



Dar Al Riyadh Insight #51

Capital Efficiency - Pull All the Levers

Dar Al Riyadh Insights reflect the knowledge and experience of our Board, executives and staff in leading and providing PMC, design and construction management services. Dar Al Riyadh believes in the importance of broadly sharing knowledge with our clients and staff to improve project outcomes for the benefit of the Kingdom of Saudi Arabia.

What is Capital Efficiency?

In simplest terms capital efficiency (sometimes referred to as capital intensity) is about getting the biggest bang for the buck.

"Leaving the question of price aside, the best business to own is one that over an extended period can employ large amounts of incremental capital at very high rates of return. The worst business to own is one that must, or will, do the opposite - that is, consistently employ ever-greater amounts of capital at very low rates of return."
-Warren Buffett, 1992 Chairman's Letter

There are a myriad of definitions used when describing capital efficiency. The basic formula for calculating capital efficiency involves dividing the average value of output by the rate of expenditure for the same period of time. This may be considered over an assets life cycle or for more discrete time periods in order to see if capital efficiency is improving or degrading over time.

A common definition used is "Return on Invested Capital" or ROIC defined as Net Operating Profit After Taxes (NOPAT) divided by Invested Capital.

What are the Components of Capital Efficiency and Who and How Can they be Influenced?

Capital efficiency as measured by Return on Invested Capital (ROIC) can be described as:

$$\text{ROIC} = \text{Operating Margin} \times \text{Invested Capital Turnover}$$

Each of these terms offers opportunities for the owner and his principal capital facility provider (such as his engineer constructor or PMC) to add value, improving the capital efficiency of the asset.



Let's look at each in turn.

- **Improving Operating Margins**

Operating margins are defined as:

$$\text{Operating Margin} = \text{NOPAT/Sales}$$

Where, NOPAT is:

Earnings Before Interest and Taxes (EBIT) = Revenue – Operating Expenses (OPEX), including feedstock and energy costs

Less

Non-operating income, losses

Less

Income tax provision

Less

Interest expense * tax rate

Plus

Non-operating income, losses * tax rate

And, the sales denominator is revenue from the sale of asset output which can be defined as:

Sales = Unit product sales price * Rated Plant Capacity * Capacity Factor (Function of plant performance and availability)

The asset owner's PMC has an ability to influence Operating Margin through:

- Interest expense (through CAPEX schedule which may play through to asset interest charges associated with the selected asset capital structure),
- OPEX and availability driven Capacity Factor (through maintenance and turnaround strategies; quality design (potential to up-rate or further debottleneck a plant); required feed stock levels; and inherent energy efficiency and incorporation of renewable energy and storage solutions)

The asset owner can influence Operating Margin through:

- Premium pricing (relative to the market level set by supply and demand) for product as a result of marketing, packaging and distribution strategies
- Sales to absorb the maximum efficient capacity of the plant



- Operating practices focused on predictive and preventative maintenance (may be done in conjunction with his PMC)
- Control of other OPEX costs such as marketing and sales

Invested Capital Turnover

Invested capital turnover is defined as:

$$\text{Invested Capital Turnover} = \text{Sales} / \text{Invested Capital}$$

Where Invested Capital =

Operating Working Capital (current assets (includes inventories) – current liabilities)

Plus

Net Property, Plant and Equipment (PPE) (book value of property, plant and equipment, net of cumulative depreciation)

The owner's influence over pricing and sales level is identical to that described with respect to Operating Margins in the previous section.

The owner's PMC has an opportunity to influence:

- Plant availability (influencing sales levels),
- Required inventories (through design and supply chain), and
- Net Property, Plant and equipment (PPE) through associated capital costs (CAPEX)

Strategies to Improve Capital Efficiency

The balance of this series of Insights focuses on the five areas identified as within the influence of the owner's PMC. The other levers associated with:

- Premium pricing
- Sales level
- Operating practices
- Control of other operating costs such as sales and marketing are not addressed further in this series.

The owner's PMC can drive process improvement along the five principle opportunity areas identified to improve capital efficiency to the extent that he is enabled by the owner's organization and contract form.

This is key, since best of class capital efficiency may require change contracting and project execution practices from what the owner has traditionally utilized. Examples may include life cycle contracting, increased use of fabrication and modularization, and utilization of the



PMC's supply chain which is tuned to the delivery of capital assets versus the owner's product profile.

These five areas (reordered), capital efficiency levers if you will, include:

- CAPEX
- Schedule
- OPEX
- Plant Availability
- Inventories (Supply Chain Design)

We will look at each in turn through the balance of this series of Insights.