



NEXT GENERATION UTILITY

FINDING A PATH THROUGH THE HAZE:
FutureWorlds™

FIND OUT MORE



WHAT WILL THE NGU LOOK LIKE IN THE NEXT DECADE?

Around the world, the electric utilities industry is talking about low carbon, renewables, commodity prices, distributed energy resources (DERs), smart grid, customer engagement, shareholder value, workforce transformation and the impact all or some combination of these factors are likely to have on the traditional business models for energy suppliers and network operators.

The influence these forces are having on the industry clearly depends on geography, as well as the overall policy and regulatory environment. However, there are more similarities than differences, particularly pertaining to the level of uncertainty that all of these factors introduce into the energy business model.

There is a tsunami of views, information, articles, blogs, and conferences on this topic, with more appearing every day. For any utility executive, it is easy to access opinions on every aspect of the disruptive forces that will impact their business. Popular and attention-grabbing topics like the “utility death spiral” multiply along with plenty of advice as to the steps these companies should and must take as a priority and to avoid oblivion.

Despite the vast number of opinions, insights and information on the topic of the Next Generation Utility, there is no clear answer yet as to what the business model will be or should look like in the next decade and in years to come. The only certainty is that it will be different from what exists today, and there will be many variants depending on the market, the regulatory regime, and the company’s strategies.



PREVIOUS



NEXT



OUTSIDE-IN INSTEAD OF INSIDE-OUT

What we know for sure is that taking logical steps toward an unknown or ill-defined future is not a particularly prudent strategy. We tend to think of this as looking inside-out — the belief that a company's strengths and capabilities will make the organization prevail — and it is a common, albeit flawed, approach.

In addition, there are significant regional variations, particularly in policy, regulation and industry structure that introduce differing levels of uncertainty.

In the Nordics, for example, where there is a high proportion of renewable generation, uncertainties surrounding the impact of new technology are significant. In the UK and Europe, there are structural impediments that make it difficult to predict the future of retail and the way in which the distribution grid will evolve. As for the US, uncertainty is abundant, given the ever-changing federal and state regulations, as well as the sheer size, number and complexities of energy markets in the country.

Regardless of the region or energy market in which a utility resides, by looking “outside in” — the belief that customer value creation and experience are the keys to success — a number of forces will shape the future, and the level of uncertainty surrounding them is significant.

Take, for example, the regulatory mandate issued by the Governor of New York in December 2015. That mandate called for implementation of a Clean Energy Standard, requiring that 50% of electricity in New York State come from renewable sources by 2030. A study by Utility Dive in 2015 has shown that most energy retailers in the UK do not think their business model will survive another 20 years, but disagree on what will take its place. In Australia, as it does in Arizona and Nevada, the debate still rages about the wisdom and economic impact of policy support and incentives for rooftop solar, which has an impact on many aspects of energy economics in the region.




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NEXT





There are even more uncertainties when considering the future. For example, PA's recent report on Energy Storage shows that storage technologies are rapidly becoming more flexible, efficient and capable of reliably delivering energy to consumers, with deployments in the US alone expected to rise four-fold in the next four years. The impact of these new technology developments is expected to be significant and disruptive. This is a paradigm we call DynamicEnergy™ — an energy environment in which two-way transactions become the new normal. In a DynamicEnergy™ model, load can follow supply as reliably as supply now follows load, with customer behavior triggered by price and engineering conditions, and with the ever-shifting demands and supplies of the energy network controlled by intelligent and automated equipment.

In analyzing the plethora of external uncertainties and their potential impacts, we observed that quite a number can be at least influenced, if not managed by leadership. This would give the customer more information and control over energy usage, or progressive development of use cases to generate value from grid data.

However, from an overall industry perspective, recognizing there are significant variations at both regional and company level, our view is that there are two powerful (mega) external forces that will not only shape the future but are also very difficult to influence and almost impossible for leadership to control — these are policy and regulation, and disruptive technology innovation.



