Networked
Energy
Services

ENERGY APPLICATIONS PLATFORM

Making **Smart Grid**
Make **Business Sense**

OVERVIEW

Time may be running out for Distribution System Operators (DSOs) to establish smart grid solutions that will grow with their business. A wave of change is approaching – regulation and legislation, locally generated renewable energy, electric vehicles, increasing need to engage the customer, smart city and smart home. All these, and others which we may not yet fully anticipate, will change the role of the electricity grid, from being a passive power distribution infrastructure to an active and agile broker of energy flows; a smart grid.

DSOs, like all businesses, need to justify investment. They achieve their smart grid through incremental investment programmes, each of which makes business sense. The capabilities in smart grid solutions are available today to make these investments technically viable, and often just need the business case as a catalyst to make them happen.

DSOs also need to change the way they think about their smart grid solutions. This infrastructure has the potential to be a lot more than a means to monetise the grid. With the right technology, and modest investment, the smart grid platforms can become the service platform for the whole of the low-voltage grid.

In this paper, we examine the characteristics required of the smart grid to enable incremental business benefits and sustain a longer-term strategy to make the smart grid truly smart. Along the way, we examine the role of the Energy Applications Platform – a key component in achieving the flexibility and agility which will be required to make the smart grid an active and agile broker of energy flows.

WHY FOCUS ON THE BUSINESS CASE

Traditionally, Smart Metering deployments have focused on improving the meter-to-cash process and meeting regulatory compliance. The initial investment in smart metering infrastructure has been justified in more accurate billing, reduced manual meter reading and reduced exposure to non-paying customers.

For those DSOs in mature markets, the expanded utilization of smart grid infrastructure is driving the demand to realise extended business benefits in areas of technical and non-technical loss reduction, electricity distribution infrastructure investment reduction and deferral, operational efficiency, accommodation of locally generated renewable energy, regulatory compliance, customer engagement and implementation of smart city/home. This is driving the need for a new suite of monitoring and control capabilities into the smart grid. While the high- and medium- voltage networks have established systems in place to provide this, the low-voltage network does not, and this lack of visibility impacts the level to which these new business benefits can be realised.

Finally, the expectation is that DSOs in emerging markets will seek to achieve the extended business benefits faster than those in the mature markets; they often have stronger business cases for these areas of improvement, and will seek to benefit from the “know-how” which has been developed in the mature markets.

Smart grid solutions which incorporate an Energy Applications Platform will be well placed to realise these business benefits. The Energy Applications Platform provides a flexible and extensible framework which offers in-built communications technology, multi-function meters, security, remote control, backwards compatibility and analytics. In short, this is how DSOs will obtain the largest return from their investments in smart grid deployments. Put another way, this is how DSOs will change their perspective on the smart grid; from a grid monetisation tool to a service platform for the low-voltage grid.

BUSINESS OUTCOMES; TRADITIONAL & EXTENDED BUSINESS BENEFITS

Meter To Cash Process – The Traditional Business Benefits

The Meter to Cash process focuses on the following areas of business benefits:

- Billing accuracy and frequency
- Remote control of supply
- Tariff-based Product innovation
- Reduction of manual reading

The Extended Business Benefits

As DSOs gain experience in their smart grid deployments and look to fund on-going investment in renewal of the smart grid infrastructure, an extended set of business benefits are targeted, which often include at least some of the following:

- Distribution efficiency; reduce the loss of energy through the distribution system. Many countries have distribution losses in the 10%-20% range, and some countries are even higher – reducing energy loss by a few %, when applied across the whole subscriber base of a DSO generates significant improvements.

• Reduced or deferred infrastructure investment; maximise the use of existing capacity and put in place proactive maintenance plans to increase life-time of equipment. Reducing annual investment by a few % through improved visibility of capacity and loading leads to significant investment savings.

• Operational efficiency; understand your distribution network all the way to the customer, and use that to optimise field-force, problem resolution and engineering activities. In countries where salaries are relatively high or quickly rising, these savings can be significant.

• Flexible tariffs/rates; quickly reconfigure your meters to meet new market and regulatory pressures for tariff change.

• Non-technical loss reduction; identify more sources for both fraudulent energy consumption and illegal activities by seeing more detail in the low-voltage grid.

• Regulatory compliance; respond to changes in a more cost-effective manner and reduce business impact of change. Situations where regulatory updates trigger multiple, significant and network wide configuration changes are common place, and without the right AMI infrastructure can lead to significant field-force costs.

• Customer experience and engagement; be ready for the day when the customer has a choice of where they get their energy from. SAIDI and SAIFI are important measures, but getting to know the customer better through their consumption of energy will provide you with market insight beyond basic outage records.

• Smart city and smart home services; lead energy efficiency initiatives.

• Security; disruption to service, lost revenue and penalties for release of private customer information can erode all the potential enhanced business benefits and so there is a significant "cost of doing nothing".

