

Breaking the Nuclear Box: What Frank Lloyd Wright Can Teach Us About Engaging the Community to Successfully Deploy Advanced Nuclear Technologies



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“I meant to live if I could an unconventional life. I turned to this hill in the Valley as my grandfather before me had turned to America – as a hope and haven.”

— Frank Lloyd Wright on Taliesin

On 800 acres about an hour west of Madison, WI sits Frank Lloyd Wright’s legendary estate, Taliesin. As an architect, Wright is best known for “breaking the box” in his designs. He designed

for the lived experience of his homes' residents, rejecting the boxed layouts of the Victorian era. His creations were visionary and ultimately transformed the way we think about and approach contemporary architecture. As much can certainly be said of his sprawling, iconic home at Taliesin.

While Taliesin plays host to many students and aficionados of architecture and design, it may seem like an unexpected stage for talks on the future of nuclear energy technologies in the age of climate change. But in May of 2018, Taliesin hosted 31 influential nuclear professionals and community leaders in environmental science, policy, communications, security, and religion for the 2018 version of the Nuclear Futures series.¹ The talks covered the history and importance of community engagement in the context of deploying nuclear energy and explored the ways vendors, utilities, and other advocates might approach engagement differently as advanced reactors reach the commercial market.

As the nuclear energy industry vies for its place in the clean energy industry, it has plenty to learn from Frank Lloyd Wright. The basic tenet of Wright's work was that architecture should change to make sense in its time rather than just be driven by past practice. With commercialization and deployment of advanced nuclear technologies, the American nuclear energy community is at the precipice of a new chapter. The advanced nuclear sector has an opportunity to reimagine and improve the entire way it engages with communities. In this sense, Wright's tenet of "breaking the box" could not have been more applicable to the conversation at Taliesin.

While the Nuclear Futures discussion sought answers to complex questions like "what should future nuclear energy look like?" and "where might it add value to a community?" there was one resounding conclusion at Taliesin: successfully marrying nuclear technology into modern communities will depend on disrupting how nuclear energy is perceived—and ultimately embraced—by Americans.



Taking Nuclear Forward

The [Nuclear Futures discussion](#) last year set an important foundation for the conversation at Taliesin: nuclear technology is an essential factor in American 2050 climate goals. It's no secret that the United States will have to take big, bold steps in carbon-free energy to achieve its 2050 climate goals. But in short, to quote Mr. Spock, you choose nuclear energy because it is logical— especially if you value emissions-free energy.

But until the conversation last year, there was an elephant in the energy room that needed to be addressed. According to the Deep Decarbonization Pathways Project, to achieve emissions free energy we would need to build the equivalent of roughly 425 of today's large nuclear reactors by 2050.² Considering that there are currently 99 operating light water reactors (LWRs) in the United States that provide about 20% of the nation's electricity (and, importantly, account for nearly 60% of the low-carbon production of electricity), nuclear reactors in the United States would have to more than double or quadruple to cover the nuclear contribution of the country's energy needs.

The other, far more efficient option is for the industry to take leaps and bounds into the modern era of nuclear technology. There is already an emerging range of new nuclear energy products that could be the critical step in taking energy markets into the 21st century and moving the ball forward on U.S. climate goals.³ These reactors could be deployed across American communities as part of the suite of carbon-free energy sources.⁴

While important, simply breaking the box on nuclear technologies alone will not be enough.⁵ Last year's Nuclear Futures Series conversation also emphasized an important gap in the industry: for nuclear technology to serve as a source of clean energy across the United States, the industry must create and follow a strategic communications plan to transform the way American communities understand – and embrace – nuclear energy technologies. We chose to focus this year's Nuclear Futures conversation on that topic, gathering a number of insights from our participants on the value of community engagement and opportunities for a new era of nuclear developers to conduct it effectively.

