

PIP SPEAK

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Concerns over emissions, energy and water pricing

"PIP has been helping clients achieve dramatic reductions in energy and water usage and carbon emissions for some time. But with carbon trading now certain to be introduced in the near future and increased water pricing equally likely, survival in the mining, mineral processing and manufacturing industries will require much greater attention to RESOURCE EFFICIENCY. Here are some examples of how PIP helps identify, capture and lock in efficiencies in resource-intensive industries."

Case Study 1: Treated water usage in metal smelter

Context

A number of prolonged dry summers created the need for a major metal smelter to substantially reduce water consumption if the smelter was to remain open. In prior years the operation had only just escaped a major slow down of operations due to lack of water. In addition, there was considerable pressure for cost reduction on the site.

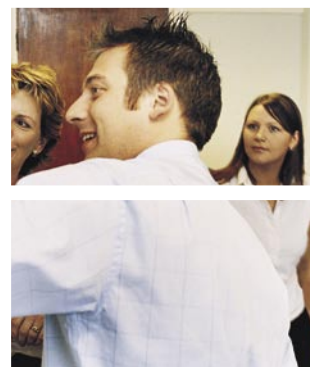
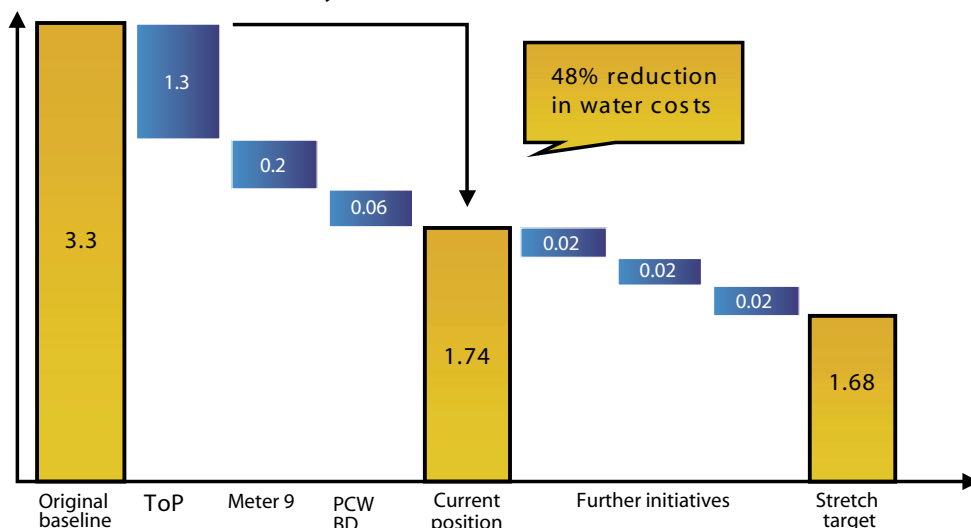
Approach

Our team set to work, helping management to generate ideas, implement short interval controls and new management practices.

Results

The process yielded dramatic results – 48% reduction in water cost and approximately 35% reduction in water usage (see Chart 1). Moreover, this approach was also successfully applied in other areas of the business with similar results - reducing acid leaks by 30% and furnace emissions by 50%.

■ Chart 1: Water Cost (\$m / year):



Case Study 2: Lime kilns emissions and fuel usage

Context

Our client was a quicklime business with a mine and three kilns. The mined limestone was heated in one of three kilns to convert the limestone (CaCO₃) to quicklime (CaO). Two kilns were of the vertical type and one was of the horizontal type, but the two vertical kilns differed significantly in their operation.

Both vertical kilns were causing environmental problems. During normal operations the stack gases were visually obvious (black smoke) and carried an offensive odour that impacted a residential area on the outskirts of the town. The Department of Environmental Protection made frequent visits to follow up community complaints, members of the community were actively campaigning against the plant and as a result, the plant's operating license was on the brink of being revoked (or the plant forced to use uneconomic diesel as a fuel).

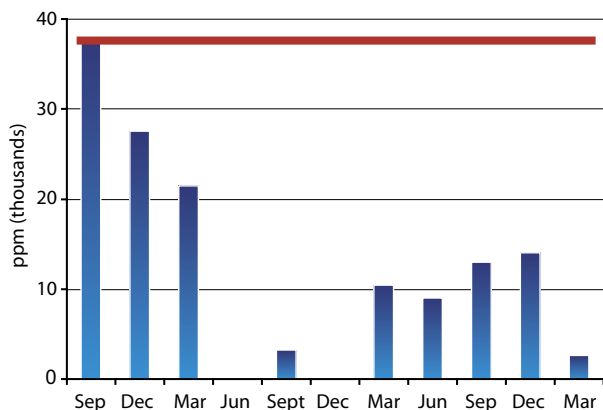
Approach

The PIP team worked with line management to implement ideas, modify procedures and put in place tight management controls.