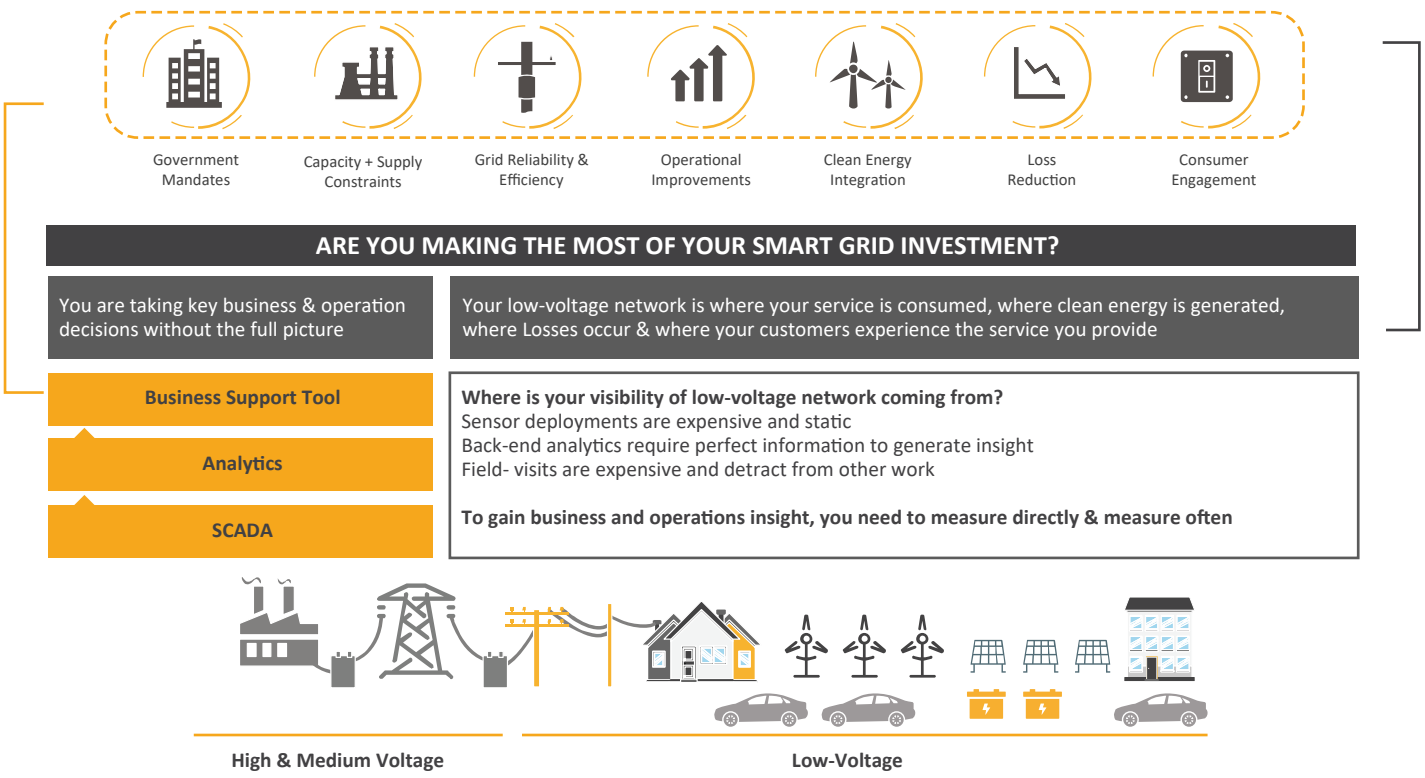


Figure 1 – Business Benefits require visibility across the grid, not just in the medium and high voltage segments

THESE BENEFITS CAN BE REALISED TODAY

Technology exists today in the network but is often under-utilised. The Energy Applications Platform exposes the potential of this latent investment to help make the business case for the incremental changes required to turn the smart grid from a passive distributer of power to an agile and active broker of energy.

The Energy Applications Platform is a key component in the smart grid. It combines the communication, security, distributed intelligence, sophisticated meters and connected home devices, back-end business analytics systems and business system integration into one framework.

Through an examination of the capabilities of the Energy Applications Platform, we can show that benefits to drive a sustained evolution in the smart grid can be achieved.

HOW TO REALISE THESE BUSINESS BENEFITS

These business benefits are dependent on the Energy Applications Platform deployed into the low-voltage grid. When selecting a smart meter provider, these should be considered very carefully, as making the wrong decision can seriously impact the level to which these business benefits can be realised, and will limit medium and long-term flexibility. Special attention should be paid to:

- Reliable Communications
- Multi-function Meters
- Interoperability and Technology Consolidation
- Security
- Upgradeability and Backwards Compatibility
- Distributed Intelligence
- Substation Monitoring
- Analytics

Each of these characteristics are examined below:

