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International Conference

Nuclear revival and legacies: insights from the humanities and social sciences

Paris – 21-22 October 2024
École des Ponts ParisTech, Cité Descartes campus, RER A station Noisy-Champs.

Call for proposals

Nuclear energy was a minor topic in previous international negotiations on climate change. However, it took an unprecedented place at COP 28 in Dubai in late 2023. The period opened by the Fukushima disaster in 2011 seems to be drawing to a close - at least partially - as several countries have affirmed a commitment to (re)developing nuclear energy. This so-called "relaunch", "revival" or even "renaissance" consists in strengthening or accelerating development plans after years of crisis. In the context of climate change and geopolitical tensions over energy supply, many actors are reviving and reconfiguring justifications and promises that have accompanied nuclear technology since the post-war years. These include energy abundance, independence from fossil fuels, affordable electricity, welfare at the local and national scale, economic growth, and technological innovation. Taken together, this makes nuclear energy development appear necessary. However, nuclear power, which only accounts for a small portion of the global energy mix, must also contend with the uncertainties and costs associated with aging infrastructure, plant life extension, waste management, and decommissioning. Moreover, recent projects have resulted in unprecedented cost overruns, while the economic profitability of nuclear power as an argument is increasingly challenged by the plummeting costs for many renewable energy sources (e.g. wind and solar).

In this context, the humanities and social sciences can provide tools for understanding the so-called revival through analysis rooted in different disciplines. This revival both presupposes and engages legacies that persevere, such as the persistence of past futures (Koselleck, 2004), "old" technologies (Edgerton, 2008), and large technical systems (Hughes, 1987). We argue that nuclear futures are framed by categories, practices, and materials inherited from the past and perpetuated until today. This hypothesis is supported by a methodological commitment to analyzing nuclear technology and policy in the long term.

While holding a futuristic promise echoing past discourses, nuclear power carries an ancient legacy that weighs on its future. In the first decades as a civil industry, nuclear technologies relied primarily on an ideal of economic or scientific progress. However, what happens when the nuclear industry is simultaneously faced with issues of decline and renewal? How does this configuration shed light on the challenges of managing infrastructures that are presented as crucial in the context of climate change?

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This conference aims to bring together social science and humanities perspectives on nuclear issues in an unprecedented context. Sociology, history, philosophy, anthropology, geography, political science, economy, and Science and Technology Studies approaches can complement each other to provide new insights into developments in this sector.

This call invites contributions documenting cases in Europe and beyond. We welcome papers analyzing nuclear issues at different scales: local, regional, national, transnational, or global. Although this conference focuses on the nuclear case, we welcome contributions analyzing how the dynamics of the nuclear sector are linked to other issues and sectors concerned with achieving an energy transition.

Submissions

Abstracts should be submitted before May 31st 2024, on the following platform:
https://cyfu-nuclear.sciencesconf.org (the platform will be open in early May)
Format: 400-word abstracts accompanied by a short bibliography, a 50-word biography, and 3 to 6 keywords.
Notification of acceptance will be given by mid-June.
For queries, please write to cyfu@sciencesconf.org

Possible topics

Proposals may relate to one or more of these themes. Proposals that are not directly related to these themes but that provide an insight into nuclear issues more broadly are also welcome.

- **Energy transition and new socio-technical networks**

Current policies to develop nuclear power are most often justified by the urgent need to curb global warming. By becoming an integral part of so-called 'energy transition' policies, nuclear power is part of a promise to achieve 'net zero' carbon emissions targets. This promise requires new infrastructures, whether of old design like large-scale pressurized water reactors, or under development such as small modular reactors, and comes with risks and uncertainties. It also introduces interdependencies between technologies, as some other energy transition projects, such as hydrogen, now depend on the development of nuclear power. What new entanglements between technologies does this development create? How are the promises of energy transition and net zero creating new socio-technical networks? How are lessons learnt from recent cost overruns of nuclear projects being considered in relaunch policies? To what extent is this relaunch challenging the economy of nuclear energy?