PREVIOUS



NEXT



TWO FORCES, FUTURE WORLDS

We see the approach to policy and regulation vary between two extremes — one extreme being highly progressive and interventionist (think Nordics, Hawaii, UK); the other, a more reactive, wait-and-see approach (think Nevada’s decision to eliminate net metering). We see much of the former, such as the implementation of renewable energy targets and mandates in Germany, that has significantly disrupted the markets and the energy firms operating within them. This has also been seen in some US states, including and most notably California, New York and Hawaii. Increasing interest in renewables, energy efficiency and climate change coupled with technology innovation, will likely drive an ever-increasing level of interest and intervention in the transformation of the grid by policy makers and regulators.

Technology will increasingly become a disruptive force, unless its introduction (as distinct from development) is controlled or, in extreme, is ignored. Our view is the level to which the introduction and adoption of new technology into the distribution grid and the utility ‘ecosystem’ form the extremes of a continuum. At one extreme, innovation and introduction is uncontrolled and potentially disruptive (think Uber) or, at the other extreme, is so tightly controlled as to stifle progress and limit the benefits of transformation (think taxis). What is clear to us is that some level of control is required, at the same time avoiding the “law of unintended consequences.” For example, think of the impact of the solar subsidies in Australia, where renewable energy targets can be met, but not without (arguably unforeseen) disruption as the policy around subsidies changes.

These two powerful forces are heavily intertwined, and by considering the plausible, a number of potential ‘future worlds’ scenarios emerge.



PREVIOUS



NEXT



INTRODUCING FutureWorlds™

Determining a preferred future, managing uncertainty, and setting strategy.

When considering the future, organizations have a natural bias to what they see as a probable future, often informed by retained institutional knowledge, past performance and what leaders in the company are prepared to acknowledge and address. History is littered with some spectacular successes and failures of foresight (think Netflix versus Blockbuster).

Throughout PA's history, we have worked with companies in a wide range of sectors, including consumer goods, telecom, life sciences and energy, helping them innovate new products and services in order to stay ahead of the market. In every case, some level of provocation — i.e., challenging current assumptions to allow better decisions to be made today that will help the organization to create the practical strategies that incorporate future uncertainties — has been the key to success.

Enter PA's proprietary scenario planning tool — FutureWorlds™. FutureWorlds™ is a platform that is inclusive of cross-functional teams, incorporates future uncertainties and their implications, envisions futures that are based on extremes, and is a powerful tool for strategic evaluation. It is tested and proven to help PA's NGU experts work hand-in-hand with utility executives to develop a coherent and insightfully-led view of the future in order to drive innovation and enhance the decision-making process via both qualitative and quantitative methods.

Importantly, FutureWorlds™ helps to remove the natural bias of probable futures, introduces the consideration of all possible futures, and tackles uncertainties head-on to arrive at a view of a preferred future, informed by the impact and implications of external events. In practice, the technique has enabled the development of a “playbook” of scenarios and integrated strategies, based on a more informed view of *probable*, *possible* and *preferred* futures.