American Perception of Nuclear Technologies

While embracing nuclear energy technology is essential to clean energy goals, the industry struggles for widespread acceptance in the United States. Because of the political and cultural atmosphere when nuclear commercialization originally occurred, the industry is often times perceived as connected to big government and highly secretive weapons projects. Further, many Americans believe that building local nuclear facilities could be physically dangerous or harmful to their health. To successfully drive nuclear technologies into the future, disrupting the existing poor public perception of the technology will be essential. Nuclear advocates will have to take strategic

steps to break the box on how the nuclear energy industry interacts with the public and to build trust and create a better general perception of the technology.

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For the industry to successfully make the argument for nuclear, they will have to make a clear connection between nuclear technology and the people it can benefit. This can be particularly challenging because in many communities, there is currently little-to-no existing communication between utility services and community members. This is likely an effect of the increasing complexity of electricity markets; while members of many communities used to engage with a local public utility, now an opaque mix of federal, state, and corporate players make decisions about how communities source their energy, and they often make those decisions without much input from their local communities.

This distance from the end user as well as the current underutilization of nuclear technologies means that people's opinions are not based on direct engagement, but rather on secondhand information about the technology. So, to clear up the misconceptions and spread the word about the importance of nuclear projects, the nuclear industry will have to thoughtfully disrupt the current pattern of communication. By strategically communicating about nuclear, the industry can close the gap and speak directly to the consumer.

Entrepreneurship in Nuclear Technologies

Because of the expansive potential for nuclear technology innovation and development, there are new opportunities for entrepreneurs to get involved in the market. A large number of nuclear entrepreneurs have already been attracted to the advanced nuclear sector, with 75 advanced nuclear energy projects underway in North America as of spring 2018.⁶ And there is still plenty of potential in the market. Nuclear technology currently directly impacts fewer than 100 communities in the United States, so nuclear entrepreneurs will bear the burden of the industry's reputational baggage as new communities are engaged. This disconnect underscores just how critical it is for the broader nuclear industry to improve the technology's reputation to continue to attract future investors to ensure the future of nuclear products.

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Nuclear in Communities

To disrupt the way many Americans think of nuclear energy, the sector must create increasingly open lines of communication with communities. There are many positive and important impacts nuclear energy can have on host communities and other end-users, but that message will only spread if the industry engages in collaborative, open conversations with stakeholders, decision-makers, and influencers. They should also engage local, state, and federal policy-makers who may be tasked with making key decisions about the energy mix for the communities they represent. Ultimately the goal of outreach and engagement is to create enough of a demand pull that nuclear energy is carefully considered as a possibility when it comes time to bring new energy generation online.

A major city, a data center, or a defense facility all have different power needs, and the related energy facilities would have different impacts on communities. This underscores the importance of listening to stakeholders and residents, understanding their needs, and incorporating those needs into business agreements and plans in an explicit way. While reactor developers themselves standardize plant design and make construction modular and factory oriented, business models should conversely be flexible in nature and effectively integrate local community needs.⁷ Here are some prompts and things to consider for successful community engagement:

- Where does leadership and accountability within each group and/or within a community system lie? Are the most visible and loudest voices the most influential? How about within a longer timeframe? Public meetings may not represent the public broadly and influential groups may not participate.
- How can we create mechanisms for accountability and consistency over time? For example, a fifty-year plant operations schedule is far longer than typical local government deals, so over decades, a community (or a utility) may lose an advocate and greatly change an existing dynamic in communication, understanding, and trust.
- The best spokesperson usually comes from within the community – rather than from the regulator, government representative, or other position within the industry.
- The success of the message often depends on empowering the right, trusted messenger.

- Look for authentic and connected voices to act as spokespeople. Young professionals and individuals who represent the diversity of a community should be considered for this type of role.

Supporting Nuclear-Adjacent Communities

The adoption of advanced reactors could mean the United States has many more host communities, but also many more nuclear-adjacent communities as well. Nuclear-adjacent communities that bear risks and impacts (e.g., hosting power lines, major traffic routes), but gain fewer benefits than host communities are extremely important targets for sustained engagement, as they historically have become some of the most ardent opposition voices to these facilities. Potential messages to highlight include the broader clean air and economic benefits to the region.

