analysys mason

THE 'ON-DEMAND UTILITY'

IN ORDER TO SUCCEED IN THE FUTURE, UTILITY COMPANIES WILL NEED TO TRANSFORM THEIR SERVICES AND CAPABILITIES TO BE FLEXIBLE AND ON DEMAND

www.analysysmason.com

INSIDE

- The challenges faced by utility organisations
- Why addressing these challenges is so difficult
- Learning from other technology-centric sectors
- A vision for utilities of the future

Executive summary

"The growing diversification and uptake of new technologies are fundamentally changing the economics of providing utility products and services, disrupting well-understood historical business models."

Utility organisations face an increasingly challenging environment. Specific pressure will vary depending on the organisation's particular characteristics (place in the value chain, geographical and economic situation), but all utility organisations will face a period of increasing change and uncertainty. This is the result of the growing three-way tension between the need for security of supply, for prices to be kept at an affordable level, while ensuring environmental sustainability (including reducing greenhouse gas emissions). Utility organisations that fail to balance these challenges (and their knock-on effects) are likely to see loss of equity/shareholder value and may be vulnerable to acquisition in a later consolidation phase of the industry. Those that succeed are likely to see significant gains in value and benefits to their local and regional economies. This success will need fundamental change in the operational and service models deployed by utility organisations, and will require novel approaches to new technology. These organisations, which we are calling 'on-demand utilities', will need to re-align themselves to be flexible and to respond fluidly to anticipated and unexpected challenges. These changes are already being seen in the energy sector and in particular in electricity.

The growing diversification and uptake of new technologies are fundamentally changing the economics of providing utility products and services, disrupting well-understood historical business models. To explore the different paths that present effective strategies for a world of on-demand utilities, it is useful to look at how innovation and disruption has affected the telecoms and computing/IT sectors.

Utility companies tend to have distribution networks with more pronounced natural monopoly characteristics than the networks of telecoms companies, for instance. Energy systems also generally have a more complex and monolithic nature than other systems. This typically means that utility companies are either vertically integrated or have to work more closely and in concert with others to deliver services to consumers. The complex nature of utility ecosystems means that there are significant lock-in challenges (where multiple facets in a system's socio-technical paradigm may restrict/challenge changes being made to the system). These lock-in challenges may deter organisations from the scale or pace of change needed.

SACHA MECKLER
Markets and Systems Specialist

It is important to understand that although inaction poses significant impacts and risks to the utility player, the key concern and risk is not really around whether to change or not. What is critical is picking the correct strategy, one that reflects a utility organisation's particular situation and can be executed effectively to deliver intended results.

The recommendation that is applicable to most utility companies is to focus on one of two potential core competencies and associated strategies. An operator should either focus on the return on asset investment and management (the revenue defence strategy) or service innovation and customer enablement (the revenue growth strategy). It is important to note that both strategies will require significant change in how a utility player is positioned and the activities it undertakes; the revenue defence strategy is no longer a 'business as usual' strategy. Focusing on one of these two core competencies can lead to the creation of additional value for both the utility organisation and its customers.

The challenges faced by utility organisations

"Some commentators have referred to an energy 'trilemma' to describe the competing demands being placed on the industry, with an array of indirect pressures and implications they produce."

