VALUE ALIGNMENT ADVANCES "ENVIRONMENTALLY SUSTAINABLE PROJECTS"

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ABSTRACT

This case study shows how the value management process can breakdown communication barriers and develop a viable commercial and environmentally friendly partnership.

Over a series of projects, the author and his client developed a process for conducting pre-feasibility studies with a range of potential joint venture partners. The client, an energy producer wished to explore business opportunities with large energy consuming plants such as paper and sugar mills to optimize total energy usage.

Each project was able to establish a business case for proceeding on a joint venture basis with two or more partners. One of these, a sugar mill has now progressed to the construction phase of a $50 Million co-generation plant. This plant will export "green energy" all year round; will provide a solution to local waste disposal while providing the opportunity to benefit local industry by extending the viable sugar-crushing season.

Using a series of workshops, the author facilitated in stages, an understanding of the issues and opportunities, the development of technical options, the refinement of options to a viable commercial proposal and the marketing of the proposal to key decision makers in the various organizations.

BACKGROUND

The progressive deregulation of the Australian Electricity Industry has presented commercial opportunities for power generation imbedded in other processes. For example, sugar and paper mills have for many years generated power and steam for their own internal usage, receiving only a nominal amount for any excess power exported to the grid. The revised electricity market has provided an incentive to maximise these exports as an additional income stream.

Austa Energy[1] a power generation planning and design organisation with extensive experience in large power plant had a desire to gain experience with smaller boiler and turbine plant, especially with co-generation situations. Austa therefore embarked via their Total Energy Management group, to explore co-generation opportunities and investments with a number of organisations and industries. Knowing that this process would challenge a number of traditional ways of doing things both for Austa and their target industries, a strategy to gain stakeholder commitment was developed. This strategy was based on the value management methodology using a series of facilitated workshops and was later called 'Value Alignment'.

[1] Austa Energy was created in 1997 along with Stanwell Corporation, Tarong Energy, CS Energy out of Austa Electric that had been responsible for the generation of power in Queensland. It was subsequently disbanded in 1999.

TRADITIONAL USE OF VALUE MANAGEMENT

The Queensland Power Industry had long been a strong advocate of Value Engineering / Value Management, using teams of planning, design and operational staff to critically review and challenge traditional designs. More than $200 Million had been saved on the 1400 megawatt Stanwell Power Station, the strategy for the half-life refit of Gladstone Power Station had been developed by a series of value management studies and power lines had been designed to minimise impact on sensitive environmental areas.

These studies had been carried out in the planning and design review stages of each project and had largely involved a single final decision maker even though a number of external stakeholders were involved. In most cases, these studies had been conducted in a single multi-day workshop with participants taken off line for the duration of the study. The current situation was somewhat different. There were no defined projects. There were more than one and sometimes several key stakeholders with commercial interests. In addition, most of these target institutions had not previously been exposed to the value management process.

The simple questions explored in the value management process were however the same issues that needed to be explored in this pre-feasibility stage:

- WHAT DO WE DO NOW?
- WHAT IS THE VALUE / COST?
- WHAT ARE THE KEY AREAS FOR IMPROVING VALUE?
- WHAT MUST WE DO?
- WHAT ELSE WILL DO IT?
- WHAT SHOULD WE DO?
- WHAT IS THE IMPLEMENTATION PLAN?

Also the commitment to outcomes and recommendations that normally result from well designed value management studies was a critical outcome sought from this exercise.

THE VALUE ALIGNMENT METHODOLOGY

To successfully conduct these pre-feasibility studies, a series of distinctive phases were identified. The traditional value management process was broken up into a number of shorter workshops to suit the availability of key stakeholders and to allow more definitive quantification and modeling to support recommendations. These phases were as follows.

1. Preparation Phase

Austa Energy had to use its considerable marketing skills just to get the industries interested in participating in the pre-feasibility study. Using a series of case studies and presentations, the merits of the value management approach were explained and over a series of meetings at senior management level, a commitment to proceed was achieved.

The scope of study was agreed and commitment of key resources and stakeholders was made. A typical scope was:

Explore export generation opportunities, always ensuring that total energy balances of the production process are not upset.
Develop practical recommendations that will provide a life cycle saving to the client energy consumer through maximising the value of every dollar spent.
Consider the opportunities for Joint Venture partners to enhance the process under adequate commercial terms.

Stage 1 Workshop

This first phase of value management is the information phase where a series of exercises enables all parties to better understand the focus of the workshop and the task at hand. To create opportunities for power generation as a secondary process to sugar or paper production requires all stakeholders to understand the primary process to avoid undesired outcomes. It was also important to break down organisational barriers and commence the partnering process. Hence this first workshop concentrated on the following:

- SHARING INFORMATION
- UNDERSTANDING THE CLIENT'S BUSINESS
- DEVELOPING RELATIONSHIPS
- DEVELOPING A SHARED VISION of WHERE WE WOULD LIKE TO BE AT THE END OF PROJECT
- IDENTIFYING OUTCOME CRITERIA TO BE USED TO JUDGE OPTIONS DEVELOPED LATER IN THE PROCESS
- IDENTIFYING WHAT EACH PARTY CONTRIBUTES TO POTENTIAL BUSINESS

These workshops were typically conducted over two days at the plant site so that visual inspections could also be carried out.