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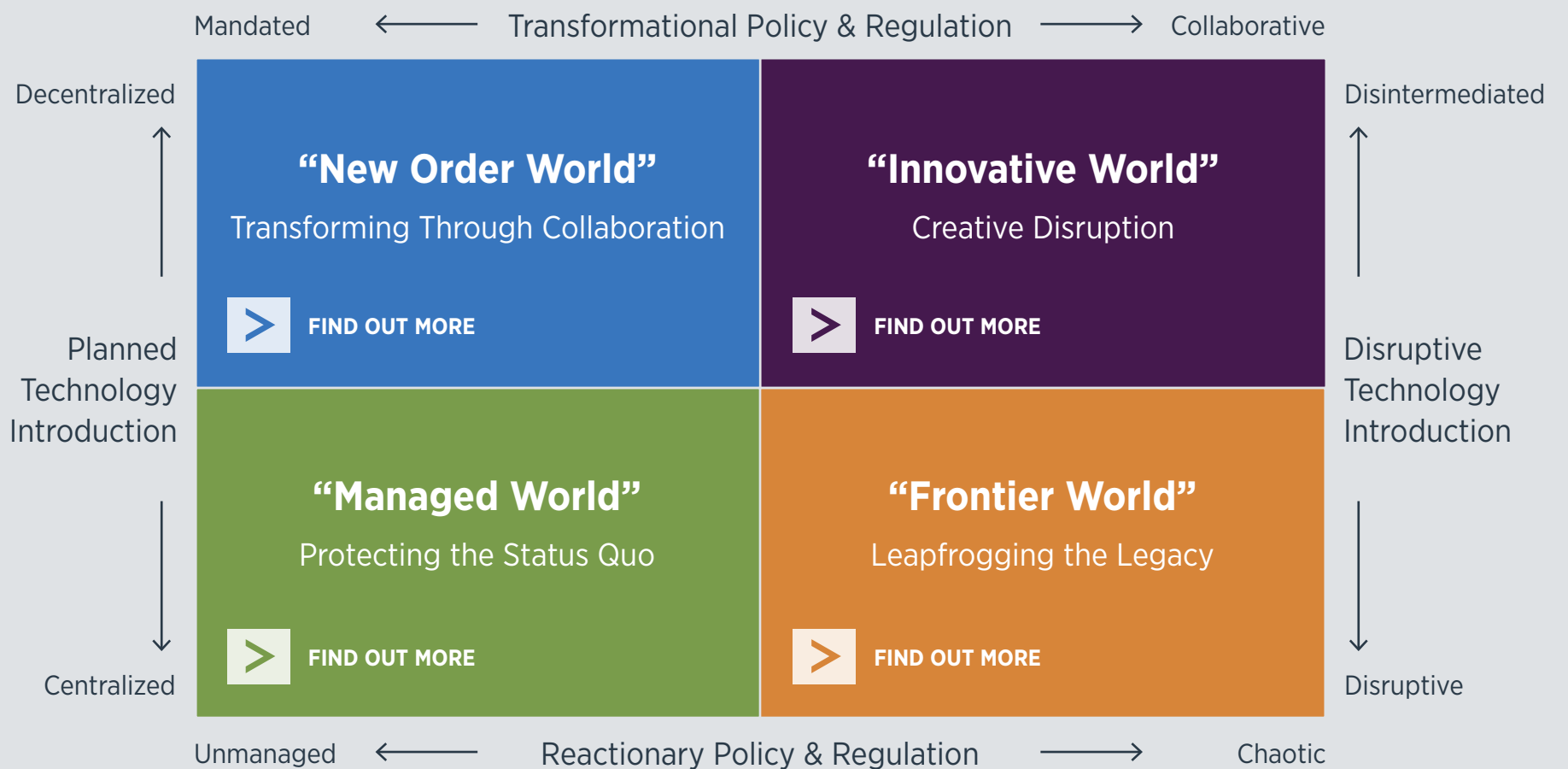