- **Scales of revival: interplay between national, European and global scales**

At the European level, no country can revive nuclear power in isolation, due to various interdependencies. These include increasing power interconnections on a European scale, the huge capital needed to finance a revival (e.g. Chinese funds for Hinkley Point C in the UK), and political decisions on the qualification of nuclear power (e.g. green taxonomy). In addition, the nuclear policies of other countries around the world are also having an impact on the ability of European actors to revive nuclear power on an industrial level. How are the scales involved in these relaunch announcements intertwined? What does "European revival" mean institutionally and industrially? To what extent are European supply chains currently dependent on Chinese and Russian industries, which have been very active over the past 20 years?

- **Territories of nuclear power**

In the early days of nuclear power, some countries envisaged the construction of small-scale reactors in the immediate vicinity of towns and cities. This idea was later abandoned because of concerns about the risks involved. With the promise of small modular reactors comes a new idea of proximity between electricity generation and demand, together with significant land requirements. Can technologies such as small modular reactors change the geography of nuclear power? Revival announcements also entail consequences at the regional scale: what does it mean for a region to become a site for nuclear power, or to be destined for nuclear power over the long term? How do the infrastructure choices made for nuclear power affect the possibility of developing other energy sources? How does the abundance of nuclear energy shape local energy demand policies in regions and cities?

- **Visions of energy futures inherited from the past**

Current visions of energy futures are framed by previous representations of energy in society: in different countries, nuclear energy has been associated with energy abundance, specific lifestyles, particular economic worldviews, independence from fossil fuels, and geopolitical stakes, amongst others. Visions of energy futures shape decisions; they are informed by modes of representation and mobilization of the future, be they sociotechnical imaginaries, technoscientific promises, or energy scenarios associated with dedicated modeling activities. How do past visions inform current expectations and configurations presented as solutions to climate change? What continuities and discontinuities modify these past visions of the future? How are these tensions formulated and addressed in expert circles or wider arenas of public debate and policymaking?

- **Policies and politics of nuclear energy**

Recent evolutions of nuclear power policies and politics deserve scholarly attention. How have institutions, decisions, and instruments evolved, e.g. the crafting and justification of economic tools designed to encourage nuclear energy in electricity policies? Public opinion research and discourse analysis can renew our understanding of the emergence and treatment of nuclear questions in politics: have these issues co-evolved with other issues inside or outside the energy sector, such as industrial policies and political discourses on environmental issues? How have debates, controversies, political parties, and social movements evolved? While anti-nuclear movements have received scholarly attention in the past, the emergence of a vocal pro-nuclear movement using the internet in some countries could be an object of digital sociology. The current context thus calls for an extension or renewal of studies carried out by political science, as well as sociological, historical, and economic approaches.

- **Assessing and (re)organizing nuclear safety**

The present acceleration of nuclear projects led countries like France to restructure their nuclear risk expertise and regulatory system. The controversial reform of France's Nuclear Safety Authority highlights how the acceleration of nuclear projects can imply, for some actors, a so-called "optimization" of safety. On the other hand, a decade after the accident at Fukushima, the risk of a major nuclear disaster seems to be becoming less significant than in the past, given the imminent danger posed by climate change. Controversial but popular public figures consider the danger of nuclear energy negligible compared with climate change and state that the Fukushima disaster caused no casualties. Do relaunch policies represent a turning point in the approach to nuclear safety? How are the promises of nuclear safety

reactivated in the face of climate emergency? What are the new risks and uncertainties engendered by a rapid revival of nuclear energy?

