something inherently Austrian, even though it would at some point compete with the interests of the hydropower industry.<sup>61</sup> Through relating nuclear power production to hydropower, and showing Austria’s active role in shaping both projects, the nuclear “was made Austrian.” Simultaneously demonstrating the potential of the Austrian nation state and its capacity to master nuclear technologies became an underlying technopolitical agenda of political and scientific elites who drove “the quest for [a peaceful] nuclear capability” in post-WWII Austria.<sup>62</sup>

### Relating Pasts and Nuclear Futures: Making an Austrian Technoscientific Development Trajectory

In addition to embracing the nuclear through institutionalizing an austro-corporatist nuclear regime and by producing myths and ideologies that reconciled nuclear imaginaries with visions of Austrianness, it was also important to create a technoscientific development narrative that promised bright futures connected to pasts worthy of pride. Although a strong discourse stressing the need to “catch up” with international technoscientific developments was omnipresent in the immediate post-WWII era in Austria, nuclear science was a particularly good candidate for supporting this argumentative strategy. Until WWII, Vienna had been one of the few global centers in nuclear research, a position that could not be maintained.<sup>63</sup> Invoking the need to “catch up” created urgency, and one could thus build on a convincing historical narrative that made Austria an ideal candidate to engage in the nuclear endeavor.

59. Susanne Breuss, Karin Liebhart, and Andreas Pribersky, “Land des Stroms,” 506–7.

60. Oliver Rathkolb, “NS-Erbe, Wiederaufbau, Mashallplan”; Breuss, Liebhart, and Pribersky, “Land des Stroms.”

61. Andreas Kuchler, “Das Atomzeitalter erreicht Österreich (1950–1970),” 223–24.

62. Ian Welsh, *Mobilising Modernity*, 20.

63. Silke Fengler, *Kerne, Kooperation und Konkurrenz*.



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Arguing for strategic investments and commitments within the AAEC, Karlik and her colleagues repeatedly emphasized the role of Austrian nuclear physics in the early twentieth century. For example, when arguing for the acquisition of a research reactor, Karlik stressed how the Institute for Radium Research had been the first institution solely dedicated to nuclear matters worldwide. According to this depiction, Vienna was the only place apart from Cambridge where the new field was practiced between 1920 and 1930. In Karlik's view, however, the enormous development of the field had not been adequately addressed, because the number of staff in 1945 was equal to that in 1928, and most newly educated researchers tended to leave the country.<sup>64</sup> In the commission's internal documents, other physicists also referred to Austria's long-standing tradition in the field before calling for steps to be taken to allow the Austrian nation to catch up with international developments and to secure continuous participation.<sup>65</sup> Such references to a glorious tradition of research expanded through the AAEC to other institutions and actors. Politicians started referring to the past contributions of Austrians in nuclear research (see above); similarly, journalists adopted this move, glorifying and mythologizing the history of nuclear research in Austria.<sup>66</sup> By the time the construction of the first Austrian research reactor started in 1958, some even celebrated the sixtieth anniversary of "the atomic age" in Austria.<sup>67</sup>

These efforts at inventing a tradition—in other words, stabilizing a shared view of a specific past—were essential to constructing a specific future, one in which the visions and scenarios of nuclear power production propagated by the United States could gain considerable space.<sup>68</sup> These nuclear futures would contain the promise of nuclear power that was "too cheap to meter" (see above) and the projection that 50 percent of constructed power generators would be nuclear by 1976 at the latest.<sup>69</sup> All this occurred even though the technical realization and profitability remained unresolved issues. Also, the need for a new energy source was not self-evident in the United States or on an international level. The very imagination of ever-increasing energy demands had still to be actively assembled, cultivated, and appropriated in different settings.

64. Memorandum über die Zweckmäßigkeit der Errichtung eines Forschungsreaktors in Österreich, 14. Beilage zum 1. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, Karton 50, Fiche 730, in AÖAW.

65. Ferdinand Cap, Exposé über die friedliche Verwendung der Atomenergie, 25–28, Karton 50, Fiche 727–728, in AÖAW.

66. "Energiequelle Atom, 1. Teil: Das ABC der Atome," *Wiener Kurier am Sonntag*, 22. Jänner 1955, in ÖNB.

