

# Improve the value of plant based project portfolios

To improve the value of projects, owners need to focus on the right measures of success

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Refineries, chemical manufacturing facilities, power generation facilities, and other industrial plants seem to have an unlimited supply of justifiable projects. Many are driven by regulatory, safety, or other operational needs. Many are discretionary, seeking high returns (typically measured by internal rate of return [IRR] or net present value [NPV]) trying to capture a market opportunity. In examining these projects in Industry, our research shows that more than half of these plant based projects do not meet their business objectives. Furthermore, our research indicates that by improving project categorisation, prioritisation, and selection, many owners can reduce their expenditure on plant based projects by 25% and still achieve the plant's objectives for health, safety, and environmental (HSE) and reliability. Implementing other portfolio focused and project focused best practices could potentially reduce expenditures by another 15-20%. With many sites spending between \$50 million and \$100 million annually on these plant based capital projects, the potential savings would have a tangible impact on the bottom line.

Figure 1 illustrates the benefit of using best practices to optimise the value provided by investing in plant based projects. Plant based projects are often difficult to assess, develop, and implement due to the varied nature of their business drivers and scope. The challenge is to optimise project selection and execution of a portfolio of projects, rather than to optimise the execution of an individual project

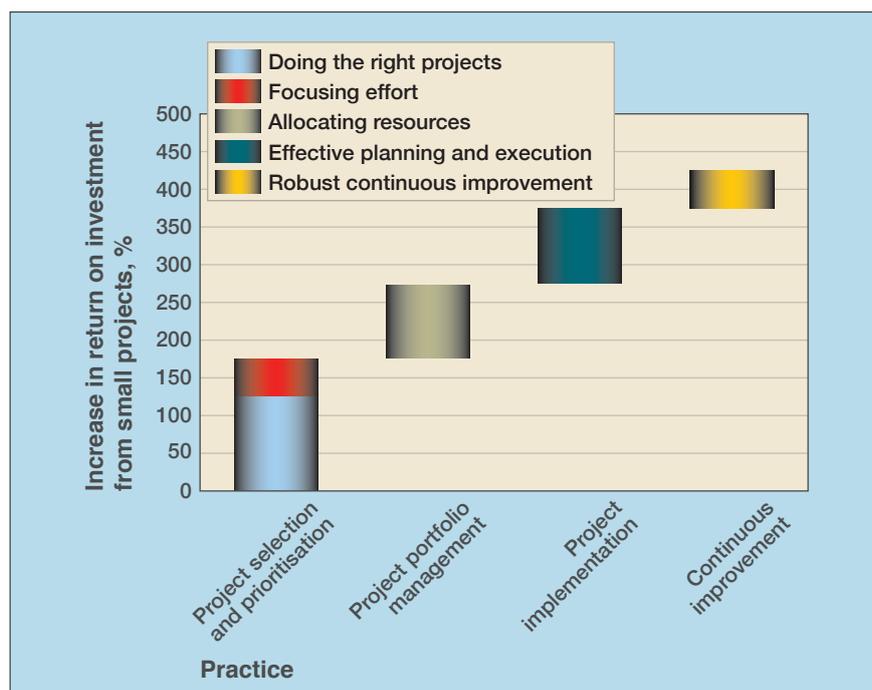


Figure 1 Impact of plant based project practices on delivery of value

that will achieve the discount rate or some other financial hurdle. Effective use of the capital budget in terms of project selection and delivery can provide a site with tens of millions of dollars annually in savings or improved value. Successful delivery of a portfolio of projects requires that Industry shift its project paradigm to a more comprehensive view that involves prioritising the project portfolio and managing a portfolio of projects.

## Industry is overly focused on optimising individual projects

Many plant based projects are non-discretionary, meaning that they address health, safety, environmental, or regulatory needs. Some are discretionary, but address infrastructure needs that are difficult

to quantify. Some keep the plant operating reliably. Others are premised on providing a huge return on investment. Still, companies expend the capital to maximise the assets' NPV for the total life cycle. Refineries and process plants can systematically evaluate the performance of their capital project portfolios to identify opportunities to make better use of capital.