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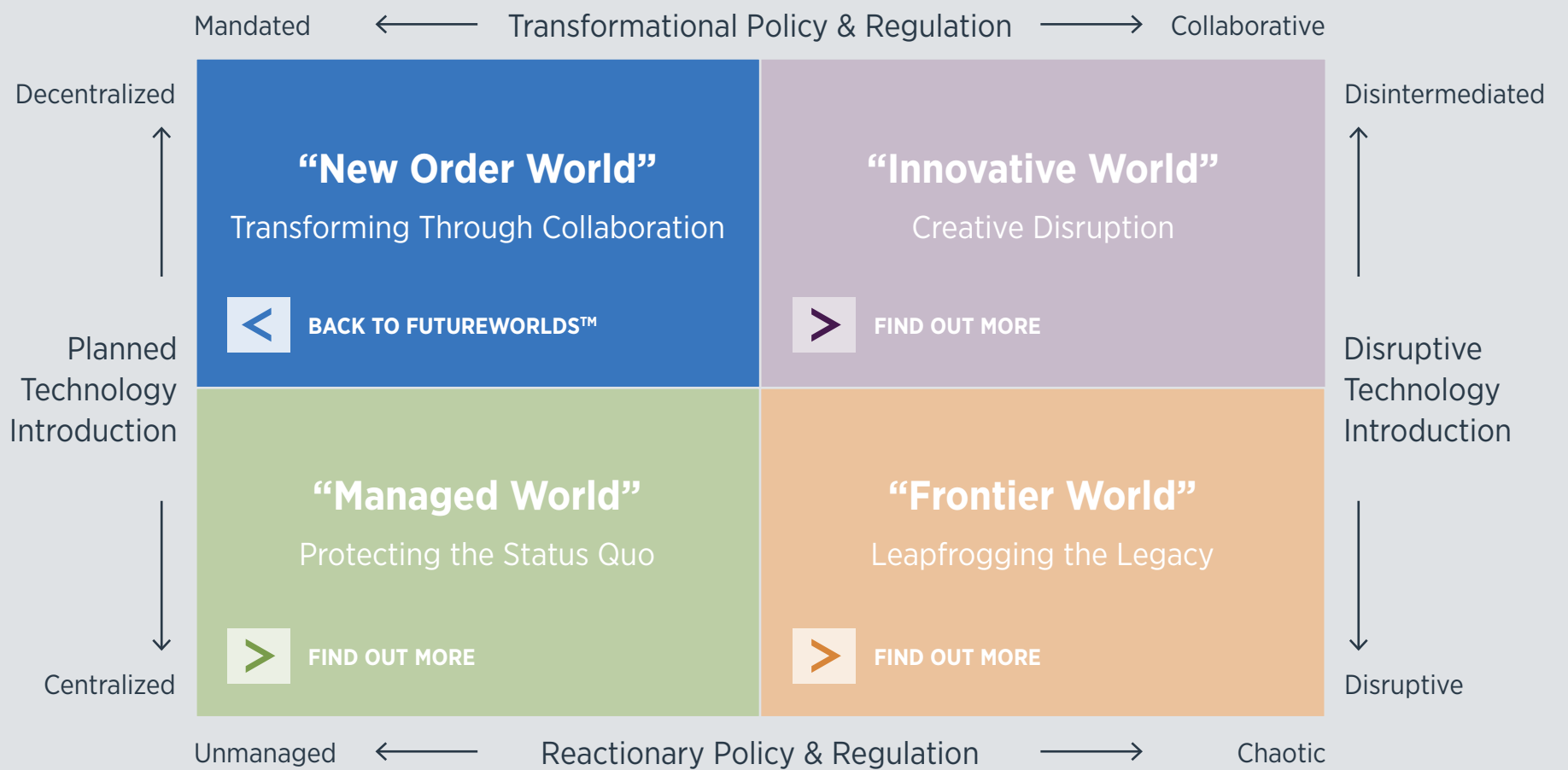
PA'S OWN VIEW OF THE NGU OF THE FUTURE, USING FutureWorlds™

Conducting our own industry-level analysis using FutureWorlds™ we arrived at a macro level view of the potential worlds that emerge. The two powerful forces of policy and regulation and disruptive technology innovation will determine the future. At this industry level, we see four future energy worlds each with winning business models. In considering a preferred future and winning business model, the role of the executive leadership will be to exert as much influence and control over these factors as is warranted.



NEW ORDER WORLD

Transformation through collaboration.



In this world, policy makers and regulators stay ahead of the game, understanding how technology can enable the modernization of the grid to accommodate DERs, affordability and reliability of supply, and clean energy goals. Regulators adopt a forward-looking and proactive stance to transforming the market in order to improve competition and to address political considerations, such as climate change and resource scarcity.

The role of the utility is protected, but it is also very different as the relationship between regulators and utility leadership is much closer, with both having a strong influence over, and stake in, the role the utility should play versus others that inevitably will enter the grid ecosystem. In this world, utilities work in close collaboration with regulators to meet performance-based metrics and planning objectives.

The utility business model will adapt, but it will also be protected from disruption. Likely, a hybrid of central and decentralized grid configurations will emerge, though the utilities will continue to own and operate many of the assets that comprise the grid. Transformation will occur and it will incorporate new technologies, but it will be carefully managed.