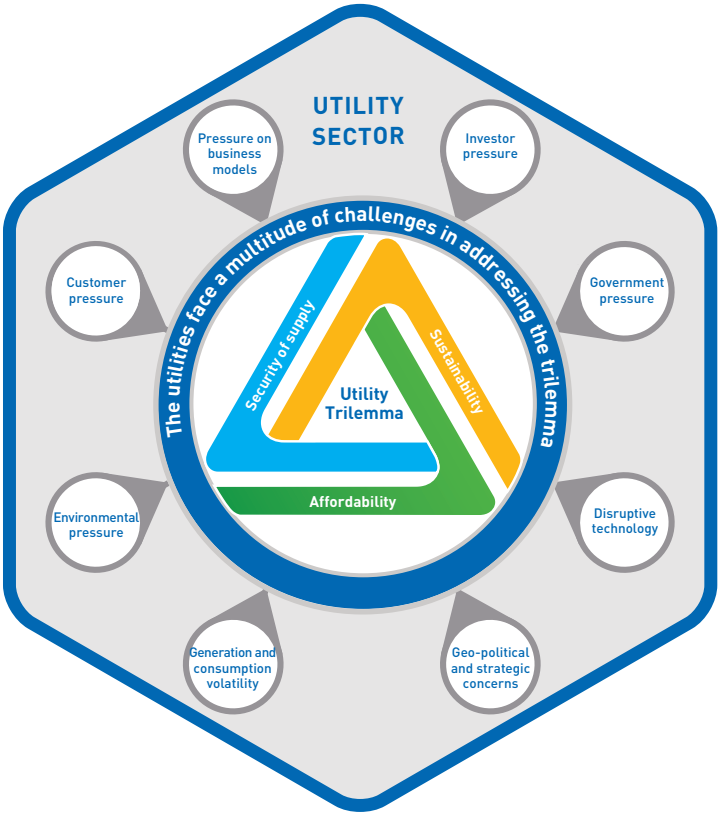


FIGURE 1: THE UTILITY 'TRILEMMA' AND ASSOCIATED FORCES AFFECTING UTILITIES
[SOURCE: ANALYSYS MASON, 2016]

The utility industry is facing an increasing range and scale of challenges. This includes new expectations regarding sustainability and efficiency, concentrations of demand and supply, and the need to adapt to emergent technologies such as the Internet of Things (IoT), renewable energy and distributed assets. Many organisations consider some of these components to be solutions to specific problems: renewable energy improves sustainability, for example. However, these solutions also create bigger organisational and operational problems, most often due to organisations' historical operating models, or the outdated structure and function of the industry (or in many cases, both).

These challenges are faced by all utility sectors and they are currently most visible in the energy sector. Some commentators have referred to an energy 'trilemma' to describe the competing demands being placed on the industry, with an array of indirect pressures and implications they produce (see Figure 1).

These forces often require specific individual attention and effort, but must also be addressed as part of an interdependent web of indirect pressures and factors that are not immediately evident.

Why addressing these challenges is so difficult

"Meeting the needs of expanding cities in a flexible manner can drive very different design, operation and decision priorities across different contexts."