- **Nuclear residues**

Nuclear waste, with its radioactive decay time often measured in centuries or thousands of years, is generally seen as one of the most extreme forms of residue we inherit from industrial activity. Contested deep geological repository projects in Finland, Sweden, France or the United States are now presented as guaranteeing control of the entire nuclear "cycle". But nuclear waste is more than the high-level waste destined for this very particular type of treatment. Low-level waste represents large quantities which will increase as past and present nuclear infrastructure is decommissioned. Moreover, the nuclear "revival" implies more future waste, including new and more complex types of waste such as those produced by small modular reactors. How is this waste-making future taken into account in the way actors imagine its development? How do residues that were neglected in the past appear in the current context? What multiple temporalities are unfolding around nuclear waste? How is nuclear waste constituted as a material and political entity?

- **Aging and decay of nuclear infrastructure**

To fully comprehend the implications of the recent relaunch announcements, it is essential to place them in the broader context of aging nuclear infrastructures. Rather than new reactor constructions, we are witnessing numerous announcements of life extensions for existing nuclear reactors in Europe and North America. However, this aging process intensifies long-standing challenges, such as breakdowns and cracks, making maintenance practices a major issue. Furthermore, it is clear that the issue does not just concern aging facilities, but also new ones. All nuclear power plants currently under construction in Europe are facing defects and delays. How do declarations of massive construction plans integrate these issues? How do announcements of life extension relate discursively to a possible revival of nuclear power? How are these tensions problematized by stakeholders and what form of nuclear economics emerges from them?

- **Analyzing the nexus between military and civilian nuclear**

Nuclear power is a paradigmatic example of dual-use technology. What does this imply, and how does the nuclear industry's military past persist in current "revivals"? Potential military uses have framed the international nuclear order through treaties, monitoring infrastructures, and institutions such as the IAEA, and have also played a central role for nation-states aiming to achieve technological modernization, geopolitical status and military power. What forms does the "peaceful atom" imaginary take today, an idea that has been regularly challenged in debates on nuclear proliferation? What role do the interdependencies between military and civilian infrastructures play in calls for a "revival" of the industry? How does the vulnerability of nuclear power plants in wartime contexts - as illustrated by the current situation in Ukraine – reshape approaches to nuclear infrastructures?

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Indicative bibliography

Barthe, Y. (2006). *Le pouvoir d'indécision. La mise en politique des déchets nucléaires*. Economica.

Bensaude-Vincent, B., Boudia, S., & Sato, K. (Éds.). (2022). *Living in a nuclear world: From Fukushima to Hiroshima*. Routledge. https://directory.doabooks.org/handle/20.500.12854/98553

Bernas, H. (2023). *Les merveilleux nuages : Que faire du nucléaire ?* Éditions du Seuil.

Blanck, J. (2021). Déconstruire l'héritage nucléaire: Le démantèlement des installations du Commissariat à l'Énergie Atomique. *VertigO*, *Hors-série 35*. https://doi.org/10.4000/vertigo.33016

Brown, K. (2013). *Plutopia : Nuclear families, atomic cities, and the great Soviet and American plutonium disasters*. Oxford University Press.

Brown, K. (2019). *Manual for survival: A Chernobyl guide to the future*. W.W. Norton & Company.

Chateauraynaud, F. (2011). Sociologie argumentative et dynamique des controverses : L'exemple de l'argument climatique dans la relance de l'énergie nucléaire en Europe: *A contrario*, *n° 16*(2), 131-150. https://doi.org/10.3917/aco.112.0131

Denoun, M. (2022). *Du salut énergétique au sauvetage de la filière nucléaire française. Enquête sur l'évolution des visions du futur au cœur d'un système sociotechnique* [Thèse de doctorat en Sociologie]. EHESS.

Edgerton, D. L. (2008). *The shock of the old: Technology and global history since 1900*. Profile Books.

Felt, U. (2015). Keeping Technologies Out: Sociotechnical Imaginaries and the Formation of Austria's Technopolitical Identity. In S. Jasanoff & S.-H. Kim (Éds.), *Dreamscapes of modernity : Sociotechnical imaginaries and the fabrication of power* (p. 103-125). The University of Chicago Press.

