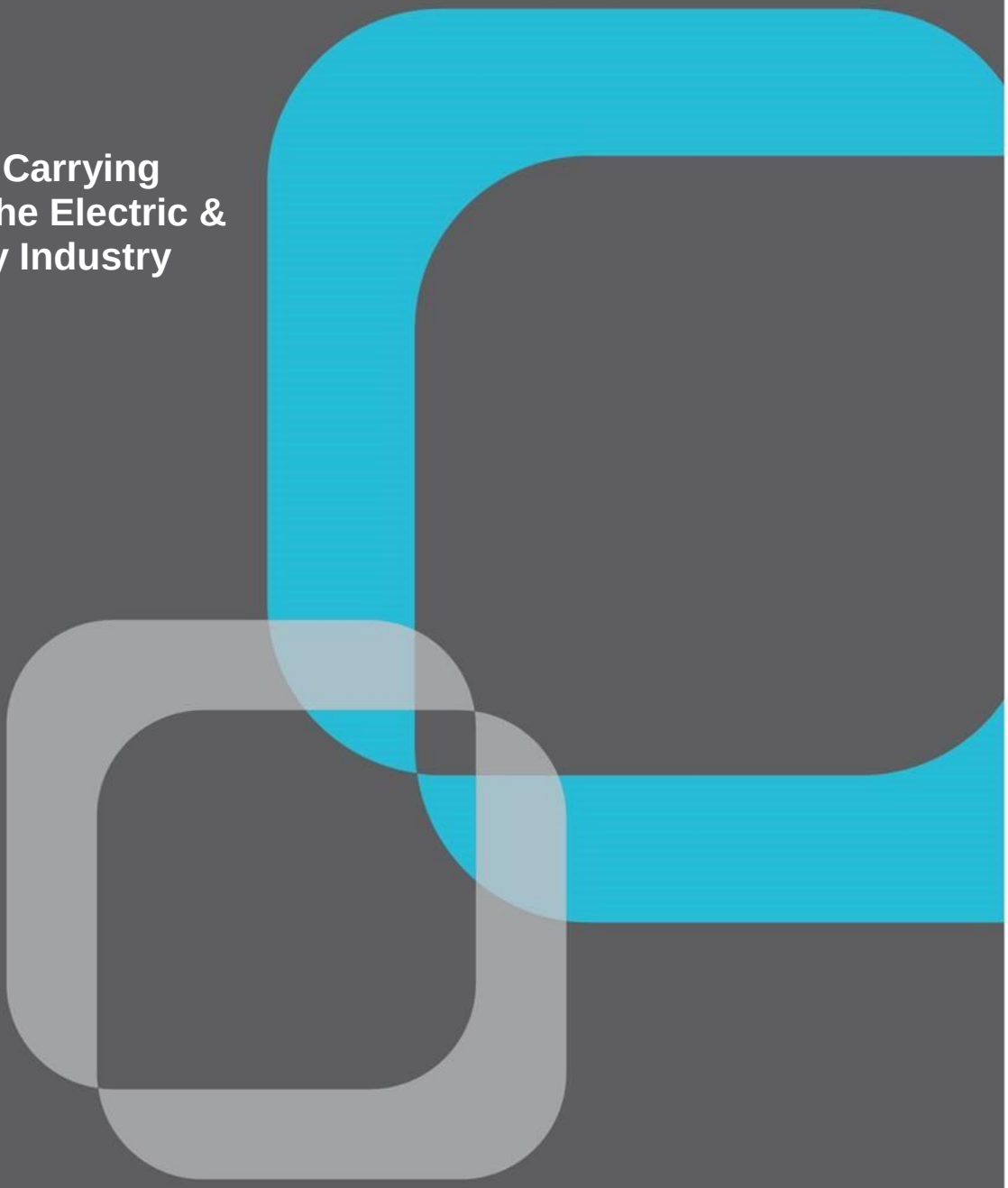
Inventory Carrying Costs in the Electric & Gas Utility Industry



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SUMMARY

The calculation and use of inventory "carrying costs" is a standard leading practice in supply chain management. In a recent multi-industry benchmarking survey, more than 78% of the respondents indicated that they calculate and apply this metric. More than half indicated that they use the metric to make inventory management decisions. Similarly, a study of supply chain management software found that the most frequently used module was the inventory optimization and replenishment module which uses inventory carrying costs to estimate optimum levels of inventory for each item. Eighty-five percent of the respondents currently use, or plan to use, this module as part of their supply chain management operations.

