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Breakthrough Ideas for 2010

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A common standard for sharing drug asset data would unleash tremendous innovation.

vances in genomics and the discovery of drug response markers. This is leading to a rise in tailored drugs aimed at smaller markets. The combined effect of these forces will make the economics of being a large, fully integrated pharmaceutical company increasingly untenable. Already, innovative drugs are routinely coming from smaller players.

How, then, should a traditional drug company change its business model? In the short term, it can focus on becoming the scaling partner of choice—using its infrastructure to support smaller innovators in conducting clinical trials, manufacturing efficiently, and marketing and selling globally. That will remain a viable model as long as one-size-fits-all blockbuster drugs continue to offer value, however limited, to payers and patients. In time, however, even that oasis will dry up, and a reinvention will be necessary. The survivors will be companies that have moved beyond their fully integrated past and established orchestrated drug-development networks.

Such networks have already been seeded; large companies have been acquiring or licensing pipeline innovations for years. But their imperatives to grow through innovation require them to form many more external partnerships, and faster. The problem is that despite advances in information and communications technologies, the coordination and transaction costs of operating a network model remain high.

The Breakthrough Idea. One change would make a substantial difference: the creation of agreed-upon standards for digitally representing drug assets. The challenge is that every company has its own idiosyncratic (and therefore redundant) means of collecting, storing, and exploiting information from development trials, making it difficult to share the hundreds of gigabytes of documents and images among partners. Not only does this throw up barriers to collaboration, but it makes market transactions highly inefficient. It is not uncommon for the seller of an asset to have to set up as many data rooms as there are potential acquirers or licensees, since each one requires its own format. If a common standard for drug asset representation existed, it would speed up transactions, reduce coordination costs, and promote better decision making across networks by providing what the military calls a “common operating picture.”

The Promise. Let’s play out the probable consequences of taking this relatively simple step. If we created a standard that was accepted across the industry, the drop in transaction costs would enable the largest players to share risk and monetize their undeveloped assets. Foundations or even patient groups could have drugs developed that targeted markets too small for the big players. Venture capital firms would be able to develop assets that were languishing at failed portfolio companies. Smaller pharmaceutical companies, government labs, and academic institutions would be able to broadcast the availability of their assets to a wide audience and find eager developers and partners. In short, tremendous innovation in drug development would be unleashed.

The emergence of fluid drug development networks would change how the value of intellectual property was captured. As information flowed more freely among partners, we would need clear mechanisms for assigning credit. The regulatory framework would have to adapt to innovative uses of information. It’s easy to imagine the emergence of a new type of business dedicated to orchestrating development activities.

The end of the fully integrated pharmaceutical company needn’t be the death of today’s big pharma and biotech companies. They can continue to play a central role by embracing a network model and, with their depth of expertise, acting as its orchestrators. But whether they choose to or not, their world will move on.

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5. ENERGY ALTERNATIVES

A Market Solution for Achieving “Green”

by Jack D. Hidary

Financing that encourages building retrofits.

The Problem. It’s easy to get excited about the promise of clean technology—especially new high-efficiency and solar devices that can significantly reduce the energy use of existing

homes and commercial buildings. But the retrofitting challenge we face is immense, and if we hope to see major progress, we must help home and building owners overcome the barrier of up-front costs.

Few of today's owners have the necessary capital on hand, or can tie it up until the break-even point is reached and payback begins. In theory they could tap into lines of credit and home equity to pay for clean tech, but in practice they are reluctant or unable to do so. Institutional investors, meanwhile, have the capital and the appetite for the sure and steady returns of clean-tech installations; but they are set up to write large checks, not to finance disaggregated, small-scale projects. And, as smart investors, they are leery of opportunities where borrowers can default but improvements can't be undone and funds recouped.

Already we are at the point—thanks to falling prices from large-scale production in China and other manufacturing hubs, and thanks to government rebates—where some clean-tech retrofits achieve cash payback in less than three years. But unless we can provide the necessary assurance to investors and tap into private capital markets, the improved economics of clean technology won't make enough difference.

The Breakthrough Idea. Enter PACE (Property Assessed Clean Energy) bonds, which are just being introduced in 15 states across the country. PACE bonds are debt instruments issued by a municipality and backed by property-tax liens on buildings whose owners take PACE loans from the bond pool. Here's an example: Suppose a commercial building in Annapolis, Maryland, has utility costs of \$20,000 a month, which include electricity and natural gas. The building owner, Annapolis Management, has done an energy audit and concluded that a \$300,000 investment in energy efficiency (retrofitting windows, lighting, and HVAC) would bring monthly utilities down to \$13,000.

Annapolis Management takes a \$300,000 loan from the city's PACE program and retrofits the building. The owner repays the loan over 20 years through an increase in the building's annual property taxes equal to one-twentieth of the loan amount plus interest. In this example, assuming an 8% interest rate, that means additional taxes of \$1,350 a month. Because this expense is markedly less than the

utility cost savings of \$7,000, the owner is cash-flow positive from day one after retrofit.

The Promise. Let's examine PACE bonds from the perspective of the city. The municipality issues the bonds, which are bought by institutional investors. Investors are drawn to bonds backed by property taxes, because they have very low default rates. The obligation to pay them survives foreclosure, so even if a property owner defaults on a mortgage, the new owner who buys the building at a bank fire sale must immediately bring the tax payments up to date.

PACE bonds are also very attractive to political leaders. As opt-in solutions, they raise taxes only for the property owners who choose to take loans. Other constituents' pocketbooks are unaffected. Furthermore, retrofitting projects financed by PACE bonds bring employment for more construction and installation workers, potentially amounting to hundreds of thousands if not millions of jobs as this idea spreads across the country. What politician would not want to lay claim to a program that increased property values, lowered monthly utility costs, and created jobs?

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6. INNOVATION

A Faster Path from Lab to Market

by Robert E. Litan and Lesa Mitchell

Removing the technology licensing obstacle.

The Problem. University-based innovators routinely produce breakthrough technologies that, if commercialized by industry, have the power to sustain economic growth. Because their research is largely funded by the U.S. government (much of whose \$150-billion-plus R&D budget is channeled through universities), it is all the more imperative that these innovations find their way to the marketplace and generate benefits for society. But our system today is suboptimal: Many university-developed innovations could reach the marketplace much faster than they do now. The problem, ironically, centers on the very entities designed to facilitate commercialization. Nearly 30 years ago Congress provided a huge incentive for universities to pursue more commercialization of federally

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