Foasso, C. (2012). *Atomes sous surveillance : Une histoire de la sûreté nucléaire en France*. P.I.E. Peter Lang.

Fressoz, J.-B. (2022). La « transition énergétique », de l'utopie atomique au déni climatique, USA, 1945-1980. *Revue d'histoire moderne & contemporaine*, *n° 69-2*(2), 114-146. https://doi.org/10.3917/rhmc.692.0115

Fressoz, J.-B. (2024). *Sans transition : Une nouvelle histoire de l'énergie*. Seuil.

Garcier, R. J. (2012). One cycle to bind them all? Geographies of nuclearity in the nuclear fuel cycle. In C. Alexander & J. Reno (Éds.), *Economies of recycling: The global transformation of materials, values and social relations* (p. 76-97). Zed Books.

Garcier, R. J. (2021). The experience of nuclear waste. In Z. Gille & J. Lepawsky, *The Routledge Handbook of Waste Studies* (1re éd., p. 211-223). Routledge; https://doi.org/10.4324/9781003019077-14

Goumri, M. (2021). *Apprivoiser le cygne noir. Construction et circulation des savoirs et des ignorances dans le gouvernement de l'accident nucléaire majeur.* [Thèse de doctorat en Sociologie, Université de Paris].

Gutting, A., Högselius, P., Meyer, T., & Mbah, M. (2024). Geographies of Nuclear Energy. An Introduction. *Historical Social Research*, *49*, 731. https://doi.org/10.12759/HSR.49.2024.01

Hecht, G. (2009). *The radiance of France : Nuclear power and national identity after World War II*. MIT Press.

Hecht, G. (2014). *Being nuclear: Africans and the global uranium trade*. MIT press.

Hughes, T. P. (1987). The evolution of large technological systems. In W. E. Bijker, T. P. Hughes, & T. Pinch (Éds.), *The social construction of technological systems: New directions in the sociology and history of technology* (p. 51-82). MIT Press.

Ito, K., & Rentetzi, M. (2021). The co-production of nuclear science and diplomacy: Towards a transnational understanding of nuclear things. *History and Technology*, *37*(1), 4-20. https://doi.org/10.1080/07341512.2021.1905462

Jasanoff, S., & Kim, S.-H. (2009). Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea. *Minerva*, *47*(2), 119-146. https://doi.org/10.1007/s11024-009-9124-4

Johnstone, P., & Stirling, A. (2020). Comparing nuclear trajectories in Germany and the United Kingdom : From regimes to democracies in sociotechnical transitions and discontinuities. *Energy Research & Social Science*, *59*, 101245. https://doi.org/10.1016/j.erss.2019.101245

Joly, P.-B. (2010). On the economics of techno-scientific promises. In M. Akrich, Y. Barthe, F. Muniesa, & P. Mustar (Éds.), *Débordements : Mélanges offerts à Michel Callon* (p. 203-221). Presses des Mines. http://books.openedition.org/pressesmines/747

Kalmbach, K. (2020). *The meanings of a disaster: Chernobyl and its afterlives in Britain and France*. Berghahn Books.

Kalshoven, P. T. (2023). The Skyline is Changing: Editing Space and Discourse in Nuclear Decommissioning. *Visual Anthropology*, 36(5), 487–514. https://doi.org/10.1080/08949468.2023.2280426

Kasperski, T., & Storm, A. (2020). Eternal Care: Nuclear Waste as Toxic Legacy and Future Fantasy. *Geschichte Und Gesellschaft*, *46*(4), 682-705. https://doi.org/10.13109/gege.2020.46.4.682

Kirchhof, A. M. (Éd.). (2020). *Pathways into and out of nuclear power in Western Europe: Austria, Denmark, Federal Republic of Germany, Italy, and Sweden* (1st edition). Deutsches Museum.

Koselleck, R. (2004). *Futures past: On the semantics of historical time*. Columbia University Press.