Stage 2 Workshop

This second stage reverted to a more typical value engineering approach with Austa gathering the necessary technical expertise to develop a series of technical options that might meet the desired outcomes. The question of how else we could do it was explored exhaustively. Current practices were challenged and alternatives proposed. Cost estimates were developed for each of the short-listed options ready for presentation back to the combined team. Business models were developed to allow 'what if' questions to be explored for different assumptions, especially with respect to financial factors. Preliminary modeling of possible funding arrangements was also carried out.

Depending on the complexity for the plant, this phase would extend over 3 to 6 weeks before returning to review results with combined team.

Stage 3 Workshop

Options developed by Austa were presented to the combined team as were any options worked on by other team members. The technical and operational feasibility of the options were explored and improvements / modifications suggested. Using the criteria developed in the Stage 1 workshop, each option was scored and the best options then reviewed for commercial feasibility. In many cases, the options included the funding of larger power generation plant to enable higher export into the grid.

The financial models were used to explore questions such as: Could the team justify the funding required to implement the option based on the respective organisations' return on investment criteria? What was the optimum joint venture contribution to provide each party with the best returns?

Gaining Acceptance

Once the team was convinced that they had a proposal of commercial and technical merit, they then needed to present their recommendations to their organisational decision makers and ultimately to their Boards for funding approvals. Considerable effort was put into these presentations, firstly to joint senior management groups from all stakeholder organisations to get approval to proceed and then later to individual boards for funding approval. Technical and financial modeling was critically reviewed and cost estimates were confirmed. A risk assessment was carried out to identify issues that could upset a successful outcome and to formulate appropriate mitigation strategies.

Implement Partnering Arrangements

A high proportion of these studies were able to establish a business case and proceeded forward where formal partnering and joint venture arrangements were entered into. Austa had provided a catalyst for improved commercial returns, enhanced use of existing assets and in most cases, a greatly improved environmental outcome.

A CASE STUDY

One of these projects, a sugar mill has now progressed to the construction of a $50 Million co-generation plant. The plant will export 'green power' all year round, will utilise recycled sewage effluent in the process and provide a solution for waste disposal while providing the opportunity for extending the sugar-crushing season to take advantage of local conditions. Stanwell Corporation and Rocky Point Sugar Mill owners, the Heck Group, are jointly developing the project.

Refer Stanwell Corporation's web site www.elementalpower.com for details of project.

Prior to this study, Rocky Point Sugar Mill at Woongoolba near Beenleigh in South East Queensland had a number of bagasse-fired boilers providing steam to a small turbo-alternator (2.4 MW), to plant drives, the sugar production process and an ethanol plant. Power used in the process was supplied from the turbo-alternator and purchased from the grid. The internal power was only available during the 20 to 22 week annual crushing season.

The team challenged the need to restrict energy production to only the sugar-crushing season when bagasse was available. The boilers in a sugar mill are capable of being fired with a number of biomass fuel sources – biomass refers to an energy source that is naturally self-sustaining. The prime alternative biomass source was identified as the green waste produced in Queensland's southeast corner and normally transferred to land fill or burnt. The most economic plant arrangement was the installation of 30 MW turbo-alternator and boiler that is sufficient to supply the electrical and steam needs of Rocky Point Sugar Mill and distillery and export 'green energy' equivalent to the annual usage of more than 18 000 average homes. This project will displace sufficient coal-fired generation to reduce overall carbon dioxide emissions by about 130 000 tonnes per year.

In terms of total energy generated per annum, this progressive new biomass industry is one of the largest biomass projects in Australia and will give a new lease on life to the sugar farms in the Woongoolba area and ensure the survival of the Rocky Point Sugar Mill for at least another 20 years.

About 100 jobs will be created during the 21-month construction period. Permanent jobs will also be created, including fuel supply contractor personnel when the plant is operational.

Wood Mulching Industries (WMI), a Queensland-owned company based at Cannon Hill, will determine the most suitable blends of biomass to use in Rocky Point's boilers. They will coordinate supply of all the project's non-bagasse fuel requirements.

The problem of a glut of biomass at Council refuse dumps and landfills throughout the region will be solved for a many years by the commissioning of the Rocky Point Project.

The condenser is cooled by tertiary treated water from the Gold Coast City Council's reclaimed water. This same reclaimed water is purified in the cogeneration plant's de-mineralised water plant for use in the boiler-steam turbine water cycle.

Ash, which forms from non-combustible material such as dirt, is left over after burning biomass in a boiler. This will be removed from the site on trucks to be used as a soil conditioner in landscaping work. The wastewater from the boiler and from the condenser cooling system is passed through wastewater treatment ponds and then used to water the crops for the local cane farms.

CONCLUSION

This project and other similar projects with sugar and paper mills are demonstrating that a commercially viable project can also deliver significant environmental and social benefits to both the local and global community.

To achieve this 'triple bottom outcome' required a structured process to enable the incubation and acceptance of new ideas that challenged conventional thinking and the courage of the developers to fund such projects. Value Management conducted by an independent facilitator provided this structure and was critical to the success of this and several other studies involving multiple stakeholders at the pre-feasibility stage.

A recent success has been the introduction of 10% ethanol blend into vehicle fuel for government car fleets in Queensland. Stakeholders in this exercise included sugar farmers, environmentalists, petroleum producers, regulators, government agencies, academics and motoring organizations – all with a diversity of agendas. The outcomes of this project include a reduction in exhaust emissions and green house gas production, a reduction in dependence on imported oil, additional markets for Queensland sugar producers and potential optimization of crops and extension of seasons. Agreement with all stakeholders to proceed was achieved within 6 months of the initial workshop – a result that could not have been achieved without the value management process.

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