67. "Sechzig Jahre 'Atomzeitalter' in Österreich," *Die Presse*, 4. Dezember 1958, in ÖNB.

68. Hobsbawm and Ranger, *The Invention of Tradition*.

69. President of General Electric, Ralph J. Cordiner, cited from Protokoll zur interministeriellen Besprechung am 21. Dezember 1954, Karton 50, Fiche 726, in AÖAW.

The Geneva Conference of 1955 performed an important part of that work. It served as an important vehicle to a) foster the idea that a rise in energy consumption would be inevitable, and b) convince science, politics, and international publics that this demand could only be met with nuclear power production. To implement this very line of argumentation, the conference was structured as follows: The opening plenary sessions addressed forecasts in global power consumption, which were contrasted with available power sources. The discussion then deepened into debate over the energy demands of selected countries. Before actual applications of and experiences with nuclear technologies were shared, assessments of uranium and thorium deposits were up for debate. Finally, “the maximum role that nuclear power can play as an energy source during the next 25 to 50 years” was at stake.<sup>70</sup> This orchestration was actually successful in presenting a “problem-solution package”: It created and nourished the very idea of increasing demands and presented *the* solution—nuclear energy.<sup>71</sup>

Throughout the preparation process for the conference, the United Nations, the Austrian Atomic Energy Commission, and the ministries concerned with issues of energy production and consumption contributed to this process by delivering respective reports. Energy consumption in Austria was identified as growing even faster than in other countries and was expected to double within ten years. In part, “energy consumption” was perceived as a result and as an indicator of Austria’s economy’s being successfully reestablished after WWII. Extrapolating trends into the future, it was described as “desirable that Austria will also have reached the high per capita consumption of electric energy of other highly industrialized states in a not too distant future.” In light of the expected fuel usage and deposits, “Austria was interested in the development of new energy sources to a great extent to cover its increasing energy needs in the future.”<sup>72</sup>

These moves were successful on two levels. First, the need for the new power source was established and made unquestionable, and nuclear power was presented as the ideal candidate. Second, this succeeded without calling into question the important role of the hydropower industry, thus eliminating a potential opponent from within the energy sector. When Austria hosted the fifth World Power Conference (WPC) in June 1956, the director of the nationalized power industry (Österreichische Elektrizitätswirtschafts AG) and future president of the WPC could address approximately 2,000 experts and 1,000 representatives from fifty-four countries during the opening event, announcing that: “Today, we are relieved of such worries [i.e.,

70. United Nations, Department of Public Information and Press and Publications Divisions, NY: The International Conference on the Peaceful Uses of Atomic Energy, Background Paper, Karton 50, Fiche 728-729, in AÖAW.

71. Joan H. Fujimura, “Crafting Science.”

72. Anhang 3, 1. Tätigkeitsbericht der ÖAEK, 5. Juli 1955, Karton 50, Fiche 730, in AÖAW.

energy shortages] because the new aspects resulting from atomic energy are reserves that not only cover the energy needs of several thousands of years but also reveal new forms of application.”<sup>73</sup>

Additionally, Thirring’s conversion from nuclear energy critic to enthusiastic supporter can be viewed as contributing to such a developmental narrative. In 1952, as a supporter of the expansion of nuclear research, Thirring advocated against nuclear power production in the *Bulletin of the Atomic Scientists*, arguing that it was irresponsible to future generations: Although the cutting of the cedars in Lebanon by the Phoenicians and the deforestation of Dalmatia by the Venetians may have been the result of sound decision-making, he argued, “two thousand years later, they stand condemned before history for having irresponsibly and selfishly robbed future generations.”<sup>74</sup> Projecting these past experiences of humanity into the future, he argued:<sup>75</sup>

I can well imagine that within a time that is infinitesimally short compared to the millions of years of future history of man, people will begin cursing the physicists and technologists of our own age for having erected, under the name of atomic power generators, Molochs destined to consume, year by year, ton after ton of irreplaceable uranium.<sup>76</sup>