Customers will be concerned about energy usage and climate change, but they will show limited attitude for risk and adoption of new technologies themselves, preferring to make use of new products and services offered by utilities. Therefore, renewables will continue to evolve along planned and forecast trajectories with existing energy sources continuing to dominate.

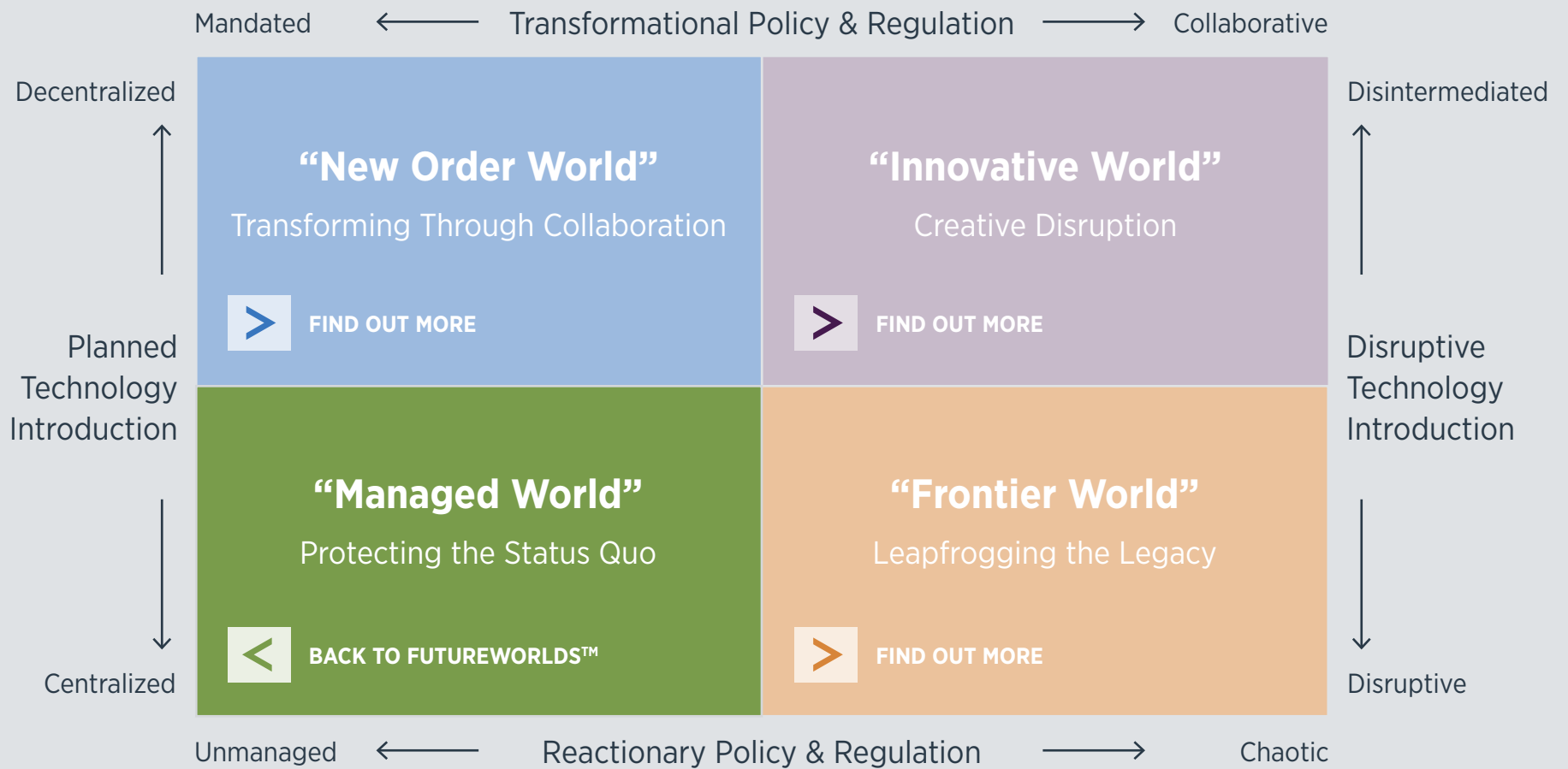
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MANAGED WORLD

Protecting the status quo.