Making the Argument for Nuclear

Because Americans don't necessarily believe that there is a need for nuclear energy (or advanced nuclear reactors more specifically), the onus is on the industry to make that argument and to make it in a way that creates demand. To do this, the framing of the nuclear story needs to shift.

Historically, communication about nuclear energy has been through the frame of engineering (improving safety, decreasing waste of the technology, etc.). This approach focuses discussions on the technical aspects (and challenges) of the technology rather than the benefits it can provide. To improve the public perception of – and openness to – nuclear energy, professional communicators, spokespeople, and advocates should focus on making the case for what communities could gain.

Part of developing a more optimistic conversation around nuclear energy requires moving away from focusing predominantly on the scientific details of nuclear energy projects. The public generally does not understand how a car works or how a solar panel works, yet they largely trust both of these technologies. Nuclear energy is difficult for many people to understand – and that's okay because they can accept a technology without having an in-depth technical understanding of how it works.

By reframing the conversation to focus on telling real, compelling, and nontechnical narratives, people will be more likely to embrace a positive vision of nuclear for their own communities, even if they never grasp complex equations about the rate of nuclear fission and radioactive decay.

Reframing the conversation to focus on benefits does not mean glossing over risk or dismissing the legitimate concerns of communities. It is still essential to listen to the concerns of the community and to provide appropriate responses and adjust plans accordingly. Thoughtful framing and responsiveness to concerns are both critical for building trust that will last the life of the project.

Nuclear Advocacy

Advocacy is an important part of disrupting the current narrative and taking nuclear projects through to the finish line. So, you may ask, where is the stage on which you and other advocates for

nuclear energy should be making this positive case for nuclear technology? Opportunities for advocacy come in many different shapes and sizes. The ultimate strategy to breaking the box on the current energy narrative will be to engage in a strategic, multi-pronged, collaborative approach between advocacy groups, developers/utilities, academics and think tanks, and through legislative and regulatory efforts at the local, state, and federal level. But spreading the right message is essential to the future of nuclear.

Advocacy done poorly can damage relationships and ultimately harm potential nuclear projects, so dedicating appropriate resources towards communications and advocacy efforts should be a priority for any serious nuclear project. Ideally, professional communicators, spokespeople, and advocates should be hired or otherwise leveraged when possible. There are many volunteer advocates who are passionate about nuclear energy; their efforts and activities are not generally an appropriate stand-in for a professional strategic communications effort, but should be leveraged as a part of such a plan.

Actions for Advocacy Groups

For professional advocacy groups to carry out their full impact, they should participate in inter-municipal organizations that help coordinate and define good energy policy. Here are a few examples of organizations where pro-nuclear voices are not typically present:

- International Council for Local Environmental Initiatives (ICLEI);
- C40 Cities;
- US Conference of Mayors, Mayors Climate Protection Agreement;
- Rural Utilities Services; and
- American Public Power Association

Further, advocates could seek to strike a collaborative relationship with wind and solar organizations. Because wind and solar are necessary tools for deep de-carbonization, marrying that approach with the benefits of nuclear energy is not only a positive step for clean energy progress, but it would also help wind and solar organizations see the nuclear community as an ally in progress towards clean energy goals. By engaging these organizations, advocates will continue to encourage other groups to embrace nuclear energy-positive policies. But beyond influencing organizations to recognize the importance of nuclear energy sources, advocates should also encourage the advocacy of nuclear-friendly approaches in and around communities they want to impact.

One way to create this impact is through a “sister community” program. In these programs, electricity-producing communities engage nearby electricity-using communities. This open

communication, and ultimately the exchange of information, has the potential to alter the way communities think about how they could benefit from hosting a reactor site.