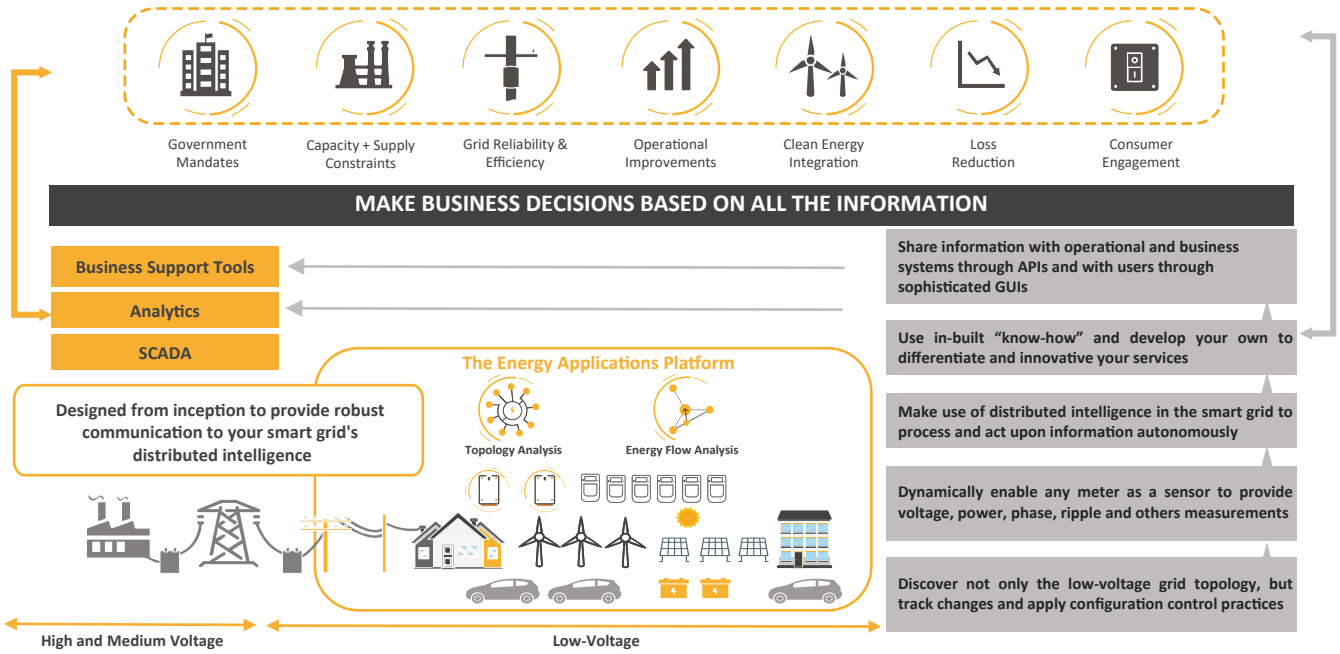


Figure 2 – The Energy Applications Platform fills the information gap in the low-voltage grid

CHARACTERISTICS OF THE ENERGY APPLICATIONS PLATFORMS; MAKING THE BUSINESS CASE

The Energy Applications Platform is key to achieving the potential return on investment for the smart grid. Without it, DSOs are forced to create their own solutions from the ground up, and address each of the characteristics individually. This leads to greater expense and time whilst building out the infrastructure and greater cost and inflexibility when responding to market or technology changes.

The Energy Applications Platform should provide the following characteristics "out of the box":

Reliable Communications

Reliable communications are one of the foundational layers for making the business case for both the traditional and the extended business benefits.

This is a challenge; the critical flow of information between the meters and billing and operational systems is subject to the reliability of the communications path between them, and this is often far from perfect.

Even in mature markets with established communications paths, provided by either the energy grid itself (using PLC), use of public networks (such as cellular/mobile) or dedicated communications networks (such as RF), it is often a challenge to reliably and securely connect the meter to the back-end systems, limiting the level of business benefit which comes from the meter to cash process.

In emerging markets, the situation is often worse, as the communications path is less reliable and secure. Projects in these markets will often falter unless the communications path is given a specific focus as part of the delivery of the metering infrastructure.

The simplest way to look at communications reliability is through the combination of two metrics: the rate of information flow which can be supported by the meters to the back-end billing and operational systems and the reliability of communications with the meters.

Underlying protocol for communications

Many protocols focus on the high data exchange rates that can be achieved in laboratory or near-perfect situations. These situations are rarely experienced throughout a low-voltage grid.

PLC technologies (which use the power lines to communicate metrics back to an aggregation point) are subject to noise, attenuation and cross-talk resulting from the grid infrastructure history, maintenance, addition of local generation, and domestic usage and appliances.

Solutions like RF and cellular, which avoid these problems, have their own unique challenges, including the reach of the RF and cellular signals to the meters (often in metal boxes or in out of the way parts of domestic residences), environmental impact, RF interference, maintenance issues, set-up costs, on-going charges and dependencies on a 3rd party to provide the infrastructure.

The selection of a communications technology must consider the performance of these technologies in practical real-life scenarios through specific reference cases, and not focus on lab results.

Improvement and maintenance of high-level of quality

The key enabler for the traditional and extended business benefits is the quality of communication which can be achieved; this is because both are dependent on the information received from the meters.