Results

- 55% reduction in Carbon and particulate emissions
- Emissions finally well within the environmental license limits defined by the State Regulatory Authority
- Quality of the quicklime increased from 75% to 85% CaO (quality and price of quicklime is proportional to the percent of the product that is CaO)
- 22% reduction in recycled oil consumption which significantly reduced the conversion cost of the lime

■ Chart 2: Lime kiln carbon emissions



Case 3: Blast furnace emissions

Context

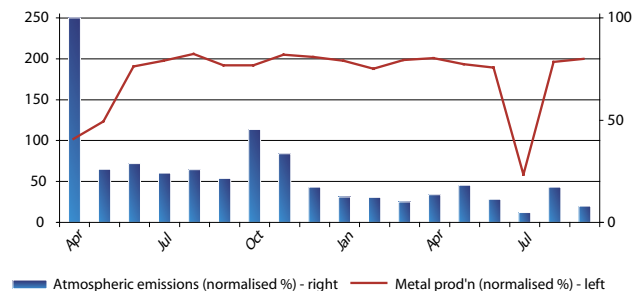
Our client's blast furnace had high levels of emissions that were causing concern for the company, employees and nearby residents. Emissions were being caused by highly variable, sub-optimal operating conditions.

Approach

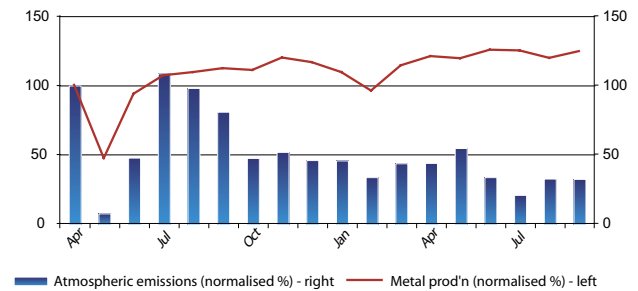
Once the team had determined the major drivers of emissions, it focused on:

- Managing the causes and consequences of feed variability
- Operating procedures, coaching and management disciplines to lock in the new procedures and ensure consistent practices between operators and across shifts.

■ Chart 3: Plant 1 - production grows, emissions reduce



■ Chart 4: Plant 2 - production grows, emissions reduce



Results

Emissions, much like waste, are inversely correlated with the stability of a production process. Improved control led to a 75% reduction in emissions and a 25% increase in the daily production rate.

At a third smelter on a different site, the team systematically determined the root causes of emissions and delivered a 50% reduction in emissions, and increased production by 34%.

Case Study 4: Smelting

Context

Coke was one of our Australian smelting client's largest consumable spend items and a major source of carbon emissions. The site was locked into a 4 year contract with the supplier.

Approach

PIP developed a mass balance to identify where coke was consumed in the process – starting back at the coke supplier and ending in the furnace. This involved setting up controls and measurement points, tracing “missing” coke throughout the system until a robust mass balance was in place as an ongoing information and control tool. This tool led to a number of improvements throughout the system.

After much work, we found that the supplier of coke was weighing delivery-haul vehicles very shortly after a standard water-quench process, and the client was being invoiced based on gross weight which included residual quench water. In other words, our client was paying for water at the same rate as coke. Worse, contracted road-haul delivery drivers were also paid on tonnages across the weighbridge, so they often re-quenched their coke just prior to arrival at the client site.

In order to manage supplier and driver behavior, moisture sampling on arrival was initiated for every inbound truck to determine a dry weight for each coke load, and existing moisture specification clauses in the client's supply contracts were used to ensure that the furnace burnt coke – not water. Once the supplier and drivers “got the message” a standard more reasonable moisture content assumption was applied.

The team also implemented a variety of ideas to change procedures which further improved the efficiency of coke use in the furnace.

Result

The combined PIP/client team was able to reduce the organisation's carbon emissions, and cut coke spend by more than 10% - a significant result for a commodity that was considered incompressible by the client when PIP arrived on site.

Case Study 5: Diesel fuel emissions - integrated mining and production

Context

PIP's client was a fully integrated facility, with all production steps from mining through to production and distribution of finished product. Diesel fuel costs in the distribution process were seen as an area for potential emissions reductions and associated savings.



Our client consumed in excess of 15 million litres of diesel fuel per year in its operations.

Road conditions at mining sites have an impact on the amount of diesel consumed. High rolling resistance, excessive dust, too many stoppages, steep gradients and overall distance traveled all cause fuel consumption to rise.