Getting the full value from the expenditure on plant based projects is difficult, because:

- There are several different project stakeholders with competing priorities. Stakeholders lack quantitative tools to prioritise and select projects and to assess project delivery, resulting in differing perceptions on project success.

- **The projects are difficult to evaluate quantitatively**

Quantitative assessment of projects is based on ineffective metrics, such as delivering a project within budget and schedule, leading to practices that erode rather than improve overall value to the enterprise.

- **Industry's project execution paradigm is more appropriate for major projects**

Application of Industry's large project paradigm to plant based projects results in projects that do not deliver value and fail to meet stakeholder expectations.

The interrelated nature of these issues exacerbates the challenge to deliver value. And the complexities can result in a cascade of project failures. Sometimes failure to deliver value has become so common that sites accept these problems as normal. But manufacturing facilities and project organisations can improve the value that they deliver by taking a more comprehensive view of the project process and the value generated from it, thereby avoiding common pitfalls such as:

- **Projects failing to deliver the promised value**

Projects generating a return are often premised on a ROI that is 50% or higher. Few owners capture all the value on some of the small projects to which they were premised because the returns are based on unrealistic assumptions that most of the time go unchallenged or are at least inconsistently challenged. If all ROIs are realised on a large facility with, for example, a budget of \$100 million per year for plant based projects, and that has been going on for 20 years, the potential profits from these projects alone would be billions of dollars, notwithstanding the revenues from investment in the original asset.

- **Failure to deliver high value projects**

Site project organisations often lack the ability to respond to schedule driven opportunities because their project work process requires spe-

cific deliverables and timelines to ensure that no project over-runs by more than 10%. To improve the accuracy of their estimates, some sites need to develop 'issued for construction engineering' deliverables ahead of final funding. This practice significantly extends the front end development process beyond the norm of funding after 'issued for design' deliverables, and often causes project teams to miss time sensitive opportunities.

- **Differing perceptions on the value delivered by project organisation**

Operations representatives and commercial representatives are frustrated by an inability to deliver the projects that provide the most value. At the same time, project organisations view themselves as responding

## **Manufacturing facilities and project organisations can improve the value they deliver by taking a more comprehensive view of the project process and the value generated from it**

to their customers' requests, rather than solving a problem or capturing a business opportunity.

- **Constantly changing priorities**

Projects are sequential in nature and are based on a set of unknowns that become more and more known as the project progresses in its development process. Shifting priorities causing different projects to take priority, and slowing or shelving other projects for a significant period of time, changes the environment. Thus, many thought-to-be-knowns become unknowns or surprises in the future, causing wasteful recycling and inefficient use of resources at best, and failed projects that have

been developed based on information that is no longer valid.

- **Under-utilised projects**

Installed equipment is not used per the project premise because the need for the project was not vetted. The site may have been able to find a better solution to address its need that did not involve a project.

- **Overspending on the project portfolio**

Sites may spend substantially more than their peers on their project portfolio because unnecessary projects are pursued to ensure that 100% of the annual project budget is spent, further exacerbating poor selection and out-of-sequence engineering and execution.

### **Industry needs to shift its focus to the entire project portfolio**

Most project organisations focus heavily on the front end development (or planning) of individual projects, and on the execution of individual projects. The metrics for measuring the success of individual projects are well suited to major projects and optimising individual projects, but not effective for driving the success of a portfolio of projects. This can also lead to inefficient work processes for plant based projects because of the enhanced focus on front end development at the project level.

Focusing on the portfolio, Asset Performance Networks (AP-Networks) proposes evaluating metrics in plant based projects that focus on whether or not the project meets business objectives as well as traditional efficiency benchmarks. When evaluating annual site project spend, many different factors come into play to determine what the correct spend should be. For example, a site's annual project budget may vary annually, and may be dependent on the condition of the facility and/or previous years' investment. This spend may be to bring the facility up to corporate standards or regulatory compliance, to improve site reliability, to make better use of an asset, or an appropriate mix of many of these factors. A practical approach should consider the drivers of site

investment and how the business cycle may influence site expenditure.