In Austria, Thirring had positioned himself as a public promoter of hydro-power production and alternative energies since 1950, publicly speaking out against nuclear power production due to problems and dangers regarding radiation protection, the disposal of radioactive materials, and insufficient security.<sup>77</sup> However, by September 1954, Thirring’s position shifted, and he had started to advocate for nuclear power production as an integral part of the future energy mix to cover global energy demands. He expected the price of “nuclear” electricity to be similar to traditional steam-driven power production, while, to paraphrase Thirring, U-238 was to become one of humanity’s central sources of power production once breeder reactors were realized. Within these scenarios, nuclear power plants had appeared as “a deus ex machina” at “exactly the right moment in time”; now, it was imperative that steps were taken to be prepared by the end of the century.<sup>78</sup>

Energy futures played a visible role in the shift of Thirring’s position

73. Cited from Hannes Leidinger, “Schlaglichter,” 212.

74. Hans Thirring, “Is It Wise To Use Uranium for Power,” 171.

75. Nik Brown and Mike Michael, “A Sociology of Expectations.”

76. Thirring, “Is It Wise To Use Uranium for Power.” A German version of the text appeared in “Dürfen wir Uran verheizen? Bau von Atomkraftwerken – unverantwortlicher Raubbau,” *Die Presse*, 12. Juli 1952, in ÖNB.

77. Kuchler, “Das Atomzeitalter erreicht Österreich (1950–1970),” 223.

78. Hans Thirring, “Ausblick auf die Energiewirtschaft der nächsten hundert Jahre,” 346.

toward nuclear energy. Although his earlier position can be understood as a critique of the growing tendency to colonize the future without thinking in terms of generational justice, the reversal of his position can be viewed as related to the emergence and establishment of a dominant energy future, pointing to a potentially enormous discrepancy between the estimated energy sources and the expected demands.<sup>79</sup> The nuclear, then, was the only reasonable solution to this future problem. This nicely shows “how stories of the future become trustworthy and garner credibility,” while simultaneously, they powerfully “trajectorize” contemporary developments.<sup>80</sup>

Similarly, not only did Austrian policy makers calculate future demands in preparing for the Geneva conference, but implicitly, they also equated the rise in (electric) energy consumption with societal development and individual well-being, much like policy elites in the United States.<sup>81</sup> In this manner, increasing per capita consumption became the foundation for the pro-nuclear sociotechnical imaginary. This was actively supported by diverse strategic efforts to stimulate individual energy consumption after the post-WWII energy shortages had been overcome.

Although the act of saving electricity had been mythologized as a sacrifice for the greater (national) good during the post-WWII energy scarcity, the state now took active measures to encourage individuals to consume energy. At the beginning of the 1950s, the federal government sponsored the modernization of households with the so-called “Elektrogeräte-Aktion” (Campaign for electrical tools), offering interest-free loans for people to buy refrigerators, electric stoves, and washing machines. The equation of technological innovation and social progress was directly expressed by contemporary advertisement slogans such as “electricity makes life more comfortable and the economy more efficient” and “living electric means living better.”<sup>82</sup>

In this manner, nuclear power production was imagined to be on a trajectory combining technological progress, energy consumption, and social well-being. Additionally, it could be connected to a past in which Austria had a leading role in creating the knowledge base for this development. By the 1970s, this equation of innovation and social progress had become self-evident and could easily be mobilized in the nuclear debates, for example by Federal Chancellor Bruno Kreisky, who stated: “In all clarity, I want to stress that . . . it cannot be the intention of the government to propagate a politics of austerity in this field that passes the feeling that the use of electrical tools in the household, greatly relieving the life of housewives, is something of ill repute.”<sup>83</sup>

79. Barbara Adam and Chris Groves, *Future Matters*.

80. Cynthia Selin, “Trust and the Illusive Force of Scenarios”; Arjun Appadurai, *The Future as Cultural Fact*.

81. Frank N. Laird, “Constructing the Future,” 48–49.

82. Breuss, Liebhart, and Pribersky, “Land des Stroms,” 517.

83. Stenographisches Protokoll des Österreichischen Nationalrates, XIV/117.

We suggest understanding these aspects of the post-WWII nuclear imaginary as a manifold expression of a sociotechnical trajectory.<sup>84</sup> Deeply rooted in modernity, this trajectorization of technological development shaped the formation of the pro-nuclear sociotechnical imaginary in post-WWII Austria, propagating the realization of individual and collective welfare by overcoming natural limitations through scientific and technological innovation. In this regard, continuous increases in energy consumption served as an indicator, which made it possible to check on a regular basis whether Austrian society “was still on track” toward its bright electrical future, which increasingly also became a nuclear future.

