



Energy and Sustainability Topics – Site Cost Review

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Energy and Sustainability Topics – Site Cost Review

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Part 1: Introduction

1. The Site Cost Review

The Site Cost Review (SCR) is a diagnostic self-assessment tool developed to help plastics processing sites to:

- Assess their current cost management efforts.
- Provide a road-map for future work and improvements in cost management at a site.

It is not strictly suitable for use at a corporate level because of the focus on site performance but can provide some useful guidance in developing a corporate cost management strategy.

The SCR generates a series of radar charts to allow a site to assess where it is in cost management terms. The SCR is not designed to be a criticism of site activities but to provide a simple method of assessing status and progress.

2. Completing the SCR

The SCR is based on the contents of a book, 'Cost Management in Plastics Processing' by Robin Kent, published by Elsevier (ISBN 978-0081022696).

This provides a structured approach to cost management for plastics processors and covers all the main topics of relevance. It is a practical workbook designed for use by plastics processors around the world and not as an academic textbook.

The SCR is based on the longer treatment of cost management in the book and uses the structure of the book to assess cost management. This means that some of terms and words used in the SCR may not be totally familiar unless the user has read the book. If you are not familiar with a specific term then reference to the book should make it clearer.

This document which allows the user to print the document and complete the SCR in hard copy and transfer the results to the radar chart for each topic.

3. The self-assessment sheets

Each self-assessment sheet covers a single issue.

Simply select the most appropriate description of the current site status and fill in the 0 to 4 grade in the score area. The results can then be transferred to the radar chart for assessment.

It is recognised that in many cases the site will not meet the exact description given – simply select the most appropriate score for the site even if it varies slightly from the description given.

In general, unless the site meets all of the statements in the box then the next lower box should be selected.

Continue this process until all the relevant self-assessment sheets are completed.

Note: It is recommended that the SCR is completed by a group through discussion.

4. What to do if the topic is not relevant to the site

The SCR covers a broad range of cost management topics and some of topics in the Technical Issues section may not be relevant to all sites. If a topic is not relevant to your site, then feel free not to complete the particular topic. All topics in the 'Basics' section should be completed.

5. Example of using the SCR

The SCR is designed to provide not only an assessment of the current status of the site but also to signpost possible future actions to improve the status.

For example, in the 'Key Measures' section for the 'World class principles' Sheet for the options are:

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Level	Operational
4	Key measures established & reported in all critical business areas. All key measures improving.
3	Key measures established & reported in financial & in most other areas. Key measure performance variable.
2	Key measures established & reported in financial & in some other areas.
1	Key measures established & reported only in financial areas.
0	No key measures defined or measured.
Score	

If the most appropriate current description is: 'No key measures defined or measured.' then the score is 0 but the site can see the next set of recommended actions to improve the score.

This highlights areas for potential improvement and the SCR can serve as a road-map for future actions.

6. Feedback

It is hoped that the SCR will provide valuable information to companies on both their current status and actions for the future. If you have suggestions for improvements then please send these to the address on the front cover. We hope to further improve the SCR to support cost management in the plastics processing industry.

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Part 2: Management

1. Structured management

Understanding the current situation provides the basis for an improvement strategy and many of the basic actions necessary for successful cost management.

Completing the chart

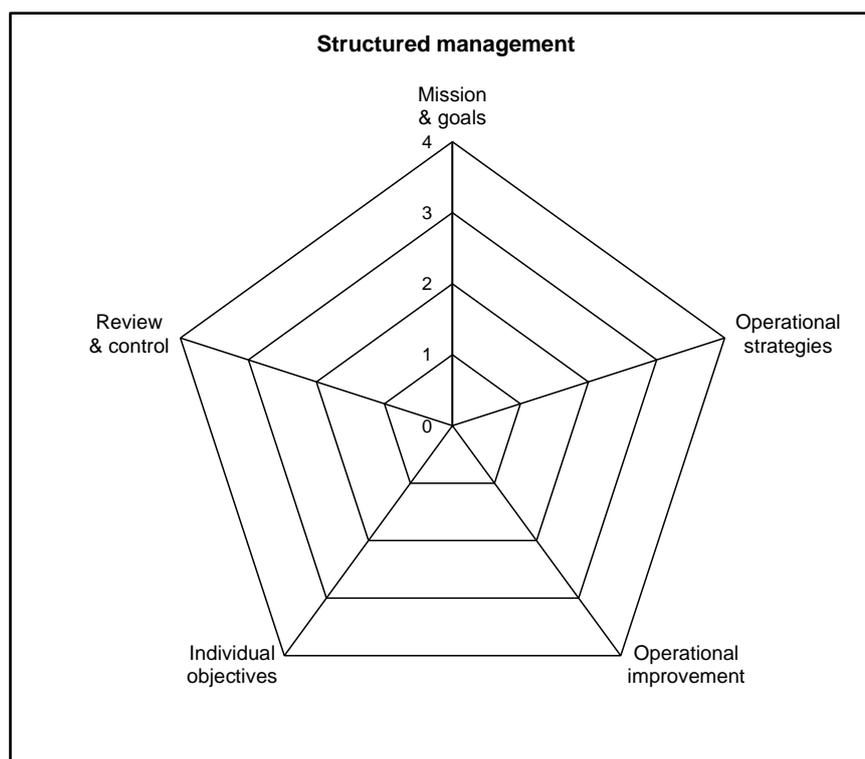
Each chart has several columns which cover various aspects of the main topic.

To complete a column read the descriptions in the column cells and select the cell that is closest to the current situation at your site.

It is unlikely that every part of the description in the cell will fully describe your specific situation but choose the cell that has the most appropriate description. This will give a score ranging from 0 to 4, mark this at the base of the column.

After all the columns have been scored, transfer the scores to the radar chart for the relevant columns/axes. This gives a rapid visual assessment of the current situation for the specific topic.