Further, local changes through ballot initiatives are another way residents can advocate for nuclear energy usage in their communities. An example of this approach is the renewables initiative that was recently put up in Michigan requesting nuclear be included in clean energy policy goals.⁸ This is an example of the positive public opinion on an issue driving the policy goals of politicians that ultimately impact the area, and could be a useful model for other states looking to embrace nuclear energy as well.

Actions for Developers and Utilities

Under the umbrella of the nuclear community making itself more approachable to the public, developers and utilities should take every measure they can to familiarize local leaders and residents with the technology. Even if not legally obligated, a developer might want to work through local rules bodies (e.g., zoning) when spearheading nuclear projects. Further, some nuclear technologies are aiming for deployment a few decades out. Those cases are ideal for community outreach because of the long-term time horizon involved in the project. The earlier engagement activities begin, the better.

Communities that already host nuclear facilities and have achieved local public support are essential resources and potential partners for the developers of advanced nuclear technologies. For instance, the Canadian Small Modular Reactor Roadmap asks current large nuclear operators to provide advice on how to operate a large number of very small reactors across remote territories.

Actions for Academics/Think Tanks

There are many important courses of study academics and think tanks can and should undertake to help facilitate more integration of nuclear energy into communities around the United States. Here are some ideas that came up in the conversation at Taliesin:

- The NuScale small modular reactor project with Utah Associated Municipal Power Systems (UAMPS) could be an excellent community engagement case study. This process would need to start very soon (similar studies of Waste Isolation Pilot Plant started ten years before the facility opened) because it is important to measure how community support (and opposition) change as the program develops. Ideally, such a study would be conducted by an independent outside academic institution, rather than a developer or utility.

- Decommissioning Fund rules have, in some cases, made it more financially viable for a utility to shut down a plant rather than continue to operate it. Could that be discouraged in the initial agreements with a community or through decommissioning fund rules? Site restoration standards are overseen by state rather than the federal government, so best practices could be assessed based on past performance of existing reactors and adopted by advanced nuclear host communities.
- Study how the use of blockchain technologies might allow consumers greater control over energy purchases.
- Looking for communities that want to repurpose facilities or labor forces may be fruitful. Who is engaging the 66 current communities that host operating large light water reactors?
- Are there communities that would align with a specific clean energy mission?
 - Example: repurposing a university research reactor infrastructure as part of a 100% clean energy source for the campus.
 - Are there lessons to be learned from Amazon or similar companies which have cities compete and 'bid' for a plant to be located in their town based upon the perceived economic and other benefits that may accrue from such an investment?
- Some government agencies are intended to be independent from political interference; could there be something like that to accommodate the long time horizons needed for nuclear energy? Could technical innovation work be housed in a place that is protected from administrative changes that occur over election cycles?

Conclusion

While it may be counterintuitive, Frank Lloyd Wright's estate, Taliesin, could not have been a better symbolic stage to discuss the future of nuclear energy in the United States. Open dialogue and diverse perspectives at Taliesin offered one foundational, essential piece of advice for the nuclear energy industry: nuclear influencers and advocates must break the box on how the United States has historically interacted with and used nuclear energy. By employing strategic and open communication between communities and the nuclear industry, Americans will be able to reap the rewards of clean air, a new source of local jobs, economic development, and a stable low-carbon source of electricity. Though, looking back, the industry may have made mistakes on how it has engaged the American public, advanced reactors provide an opportunity to turn a new leaf on how the sector engages the public so they can ultimately provide communities with the important benefits that nuclear has to offer.

ENDNOTES

1. Todd Allen, “The Nuclear Energy Futures Conversations: Injecting Fresh Ideas on Market Opportunities for Nuclear,” Third Way, October 2017. Accessed September 19, 2018. Available at: <https://www.thirdway.org/report/the-nuclear-energy-futures-conversations-injecting-fresh-ideas-on-market-opportunities-for-nuclear>.
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