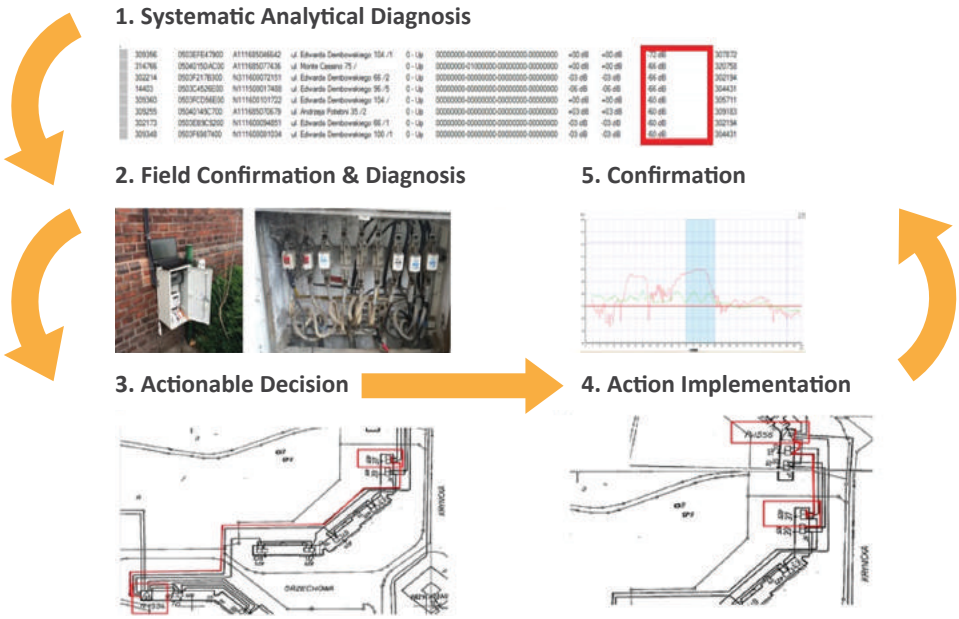


Figure 3 – Improved Meter Communications is a Foundation of the Energy Applications Platform

Any smart grid solution needs to include both:

- Monitoring tools which allow the ongoing tracking of SLAs for the communication, focusing the activities of maintenance teams in areas where SLAs are falling.
- Services to investigate, identify and resolve root-cause for any SLA degradations.

Not just PLC

PLC may not always the right answer. Any meter solution should provide the flexibility to deploy point to point solutions for the cases where PLC cannot reach the meter, or because of meter density, may not be cost effective. However, integrating the point to point meters into the same back-end system is essential so that effective communications monitoring across the whole deployed meter base can be achieved.

Multi-function Meters

There are a wide range of smart meters available on the market, from those which offer basic energy consumption measurement through to those which offer opportunities to meet both traditional and extended business benefits through rich functionality.

Basic energy consumption metering (often called AMR, Advanced Metering Reading) can only achieve one aspect of the traditional business case; billing accuracy and frequency. Whilst this is often seen as being sufficient for an initial deployment, it is often short-sighted, as AMR does not support the wider business case which will rapidly become a necessity for the DSO to demonstrate a return on the investment of the smart-grid.

Some meters also include the ability to provide remote control of supply to the consumer and remote control of relays which can turn on/off other power circuits (such as heating). This allows the DSO to better manage customer moves, protect themselves from fraud, and design tariffs based on availability of services.

Some meters include the ability to connect to local devices; both other meters on the premise (to bring back information from other utilities for metering, such as water, heat and gas) and home equipment, such as local usage monitoring devices.

Finally, the most sophisticated meters also offer the ability to record supply quality parameters, including events related to outages, frequency, and voltage sag and swell.

The more sophisticated the deployed meters, the more opportunity the DSO has to develop new business benefits. Only with a fully featured meter, employing all these capabilities, is it possible to generate a return on investment based on the complete traditional and extended business case.

In fact, all the extended business benefits rely entirely on the supply of fully-featured smart meters for customers.

Interoperability and Technology Consolidation

Of course, DSOs need flexibility and want to spread their investment across several technology and infrastructure providers.

Solutions which even talk the same language through alignment to a common standard, do not necessarily communicate well with each other, or present a common interface at the head-end and infrastructure management and operations layers.

Interoperability does not mean simply purchasing multiple solutions and integrating them. For interoperability to be valuable to a DSO, it needs to come with a proven track record of integration into those back-end systems which, through consolidation of information, drive the return on investment. Any solution which fragments the operations and maintenance process, the billing process and the analytics outputs will have negative value for the DSO in the long run. DSOs which allow their back-end infrastructure to become complex, through multiple systems, multiple information sources, multiple processes, will soon find that they are not able to scale and have lost their agility to respond to growth and change. The Energy Applications Platform consolidates many features of the smart grid infrastructure into one, and through this simplification, provides greater agility to respond to change, and keep the cost of change under better control.

This prepares the DSO for the exciting future when the grid will be as much about software and configuration as physical infrastructure, and the point when operational and maintenance processes for the grid start to align to standard ICT processes.