Scoring



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Management - Structured management					2.1
Level	Mission & goals	Operational strategies	Operational improvement	Individual objectives	Review & control
4	Clear & published statement of company mission & goals. Mission, goals & values aligned with strategic advantages, skills & capabilities.	Strategies clearly stated, widely known & support company mission & goals.	Operational improvement plans in place, clearly stated & clearly related to operational strategy & company mission & goals.	Individual objectives clearly stated, widely known & aligned with company mission & goals.	Regular management review & control of all areas. Reviews carried out in accordance with defined process that is consistent across the company.
3	Company mission & goals available to higher management. Strategic advantages, skills & capabilities not considered in mission & goals.	Strategies vague but broadly related to company mission & goals.	Operational improvement plans vague but broadly related to operational strategy & company mission & goals.	Individual objectives vague but broadly aligned with company mission & goals.	Frequent management review & control of key areas. Reviews carried out in accordance with defined process that is consistent across the company.
2	Company mission & goals considered at Board Level.	Strategies vague & unrelated to company mission & goals.	Operational improvement plans vague & unrelated to operational strategy & company mission & goals.	Individual objectives vague & not aligned with company mission & goals.	Infrequent management review & control of most areas. Reviews carried out in accordance with defined process but not consistent across the company.
1	Unstated & unwritten company mission & goals.	Strategies not stated or produced.	Operational improvement plans not stated or produced.	Individual objectives not stated or produced.	Infrequent management review & control of some areas. Reviews have no defined process and are not consistent across the company.
0	No consideration of company mission & goals.	Strategies differ substantially from company mission & goals.	Operational improvement plans differ substantially from operational strategy & company mission & goals.	Individual objectives differ substantially from company mission & goals.	No management review & control of any area.
Score					

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2. Financial structure

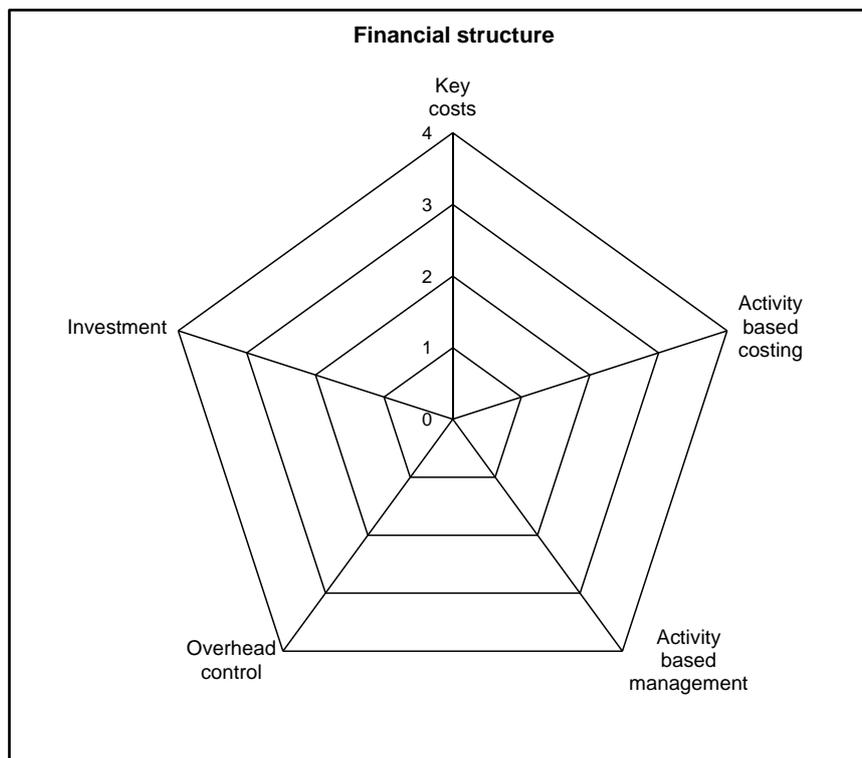
The financial structure and the allocation and reporting of costs drive the cost management process. Only when the real costs in each area are understood is it possible to start to reduce these.

This is not helped by many of the current financial structures where the needs of financial accounting and conventional management accounting are regarded as being more important than actually running the business.

We need to see our management accounts as a tool to drive the business and configure them accordingly. The techniques of ABC and ABM can act as drivers for real business improvement and cost reduction by focusing attention and therefore the efforts on the real cost and activity drivers.

This means critically looking at the area of overheads which have tended to be ignored in favour of crude efforts to reduce direct labour whilst ignoring other larger cost contributions.

Scoring



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Management - Financial structure					2.2
Level	Key costs	Activity based costing	Activity based management	Overhead control	Investment
4	Understanding of the real costs in all areas. Accounting systems modified to reflect company mission & goals.	Product costing reflects the real efforts & resource usage in the business. Overhead allocation is based on activity based assessment of usage.	Business costs & efforts aligned. Efforts at cost reduction are appropriate to the relative magnitude of costs. Reporting identifies non-value adding activities in all areas.	Overheads controlled & control efforts are in proportion with expenditure.	Long term investment plan available & based on company mission & goals. Justification based on overall cost reduction & not just head count. Good post-project assessment.
3	Understanding of the real costs in key areas. Accounting systems modified to reflect company mission & goals.	Product costing approximately reflects resource usage in most areas but significant costs are allocated by mechanical formulae that are regularly revised.	Business costs & control efforts aligned in most areas but reporting is based on variance model.	Overhead growth is controlled but control efforts not fully related to proportion of expenditure.	Long term investment plan available but adherence is variable. Nominally based on mission & goals but actually reaction to events.
2	Understanding of the real costs in most areas. Standard accounting systems used.	Product costing approximately reflects resource usage in most areas but significant costs are allocated by mechanical formulae that are rarely revised.	Some correlation between costs & control efforts in some areas but little effective management of real costs.	Overhead growth is controlled but control efforts are sporadic & unrelated to proportion of expenditure.	Medium term investment plan available but unrelated to company mission & goals. Investment plan is reaction to events.
1	Understanding of the real costs in some areas. Standard accounting systems used (not modified to reflect company realities).	Product costing accurate for labour & material but large areas of cost are allocated arbitrarily.	Little correlation between costs & efforts.	Overhead growth is uncontrolled despite large expenditure rises.	No long term investment plan & cursory post-project assessment. Investment is reactive & justified for a variety of reasons.
0	Key costs not analysed or recorded. Standard accounting systems used (not modified to reflect company realities).	Product costing variable for most elements. Some elements treated with high precision but others ignored in calculations.	Business costs & control efforts are seriously misaligned. Focus is on direct labour but real costs are elsewhere.	Overheads are never studied & reduced except when demanded by cost reduction exercises.	No long term investment plan & little post-project assessment. Investment is reactive & primarily justified by head count reduction.
Score					

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3. Cost management projects

Choosing between cost management projects has always been a concern and difficulty. There are always too many projects competing for too few resources.