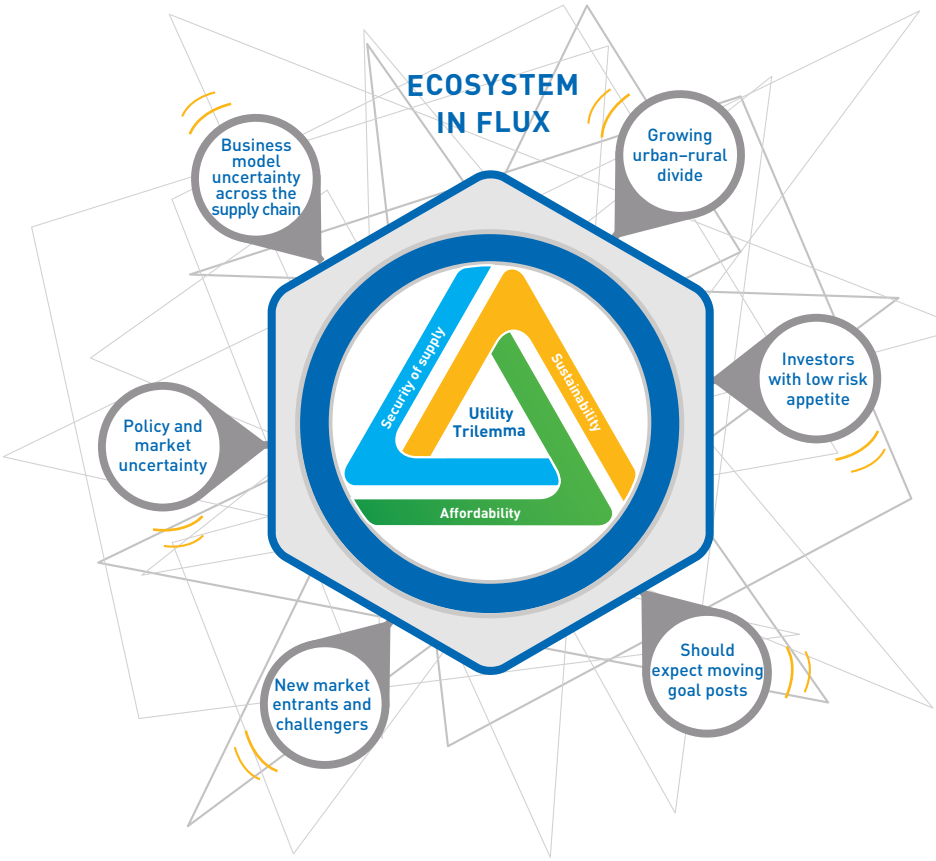


FIGURE 2: ECOSYSTEM PRESSURES INTENSIFY CHALLENGES [SOURCE: ANALYSYS MASON, 2016]

In addition to the challenges faced within the energy industry itself, operators must work within a wider context that is in flux, as illustrated in Figure 2.

In the broader context, significant additional uncertainty and complexity exist, including:

- Policy and market uncertainty
- Changing business models and needs across the supply chain
- Moving goal posts.

There are also factors that create further limitations in terms of the range of options available to utility players and the speed with which they are able to execute strategies and succeed, including:

- Investors in utilities continue to have a low risk appetite
- New market entrants and challengers are emerging
- There is a growing urban–rural divide.

Some of these factors, such as the growing urban–rural divide, can create very large and costly impacts for utility companies. Urbanisation is applying downward pressure on the value of rural assets, although the costs to maintain and serve these areas do not fall. In fact, in some cases costs may increase. Meeting the needs of expanding cities in a flexible manner can drive very different design, operation and decision priorities across different contexts. This range of divergent priorities will challenge the models historically used to deliver a socially balanced universal service in developed markets. Developing countries may, in many cases, not be able to rely on proven solutions from developed economies, and may need to carefully consider the design and development of their individual energy systems. This highlights how difficult it is to separate questions of energy supply and provision from the wider context of economic growth and social development.

Learning from other technology-centric sectors

"The transformations and innovations in the telecoms and computing/IT markets evolved in line with changing business opportunities and increasing demand for better communications and computing power."

The growing diversification and uptake of new technologies are further changing the economics of providing utility products and services, disrupting well-understood historical business models. To explore the different paths that may be taken by utility companies, it is useful to look at how innovation and disruption has affected the telecoms and computing/IT sectors.

Historically, the fixed and mobile telecoms markets were both heavily based on the deployment of communications assets and the provision of communications capability on a dedicated circuit or connection basis. Figure 3 provides a high-level illustration of the telecoms market's transition to a more service-orientated sector.

Innovation in the hardware/physical infrastructure and software areas of the fixed telecoms market includes the broader deployment of new infrastructure such as fibre-optic cables, the advancement of protocols, and the virtualisation of terminal equipment, capacity and provisioning. Products and services are now far more responsive to customer needs. This has been enabled by multi-service platforms, soft switches and other systems that allow service delivery and operations to be more dynamically managed.