Unfortunately, the use of this metric is less than in most industrial sectors due to the regulated nature of the industry. Nevertheless, we believe that the metric is an important component of any leading supply chain operation and should be widely adopted within the utility industry. Our rationale is as follows:

1. We believe that it is management's responsibility to optimize actual shareholder return on assets (ROA) and to ensure that regulated revenue is not earned on unnecessary or obsolete assets.

2. Inventory in excess of what is needed to meet established "levels of service" (e.g., desired availability) is "surplus" inventory and should be eliminated. Maintaining such inventory reduces actual ROA and may result in artificially inflating regulated revenue.

3. Inventory is "optimized" when there is no surplus inventory. The objective of the materials management team is to determine the "optimal" level of inventory and then work to achieve this level for each item under its control.

4. In order to calculate "optimal" inventory levels, it is necessary to derive and apply an estimate of inventory carrying costs.

5. Finally, calculating inventory carrying costs provides a core metric that is routinely used in leading materials management practices for a variety of purposes including: (1) determining economic order quantities (EOQs); (2) determining lot sizes; (3) performing price break analysis; (4) making make-to-order vs. make-to-stock decision; (5) analyzing lifetime buys; (6) evaluating promotional deals from suppliers; (7) evaluating vendor-managed inventory (VMI) opportunities; (8) conducting inventory risk analysis; and (9) setting annual budgets.

INVENTORY OPTIMIZATION

The objective of inventory replenishment is to ensure the adequate inventory is on hand to meet anticipated demand at a pre-determined level of service. Level of service is defined as the desired level of inventory availability. This is generally expressed as a percentage of times that the part is available when needed. Inventory is considered optimized when the least amount of inventory is on hand to meet the desired service level. Given this understanding, inventory reduction, in itself, is not a desirable outcome. Inventory optimization, on the other hand, is.

Surplus Inventory

Inventory on hand that is in excess of the optimized level is surplus inventory. Surplus inventory consists of "excess inventory" (e.g., usable items in quantities above their optimized levels) and "obsolete inventory" (e.g., items that can no longer be used due to obsolescence, damage or other reasons). Having surplus inventory on hand is undesirable for a number of reasons, the most common of which are listed in the table below.

Figure 1: The Cost of Surplus Inventory

Opportunity Cost/Financing Cost	Surplus assets have zero value to the company until they are converted into cash in the course of operations.
Poor Space Utilization	Surplus assets occupy space that could be used for productive, revenue-generating activity.
Depreciation Expense	Relative to other assets, surplus assets depreciate more rapidly in value as they become obsolete.
Tracking Expense	The cost of resources allocated to track surplus assets could be better utilized in other activities.
Maintenance Costs	While sitting idle, some surplus assets must be maintained to keep them in good operating condition.
Damage and Repair	Surplus inventory is subject to damage in the warehouse resulting in potential repair costs and potential write-off.
Shrinkage	Surplus inventory is subject to loss and shrinkage.
Insurance Costs	Surplus assets must be insured against damage.
Higher Taxes	Surplus assets may increase the company's property tax.
Lower ROA	Surplus assets reduce a company's ROA (a key financial measure that reflects a company's performance). A low ROA represents inefficiencies and impacts stock price.

Some of these factors are more relevant to the utility industry than others. In general, however, surplus inventory above what is needed to optimize service levels is simply wasteful.

CALCULATING INVENTORY CARRYING COSTS

Inventory carrying costs are all costs associated with holding materials and supplies in inventory prior to their use by the business. There will always be an inherent trade-off between the cost of holding inventory and the impact on desired service levels. It is essentially a financial and operational decision—"how much inventory holding cost should we absorb to meet our desired service level?" If the cost is set at zero, then holding inventory has no cost, and it will be financially feasible to hold greater volumes of inventory. On the other hand, if inventory holding costs are higher, then there will be increased pressure to reduce inventory levels.

The elements that typically comprise inventory carrying costs are discussed below. In each case we address the cost category, as well as our experience in dealing with these costs in the utility environment.