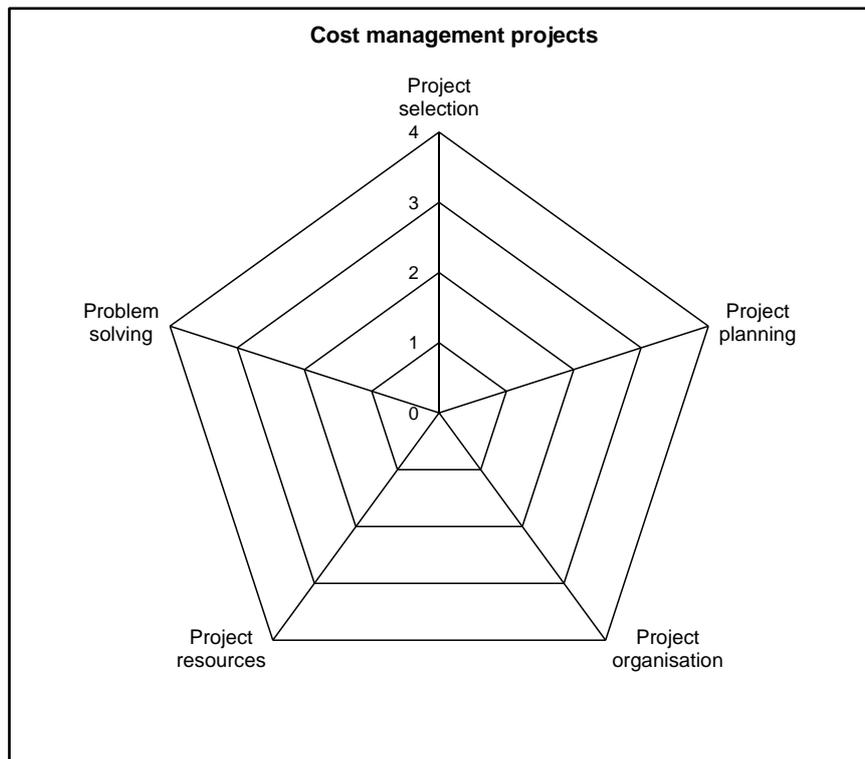
Companies need to rapidly assess the potential gains and difficulty of implementing any potential project before rushing into a complex project that has a relatively low-cost management potential.

Project selection is a key to cost management.

After projects have been selected then an effective project management system is an essential to actually delivering the project and achieving the potential gains.

Cross-functional cost management teams are an invaluable tool for cost management due to the organisation of most companies.

Scoring



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Management - Cost management projects					2.3
Level	Project selection	Project planning	Project organisation	Project resources	Problem solving
4	All relevant cost reduction opportunities identified & prioritised for action.	Formal project definition & project plan necessary for any project. Progress is regularly reported & post-project assessment is carried out.	Excellent cost reduction project management system used in all cases. Projects have clearly defined management & cost/benefits.	Project resources defined & allocated before project start. Projects are rarely delayed due to resource constraints.	Firmly embedded culture of improvement & problem solving through planning, action & review. Root causes identified & resolved.
3	Most available cost reduction opportunities identified but not prioritised for action.	Formal project planning carried out for all projects but control, reporting & assessment is variable. Failed projects are sometimes hidden & no lessons learnt.	Good cost reduction project management system but use is variable. Good integration across departments but many projects have poor cost/benefit definition.	Project resources defined but not allocated at project start.	Problem solving is largely reactive with focus on solving root causes. Solutions developed but not always fully implemented.
2	Some cost reduction opportunities identified but no real planning process.	Project planning carried out for most projects but control, reporting & assessment is poor or rarely carried out. Failed projects are often hidden & no lessons learnt.	Cost reduction project management system available but not used. Some integration of projects across departments & poor cost/benefit definition.	Project resources poorly defined at project start.	Problem solving is largely reactive; solutions are developed but rarely fully implemented. Focus on dealing with urgent effects & not on solving root causes.
1	Few cost reduction opportunities identified via unplanned process.	Cursory & undocumented project planning but no formal project planning or monitoring. Projects can become dormant & remain unfinished.	No cost reduction project management system. Some integration of departments for projects that clearly cross departmental boundaries.	Project resources rarely considered at project start.	Problem solving is purely reactive & focused on dealing with urgent effects & not on solving the root cause.
0	Significant cost reduction opportunities ignored due to 'urgent' daily pressures.	No effective project planning. Actions are ad hoc & driven by events. Action is seen as more important than planning.	No cost reduction project management system. Every project is 'different'. Projects are run by departments with little input from other departments.	Projects often started without adequate resources (due to poor planning) or starved of resources during project. Urgency is rated more highly than strategic importance.	Problems are ignored until they go away.
Score					

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4. Cost management process

Across the company

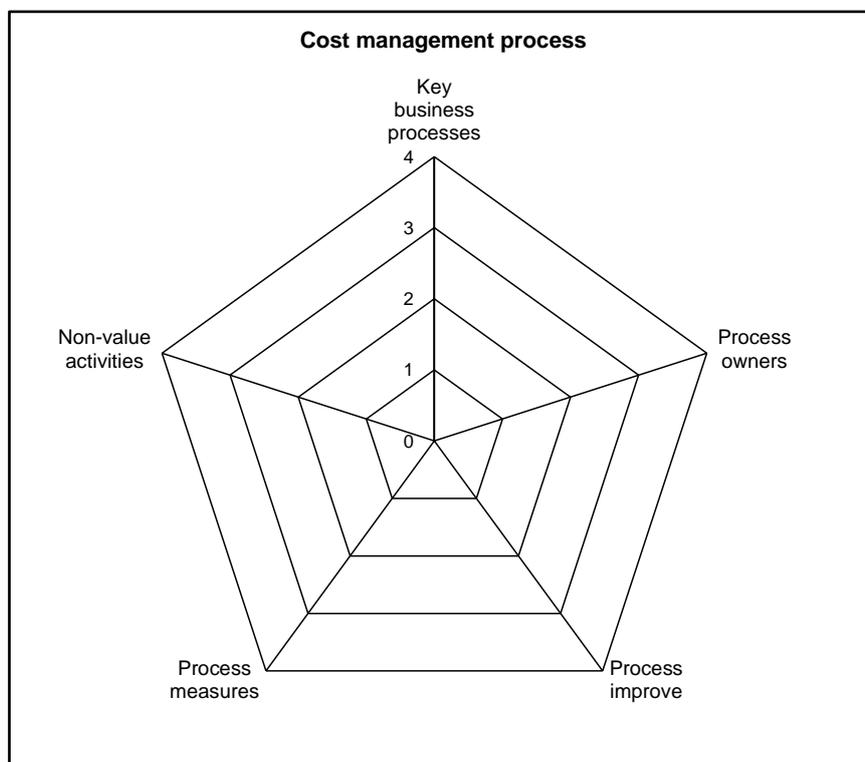
Cost management is rarely a single department activity and most often cuts across the traditional boundaries. The process needs to be organised with this in mind to achieve the gains that are necessary.