## Conclusion

In contrast to a shared understanding of anti-nuclearity in contemporary Austria, we have uncovered a multifaceted pro-nuclear imaginary in the post-WWII era. Therefore, in this conclusion, it seems interesting to reflect not only on how the pro-nuclear imaginary could be formed, gain traction, and become (temporarily) stable, but also on how this relates to subsequent anti-nuclear positions. Building on the conceptual work of *technopolitical regimes* and *sociotechnical imaginaries* has allowed us to shed light on the work needed to build such a strong pro-nuclear position in post-WWII Austria. However, it has also made us aware that any imaginary and regime builds on a specific assemblage of actors, technologies, future visions, and societal values that is always fragile and requires continuous work to keep stable. From such a perspective, it would make little sense to say that as Austrians in 1978 decided against nuclear energy, the Austrian pro-nuclear imaginary was maybe never as strong as some seemed to believe.<sup>85</sup> Rather, we must understand that even minor shifts on the level of any element in the assemblage can lead to a destabilization, to the need for rearrangement, and to a redefinition of what it means to be pro- or anti-nuclear.

We captured a process of coproduction, triggered by foreign stimuli in the post-WWII era, of a strong belief in the nuclear research/energy production complex and a specific Austrian technopolitical culture. Although the sociotechnical imaginary of nuclear power was initially formed in the United States, policy elites and scientists on both sides of the Atlantic expected it to be taken up internationally. This meant that embracing the nuclear could make Austria a full-fledged nation-state in the international landscape. Therefore, a context-specific “translation” of the sociotechnical imaginary was gradually built, refined, and stabilized through repeated rehearsals. As we have shown, the formation of the *austro-corporatist nuclear*

84. Ulrike Felt, “The Temporal Choreographies of Participation.”

85. Bruno Latour, *Reassembling the Social*.

*regime* enabled the performance of unanimous decision-making in favor of nuclear research and development in the mid-1950s. It allowed a shared position to be carefully negotiated between political elites, scientific experts, and economic actors, and the regime was able to mediate between these actors and society at large. The success of this regime can be observed in reference to subsequent developments. In the late 1960s, the coalition of the two dominant parties (ÖVP and SPÖ) was succeeded by several periods with an absolute majority for one or the other of them, first for the conservative ÖVP from 1966 to 1970 and then by the socialist party (SPÖ) until 1983. However, in the first years of the absolute majority, technopolitical decision-making seemed to be somehow still exempted from classical party politics and remained both collective and largely unanimous—even though some more critical voices started to rise in the ÖVP, which had initially been a strong proponent of nuclear power. The mediation through austro-corporatist structures was key in this case and managed to secure the consent of elites, the support of the media and the silence of “the Austrian public”—whose opinion was never explicitly sought.<sup>86</sup> This would begin to change in the early 1970s, given that, for the first time in postwar history, the chancellor was a socialist. Gradually, anti-nuclear voices in the ÖVP would emerge, partly as a strategy to counteract the political opponent.

These political constellations explain why the slowly rising anti-nuclear movement needed more than a decade to gain voice and to gradually weaken or even undermine the functioning of this technopolitical regime. It also makes us aware of how party politics and technopolitics must be understood as entangled. The thin rejection of the nuclear energy future in the 1978 referendum did much more than halt the production of nuclear energy; more generally, it started to shift Austrian technopolitical culture. Therefore, the 1978 referendum and preceding debates were not just about conflicting positions around nuclear energy, but also about the political culture in Austria and who should have a voice in defining the future, as realized through Austrian technological projects.

