Logical steps to logistics optimization
Preparing for smart metering mass deployment

High performance. Delivered.
Around the world, smart metering is a major transformation changing the way energy and utility companies engage with their customers. Through new technological solutions, energy consumption information will be available in real time, allowing customers to benefit from different tariffs and improve energy management in the home.

Smart metering deployment is very different to traditional metering activities. Scaling-up businesses to deliver massive deployments of new meters presents challenges at many levels: technological e.g. new systems and systems integration with meters; as well as skills and recruitment, e.g. up-skilling of existing labour and recruitment of new capabilities. Within the supply chain responsible for moving metering materials from suppliers through to engineers in the field, the cost of assets being handled is up to ten times that of traditional metering equipment. Also the function has to respond to an unprecedented rate and pace of install.

This means that even the smallest stock loss can translate to a significant cost impact. If the logistics infrastructure (warehouse and stores) does not match the deployment plan because, for example, stores are in the wrong location or have exceeded their stockholding capacity, engineers incur additional drive time and have less opportunity to engage with the end-customer.

The result of a poor performing logistics function is to add program and business risk to a complex transformation project. The impacts are potentially widespread, including cost overruns and the utility underperforming compared to its business case, as well as customer churn and damage to reputation. Ultimately, utilities also face the risk of failing to meet regulatory commitments.

In this paper, we look at the installation journey and opportunities afforded through optimization of the supply chain.

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1 What is supply chain in the context of an asset-intensive industry? Supply chain is the integration of procurement, logistics and operational functions to ensure the right materials are delivered from point of supply through to point of installation (along with management of used / returned assets).
Smart metering mass deployment challenges

The scale, duration and cadence of a smart meter deployment places exceptional pressure on the logistics function of most utilities. Utilities have found themselves achieving weak returns on investment due to poorly planned processes and implemented systems that together fail to underpin a high performing supply chain. The team potentially loses time through inefficiencies, as well as through their efforts to rework and right the situation. Poor productivity can be due to sub-optimal asset use or under-utilized engineers, as well as, high working capital due to inflated or insufficient inventory or stock loss. Typical stock loss within traditional metering operations [pre-smart] range from 0.3% to 3.5%, equating to approximately USD 0.25m – 2.94m losses per 1,000,000 meters deployed [based on an average asset price of approx. USD 84].
Optimizing supply chain performance can deliver positive business outcomes, with financial benefits achieved through greater workforce efficiency and improved cost management, as well as better return on invested capital.

**Figure 1: Optimizing supply chain performance for increased shareholder value**

**Shareholder Value Tree**

- **Profitability**
  - Workforce Efficiency
    - Improved product availability
    - Improved time on tool
    - Decreased mean time to repair
  - Costs
    - Reduced infrastructure costs
    - Reduced people costs
    - Improved productivity in stores
    - Improved rates from suppliers
  - Working Capital
    - Lower inventory levels
    - Higher asset utilization
    - Reduced obsolescence
- **Invested Capital**
  - Fixed Capital
    - Fewer physical assets (i.e. stores, vehicles, MHE, IT)

**Typical Financial Benefits**

- 10 - 15% efficiency
- 10 - 30% costs
- 10 - 20% inventory
- 10 - 30% asset utilization

**Benefits of logistics and supply chain optimization**

- Improved product availability
- Improved time on tool
- Decreased mean time to repair
- Reduced infrastructure costs
- Reduced people costs
- Improved productivity in stores
- Improved rates from suppliers
- Lower inventory levels
- Higher asset utilization
- Reduced obsolescence
- Fewer physical assets (i.e. stores, vehicles, MHE, IT)
More broadly, optimization of the smart meter supply chain function can drive towards better management of cost and risk, as well as a more efficient and effective deployment.

**Figure 2: Quality, cost and risk benefits can be generated through a logistics optimization strategy**

<table>
<thead>
<tr>
<th>Better cost management</th>
<th>Greater risk control</th>
<th>Improved solution quality</th>
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</thead>
<tbody>
<tr>
<td>- Cost to serve associated with deploying materials to engineers and the installation thereof, improved by reducing warehousing and stores and optimizing the time and frequency of material replenishments</td>
<td>- Failed appointment risk reduced by having the correct materials available for installation through good inventory management processes</td>
<td>- Improved flexibility and scalability to meet challenging and changing demands in installation profiles, thanks to a robust logistics network, linked to a master deployment plan, enabling readjustment and continuous improvement in the supply chain process</td>
</tr>
<tr>
<td>- Working capital minimized through good stock management processes</td>
<td>- Idle engineer risk limited by ensuring a minimum inventory and having the right stock</td>
<td>- Eradication of stock losses by tracking and tracing assets throughout the supply chain</td>
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<tr>
<td>- Waste and returned assets removed from the field for recycling or re-use in line with scrap value</td>
<td>- Reduce liability by minimising investment in capital and equipment, and people-count by using third party logistics infrastructure, systems and resources on a transactional basis</td>
<td>- Quality problems during manufacturing detected by properly tracking each device through its life-cycle and being able to determine if detected errors come from a common manufacturing batch</td>
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<td>- Weight on vans reduced, improving vehicle performance through fuel savings, as well as potentially improved driver behaviour leading to improvements in safety</td>
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<td>- Reduced drive time for engineers replenishing stocks by optimizing the network of warehouses and stores</td>
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A major European energy provider conducted an assessment of their logistics function against future requirements, identifying insufficiencies in the supply chain and a potential stock loss of 3-4 percent.