Cross-functional processes rarely have formal process owners who have responsibility for achievement of the process measures. These processes often fail or underperform because of lack of ownership and the lack of a driver for success.

Companies need to define their key business processes (preferably in terms of how the customer views the activity), assign owners for each business process and task the owners with setting up the appropriate measures and improvement plans.

Particular effort needs to be spent on identifying non-value activities and eliminating these. Projects that eliminate non-value activities have a great return on effort.

Scoring



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Management - Cost management process					2.4
Level	Key business processes	Process owners	Process improve	Process measures	Non-value activities
4	All key processes well defined, documented, resourced & optimised. Documentation links to other processes, status, version & approval well controlled.	Process owners for all key business processes clearly & unambiguously defined with responsibilities & authority also clearly defined.	Formal process improvement plans in place for all key business processes. Plans are regularly reviewed for relevance.	Process measures in place for all key business processes. Measures regularly monitored, reported & show continuous improvement. Prompt action taken on adverse results.	Non-value adding activities minimised. Continuous review of processes to prevent accumulation of non-value adding activities.
3	Good understanding of most key processes but inadequately documented & resourced. Automated processes filed on company Intranet.	More than half of key business processes have defined process owner but owner primarily has responsibility without power.	Formal process improvement plans in place for some key business processes but no regular review for progress or relevance.	Process measures in place for most key business processes. Measures regularly monitored & reported but do not show improvement & little action is taken.	Non-value activities identified by process flow charts but not totally eliminated. Some gains still to be made in activity reduction.
2	Good understanding of some key processes but generally inadequately documented & resourced. Processes in common file format on company Intranet.	Less than half of key business processes have defined process owner.	Informal process improvement plans in place for most key business processes but no regular review for progress or relevance.	Process measures in place for some key business processes. Those in place are rarely monitored & reported. No action taken on adverse measures.	Non-value activities identified across the company but many areas remain to be investigated. Considerable gains still to be made in elimination of activities.
1	Poor understanding of key processes & of how they work. When created processes are in common file format on personal computers only.	Few key business processes have defined process owner.	Informal process improvement plans in place for some key business processes but no regular review for progress or relevance.	Few process measures in place for key business processes. Those in place are not monitored & reported.	Sporadic attempt to minimise non-value activities (primarily in production areas). No consistent approach to process analysis & activity reduction.
0	Little or no understanding of what the key processes are or how they work. When created processes are paper based.	No key business processes have defined process owner.	No process improvement plans in place.	No process measures in place for any key business process.	No attempt to identify non-value adding activities in company. Substantial non-value activities seen.
Score					

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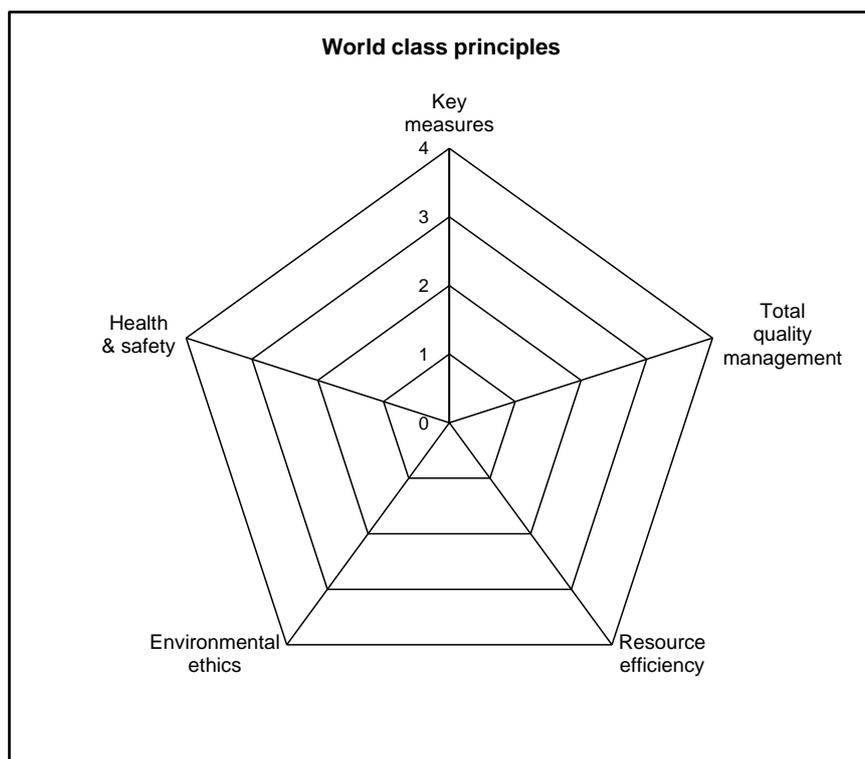
5. World class principles

World class is one of the buzz-words but there is really a cost management logic in achieving high standards in all of the areas listed. World-class companies are not doing this because it makes them feel good – they are doing it because it increases profits.

These are not simple tasks but achieving high ratings in all the areas will reduce costs substantially and improve operational performance.

Knowing, measuring and reporting the key measures for the business will focus attention on achieving the things that really matter. Benchmarking these measures against external data will enable companies to set realistic and demanding targets for improvement.