Security

Of course, meters are deployed in the street and single- and multi-dwelling premises. This makes them a very tempting attack point for potential criminals. Through poorly protected meters and communications infrastructure, cyber criminals can initiate denial of service attacks (both local and regional), obtain customer information, and also corrupt the DSO's operational data. Another consideration is the recovery time from an attack, which can realistically be months, during which operations will be running sub-optimally and also eroding any gains in the overall business case.

Any one of these can wipe out all the advantages achieved through the business benefits outlined above; both in terms of lost revenue, fines for violating regulation, additional operational expense to recover from an attack, customer confidence, and the impacts of negative publicity.

When selecting your smart meter infrastructure, it is critically important that security is examined. The solutions should include:

- Secure communications.
- Penetration and intrusion identification and localisation solution.
- Frequent exchange and refresh of security keys to limit any exposure to attack.
- Security features implemented as default and designed into the meters and communications protocol from inception.
- Upgradeability and backwards compatibility to ensure that all meters can be upgraded to achieve the highest available security levels over the lifetime of the system.

You should also review business continuity in the scenario of a cyber-attack which damages systems and information essential for the safe and efficient operation of your business.

Upgradeability and Backwards Compatibility

A DSO will expect meters to be deployed in the field for decades. In that time, there could be regulatory changes (which may drive security requirements, meter reading and tariff development), market changes (which may drive development of new tariffs and smart-home services) and technology changes (which may drive new monitoring and new functionality in the meters).

The smart meters that a DSO deploys must be upgradeable and new features must be backwards compatible. Furthermore, where hardware is in place, it must be possible to remotely upgrade the equipment through configuration and firmware changes, to avoid having to send out field-engineers to conduct meter by meter manual upgrades.

Whilst the traditional business benefits are relatively static in their demand for meter capabilities, the extended business benefits will demand flexibility in the capabilities of the metering infrastructure.

Distributed Intelligence

The flexibility to extend the meter infrastructure to meet future drivers is dependent on the distributed intelligence which can be provided by smart meters and the communications infrastructure. The more sophisticated AMI solutions provide meters with significant memory and processing power, allowing them to behave like mini-computers distributed throughout the low-voltage network. Other communications nodes within the infrastructure can be equipped with even more memory and computing power.

This distributed intelligence is the basis for providing additional monitoring, automation, and analytics capabilities which are required to meet the extended business benefits.

Substation Monitoring

Once intelligence is distributed into the field, it becomes possible to provide a whole range of new capabilities which have not been cost effective before. One example is substation monitoring, where the distributed intelligence can be used to create software solutions to monitor and control sensors for the substation and transformer, as well as the local CT meters. Previously, this was not cost effective, owing to the cost of deploying dedicated SCADA, DMS and communications elements. However, with distributed intelligence, it is possible to use existing advanced metering infrastructure to provide this capability.

This can address a number of the extended business cases including:

- Infrastructure investment reduction or deferral
- Operational efficiency
- Enhanced Customer Experience

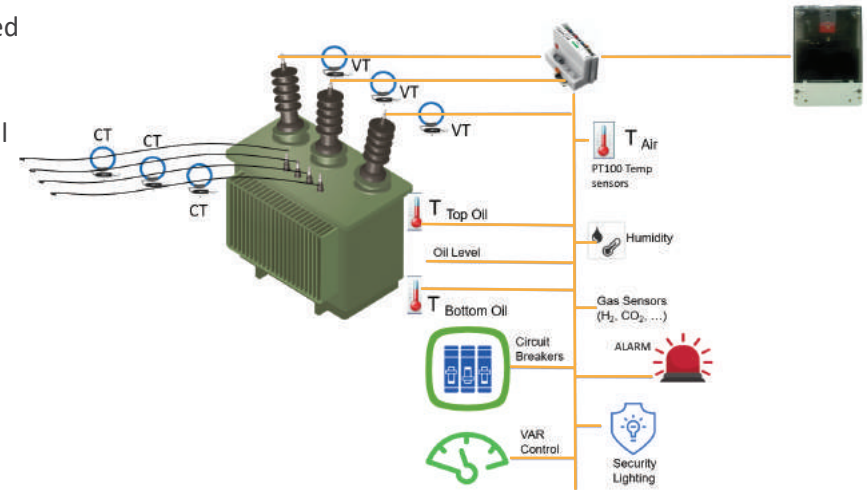


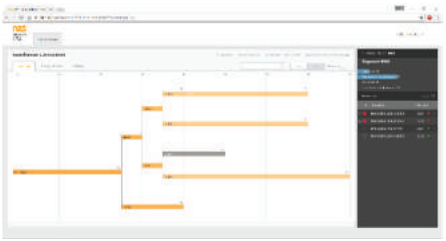
Figure 4 – A commercially viable Substation Monitoring solution to provide comprehensive visibility