Mobile telecoms have changed at an even faster rate as this market does not face the same legacy issues as the fixed telecoms market. Initially, mobile operators were highly competitive in providing and marketing their network

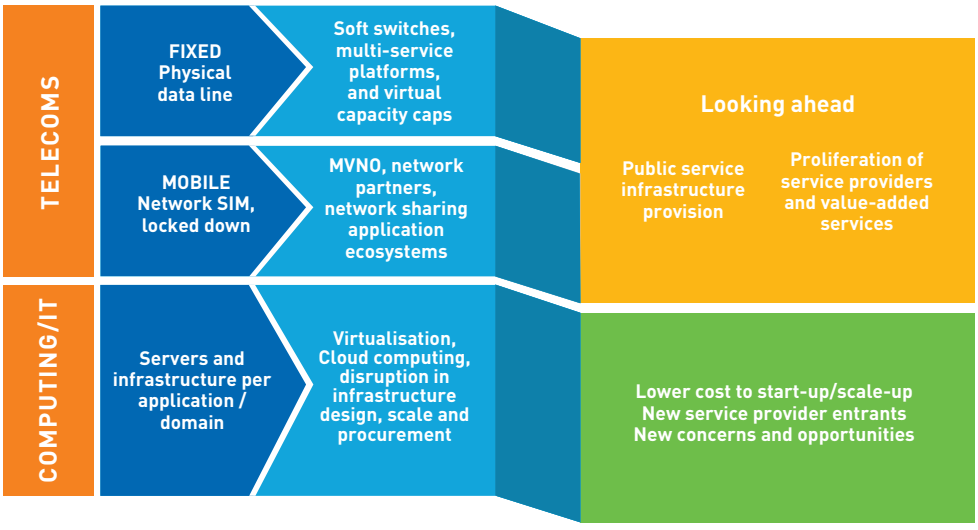


FIGURE 3: TRANSFORMATION OF THE TELECOMS AND COMPUTING/IT SECTORS (HIGH-LEVEL ILLUSTRATION)
[SOURCE: ANALYSYS MASON, 2016]

coverage, and SIMs and handsets were locked to specific networks. In markets where coverage had become effectively ubiquitous, operators sought new ways to find competitive advantages, and adopted new models and approaches. To extract maximum value from the investment in network infrastructure, operators launched sub-brands as well as hosting mobile virtual network operators (MVNOs) on their networks. In some cases, as cost pressures increased, operators moved to full sharing of infrastructure. Successive generational upgrades of technology and software platforms have allowed rapid advancement of services. The improved capacity and capability of smartphones have made that device one of the most used and valued personal consumer products of our time, allowing consumers to get on-demand access to various services and capabilities and disrupting the status quo of the mobile phone market.

Figure 3 also provides a high-level view of the computing/IT sector's transition to a more cost-efficient, accessible and service-oriented sector. Virtualisation of the underlying computing infrastructure (processing and storage) removed the need to match a specific piece of infrastructure to a specific application. Use of computing resources not only became more efficient, but the speed of uptake and scaling also dramatically improved. This resulted in large economies of scale with a huge impact on accessibility, cost of innovation and service delivery and means that cloud computing has become mainstream and is now available on demand.

The transformations and innovations in the telecoms and computing/IT markets evolved in line with changing business opportunities and increasing demand for better communications and computing power. Innovative business models played a significant role: key players invested in building long-term business opportunities based on customer-centric solutions with improved efficiency. Initially there were misgivings about these approaches, especially in relation to return on investment (RoI) and the pressure placed on margins. In the long run, however, the markets and utilisation grew significantly and sustainably.

In the next section we draw on some of the relevant developments in the telecoms and computing/IT sectors to explore how the utilities sector – a sector with its own particular dynamics and complexities – will move forward.

A vision for utilities of the future

"Utilities need to become more efficient and effective in dealing with a multitude of consumer, customer and stakeholder needs."

Utility companies tend to have distribution networks with more pronounced natural monopoly characteristics than the networks of telecoms companies, for instance. Energy systems also generally have a more complex and monolithic nature than other systems. This typically means that utility companies are either vertically integrated or have to work more closely and in concert with others to deliver services to consumers. The complex nature of utility ecosystems means that there are significant lock-in challenges (where multiple facets in a system's socio-technical paradigm may restrict/challenge changes being made to the system). These lock-in challenges may deter organisations from the scale or pace of change needed.

