

Social License and Ethical Review of Fusion: Methods to Achieve Social Acceptance

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Three Key Points from the Social Acceptance Literature

1. Case studies and social science literature indicate that fusion will be a more substantial component of climate change mitigation if it enjoys wide social acceptance.
2. There are established mechanisms for achieving social acceptance, such as a “Social License” and bioethical review committees
3. There are steps that physicists, engineers, CEOs, funders and other stakeholders can take now to advance social acceptance

These steps require more than communications and transparency, i.e., “education” and “letting the public see the experts at work”

- Hoedl, Seth A. "A Social License for Nuclear Technologies." *Nuclear Non-Proliferation in International Law-Volume IV*. TMC Asser Press, The Hague, 2019. 19-44. <https://arxiv.org/pdf/2009.09844>
- Hoedl, Seth A. "Ethical Review for Nuclear Power: Inspiration from Bioethics." *Nuclear Non-Proliferation in International Law-Volume VI*. (Springer/Asser Press, forthcoming in 2021)

Lack of wide social acceptance hinders technology deployment

- A lack of acceptance increases capitals costs, litigation costs and risks, and regulatory burdens ¹
- Three examples:
 1. Fission²
 2. Genetically modified food³
 3. Facial recognition

Risk-reducing technical solutions, regulatory compliance, and better “communication” or “education” are unlikely, on their own, to alleviate a lack of social acceptance⁴

1. Gunningham N, Kagan RA, Thornton D, “Social license and environmental protection: why businesses go beyond compliance,” *Law & Social Inquiry* 29:307–341 (2004).
2. Bickerstaffe, J., Pearce, D., “Can there be a consensus on nuclear power?” *Social Studies of Science* 10:309:344 (1980); Slovic, P., “Perceived Risk, Trust, and the Politics of Nuclear Waste” *Science* 254:1603-1607 (1991).
3. Devos Y, Maesele P, Reheul D, et al. “Ethics in the Societal Debate on Genetically Modified Organisms: A (Re)Quest for Sense and Sensibility.” *Agricultural and Environmental Ethics* 21:29–61 (2008). <https://doi.org/10.1007/s10806-007-9057-6>
4. Otway HJ, Maurer D, Thomas K, “Nuclear power: The question of public acceptance,” *Futures* 10:109–118 (1978). doi: 10.1016/0016-3287(78)90065-4

Two Established Methods to Achieve Social Acceptance

1. A “Social License”¹

- A process of acquiring “society’s consent” to a particular project or endeavor
- Long history of successful analysis and application
- Applied to project siting, extractive projects, ecological research, genetic engineering research, etc.

2. Ethical Review Committees²

- 40-year application to controversial biomedical technologies
- Global adoption and global literature pertaining to diverse ethical perspectives
- Focus on non-technical perspectives

Neither approach is exclusive – both approaches complement each other

1. Gunningham N, Kagan RA, Thornton D, “Social license and environmental protection: why businesses go beyond compliance,” *Law & Social Inquiry* 29:307–341 (2004).
2. UNESCO, *National bioethics committees in action*. (2010); Watts G, “Novel techniques for the prevention of mitochondrial DNA disorders: an ethical review.” Nuffield Council on Bioethics.(2012); Warnock M, “Report of the Committee of Inquiry into Human Fertilisation and Embryology.” U.K. Department of Health & Social Security, London. (1984) <https://www.hfea.gov.uk/media/2608/warnock-report-of-the-committee-of-inquiry-into-human-fertilisation-and-embryology-1984.pdf>.

Features of the Social License Method

A two-way **process** that opens expertise to new questions and perspectives:¹

- More than “education,” public relations, or “letting the public see the experts at work”²
- Project proponents have to learn from and meaningfully consider input from non-experts
- Addresses what people actually worry about, rather than what they “should” worry about
- Creates a sense of “procedural justice,” even for opponents of a particular activity³

Far more than a legal license or permit⁴: successful examples see regulatory compliance as only a starting point for social acceptance⁵

1. Stilgoe, J, *The received wisdom: opening up expert advice*. Demos, London, 2006. <https://www.demos.co.uk/files/receivedwisdom.pdf>
2. Raman, S, Mohr, A, “A social license for science: capturing the public or co-constructing research?,” *Social Epistemology* 28:258-276 (2014).
3. Ottinger, G. “Changing Knowledge, Local Knowledge, and Knowledge Gaps: STS Insights into Procedural Justice.” *Science, Technology, & Human Values* 38:250 (2013).
4. Rooney, D., Leach, J., Ashworth, P., “Doing the Social in Social License.” *Social Epistemology* 28:209-218 (2014).
5. Gunningham N, Kagan RA, Thornton D, “Social license and environmental protection: why businesses go beyond compliance,” *Law & Social Inquiry* 29:307–341 (2004).