Scoring



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Management - World class principles					2.5
Level	Key measures	Total quality management	Resource efficiency	Environmental ethics	Health & safety
4	Key measures established & reported in all critical business areas. All key measures improving.	TQM is integral part of all company operations. Focus is on delighting the customer by exceeding their expectations throughout the complete process.	Resource efficiency is an integral part of all operations & at all product life cycle phases (materials, manufacture, use & end-of-life). Operations minimise waste & maximise resource utilisation.	Well developed environmental ethics as an integral part of operations. Improving environmental performance is seen as profitable & ethical.	Excellent Health & Safety performance. All areas safeguarded & minimum time lost due to accidents or Health & Safety issues.
3	Key measures established & reported in financial & in most other areas. Key measure performance variable.	TQM is used in all areas of the company. Focus is on delivering to customer specification.	Resource efficiency considered for all internal impacts but not for complete product life cycle phases. Considerable effort made to reduce internal impacts.	Environmental ethics compete with other issues for management attention & action but often sacrificed for short-term financial gains.	Good Health & Safety performance. Most areas exceed regulatory requirements.
2	Key measures established & reported in financial & in some other areas.	TQM is important for all production products & processes but not for all business processes throughout the company.	Resource efficiency considered for some internal impacts but not all areas, e.g. design. Waste is 'production' concern. Some effort made to improve resource efficiency, e.g. energy.	Environmental ethics are treated as subsidiary to other business requirements & often overlooked.	Acceptable Health & Safety performance. Most areas adequately protected & few areas for improvement identified.
1	Key measures established & reported only in financial areas.	TQM developing & seen as important in production areas but not for all products or processes. No extension of TQM into other areas of the company.	Resource efficiency is seen as relevant in some limited areas. Very limited efforts made to improve resource efficiency.	Environmental ethics are being developed but still seen as a cost to the company instead of an essential part of the business. Primary driver is public relations benefits.	Minimum regulatory conformance achieved but areas for significant improvement easily identified.
0	No key measures defined or measured.	No concept of TQM. Quality is a 'production problem' & inspection is the primary control method.	Resource efficiency is an unknown concept. Waste is tolerated & not considered a problem.	No concept of environmental performance or ethics.	Below minimum regulatory conformance. Areas of significant risk seen without appropriate safeguards.
Score					

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Part 3: Design and development

1. Competitors and markets

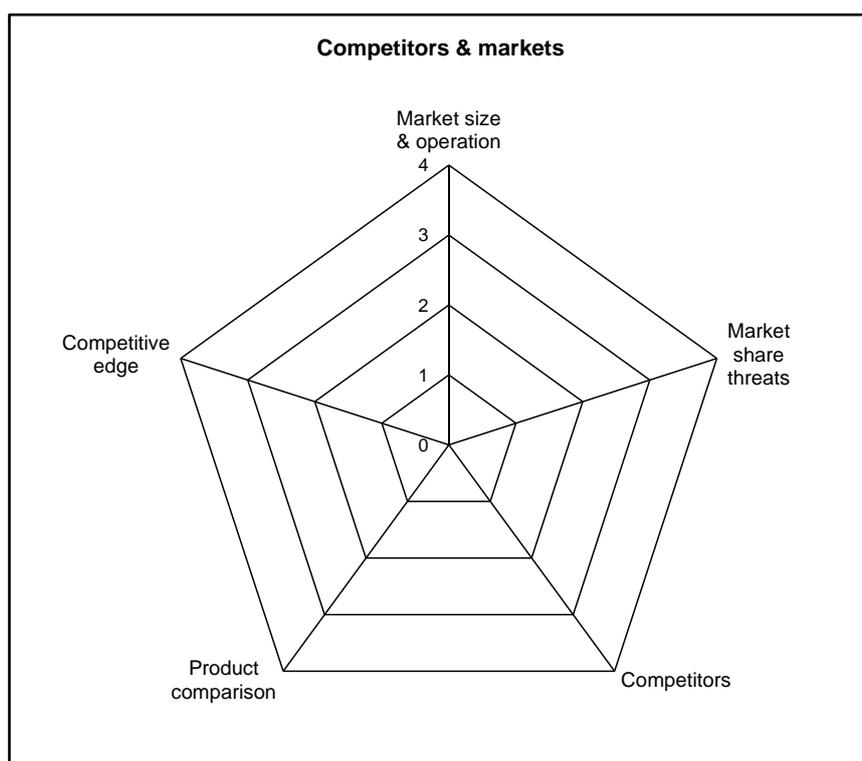
Understanding the market you are operating in is an essential to both setting prices and comparing the profits that you make. Not all markets operate on the same price/profit basis and only by understanding your specific market can you hope to set the correct prices.

This means understanding the detailed market and how it operates as well as the specific threats to continued success in the market.

The threats can range from technology changes (slide rules were wiped out by cheap pocket calculators and the role of the horse changed considerably with the invention of the car) through legislative changes by governments to changing consumers tastes.

Direct and identifiable competitors are only one type of threat but possibly the most visible. Despite this, many companies do not formally examine competitor's products or carry out product comparisons to determine if their competitive edge is significant or sustainable.

Scoring



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Design & development - Competitors & markets					3.1
Level	Market size & operation	Market share threats	Competitors	Product comparison	Competitive edge
4	Market size & characteristics well known. Changes in market size & trends well known & documented. Plans for major market trends.	Main threats to market share identified & well documented. 'Unknown' threats monitored & reviewed.	Excellent knowledge of visible competitors & potential invisible competitors. Good knowledge of operating niche.	Formal comparison of own products with competitor's products. If competitor's product is superior then plans in place to match features.	Competitive edge defined in terms of unique products & services. Products are externally acknowledged as 'Best of Breed'.
3	Good knowledge of market size changes from external evidence. Major market trends identified but no planning to deal with these.	Formal market share threat analysis carried out for all known threats with good documentation.	Good knowledge of visible competitors. Good knowledge of operating niche.	Formal comparison of own products with competitor's products. If competitor's product is superior then no plans in place to match features.	Competitive edge defined in terms of distinctive products & services.
2	Good knowledge of market size changes based on external evidence, e.g. market surveys. Major market trends not identified.	Formal market share threat analysis carried out for some limited threats but poor documentation.	Good knowledge of main visible competitors but no detailed knowledge of operating niche or how it is changing.	Formal but poorly documented comparison of own products with those of competitors.	Competitive edge defined in terms of price & historical relationships.
1	Vague knowledge of market size changes, primarily based on internal experience. Major market trends not identified.	Cursory, poorly documented & informal market share threat analysis carried out.	Vague knowledge of main visible competitors but no detailed knowledge of operating niche or how it is changing.	Informal & undocumented comparison of own products with those of competitors. Comparison based on feelings not hard evidence.	Competitive edge defined simply in terms of price but no measure of actual price advantage.
0	No reliable knowledge if market is currently growing or declining. Major market trends not identified.	No market share threat analysis carried out.	No knowledge of main competitors, niche in which the company operates or of how this niche is changing.	No comparison of own products to those of competitors.	Company does not have definition of competitive edge.
Score					