Utilities need to become more efficient and effective in dealing with a multitude of consumer, customer and stakeholder needs. Innovation and the ability to flexibly deploy services and technology are paramount. The operator will need to do this in response to customer needs, and in such a way that is both affordable and environmentally sustainable. Utility companies will have to become adept at optimising existing assets while flexibly and nimbly deploying new assets or capabilities.

It is important to understand that although inaction poses significant impacts and risks to the utility player, the key concern and risk is not really around whether to change or not. What is critical is picking the correct strategy, one that reflects a utility organisation's particular situation and can be executed effectively to deliver intended results.

The recommendation that is applicable to most utilities is to focus on one of two core competencies. Utility incumbents should either focus on the return on asset investment and management (the revenue defence strategy) or on service innovation and customer enablement (the revenue growth strategy). These options are illustrated in Figure 4.

Utility providers will have to innovate and alter their business models to adapt to either of these strategies. In each case, the majority of system operation interactions (whether technical- or market-orientated) will remain under the control of the licensed organisation.

Utility organisations focusing on the revenue defence strategy will need to hand certain functions to their suppliers, surrendering some contact with clients, and with it a degree of influence and control over customer expectations and requirements. In this model, utility companies will still be responsible for elements of the service delivery.

Those focusing on the revenue growth strategy, by contrast, will need to deepen their relationship with customers, offering them more value. To enable this closer relationship between utility companies and customers, many of the traditional utility competencies will need to be outsourced to the companies' suppliers.

Utility companies will need to assess many factors before determining which strategy best suits their needs and market. In liberalised markets co-operation and co-ordination between utilities in different parts of the value chain will be needed to deliver maximum consumer benefit. In vertically integrated markets sanctioning such transformation will be more difficult, as will be the delivery and governance of the transformation. However, the benefits that accrue could also be greater.

Whichever approach utility organisations choose, they will face ongoing and mounting challenges in the future. In order to succeed they will need to re-align themselves to be flexible and to respond fluidly to anticipated and unexpected challenges. The ability to plan for uncertainty and to firmly instil flexibility will be critical. In this way, the on-demand utility of the future will be able to generate value for itself and its customers. This holds true whether the utility takes a conservative or innovative approach to the products and services it wishes to provide.

Analysys Mason has a long history of supporting strategic and technical change across various industries. In particular its Smart Energy and Smart Cities team has experience in developing and leading among the most significant business and technical developments and innovations in the energy sector over the past few decades.

If you would like to discuss any of the issues covered in this white paper please contact Sacha Meckler at sacha.meckler@analysysmason.com