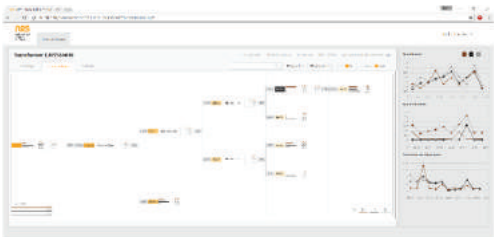
Analytics

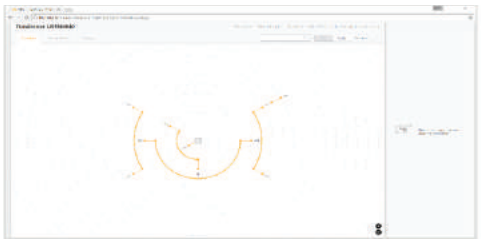
The end-goal for most DSOs in the mature market, and those DSOs in emerging markets looking to catch-up, is around analytics – using the information from the smart grid to make business decisions.

This has been readily available for the medium- and high-voltage grids through the mature SCADA systems which are cost-effective in these environments. This has not been available in the low-voltage grid where the sheer numbers of measurement points and historic communications challenges have made this not commercially viable.

However, by combining reliable and secure communications, fully featured meters, and distributed intelligence, it is now possible to provide the monitoring and control for the low-voltage grid.







Topology Analysis

- Discover your low-voltage grid topology and connectivity
- Track changes in configuration over time
- Understand the phase wiring across the low-voltage grid
- Remove dependency on paper records and cumbersome schematics
- Improve field-force usage
- Identify changes which may have introduced faults
- Expose topology information into other management tools

Energy Flow Analysis

- Provide power flow models for each phase of the grid
- Detect and alarm on phase imbalances within the low-voltage grid
- Identify transformer under or over utilization
- Identify meter mis-wiring
- Record current and historic low-voltage grid parameters
- Optimize use of low-voltage distribution assets
- Improve health and safely
- Avoid equipment failures and outages
- Increase customer satisfaction
- Improve regulatory compliance
- Reduce the need for expensive sensors

Energy Application Platform

- Cloud Ready, Move to the cloud when it suits you
- Secure, Improve your protection against cyber-attacks
- Distributed intelligence; use the smart grid to analyse and automate
- Robust communications with SLAs, connect to your AMI and use it as a low-voltage sensor
- Extensible, Flexible and Adaptable, allow you to differentiate and respond
- Compliance with standards; future-proof
- Open, SOA enabled through web-services API; integrate into your business decision tools
- Leverage your investment in high-quality technology solutions

Figure 5 – Analytics Solutions expose the value of your smart meter investment through the Energy Applications Platform

These capabilities provide the DSO with the opportunity to not only see what is happening in the low-voltage grid, but also incorporate that information into their analytics tools to drive the business decisions that will help them realise the extended business benefits, specifically covering:

- Distribution efficiency
- Reduced or deferred infrastructure investment
- Operational efficiency
- Non-technical loss reduction
- Regulatory compliance
- Customer experience and engagement
- Smart city and smart home

Implementation and Consulting Services

Deploying an Energy Applications Platform requires experience and skill. Productised Energy Applications Platforms provide pre-integrated and interoperable components which mean the heavy-lifting has been done already. However, understanding specifically how the solution can achieve business requirements and the configuration of the solution to meet those business and technology requirements is still required. Furthermore, success is also dependent on external factors, such as communications quality and system integration.

Energy Applications Platform deployments benefit from professional consulting and advisory services together with experienced implementation services. This ensures that best practices are followed, and the introduction of the Energy Applications Platform has both a short-term and long-term positive business impact.

MAKING THE BUSINESS CASE WITH THE ENERGY APPLICATIONS PLATFORM

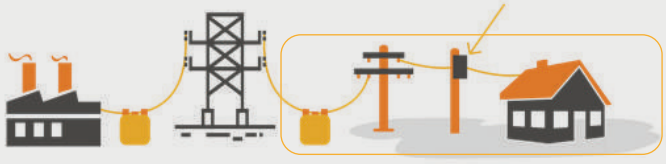
All the characteristics described above support the traditional and extended business case. What is required is to create the business case based on these characteristics and see how this can help you drive your evolution of the smart grid.

Business Case for Energy Applications Platform	Reliable Communications	Multi-function Meters	Interoperability	Security	Upgradeability and Backwards Compatibility	Distributed Intelligence	Substation Monitoring	Analytics
Traditional								
Billing Accuracy	✓			✓				
Reduction of Manual reading	✓			✓				
Remote Control of Supply	✓	✓		✓				
Product Innovation	✓			✓	✓			
Extended Case								
Distribution Efficiency	✓	✓	✓	✓	✓	✓	✓	✓
Reduced or Deferred Infrastructure Investment	✓	✓	✓	✓	✓	✓	✓	✓
Operational Efficiency	✓	✓	✓	✓	✓	✓	✓	✓
Non-technical Loss Reduction	✓	✓	✓	✓	✓	✓	✓	✓
Regulatory Compliance	✓	✓	✓	✓	✓	✓	✓	✓
Customer Experience and Engagement	✓	✓	✓	✓	✓	✓	✓	✓
Smart City and Smart Home	✓	✓	✓	✓	✓	✓	✓	✓

And here is where the consulting support from your smart grid partners comes to play. They bring experience from a wide range of similar businesses to help you define your long-term evolution of the smart grid in a sequence of incremental changes, each one of which is supported and sustained by a business case.

