Five steps to enable insurance innovation that accelerates the energy transition

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Unlocking trillions of dollars in clean energy investment requires increasing lender and investor confidence in new technologies.

It's a mammoth job. Energy and construction technologies that are first and early movers can be perceived as risky investments. There's not always as much data available on new technologies' performance as one might like, and there may be uncertainty around the market size, business model, and supply chain.

Luckily, a promising partner already exists to address some uncertainties: insurance. The business of insurance is to "pool" and transfer risks of loss, to enable economic activity. While insurers might not seek to bear the full risk of new technologies, they can pool and transfer specific risks of innovation, and thereby increase investors' willingness to invest, and lenders' appetite to lend. This increased confidence is vital to catalyze the additional $2.5 trillion per year in incremental investment that's required to align the energy sector with net-zero emissions by 2050.

How insurance can accelerate development and scaling of emergent clean technologies was the topic of a working session at Climate Week NYC, cohosted by EDF and the Harvard Salata Institute for Climate and Sustainability.

The lively engagement by senior leaders from insurance, cleantech and finance pointed to five essential steps to enable the kind of insurance innovation that will help new technologies develop and scale — as well as pragmatic warnings about the limits of insurability.

1. **Convene people from across sectors to educate one another and co-develop solutions.** Energy companies exist in an ecosystem of interdependent actors: suppliers and offtakers; engineering, procurement & construction (EPC) contractors; investors, lenders, regulators and insurers; and more. A decision or constraint in one part of the ecosystem will ripple through the rest, which is why innovation requires shared understanding, communication and coordination about the big picture.

For example: developers looking to build small modular reactors are required by law to purchase nuclear liability insurance, which streamlines legal processes and shields their suppliers and contractors from liability in the event of a disaster. Currently, these small-scale developers often must purchase the same amount of nuclear liability insurance as much larger companies. For instance, in the U.S., all nuclear power plant owners — regardless of size — must purchase $500 million in nuclear liability coverage, at an average cost of $1.1 million per year for one reactor. This can cause financial strain for smaller developers, as well as uncertainty for their investors. Developing right-sized nuclear liability insurance policies — as well as tailored insurance products to support small modular reactor construction, risk management and decommissioning — requires collaboration among regulators, developers and insurers to co-develop approaches that work for everyone.

2. **Foster risk literacy.** "Risk" means different things to different people in the ecosystem. Is it the variability of outcomes, the average loss, or the probability of extreme or "tail" risk? Entrepreneurs, investors and lenders tend to use the word in a general, qualitative sense, referring to the possibility a technology, business or its operations might fail. For insurers, "risk" is more specific and can be quantified. Understanding these differences isn't just semantics; it's essential to bring together the different kinds of financial services that can help develop and scale first-of-a-kind technologies.

   For example: a battery energy storage provider wants to launch a project in a country where it hasn't previously operated. The climate in this country is hot, and investors are reluctant to invest for a few different reasons: first, because the company doesn't have a track record of successfully operating in this country, and second, because they're worried the heat could cause the battery storage technology to malfunction or underperform.

   In this situation (drawn from a real-world example), an insurer could quantify the risk that heat causes the technology to malfunction, then provide an insurance policy that guarantees the investors would be repaid even if the technology fails. This policy could be tailored to the project—or could simply be a payout if the temperature exceeded a certain threshold (so-called "parametric" insurance). Now the investors have one less risk to consider in their decision-making. They just need to decide whether they're comfortable with uncertainty about whether the company can succeed in a country where it hasn't operated before.

3. **Think creatively about data.** Insurers rely heavily on historical data: it's an essential ingredient they use to quantify risks and decide what premium to charge in exchange for shouldering those risks. Unfortunately for new technologies, historical data isn't always available, or there's not as much of it as insurers would like. This doesn't necessarily mean insurance is out of the question. Sometimes, insurers can use data from proxies: for example, they might be able to price risk for a geothermal project by re-using some of the same geologic datasets and models they use to price oil and gas exploration risks.

   In other cases, insurers might be able to work with the first-of-a-kind energy producer to gather relevant data from pilots or testing. This brings us to our next recommendation…

4. **Build brokers' capacity to help early-stage technology companies.** Time is an incredibly precious resource for technology developers, who must test, market and scale their technologies while simultaneously working to secure financing. While many developers understand that insurance can be a valuable financing tool, they don't necessarily have the capacity or subject-matter expertise for the kind of early engagement with insurers that will help them in the long run. This is where insurance intermediaries, particularly brokers, can play an important role.

   A broker is an insurance expert who can help a company navigate the insurance market to find the appropriate product for their needs — exactly like an insurance agent might help a homeowner find cost-effective insurance product for their house. Brokers could be the one-stop shop for developers with questions like, "Is there an insurance product that can help de-risk this technology and make it more appealing to lenders and investors?" or, "What kind of data can we collect from a pilot to help an insurer price my risk?" While many brokers still are learning about first-of-a-kind technologies, and while more could be done to ensure they look at non-traditional risk transfer strategies (e.g., surety bonds, revenue hedges) in addition to more traditional insurance policies, savvy brokers who work with insurers on behalf of new technology clients will generate value for everyone in the ecosystem. They can be the "translators" between the technology and insurance worlds.

5. **Increase catalytic capital for insurance.** Ultimately, most insurance companies are for-profit businesses: they charge a premium for taking risks off others' balance sheets, and they have legal obligations to try to make a profit and maintain solvency for their

shareholders or members. Insurers may hesitate in the face of new uncertainties around new technologies. This is where philanthropic or governmental "catalytic" capital can play a role. In the United States, the Coalition for Green Capital awarded $200 million to Greenie RE, a reinsurance company focused on accelerating the deployment of green energy technologies, and the New York State Energy Research and Development Authority (NYSERDA) established a $6.5 million pilot program a few years ago, to support development of insurance products and policies that will support the energy transition in the state. In the UK, Lloyd's of London, the world's largest specialty insurance marketplace, has an initiative that allows its insurers to underwrite energy transition risks without these counting toward performance evaluation in the same way other risks do.

Just as reinsurers bear risks that primary insurers hesitate to hold, catalytic capital can take the lead on risks that private sector insurers may hesitate to take on. While still fairly limited, catalytic capital can foster the kinds of cross-sector collaborations that enable development of bespoke insurance solutions for individual green energy producers' needs—and help fund their premiums.

Insurance can mitigate real and perceived risk around first-of-a-kind technologies, increase confidence for investors and lenders, and help catalyze additional finance to develop and scale low-emissions projects. While insurers can't be expected to bear risks of all sizes, there are meaningful opportunities for risk transfer and pooling that can extract specific risks, enabling debt and equity to absorb the remainder. To maximize the impact of existing insurance and risk transfer tools, and develop innovative new ones, it's essential to convene people from across the insurance and energy ecosystems, foster shared understanding of risks and data, and advocate for catalytic capital that ensures insurance innovation keeps pace with energy transition needs.