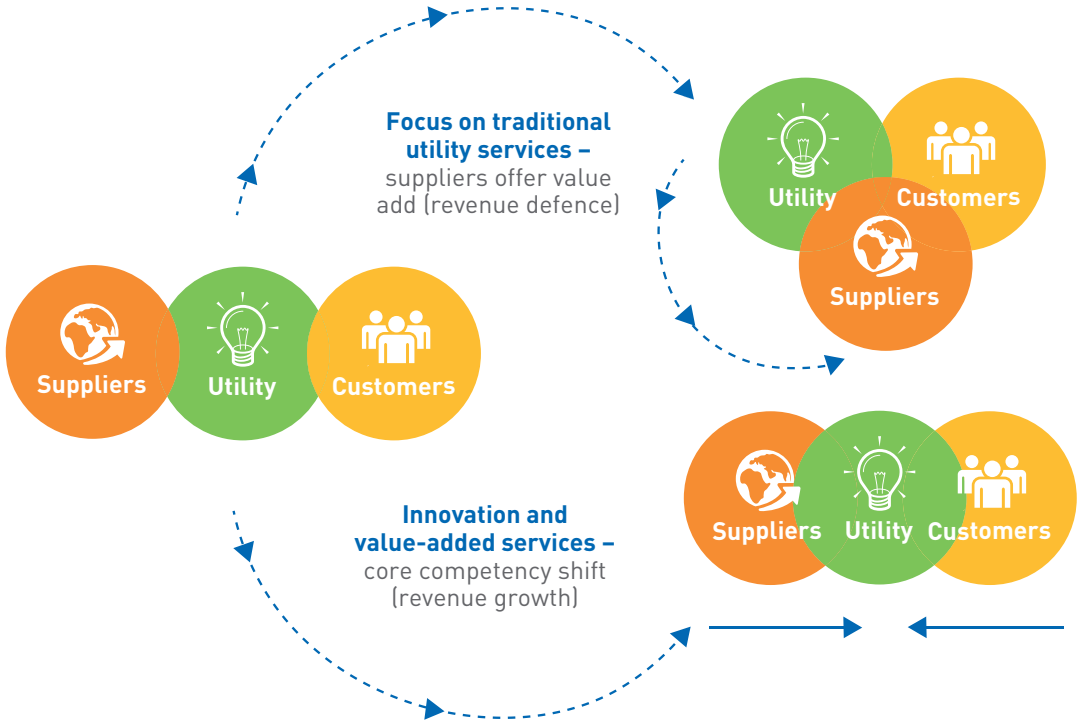


FIGURE 4: STRATEGIC OPTIONS FOR UTILITY COMPANIES OF THE FUTURE [SOURCE: ANALYSYS MASON, 2016]

Analysys Mason's Smart Energy and Smart Cities Practice – uniquely positioned

Analysys Mason's Smart Energy and Smart Cities Practice comprises a dedicated team of specialists focused upon the development and application of telecoms and information management solutions across the energy and city landscapes.

The practice draws upon operational experience from across key aspects of the utility telecoms value chain: from software and hardware product development, to investment planning, network/service operation, standards development and regulatory policy.

Our Smart Energy and Smart Cities Practice is led by David Healey, acknowledged internationally as an authority on Smart Energy strategies and recognised as an industry leader and influencer in this sector for over 25 years. In 2014, David was appointed as Expert Industry Advisor to the United Nations, advising on the defining role of smart utility solutions in combating climate change.

Addressing the multiple global challenges of energy security, equity and environmental sustainability is critical in order to achieve the world's carbon reduction objectives.

The capability of an intelligent, fully dynamic and flexible power distribution network is therefore essential to facilitate the urgent adoption of low-carbon energy sources and the realisation of a sustainable energy-based economy.

Analysys Mason's Smart Energy and Smart Cities team has therefore taken up an advocacy role, to promote an industry focus upon the importance of telecoms and information solutions as a key enabler in realising our global smart energy and smart city ambitions.

ABOUT OUR SERVICES

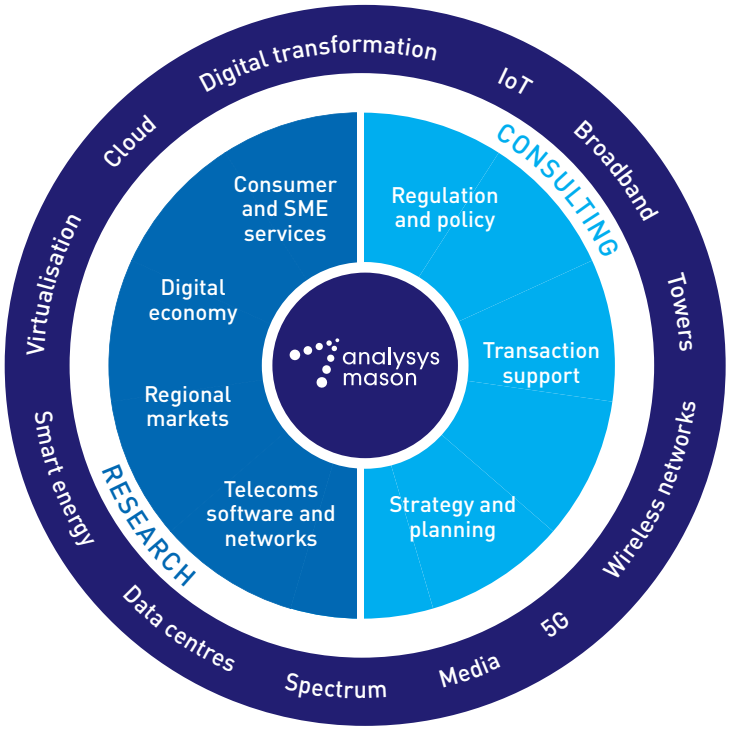
At Analysys Mason, we understand that clients in the TMT industry operate in dynamic markets where change is constant. Our consulting and research help to shape clients' understanding of the future so they can thrive in these demanding conditions.

