Breaking Through

Deployment in Action

At Breakthrough Energy, we pay attention to what's possible in energy—new chemistries, materials, and systems that will reshape how the physical economy operates.

As companies mature, they move toward deployment. Their promise shifts from possible to probable, to in our view: inevitable. That transition is now visible across our portfolio. Successful deployment is happening, and we're learning what enables more companies to seize the opportunities of commercial scale.

> Antora is shipping gigawatt-hours of high-temperature thermal batteries.
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> Redwood Materials is operating one of the largest microgrids in North America.
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> Rondo is powering up the world's largest industrial heat battery.
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> LuxWall is being installed in a large-scale building retrofit in New York.
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> Sortera is expanding domestic capacity for aluminum recovery.
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> Commonwealth Fusion Systems and Dandelion are securing customers and building pathways toward scale.

And just days ago, Fervo completed its initial public offering on the Nasdaq—a major step forward for enhanced geothermal and clean energy innovation more broadly. Its Cape Station project in Utah is on track to deliver hundreds of megawatts of clean, always-on power and become the world's largest next-generation geothermal project.

These efforts are part of a broader transition. Projects are moving beyond early validation into sustained operation with customers and financing designed for long-term infrastructure. Deployment creates a reinforcing cycle where early projects generate data and confidence, which attract capital and demand, enabling further buildout. This is where clean energy innovation starts to behave like an asset class.

Adapting to Massive Market Shifts

Our industrial systems face several challenges that frame the opportunity for companies working toward deployment. Exploding energy demand and consumption from AI, electrification, and a growing global middle class create an urgent need to produce more forms of affordable, reliable, and clean energy and upgrade outdated grids. Geopolitical upheaval is reshaping supply chains and putting a premium on resource resilience and

energy security. These forces create a powerful demand pull for new technologies that meet nations' growing needs.

These dynamics already influence project development and timelines. Our companies are responding to these conditions, accelerating deployments and converting technical progress into real-world outcomes, creating dynamic, promising feedback loops that inform what’s next.

Bridging the Gap

Constraints sharpen when systems reach deployment. This is a familiar transition: crossing the chasm from first-of-a-kind to repeatable deployment has long been the central bottleneck.

Technologies can perform as expected yet struggle to fit established financing models, align with procurement cycles, or scale. These opportunities sit between venture and infrastructure capital and must balance the risk appetite and return expectations for the ultimate investors. Offtakers and governments also play a role by enabling early projects that establish durable foundations.

The challenges that emerge at this stage tend to follow recognizable patterns:

> First-of-a-kind projects carry risks that are difficult to fully mitigate.
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> Demand may exist, but the offtake terms needed for financing may be different than the customer’s business-as-usual procurement.
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> Project execution capabilities may exist, but not yet be proven at scale.
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> Supply chains may exist, but lack the depth for rapid expansion.
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> Regulations may exist, but lack the clarity or permanence needed.
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> Capital providers may be interested, but need a project structure and risk profile they recognize.

These elements move interdependently. Projects depend on customers, financing, and delivery partners to align within workable timelines and risk profiles. When one lags, timelines extend and projects stall. Companies’ core challenge is translating technical readiness into project readiness.

Unlocking Scale

Scaling will hinge on technologies reaching cost competitiveness and continuing down the cost curve through deployment and innovation. It will also depend on demand being secured through durable offtake. Capital must be available at scale and structured so it can be underwritten. This comes together through the use of repeatable project models anchored by clear demand, with stakeholders and financing structures that hold across

many builds. As these models take shape, uncertainty falls and unlocks much larger pools of capital capable of supporting sustained, multi-project deployment.

The size of the prize is one of the largest investment opportunities in decades. It lies in the transformation of core industrial systems—worth trillions of dollars—that underpin the global economy. Energy, manufacturing, and infrastructure are being rebuilt, driving long-term prosperity and outperforming business-as-usual pathways. This shift is already underway. Delivering on it requires projects to be structured so that capital can support them consistently, without slowing the pace of adoption.

Breakthrough Energy is advancing this next phase by working where others are not—engaging early and navigating complexity to make projects investable. This means mobilizing capital at scale while partnering closely with companies to translate technical progress into investable projects, enabling sustained buildout across the sectors where impact and economic return grow together.