This is a world where the regulators and utility leadership work together to maintain stability in the energy markets through very limited transformation of the distribution grid. There is simply no impetus to do so as customers have limited appetite for greater involvement and engagement with the energy markets. This is a world most likely influenced by broader economic factors, such as the availability of even basic technology like broadband communications, as well as demographics and consumer expectation.

In this world, the utility focuses exclusively on managing the grid, leaving others to manage the retail end of the business with customers. That clearly depends on the regulatory regime, and is likely to be one that is more focused on price and competition, rather than on the benefits and impacts of new technologies to transform the grid. Thus, current technology plans and roadmaps in this world hold true.



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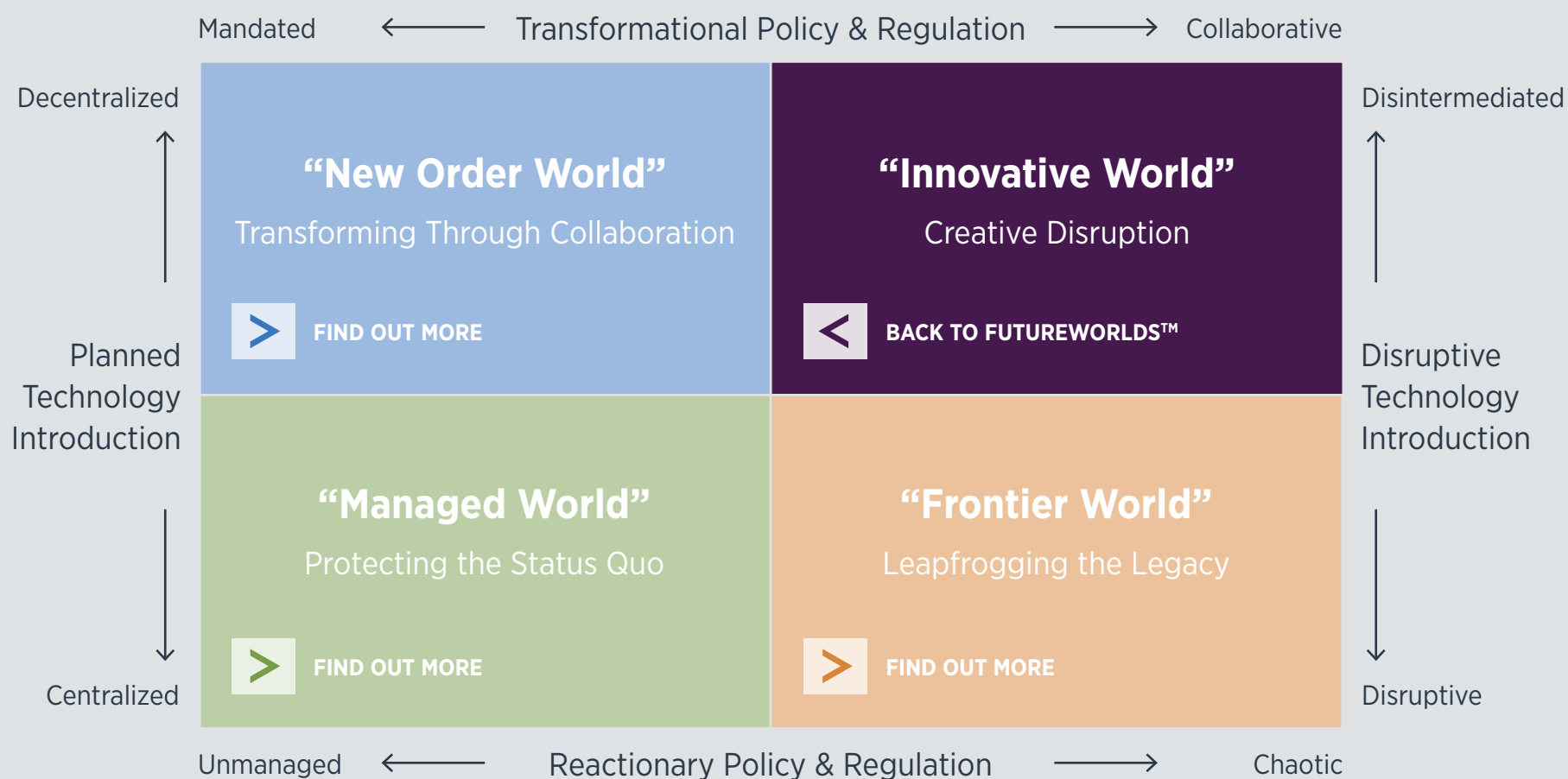


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INNOVATIVE WORLD

Creative disruption.