Nevertheless, AP-Networks advocates understanding these objectives and measuring progress against them. Frequently, projects are defined as mandatory to meet a regulatory requirement and, based on this information, the project is approved independent of an IRR or NPV calculation. In some cases, 'payback' projects are misclassified as regulatory projects, and hence prioritised over other payback projects with little justification. Other 'payback' projects may be justified as reliability projects, which should require different financial analysis. Project organisations should monitor project expenditure by project type as well as capital efficiency (cost and schedule competitiveness relative to peers) of the different types of projects. In addition, the metric of percent of capital spent on payback projects gives organisations the ability to think more collectively about the true value delivered by expenditure on projects.

### **VCAP: increasing value and competitiveness in plant based projects**

The first step to improving the value delivered from expenditure on plant based projects is a comprehensive assessment of the performance of the project portfolio. This involves reviewing the critical components that optimise the value of the plant based project system: project selection and prioritisation, portfolio management, project implementation, and continuous improvement.

Each component of the plant based project system delivers value:

- **Project selection and prioritisation**

Improving project selection directly impacts the ROI in plant based projects. While only a few projects directly provide a ROI, effective project selection and prioritisation enables sites to accomplish more with less investment, and to deliver more projects that improve the asset NPV. Many sites can eliminate investment in 5-20% of projects that are under- or never utilised.

Moreover, effective project prioritisation allows organisations to focus on the highest value opportunities, thereby improving the efficiency of project delivery.

- **Project portfolio management**

Planning staffing levels in conjunction with project selection and deploying resources to the right projects enables efficient execution of a portfolio of projects and execution synergies.

- **Project implementation**

Using best practices to plan and execute projects increases the efficiency of project delivery.

- **Continuous improvement**

Tracking performance measures of the project portfolio and the asset allows the site to maximise the value that investment provides for the asset.

### **Project selection and prioritisation**

AP-Networks' research shows that owners who have a consistent,

quantitative, evidence based, repeatable yet elastic process to identify, characterise, select, and prioritise the right projects maximise the value delivered by the plant based project portfolio. As was previously mentioned, Industry has a lot to learn, implement, and practise in this area. Many owners lack a consistent, structured method to evaluate and prioritise plant based projects, for a plethora of reasons.

What may be a common theme amongst them all is that there is not an understanding nor an agreement on what problem needs to be solved, what business opportunity needs to be captured, and ultimately what value needs to be optimised. Successful organisations apply analytical tools and structured processes to identify the projects that provide the most value for the enterprise, while accounting for risks, alternatives, disruptions to continued operations, and many other factors.

Owners should check that their process can be applied consistently to all types of projects, including HSE and regulatory. These non-discretionary projects may require different analyses to prioritise the opportunities compared with projects that provide a return and/or reliability projects.

One main focus of the AP-Networks Value and Competitiveness Assessment of Plant Based Projects (VCAP) is to evaluate the identification, selection and prioritisation process, and to illuminate the pitfalls and calculate the difference in improved value from implementing the recommended process. Important aspects of the assessment methodology are:

- Alignment with business drivers and needs
- Consideration of benefits, costs and risks
- Applicability to a wide range of projects
- Scalability to the project portfolio
- Resolution to differentiate between projects with marginal benefits
- Manageability and repeatability.

### **Project portfolio management**

Refinery and process plants often staff projects as they are identified

and approved. Generally, owners consider whether the project engineer has the appropriate experience and skill set required by the project. However, few project systems look at the portfolio of projects, evaluate the resources needed for the project portfolio, and then organise staffing to ensure efficient execution of the projects.

Using effective enterprise scheduling and resource planning practices can help a site leverage resources across multiple projects, as well as deliver projects without going through stops and starts associated with changing priorities and an unmanageable workload. Owners can look to develop fit-for-purpose, resource levelling mechanisms, and to leverage templates to build up a site-wide staffing plan.

## **To improve the value of plant based projects, owners need to apply fit-for-purpose processes, and to focus on the right measures of success**

### **Project implementation**

Owners need to have a comprehensive understanding of the performance of their plant based project systems. Project selection and prioritisation is the foundation that enables delivery of value. Nevertheless, value can be eroded or lost by poor project execution. Generally, these best practices to successfully deliver projects are known and understood by Industry. Many, however, lack the discipline to apply them, or are wed to applying off-the-shelf practices that do not fit the drivers or the value creators that a specific plant based project might be premised on.