For this reason, the debates around whether Austria should engage in nuclear energy production would continue even after the referendum, until the late 1980s, when the Chernobyl disaster eventually enabled a unanimous repositioning of austro-corporatist actors, which brought the controversy to an end.<sup>87</sup> From then onward, Austria’s embrace of the nuclear in earlier years was to be gradually erased from the collective consciousness and memory in the formation of the succeeding sociotechnical imaginary of keeping nuclear technologies out of Austrian territory. Consequently, the pro-nuclear imaginary was covered up and rationalized in narratives of “the Austrian public” and its resistance to scientific experts

86. Michael Gehler, “Die Zweite Republik.”

87. Florian Bayer, “Die Ablehnung der Kernenergie in Österreich.”

and political elites. Although the earlier austro-corporatist nuclear regime was dissolved, political elites and the public joined in the common cause of reimagining the Austrian nation state as “free of nuclear power” and as an advocate against the “nuclear lobby.”<sup>88</sup> Through this reformulation, a position in accordance with a foundational element of Austrian technopolitical culture, one with little publicly visible conflict or even dissent, was reestablished. Although this culture of political consensus may seem more fragile at present, the anti-nuclear position has become a core element of the Austrian sociotechnical imaginary and represents one of the few elements on which there is still agreement across all political parties.

In the post-WWII era, the technoscientific imaginations of the Austrian nation very much revolved around energy-related technologies. As we have argued, the nuclear was carefully established next to hydropower production in the 1950s to adopt a non-conflictual mode of energy development and to avoid calling into question the key symbolic role that major hydroelectric constructions had played in re-establishing Austria’s self-consciousness as a “developed nation” in the immediate post-WWII years. Nuclear power production offered multifaceted new ways of practicing and imagining the Austrian nation state, and consequently, mastering these technologies became central to the technopolitical agenda. By the 1970s, “the nuclear” was well entrenched in Austrian society; hence the public vote against the commissioning of the nuclear power plant at Zwentendorf—which was unexpected for the governing political party and for some other major players—challenged not only an earlier decision for a certain form of energy production but also Austrian technopolitical identity and the associated forms of governing.

The pro-nuclear imaginary in the aftermath of WWII allows us to understand how the nuclear controversy could not be easily resolved even after the referendum, and why an external event at the scale of the Chernobyl reactor explosion “was necessary” for a consensual repositioning of key actors. In political terms, this history of reversing and reformulating Austrian technopolitical identity, including the obliteration of Austria’s pro-nuclear history in the present, directs attention to the fragile grounds on which Austria’s anti-nuclear position is built. Although the collective self-understanding of Austrians as a community of those rejecting nuclear power production is stronger than ever in the aftermath of Fukushima, this can hardly be understood as the result of a political process that involved conscious decision-making between political actors, scientific experts, and the larger public. Although the anti-nuclear imaginary suggests that such a process of public learning has occurred, our analysis demonstrates how opposing interests as well as different views and visions on technoscientific choices have been covered up in relation to Austria’s national and technopolitical identity. It also reminds us that sociotechnical imaginaries need

88. Felt, “Keeping Technologies Out.”

to be rehearsed regularly to remain strong, with the last major opportunity being the Fukushima disaster.

Finally, one further aspect is brought to the fore in this analysis: We have shown how imaginations around nuclearity in the post-WWII era are to be understood—as a specific version of sociotechnical trajectories propagating the pursuit of individual and collective welfare through science and technology. Although the nuclear was removed from the energy mix in the Austrian case, Austria’s anti-nuclear position does not exempt Austrian society from the challenges posed by climate change and the need for further economic and technoscientific development. In relation to the nuclear, we profit from the advantage of ex-post observation: Many of the hopes and visions of the 1950s related to nuclear research and development are frequently made to appear irrational and absurd from the present perspective. Nonetheless, they were back then both meaningful and powerful. Furthermore, many aspects of these former development trajectories have been reinscribed into contemporary trajectories, for example, the equation of growth in energy consumption and societal progress. Additionally, although discussion of sustainability and “green” energy futures is, at present, on everybody’s lips, when debates around these issues reach beyond technoscientific innovation, we can hardly identify instances that challenge contemporary sociopolitical and sociotechnical orders. Instead, even these imagined energy futures foster today’s sociopolitical orders by black-boxing negative effects and structural dynamics.

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