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2. Total product planning

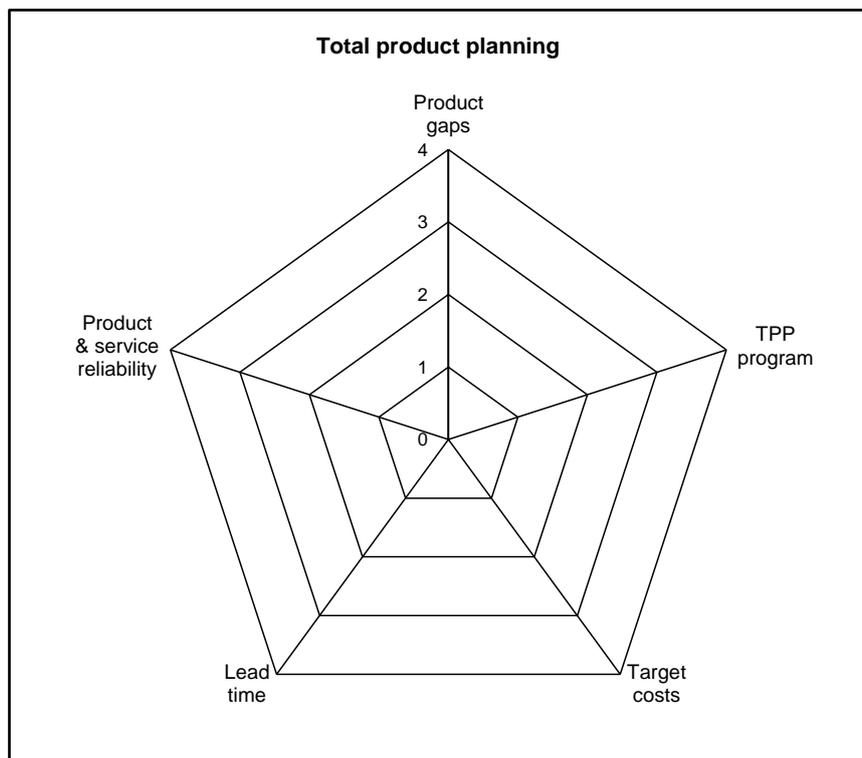
It is amazing how few companies take a logical approach to product development and management.

Product development is a vital part of any company’s survival into the future and for many companies effective product management is a key skill.

Effective product planning involves recognising that the inevitable product life cycle for a product will mean that the product either needs complete replacement or a substantial ‘facelift’ to remain competitive. Companies therefore need a map of both new product development and of significant improved products and the timings for their release.

Physical products are not the only part of a company that needs long-term planning and services, e.g., product manuals, instructions and service development also need to be included in the total product management plan.

Scoring



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Design & development - Total product planning					3.2
Level	Product gaps	TPP program	Target costs	Lead time	Product & service reliability
4	Formal product gap analysis carried out. Action taken or planned to fill all gaps in product range.	TPP program in place. Over 75% of turnover from new or significantly modified products introduced within the last 5 years.	Target costs for design & service set by market rates. Designs always achieve or are less than market costs.	Lead time to market accurately planned, results measured & total time reducing. Critical path planned, clearly known and adhered to.	100% reliability of products & services. Products & services always function as described & always exceed customer expectations.
3	Formal product gap analysis carried out. Some action taken to fill gaps but not comprehensive.	TPP program in place. Over 50% of turnover from new or significantly modified products introduced within the last 5 years.	Target costs for design & service set by market rates. Designs sometimes achieve or are less than market costs.	Lead time to market planned but controls are poor & no measurement of achievement. Critical path planned, clearly known but not adhered to. Projects sometimes start & finish late.	Products & services reliability is >99% but < 100%. Products & services rarely fail to deliver customer expectations.
2	Formal product gap analysis carried out. No action taken to fill gaps even when identified.	TPP program in place but not followed & often projects are started without consideration of where they fit into the company strategy.	Target costs for designs & services based on combination of internal costs & achievable market prices. Designs rarely achieve market prices.	Lead time to market planned but no adequate controls to ensure delivery to market. Critical path not known. Projects often start & finish late.	Products & services reliability is > 75% but < 99%. Products & services sometimes fail to deliver customer expectations.
1	Informal gap analysis for product range carried out. No action taken to fill gaps.	No TPP program in place. Most of turnover comes from 'old' products developed more than 10 years ago.	Target costs for designs & services are based simply on internal costs. No consideration of achievable market prices.	Lead time to market not planned or controlled. Projects often start & finish late due to poor planning.	Products & services reliability is > 50% but < 75%. Products & services often fail to deliver customer expectations.
0	No gap analysis for product range carried out.	No TPP program in place. Product development is ad hoc response to market developments. Company is a product & services follower.	No target costs set for design process.	Lead time to market not planned or controlled. Projects always start & finish late. Cost of late delivery not calculated.	Products & services reliability is < 50%. Products & services do not function as described & mostly fail to deliver customer expectations.
Score					

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3. Design teams and processes

It is amazing how many companies treat the design and development process in isolation. The lessons of the last 20–30 years are apparently lost on them!