A major US telecoms provider outsourced their logistics provisioning involving Forth Party Logistics (4PL) operations in transport planning and network optimization through an onshore (planning) and offshore team (for supply chain optimisation and analytics), generating significant benefits in asset (vehicle) utilisation.
The smart meter installation journey

1 Develop a clear supply chain strategy

There are several key operational dependencies that underpin a successful smart meter installation journey. Utilities should ideally manage, optimize and integrate the entire supply chain in order to deliver effective field operations and ultimately a successful smart metering deployment. At the outset utilities should carefully undertake deployment planning, including forward and reverse supply chain planning and asset and inventory management.

**Figure 3: Supply chain design and execution**

<table>
<thead>
<tr>
<th>Deployment planning</th>
<th>Forward supply chain</th>
<th>Reverse supply chain</th>
<th>Asset and inventory management</th>
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<tbody>
<tr>
<td>Understand the demand profile including annual, monthly and daily meter installs, varying different housing types, potential access restrictions, and assets and consumables required per property through site intelligence</td>
<td>Have adequate supply chain infrastructure to serve engineers; skilled logistics professionals to pick and ship assets; and asset tracking capability from supplier through to installation</td>
<td>Run fault management, quality assurance, warranty management and meter triage processes e.g. sorting, testing and refurbishment, in order to manage large volumes of both redundant and faulty assets back through the supply chain to manufacturers and recycling agents</td>
<td>Understand where assets are in the supply chain from suppliers to warehouses, stores, vans and through to installation, and minimize working capital whilst maximizing the number of jobs per day from available stock</td>
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</table>
2 Determine which supply chain functions are fit for purpose

A high performing supply chain for smart meter deployments should bring together processes and systems across deployment planning, procurement, logistics—including asset and inventory management—with field operations. Utilities designing the optimum solution, should map the supply chain from end-to-end and make an informed strategic decision about which functions are core and non-core to the business. This will drive a decision process around parts of the supply chain that should be retained in-house, versus outsourced or partially outsourced, allowing the utility to potentially benefit from lower cost, innovative third party solutions.

Figure 4: Optimum supply chain design blueprint
Practical recommendations for improved logistics optimization

**Manufacturer**
Develop an integrated approach for greater surety of supply from key suppliers, through effective category management and supplier relationship management capabilities.

**Warehouse**
Assure robust warehouse inventory management procedures and capability, linked to the master deployment plan and to the product manufacturer through effective supplier relationship management.

**Vans/vehicles**
Design a logistics network to ensure minimal drive time and number of replenishments. Consider geographic context and meter install types. Manage van stock in the field with regular audits to remove squirrel stocks and weight.

**Meters**
Track and trace assets through the supply chain through robust asset and inventory management capability. Focus on returns management, as much as outbound deployment. Implement a robust returns supply chain, with triage processes to sort, test, repair and recycle assets.

**Asset owner**

**Engineers**
Secure effective management information to inform better decision making around asset levels and location, in order to manage engineer resource levels.

**Customer**
3 Execute on your supply chain strategy

Utilities can integrate key functions across procurement, logistics, asset and inventory management and field operations to gain control and visibility of all supply chain activities through implementation of a supply chain control tower, linking overall deployment planning with supply chain execution.

Figure 5: Supply chain control tower model driving greater integration and visibility across the supply chain

In the context of a smart meter rollout, through the implementation of logical steps to logistics optimization, utilities have the opportunity to reduce program and business risk, as well as customer churn and damage to reputation.

1. Develop a clear supply chain strategy to link procurement (supply), field operations and the integrated deployment plan (demand) with logistics and consider operationalising this through an operations control tower.

2. Determine which supply chain functions are fit for purpose for example, undertake a capability assessment to quantify and measure the current logistics function and its ability to scale and meet future business requirements.

3. Execute on your supply chain strategy and determine whether an in-house, outsourced or blended model best suits the business requirements. Set up an operations control tower, for greater integration and visibility across the supply chain. When demand subsides, work through the impact to your supply chain strategy in order to adjust to usual maintenance activities.

Conclusion

In the context of a smart meter rollout, through the implementation of logical steps to logistics optimization, utilities have the opportunity to reduce program and business risk, as well as customer churn and damage to reputation.
What is the path toward the future digital grid?

Accenture’s Digitally Enabled Grid program provides actionable insights and recommendations around the challenges and opportunities utilities face along the path to a smarter grid. Drawing upon primary research insights from utilities executives around the world as well as Accenture analysis, The Digitally Enabled Grid examines how utilities executives expect smart grid technologies and solutions to contribute to their future networks.

For more information on Accenture’s Digitally Enabled Grid program, go to www.accenture.com/digitallyenabledgrid.

About Accenture Smart Grid Services

Accenture Smart Grid Services focuses on delivering innovative business solutions supporting the modernization of electric, gas and water network infrastructures to improve capital efficiency and effectiveness, increase crew safety and productivity, optimize the operations of the grid and achieve the full value from advanced metering infrastructure (AMI) data and capabilities. It includes four offering areas which cover consulting, technology and managed solutions: Work, Field Resource Management; Transmission & Distribution Asset Management; Advanced Metering Infrastructure and Grid Operations.

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