Opportunity Cost/Financing Cost

The cost of money is the most commonly applied element of inventory carrying costs. In fact, a 2005 study showed that all companies that calculate carrying costs use this element. Since inventory is an "asset" it must be financed on the balance sheet by a combination of equity and borrowings. As a result, this cost element is generally estimated using the company's "Average Weighted Cost of Capital (AWCC)." Optimizing inventory by eliminating surplus items frees up this money, which can then be applied more productively elsewhere. This, in turn, improves the company's productive use of assets and overall profitability.

In the utility industry, financing costs are generally lower than those found in other industries. Typically, utility AWCC values will range from 6.5% to 8.5% versus 9.5% to 12.5% in other industries. While this may appear as a theoretical opportunity cost, it is real and has an immediate impact on the utility's asset utilization and potentially on its share price and market capitalization.

Transportation Costs

Transportation costs are incurred in moving inventory from suppliers to the warehouse and handling any returns back to the suppliers. Optimizing inventory reduces the frequency of orders and the volume ordered. This, in turn, reduces transportation costs. This cost is generally estimated by taking total annual transportation cost and allocating it to inventory based upon either dollar value or weight. This cost is applicable to utilities as well as non-utilities.

Warehouse Space

Reducing inventory levels will result in freeing up warehouse space. The actual value of this element depends upon the company's warehouse space situation. At some locations, lower inventory may help defray the need to build new warehouses to accommodate fossil plant scrubber inventory or growth in distribution customers (and potentially improve productivity as less work is required to slot inventory upon receipt). For others, it will simply result in unutilized warehouse space. The actual benefit must be determined on a warehouse-by-warehouse basis.

Warehouse Labor

This is generally the greatest source of cost savings associated with inventory reduction. The argument is that lower inventory levels should result in a reduction in the number of full-time equivalents (FTEs) needed to count and maintain the inventory. However, since most warehouse labor is involved in receiving, putaway, and issuing inventory, a reduction in surplus inventory will not necessarily result in a proportionate reduction in labor expenses. In other words, a 20% reduction in inventory levels might only result in a 5% or 7% reduction in warehouse FTEs. The actual benefit must be examined on a company-by-company basis.

State and Local Property Taxes

Since inventory is a physical asset, it can be subject to state and local property tax. When this is the case, a dollar reduction in inventory can result in reducing the company's property taxes. The impact is calculated by multiplying the value of the inventory reduced by the company's marginal tax rate. Many utilities, however, do not pay state or local property taxes on their inventory levels. In these cases, this element should be excluded from the calculation of inventory carrying costs.

Property Insurance

In a similar manner, inventory is generally insured against damage and loss under the company's overall casualty and loss insurance. While it may be specifically identified in the policy, in most cases it is not. Instead it is lumped into the company's overall property values. Since the insurance premiums may be tied to broad ranges of property value, one could argue that a reduction in inventory alone will be insufficient to lower the company's overall property values and therefore will have no impact on actual cash savings. We would argue against this interpretation since, followed to its logical conclusion, no single reduction in property would lower insurance costs. However, if multiple property items were taken together they would lower the overall property values sufficient to change the value bracket. The fact that one particular action is not sufficient to lower insurance is not an adequate argument for excluding this cost element.

Commodity Devaluation

Commodity devaluation represents the loss in value of standing inventory due to its reduced market value. In some industries, such as computer chips, this is the largest component of inventory carrying costs. Items not sold quickly become worthless in the marketplace, and this loss is added to the cost of holding such inventory. Commodity devaluation costs can be calculated by determining any variance between current unit prices and historical unit prices. This variance can be either negative (the unit has declined in value) or positive (the unit had increased in value). Our experience in calculating these changes within a utility generation environment showed a nearly equal mix of gains and losses with no significant net impact on inventory values. Again, the situation should be examined on a case-by-case basis.

Inventory Damage/Repair Costs

All stored inventory is subject to the possibility of damage in the warehouse. Items are dropped, lift trucks back into storage racks, and fire and other accidents occasionally happen. Any inventory on hand is subject to these potential risks. The appropriate way to determine this cost is to measure the

company's (or warehouse's) actual damage and repairs costs over the past year. This will generally be relatively small, but can still add up to six figures in a mid-sized utility.