Overly onerous work processes can also lead to a perception that the work process is inappropriate for plant based projects. This perception eventually leads to failure to apply

the work process and a lack of discipline. Thus, some projects fail to deliver value due to poor execution. Owners need to continue to assess how small projects apply the project work process and to test whether the work process is fit for purpose.

### **Continuous improvement**

Establishing measures of performance is critical to the success of the plant based project system, and so is using measures of performance to improve the value provided by the project portfolio. There are advanced analytical tools that can be applied to assess the performance of the project portfolio (such as VCAP). Many owners can affect some level of improvement by taking relatively simple steps.

A first step is to align budgeting with project selection and prioritisation so that owners can evaluate trends in expenditure from year to year by project type and across sites. Aligning budgets with project selection and project drivers helps sites to maintain the appropriate expenditure on reliability projects during periods that require more spending on environmental and regulatory projects.

A key aspect of performance measurement is validating that projects have provided the promised benefit. Many plant based projects do not undergo a robust evaluation of benefits, neither before approval nor after start-up. Owners can improve value substantially by tracking the benefits provided by individual projects. This helps project organisations understand whether the site is utilising the installed equipment. Without this critical step, organisations can lose sight of the main objective: to provide value.

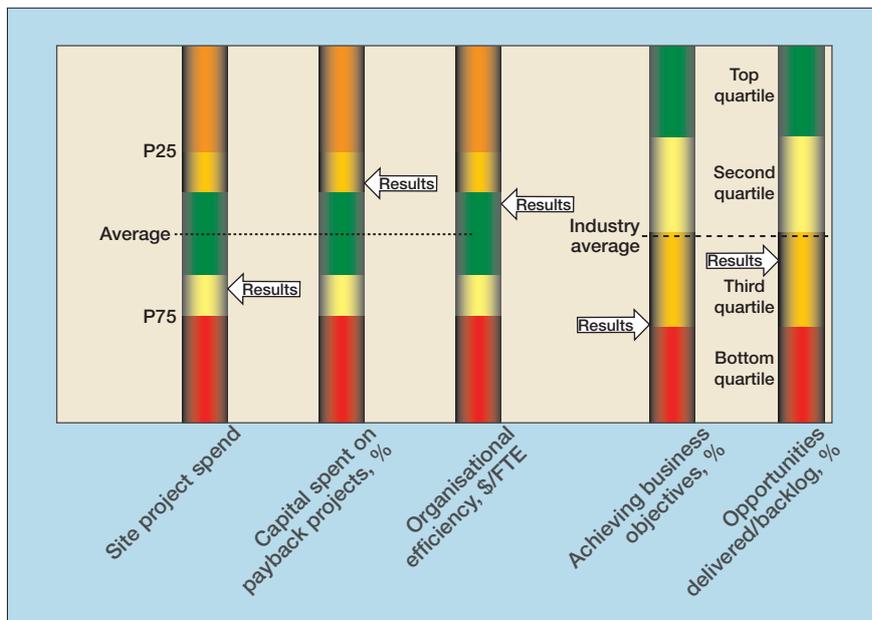
At AP-Networks we have observed sites at which the project organisation is content to have delivered all their projects during the year within budget, but have no data on the utilisation of the installed equipment. Moreover, some sites find that more than 20% of their small projects are under- or even not utilised. Eliminating this waste provides substantial savings. However, eliminating waste

requires tracking the data. Owners can benefit from simple dashboards (see **Figure 2**) to monitor the health of their project portfolio.

### Conclusion

A refinery or a large chemical facility can save or improve value by tens of millions of dollars annually by improving the performance of its plant based projects. Delivering these savings or value is difficult because plant based projects are difficult to assess, develop, and implement due to the varied nature of their business drivers and scope. To improve the value of plant based projects, owners need to apply fit-for-purpose processes, and to focus on the right measures of success. Owners should focus more on the value and benefits provided by the projects, the selection and prioritisation of the projects, portfolio management, and measurement of the overall project portfolio.

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**Figure 2** Summary of plant based project performance

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