Social License Example 1: Pulp Mill Expansion Case Study

Traditional Process

1. Design a new plant
2. Seek legal approval
3. Inform the public regarding plans
4. Build new plant

Social License Process

1. Seek public input
2. Design new plant in light of public concerns
3. Seek legal approval
4. Build new plant

Reduced civil litigation and accelerated build

1. Gunningham N, Kagan RA, Thornton D, "Social license and environmental protection: why businesses go beyond compliance," *Law & Social Inquiry* 29:307–341 (2004).

Social License Example 2: Release of Sterile *Aedes Aegypti* Mosquitoes



Oxitec and the Florida Keys Mosquito Control District are jointly studying the use of genetically engineered mosquitoes to control population of *Aedes Aegypti*¹

Oxitec has undertaken deliberate and purposeful steps to acquire and keep a social license:

- Decades-long public engagement
- Exceeded U.S. and Florida regulatory compliance:
 - Experimental use conditional on non-binding local referendums²
 - Disseminated what would otherwise be confidential information to facilitate transparency³

1. <https://www.keysmosquitoproject.com>

2. Servick, K. "Update: Florida voters split on releasing GM mosquitoes," *Science*, Nov 10, 2016, <https://www.sciencemag.org/news/2016/11/update-florida-voters-split-releasing-gm-mosquitoes>

3. "Letter from Oxitec Ltd. To FDA DDM re: Draft Environmental Assessment for Investigational Use of *Aedes aegypti* OX513A, available at <https://www.regulations.gov/document?D=FDA-2014-N-2235-1294>

Features of the Bioethical Review Committee Method

Instructed to identify ethical issues and propose solutions to regulators, funders and governments

- Composed of a mixture of experts and non-experts, including biologists, physicians, lawyers, ethicists, religious scholars, and members of the general public¹
- Committees seek compromise between competing ethical perspectives²
- Proposed solutions are subject to further multi-stakeholder review and public comment³
- Successful compromises are implemented through clear technical limits that are easy to explain, easy to understand and easy to defend⁴

Brings to light and addresses non-technical concerns

1. UNESCO, Universal Declaration on Bioethics and Human Rights. Article 18. (2005) <https://en.unesco.org/themes/ethics-science-and-technology/bioethics-and-human-rights>
2. Warnock M, "Moral Thinking and Government Policy: The Warnock Committee on Human Embryology." *The Milbank Quarterly* (1985) 63:504
3. Bioethics Advisory Committee Singapore, "Ethical, legal and social issues in human stem cell research, reproductive and therapeutic cloning." (2002) <https://www.bioethics-singapore.gov.sg/publications/reports/ethical-legal-and-social-issues-in-human-stem-cell-research-reproductive-and-therapeutic-cloning>
4. Hyun I, Wilkerson A, Johnston J, "Embryology policy: Revisit the 14-day rule." *Nature News* (2016) 533:169; Cavaliere G "A 14-day limit for bioethics: the debate over human embryo research." *BMC Medical Ethics* (2017) 18:38

Bioethical Review Example: Mitochondrial Replacement Therapy in the U.K.

Scientific Risk/Benefits Assessment

U.K. Human Fertility and Embryology Authority (2011 - 2014)

Public Consultation

U.K. Human Fertility and Embryology Authority (2012)

Ethics Assessment

Nuffield Council (2012)

Similar processes in Malaysia, Singapore, and the U.S.
for other bio-technologies

Proposed Regulation (2014)



Public Consultation (2014)



Legislative Approval (2015)

1. Cohen IG, Savulescu J, Adashi EY, "Transatlantic lessons in regulation of mitochondrial replacement therapy." *Science* (2015) 348:178–180
2. Castro RJ, "Mitochondrial replacement therapy: the UK and US regulatory landscapes." *Journal of Law and the Biosciences* (2016) 3:726–735

Actions that can be Taken Now to Advance Fusion's Social Acceptance

Policy Makers / Funders / NGOs

- Commission bioethics-inspired review of fusion, w/ input from non-western perspectives

Government and Private Funders

- Fund R&D that could advance social acceptance, such as minimizing waste and proliferation risk

Physicists / Engineers

- Participate in ethical review
- Propose and undertake R&D for issues important for social acceptance, other than net energy
- Elevate the importance of social acceptance in the fusion industry

CEOs

- Craft business plans that address concerns that could be identified in ethical review
- Pursue regulatory oversight that facilitates social acceptance in the long term
- Don't rely on regulatory compliance for social acceptance

Thank You