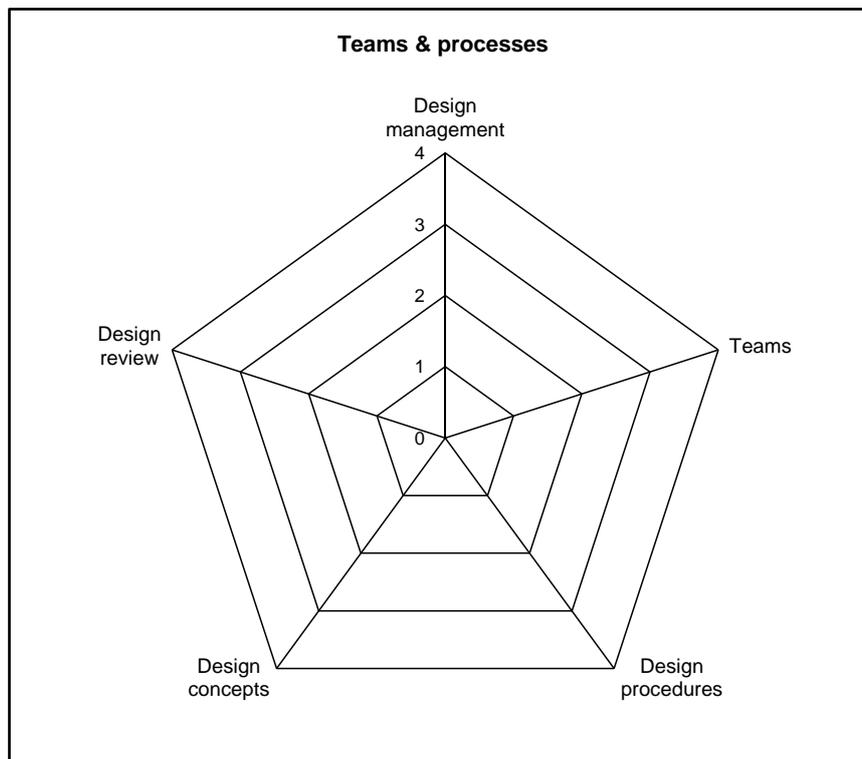
Design can hold the key to success in difficult markets and there is a new group of plastic processing companies who are using design to leverage their manufacturing capabilities to new heights. These companies see design as a key component in their success and use their design skills to win and retain business.

Design is a process and as such it is manageable as any other process. It may be creative but it must still be managed.

The best designs are a fusion of the creativity of the designer with the practical knowledge of the manufacturing people and all controlled by effective management of the process.

Good design for plastics processors is not an abstract concept; it is an essential for both productivity and success.

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Design & development - Teams & Processes					3.3
Level	Design management	Teams	Design procedures	Design concepts	Design review
4	Board Member responsible for design function. Consultants used to extend design capability. Continued training for designers.	Multi-disciplinary teams from all areas work together during the design process. Core team follows project through to completion.	Design procedures clearly written, widely available & rigorously followed. Essential design data is readily available to designers.	Essential & desirable features clearly identified. Concepts evaluated against technical & economic criteria. Design risk assessment carried out.	Formal design reviews regularly held to evaluate design against technical & economic criteria. Clear recording of actions taken.
3	Board Member responsible for design function. Consultants very rarely used. Design staff well qualified but have no continuing training.	Design by designers with substantial input from other areas. Designers responsible for taking project into production.	Design procedures clearly written, widely available but not always followed. Essential design data is not always available to designers.	Essential & desirable features clearly identified. Concepts not consistently evaluated against technical & economic criteria.	Formal design reviews held to evaluate design against technical & economic criteria. Record of actions taken is often unclear.
2	High-level manager responsible for design function. Consultants never used ('not invented here') & design staff poorly trained.	Design by designers with considerable input from other areas. Major decisions taken by designers but getting it to work is production's problem.	Design procedures have substantial gaps, not widely circulated or followed. Essential design data often not available to designers.	Some reference made to essential & desirable features but not consistent. Design concepts based primarily on internal ideas.	Informal design reviews infrequently held to evaluate design against technical & economic criteria. Poor record of actions taken.
1	Mid-level manager responsible for design function. Often overruled by higher managers. Projects poorly managed with little structure.	Design by designers with little input from other areas. When tooling arrives then getting it to work is production's problem.	Design procedures are informal, poorly written & rarely adhered to. Procedures are for show only. No essential data available for designers.	Little reference made to essential & desirable features. Design concepts based on internal ideas only.	Informal design reviews rarely held to evaluate design against technical & economic criteria. No record of actions taken.
0	Low-level staff with little authority responsible for design function. Projects are not so much managed as evolve with little control.	Design by designers with no input from other areas. Arrival of tooling in Production area is a surprise to production staff.	Design procedures are non-existent & essential data on existing own & competitors products not available.	No reference made to essential & desirable features. Design concepts based on internal ideas only.	No formal or informal design reviews held during design process.
Score					

Energy and Sustainability Topics – Site Cost Review

4. Design tools

It is possible to complete a great design without using any of the formal design tools discussed so far in this chapter. However, the odds are against it and your chances of producing a great design increase the more you use design tools and techniques.

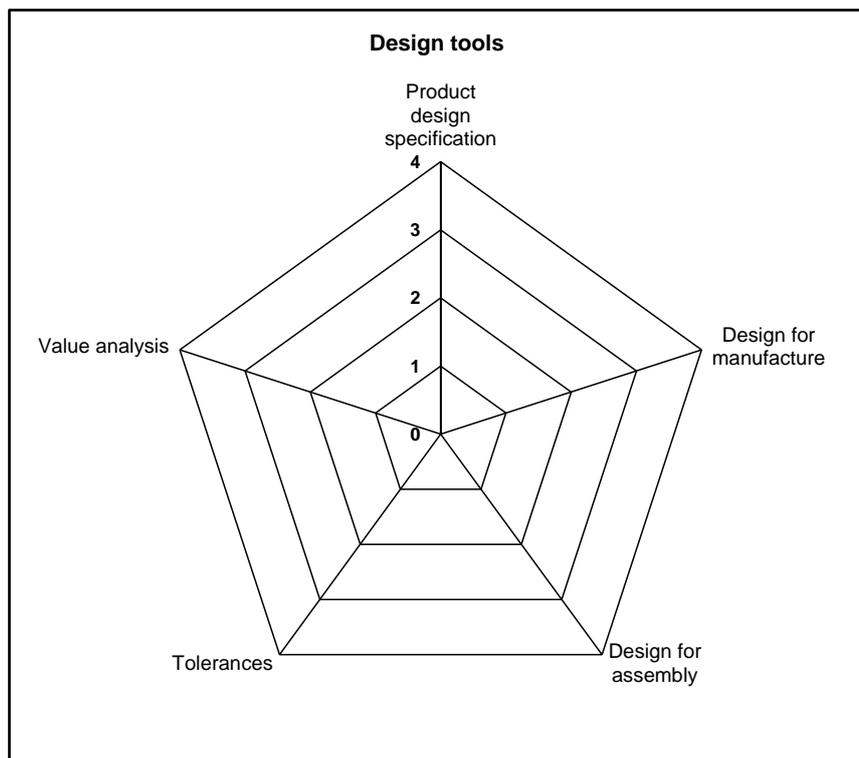
The world has already seen far too many great 'visual' designs that have never made it into production or even worse made it into production only to turn out to be virtually incapable of manufacture once they made it that far. Do not attempt to add to their number.