Pre-integration as a pre-cursor to agility ★

- Deploy anywhere, leverage local data processing and distributed intelligence and automation
- Implement latest industry leading security
- Deploy faster and with no disruption
- Upgrade and re-configure remotely, have confidence in backwards compatibility
- Achieve benefits on day one through in-built "know-how"
- Develop your own analytics to differentiate your services
- Integrate low-voltage network information with your business decision support tools
- Integrate low-voltage network information with your customer facing systems



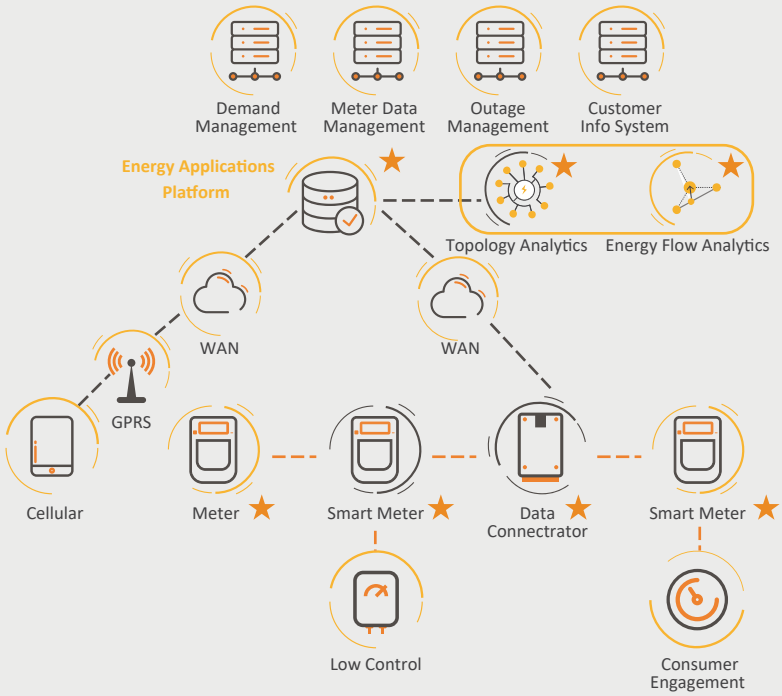


Figure 6 – The Energy Applications Platform, Expanded

★ EAP is a combination of meter, DCN, communication and back-end solutions. It covers physical infrastructure, distributed compute resource and distributed applications which privide, overall, **distributed intelligence** througout the grid.

Selecting your Smart Grid partners

When selecting your smart meter and AMI vendor, one of your key smart grid partners, it is important that you review all these points carefully, and consider how they will help you build and leverage an Energy Applications Platform. Failure to do so can result in a solution which does not achieve the full potential business benefits which would drive your return on investment.

Network Energy Services provides its Patagonia Energy Applications Platform to achieve these outcomes and, furthermore, is based on the widely adopted OSGP (Open Smart Grid Protocol) standard which meets all these criteria:

Consulting Services

Step one is to define the evolution path you require for your smart grid, and ensure you have a business case which can sustain you through the transition. NES has many years experiences helping its customers as they deploy their smart grid solutions, and this can help you define your own strategy to evolve; breaking the challenge into single steps, each of which has a realisable business benefit at the end.

Reliable Communications

NES meters are based on the OSGP which is a highly secure and reliable communications protocol. NES provides monitoring solutions and services which allow the DSO to ensure that the communications are achieving high SLAs, typically around 99.5%, pinpoint areas of lower SLA, investigate and identify the root-cause, and recommend a resolution action.

By achieving high SLAs in meter communications, it is possible to realise all the business benefits identified in both the traditional and extended business cases, otherwise it is not possible.

Multi-function Meters

NES smart meters are amongst the most functionally rich on the market providing the foundation layer for monitoring supply quality into the low-voltage grid, directly monitoring the customer experience, connecting to a range of devices on the customer's premise, and even controlling both supply and service consumed.

Interoperability and Technology Consolidation

NES has proven deployments incorporating three vendor solutions, all utilising OSGP protocol to communicate back to one head-end system. With this architecture, operations and maintenance, billing and analytics tools and processes perceive a consistent single view of the network. This technology consolidation leads to a process simplification, which brings additional flexibility and agility to respond to market and technology change.

Security

NES has designed security into the foundation of its smart meters as default capabilities. This covers communications, access to the meter, intrusion identification and intruder localisation/isolation. This means that your metering infrastructure will be safer from cyberattacks, which could, if unchecked, wipe out any business advantage from your smart grid deployment.