This world is characterized by policy makers and regulators fostering an inclusive environment to transform and proactively monitor and encourage technological change, as there is an increased recognition across the spectrum of climate change threats.

New and potentially disruptive technologies emerge and their introduction and adoption in the grid ecosystem is much less controlled. Radical technologies, such as Blockchain, will form the basis for enabling an efficient distributed system. Rapid innovation and improvement in generation and storage technologies will follow an exponential profile. Also, data and analytics will be used extensively across the ecosystem to enable new business models.

In this world, it is possible for there to be tension between utility leadership and the regulators, as the former has to deal with market and business impacts, such as loss of revenue and stranded assets. Interestingly, the profile of shareholders and investors will also significantly change as they will have a strong appetite for risk.

Thus, for the utility in this world, staying ahead of the game and being a technology leader and innovator will well-position the utility to take full advantage of the possibilities new technologies can provide and adapt the business model accordingly. It is certainly conceivable that, in this world, utilities incubate new technology-enabled products and services to replace or protect revenues, returns and their customer base. A highly distributed mix of different technologies and business models will be orchestrated to function as an adaptive ecosystem.

The profile of the customer is quite different in this world as they are keen to adopt and experiment with new technologies, as smart energy is seen as being very fashionable. The relationship between the utility and customer will increasingly become virtual and/or disintermediated.

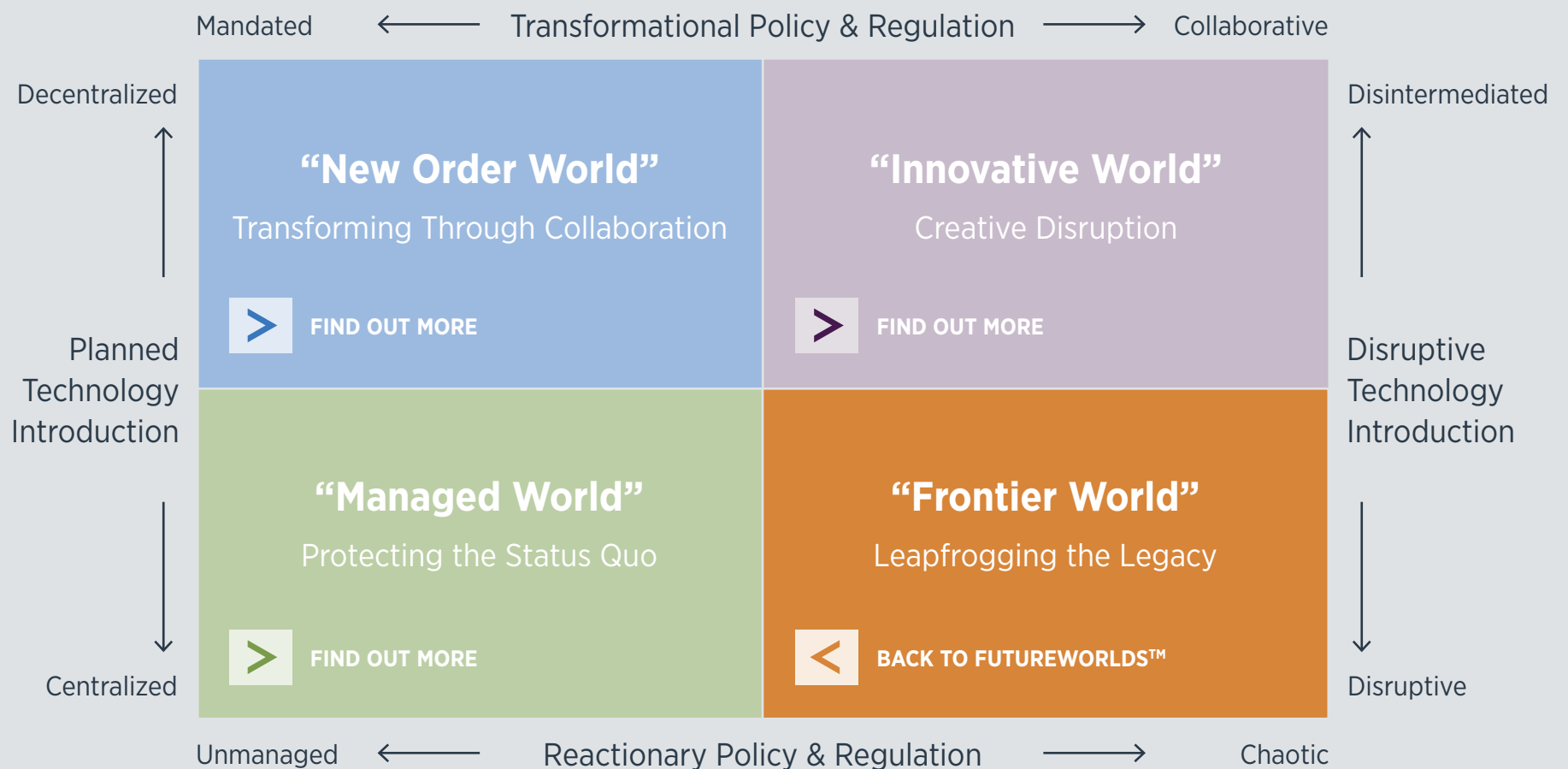
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FRONTIER WORLD