Furthermore, the client used a purchase card system (with more than 140 cards issued to personnel) in which card usage policies were poorly defined, and usage patterns and fuel consumption poorly tracked.

Road network improvement approach

PIP focused on improving conditions on the road network at the client site. The effort included:

- Improved super elevation and optimised gradients
- Reduction/elimination of stoppages
- Reduction of sharp corners
- Enhanced dust suppression
- Decreased rolling resistance
- Reduced overall travel distance.

Result

CO2 emissions were significantly reduced, while diesel fuel consumption rates (litres per hour) were reduced by between 6% and 9% depending upon equipment type. Additional non-fuel benefits included:

- Reduced tyre wear and air filter replacement frequency
- Reduced incidental truck damage
- Improved engine operating conditions overall.

Fuel card control approach

PIP focused on implementing simple processes, controls and accountability by:

- Developing fuel card issuance and usage policy
- Developing card usage tracking tools
- Developing fuel consumption tracking tools
- Communicating policies and ensuring policy adherence was measured in performance reviews.

Result

Through better control of card issuance and use, a further 2% reduction in diesel fuel consumption was attained (with a savings of ~\$350k to the client's bottom line). Better tracking tools helped identify a fuel rebate increase of ~\$425k.

Why resource efficiency needs to be “hard-wired” into your operations

In response to slowly building pressures over the past few years for action to be taken to reduce the harmful impacts of their operations on the environment, Boards and CEOs have typically divided into two groups. The first group has taken a wait and see attitude. The second group has voluntarily committed itself to certain principles and behaviors consistent with good environmental and social outcomes.

The inconvenient truth for both these groups is that neither response will prove adequate. The introduction of carbon trading will mean real, hard dollar incentives to drive behavior that takes account of the environmental and social consequences of business activities. Clearly the first group, which has taken few steps toward preparing its organisations for operating in the new environment, will be ill-prepared.

For the second and better prepared group, the newly visible and monetised environmental impacts of its activities are likely to result in pressure to translate their environmental charters into action more quickly.

Partners in Performance International (“PIP”) works with clients to build business improvement and execution capabilities. In our experience, good operational practices and execution capabilities go hand in hand with good environmental outcomes and often result in substantial cost reductions.

We have worked with clients in a number of different industries to address major environmental issues such as rehabilitation and reductions in water consumption, emissions, waste and hazardous by-products. We apply our well-proven approach to all this work:

1. Generate and prioritise ideas for improvement

- Identify areas of the business with the highest environmental impact
- Determine the key drivers of those impacts
- Conduct structured Idea Generation Sessions with key stakeholders to develop ideas to reduce environmental impact
- Prioritise ideas using a Value/Ease matrix (see example in Case 1) to select those ideas that provide high value and are easy to implement (some may require further evaluation to determine this)
- Assign accountabilities for implementation of ideas (“idea owners”) to develop detailed implementation plans, including specific deliverables and resources)

2. Implement the ideas quickly and successfully

- Focus on deliverables
- Support initiatives with adequate resources

3. Ensure the ideas are working (cash flowing) and are sustainable (locked in)

- Measure and track prioritised initiatives to ensure delivery of results

4. Ensure the organisation is ‘hard wired’ to support ongoing improvements

- Develop and implement processes, systems and skills that ensure that the business can measure and sustain results

What’s different about the PIP approach?

First we provide clients with a rigorous methodology for prioritising environmental initiatives. Prioritisation of business improvement initiatives typically involves the consideration of a number of factors, including implementation risks, costs of inaction, benefits likely to flow and financial and resource investment required. Unfortunately, existing economic frameworks are often either unable to accurately quantify or don’t place sufficient value on environmental improvement initiatives. Politically driven adjustments such as carbon credits typically understate the true environmental cost. Management is asked to exercise its ‘social responsibility’ to drive through initiatives that don’t meet conventional economic hurdles.

The prioritisation between environmental and conventional initiatives is not obvious. PIP has taken a market based approach to address this shortfall and has developed a methodology that places an economic value on environmental initiatives derived from the cost of bringing markets, such as those for carbon, into equilibrium. By framing environmental issues in economic terms, these issues can be evaluated and prioritised in a more familiar manner.

Second, we help clients across a broad range of industries to execute rapid, significant and sustainable improvements in their operations.

The combination of these important elements gives PIP the ability to help clients make a significant contribution to combating climate change while at the same time improving the bottom line today.

At the end of the day it comes down to making resource efficiency an integral, automatic part of your operations.

Partners in Performance

Partners in Performance builds better businesses. We deliver rapid performance improvements in industrial, resources, manufacturing and services companies, using a specialist team and a hands-on-approach. At sites such as smelters, paper mills, mines and railways our specialists consistently deliver lower costs and higher revenues.

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