Upgradeability and Backwards Compatibility

NES smart meters have proven to be highly upgradeable, with DSOs upgrading 100Ks of meters remotely from the NES provided Smart Meter App (SMA). As an example, NES's latest security capabilities can be deployed onto all Generation 2, 3 and 4 meters deployed in the field, without adverse performance impacts.

The same is true about upgrading meter configurations in response to changes in regulatory requirements (for example, increasing the rate at which metering information is brought back to the billing systems) and updating meter configuration to implement new products, tariffs and capabilities. Again, infrastructure of many 100Ks of smart meters can be upgraded remotely from a single head-end system.

Distributed Intelligence

NES smart meters and distributed control nodes (DCNs) have on-board computing resources, which makes them perfectly suited for on-going functional extensions, and which will help the DSO meet specific business case drivers. Substation monitoring and analytics are just two examples of such innovation.

Substation Monitoring

NES provides solutions for substation monitoring; allowing the DSO to implement cost effective monitoring solutions for the low-voltage grid and provide visibility of components of the distribution network that, up to now, had no effective monitoring and management layer.

Analytics

NES has solutions to expose the rich breadth of low-voltage grid information available in the sophisticated meters to monitoring teams, analytics tools and other business support tools. As well as monitoring information, they also derive grid topology information from the communication characteristics. The result provides a management perspective on the operation of the low-voltage grid.

Implementation Services

NES has a professional services team which can help the DSO deploy the Energy Applications Platform and make the most of its features to realise the traditional and extended business benefits. Services range from deployment, to low-voltage grid optimisation through to security advisory services.

SUMMARY

Smart Grid can make business sense. It can provide the DSO with the means to generate return on investment. But, it needs the right technology partners providing established proven Energy Applications Platforms to make this a reality. The right Energy Applications Platform provides:

- Comprehensive functionality across all required characteristics; so the DSO does not have to custom create their own solutions to fill any gaps.
- "Out of the box" integration and interoperability provided by the solution; so the DSO does not have to integrate their own components into the architecture for it to work.
- Track-record of success with supporting deployment services where needed; to de-risk the introduction into the business.
- Productised solutions; so that the DSO can be part of the R&D investment and benefit from a roadmap which is driven by a wide industry need.
- Flexibility; the DSO needs to respond to market changes and technology opportunities.

With an Energy Applications Platform providing these features, the DSO can make the Smart Grid make Business Sense.

However, the challenge remains significant, and the DSOs need partners that will help them define an incremental set of steps. Each step must result in business benefits, and drive towards the overall strategic outcome; of developing the smart grid from a monetisation tool to a complete service platform for the low-voltage network.

And time may be running out. Whilst technology solutions, such as the Energy Applications Platform, are available today, it is important that DSOs develop their approach to using this technology so that they are able to plan a response to those changes in the market we can anticipate, and retain the flexibility and agility to respond to the unknown.

Only by doing this, does the electricity grid transition from being a passive distributer of power to an active and agile broker of energy; a true smart grid.

ABOUT NES

Networked Energy Services (NES) Corporation is a global smart energy leader in the worldwide transformation of the electricity grid into an energy control network, enabling utilities to provide their customers with a more efficient and reliable service, to protect their systems from current and emerging cybersecurity threats, and to offer innovative new services that enable active, intelligent use of energy.

NES was formed as a result of the spinoff of Echelon Corporation's Grid Modernization Division in October 2014. NES is headquartered in the US with R&D centers located in Silicon Valley, North Dakota and Poland, and sales offices throughout the world.

NES' smart grid technology is used in nearly 40 million smart meters and other smart end devices around the world. NES is a member of the OSGP Alliance, a global association of utilities and smart grid companies, which promotes the Open Smart Grid Protocol and cooperates to provide utilities greater value by enabling true, independently-certified, multivendor interoperability based upon open international specifications and standards. NES smart meters and grid devices are certified as open and interoperable by the OSGP Alliance.

ABOUT THE AUTHORS

Larry Colton has been working in the utility industry for more than 25 years with utilities, AMI and smart grid vendors and consultants in many different countries throughout the world. He has worked in a number of utility positions associated with distribution networks, transmission systems and generation facilities. Most recently, Larry has been focused on smart grid related projects. His experience includes requirements definition, business case development, ROI calculations, project structuring, partnership agreements, and project implementation. Larry has received several patents associated with advanced metering and communication systems, and he has participated in industry working groups, including IEC, ETSI, NEMA and IEEE, associated with the development of public and industry standards.
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Jon Wells has 25 years of experience in the telecommunications industry, moving into the similar industry of smart grid a few years ago. Through this time, Jon has focused on helping network operators manage their distributed technology infrastructure; providing management solutions and also helping them develop business cases. He is able to bring the experience of the telecommunications industry into the arena of smart grids, quickly drawing upon the parallels to assess opportunities for cost reduction, efficiency improvement and customer experience improvement and use this to develop relevant and practical business cases for DSOs. Jon has held director roles in technical consulting, business consulting, and business development and is currently Director of Product Marketing for Networked Energy Services.
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