CONSULTING

- We deliver tangible benefits to clients across the telecoms industry. Clients include: utilities, communications and digital service providers, vendors, financial and strategic investors, private equity and infrastructure funds, governments, regulators, broadcasters and service and content providers
- Our sector specialists understand the distinct local challenges facing clients, in addition to the wider effects of global forces
- We are future-focused and help clients understand the challenges and opportunities new technology brings

RESEARCH

- Our dedicated analyst team tracks and forecasts the services accessed by consumers and enterprises
- We offer detailed insight into the software, infrastructure and technology delivering those services
- Clients benefit from regular and timely intelligence, and direct access to analysts



Meet our Smart Energy and Smart Cities Practice leaders

DAVID HEALEY
Partner, Head of Smart Grid Practice

David has worked in the energy and utility industry for more than 25 years in a wide variety of roles, and his expertise is recognised worldwide.

Prior to joining Analysys Mason, David was Smart Grid Practice Head at global information technology consulting firm Wipro Technologies.

Among his many credentials, David founded and launched Smart Grid Solutions in 2007, which was one of the first advisory consultancy companies in Europe to be dedicated to the smart energy sector that was emerging at this time.

David has worked across the full breadth of the energy utility value chain, from software and silicon design and hardware product development, to utility network operations. He has also led major smart energy implementation projects, including a consortium proposal to the UK Government's smart metering procurement process and an ICT refresh programme for a power distribution company in Ghana.

In 2014, David was invited to take an ongoing advisory role on the United Nations Economic Commission for Europe (UNECE) Sustainable Energy and Energy Efficiency committees, tasked with developing strategy to support the UN's 10-year Sustainable Energy for All (SE4ALL) initiative.

SACHA MECKLER
Markets and Systems Specialist

Sacha Meckler (Markets and Systems Specialist) has over 16 years' experience working in the smart grid, smart city and telecoms domains. During this time he has held roles across a very broad spectrum of organisations from start-ups, telecoms vendors and operators, to banks and consultancies.

His work has covered technical, commercial, policy and strategic domains, and he has designed and implemented innovation projects in Europe and Africa. Sacha also regularly writes articles on a range of topics related to innovation. He specialises in writing about the transformation of the energy sector.

EDDIE COTTLE
Smart Energy Programme Manager

Eddie Cottle has extensive operational domain experience across the utility supply chain and in technology consulting, in particular on smart grids, smart cities and innovation and transformation projects. He has worked with a range of stakeholders and with complex supply chains on behalf of both national and international clients, and has experience across a wide range of disciplines.

Eddie has also delivered strategic programmes including ICT and OT strategy development and implementations, business case developments and management of business transformation programmes, including technical implementations and demonstration projects.


analysys
mason
Stay connected
You can stay connected by following Analysys Mason on Twitter, LinkedIn, YouTube or sign up to our RSS feed.
@AnalysysMason
linkedin.com/company/analysys-mason
youtube.com/AnalysysMason
analysysmason.com/RSS/