Obsolescence/Write-offs

Obsolescence can be one of the largest elements of inventory carrying cost. An inventory item becomes obsolete when it can no longer be used productively within the company. Typically, utility inventory becomes obsolete as a result of maintenance-related parts and spare parts becoming useless when their associated plant or field assets are retired. Identifying these parts requires accurate bills of material for all assets so that associated parts can be identified for each retired asset.

All utilities experience some degree of inventory obsolescence every year. This cost can be a major contributor to inventory carrying cost. Since any inventory that is acquired runs the risk of becoming obsolete at some point, this cost should be included in all utility inventory carrying costs calculations. Generally, this value can be easily determined by reviewing the company's inventory write-off values for a particular year or range of years. This analysis can also be performed on different commodity classes, after which different obsolescence rates can be applied to actual inventory values for those classes.

Shrinkage Adjustments

Shrinkage represents losses due to pilferage or other "unexplained" discrepancies in the physical count of inventory. It occurs in the utility industry, as well as all other industries. It is generally easily calculated based upon inventory count records and adjustments. It will generally be a very small element of utility inventory carrying cost, but should be added to the overall calculation as it will typically total six-figure values.

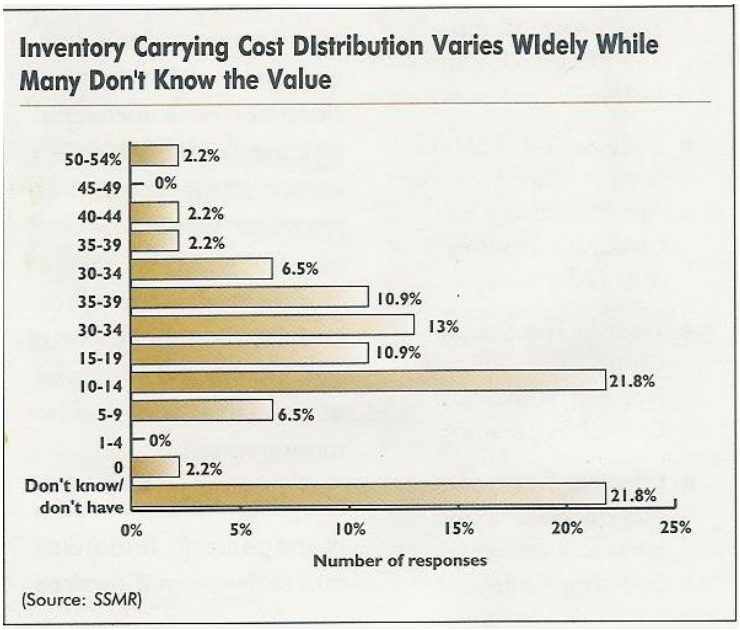
Inventory Management Fees

The last component of inventory carrying costs consists of any "inventory management fees" that the company pays to third parties. These may be related to Vendor Management Inventory (VMI) or other arrangement whereby vendors hold or manage inventory on behalf of the company. These costs can range from insignificant to very significant depending upon the company's use of third-party services. As with other inventory carrying costs, the assumption is that if less inventory was on hand, these costs would be proportionately reduced. Accordingly, these costs should be included in the overall inventory carrying costs calculation.

INVENTORY CARRYING COSTS AS A CORE METRIC

Inventory carrying costs vary greatly by industry. A survey reported in 2005 showed that companies use a wide range of cost factors as shown in Figure 2 below. The median carrying cost estimate was 21.8% of total inventory value, while the average carrying cost was 12.3%. Our experience with utilities shows that carrying costs in the range of 10% to 15% are more common.

Figure 2: Inventory Carrying Costs – All Industries



Source: "Inventory Carrying Cost: Critical Element in Purchasing Decisions, But Applied Sparingly," Supplier Selection & Management Report, (IOMA, New York, February, 2005.), p. 2

ScottMadden's long history working with utilities and deep understanding of the key performance levers in supply chain give us a clear lens through which to view efficiency and effectiveness. Additionally, ScottMadden's proven methodology to uncover the true drivers of inventory levels and develop realistic improvement plans is the most comprehensive approach in the industry. We encourage you to learn more about our capabilities and opportunities to optimize your inventory levels. To learn more about ScottMadden's supply chain practice, please contact us.

About the Authors

Andy Flores (aeflores@scottmadden.com) is a partner in ScottMadden's Atlanta office.