Krige, J. (2010). Techno- Utopian Dreams, Techno- Political Realities: The Education of Desire for the Peaceful Atom. In M. D. Gordin, H. Tilley, & G. Prakash (Éds.), *Utopia/Dystopia* (p. 151-175). Princeton University Press; https://doi.org/10.1515/9781400834952.151

Le Renard, C. (2021). *Le prototype défait. Superphénix, des glissements de la promesse technoscientifique aux épreuves de la « démocratie technique »* [Thèse de doctorat en Sociologie, Université Paris-Est].

Lehtonen, M. (2023). Brand New or More of the Same Nuclear? (De)Constructing the Economic Promise of the European Pressurised Reactor in France and the UK. *Science as Culture*, *32*(1), 29-57. https://doi.org/10.1080/09505431.2022.2087505

Masco, J. (2020). *The nuclear borderlands: The Manhattan Project in post-Cold War New Mexico* (New paperback edition). Princeton University Press.

Masco, J. (2021). *The future of fallout, and other episodes in radioactive world-making*. Duke University press.

Mattina, C., Bini, E., Curli, B., & Fournier, P. (2023). *Les territoires des transitions énergétiques. Nucléaire et énergies renouvelables en Italie et en France*. Karthala.

Merad, M., & Trump, B. D. (2020). *Expertise under scrutiny : 21st century decision making for environmental health and safety*. Springer.

Meyer, T. (2023). *Géopolitique du nucléaire : Pouvoir et puissance d'une industrie duale*. le Cavalier bleu.

Mortensen, H. B., & Karnøe, P. (2016, avril 6). *Framing the Deal for Hinkley Point C - Trials of Strength in valuation Frames of Nuclear Energy in the UK*. 6th Latin American and European Meeting on Organization Studies, Viña del Mar - Chile.

Müller, W. C., & Thurner, P. W. (Éds.). (2017). *The Politics of Nuclear Energy in Western Europe*. Oxford University Press.

Parotte, C., Macq, H., & Delvenne, P. (2024). The Efficacy Paradox Revisited: "Closing Up" Commitments in Nuclear Waste Governance. *Science, Technology, & Human Values*, *49*(2), 344-370. https://doi.org/10.1177/01622439221112459

Pélopidas, B. (2022). *Repenser les choix nucléaires : La séduction de l'impossible*. Presses de Sciences Po.

Pottin, A. (2022). *Matière Fertile. Le résidu radioactif, le capital fissile et l'écologie imaginaire de l'industrie nucléaire.* [Thèse de doctorat en Philosophie]. PSL Research University.

Saraç-Lesavre, B. (2021). Deep time financing? 'Generational' responsibilities and the *problem of rendez-vous* in the U.S. nuclear waste programme. *Journal of Cultural Economy*, 14(4), 435–448. https://doi.org/10.1080/17530350.2020.1818601

Stirling, A., & Johnstone, P. (2018). *A Global Picture of Industrial Interdependencies Between Civil and Military Nuclear Infrastructures* (SPRU Working Paper Series 2018-13). University of Sussex, SPRU. https://www.sussex.ac.uk/spru/documents/2018-13-swps-stirling-and-johnstone.pdf

Thomas, S., & Ramana, M. V. (2022). A hopeless pursuit? National efforts to promote small modular nuclear reactors and revive nuclear power. *WIREs Energy and Environment*, *11*(4), e429. https://doi.org/10.1002/wene.429

Tompkins, A. (2016). *Better active than radioactive! Anti-nuclear protest in 1970s France and West Germany*. Oxford University Press.

Topçu, S. (2014). Organiser l'irresponsabilité ? : La gestion (inter)nationale des dégâts d'un accident nucléaire comme régime discursif. *Ecologie & politique*, *N°49*(2), 95. https://doi.org/10.3917/ecopo.049.0095

Wellock, T. R. (2021). *Safe enough? A history of nuclear power and accident risk*. University of California Press.