Leapfrogging the legacy.



This is a world characterized by experimentation and innovation with new technologies and market entrants continually challenging the status quo. This world is most likely to exist where there is a lack of legacy or established market rules (i.e., in developing countries where there is relatively little grid infrastructure or regulation). Policy and regulation will lag far behind, potentially so much so, that both investors and energy consumers will not be protected.

As seen with mobile banking and payments, it is possible for new technology to “leapfrog” to the future, without concern for existing or traditional infrastructure. DER will proliferate, driven by no incumbent infrastructure, as well as businesses that are keen to take control of their own energy supply.

Innovation will draw upon pilots and experiences in other markets. There will be fierce competition in this world for a limited pool of available talent and expertise in new and disruptive technology.

Consumers are markedly different, as they will show an appetite for energy self-sufficiency and off-grid living. There is tolerance for inconsistent and intermittent supply; and thus, reliability, which is one of the basic tenets of utility regulations in First World nations, will likely no longer exist.

A great example of Frontier World development is the M-Kopa Solar Home System that provides affordable power to homes and communities that do not have ready access to an electricity grid. The product has been launched in Kenya, Tanzania and Uganda www.mkopa-com.

BACK TO THE PRESENT

The result of our analysis is four contrasting insight-driven FutureWorlds™, all of which are possible, each world offering different strategic opportunities and challenges for utilities. This process, which is repeatable at a more specific and granular level, overcomes the natural bias toward probable futures and encourages analysis of possible scenarios and identification of preferred future scenarios.

The application of the technique also serves to highlight the importance of recognizing and influencing, where possible, the many uncertainties in developing a strategy for the Next Generation Utility — preferably one that does not place all bets on one outcome and can potentially accommodate more than one future world.

With the electric utilities sector at a pivotal moment and transformational change underway, FutureWorlds™ allows better decisions to be made today and provides an insight-led platform to develop future strategies.

For an in-depth analysis of your FutureWorld™, please contact us at energy@paconsulting.com



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CONSULTING
TECHNOLOGY
INNOVATION

Corporate headquarters

123 Buckingham Palace Road
London SW1W 9SR
United Kingdom

New York office

45th Floor, The Chrysler Building
405 Lexington Avenue
New York, 10174 USA

paconsulting.com

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