These products cost a lot of money to manufacture, have high reject rates and inevitably do not meet the specification.

We all know examples of these products. They promise much, they look good but inevitably they deliver very little in terms of consumer satisfaction and they drive manufacturers crazy.

Use the tools to prevent yourself from the failures of the future.

Scoring



Energy and Sustainability Topics – Site Cost Review

Design & development - Design tools					3.4
Level	Product design specification	Design for manufacture	Design for assembly	Tolerances	Value analysis
4	Excellent PDS before project start & well circulated. PDS gives objectives, requirements & constraints. PDS reviewed & updated regularly.	DFM techniques used widely in all design projects.	Formal DFA used to analyse components & assembly method.	Tolerance based on capability of process & machinery.	VA used extensively both at design stage & for existing products.
3	General PDS before project start but small circulation. PDS does not state objectives, requirements & constraints. PDS rarely reviewed & updated.	DFM techniques known & often used in design projects.	Informal DFA used to analyse components & assembly method.	Tolerances based on historical company achieved standards.	VE used at the design stage but no use of VA on existing products.
2	Poor PDS generated & lacks vital information, has restricted circulation & is never updated. Projects do not deliver.	DFM techniques known but rarely or sporadically used in design projects.	Assembly method formally considered at design stage but no DFA used.	Tolerances assigned by application of standard published tolerances for process & machinery.	VA used for existing products but no use of VE at the design stage.
1	No PDS prepared before projects start. Projects evolve & requirements change regularly with little communication of changes.	DFM techniques known but not used in product.	Assembly method informally considered at design stage.	Tolerances assigned by individual designer's own judgement or assessment.	VA used informally but no systematic use. Confusion between when VA should be used.
0	No PDS prepared before projects start. Projects evolve & requirements change regularly with no communication of changes.	No knowledge of DFM techniques.	No concept of DFA or alternatives in assembly methods.	Tolerances based on customer supplied drawing or requirements.	No VA used and no basic understanding of VA.
Score					

Energy and Sustainability Topics – Site Cost Review

5. Sustainable design

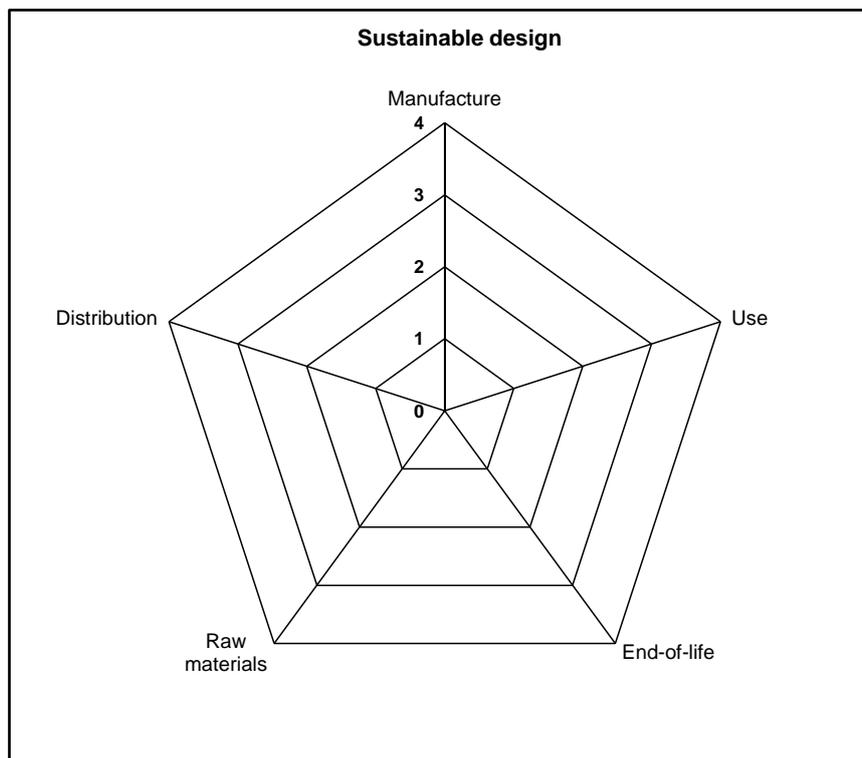
Sustainable design represents an outstanding opportunity for plastics processors to not only get ahead of the regulatory demands and reduce costs but also to establish an ethical lead in the market.

Sustainable design can provide an incentive for the design team to lead cost reduction throughout the complete product life cycle.

Changes in legislation and markets will force many of these changes on processors whether they like it or not, but by becoming pro-active processors can win through cost reductions in all areas.

Sustainable design is a growing trend and sensitive customers at all points on the supply chain are starting to ask for the basics of sustainable design, e.g., Walmart is already asking suppliers to complete their list of 15 sustainability questions which concentrate on issues such as energy use, material efficiency, natural resources and people and community. This is the start of things to come.

Scoring



Energy and Sustainability Topics – Site Cost Review

Design & development - Sustainable design					3.5
Level	Manufacture	Use	End-of-life	Raw materials	Distribution
4	Resource usage & environmental impacts of manufacturing an integral part of design brief. All benchmark resource usage targets known & achieved.	Resource usage & environmental impacts in use stage an integral part of design brief. All benchmark resource usage targets known & achieved.	Disposal options & routes are an integral part of design brief. Cost of disposal targets are known & achieved with disposal routes well defined.	Use of raw & recycled materials is an integral part of design brief. Cost of raw materials (all areas) are known & targets achieved.	Distribution considered as an integral part of design brief. Distribution cost targets are known & targets achieved.
3	Resource usage & environmental impacts of manufacturing considered in design brief. Most benchmark resource usage targets available & achieved.	Resource usage & environmental impacts in use stage considered in design brief. Most benchmark resource usage targets available & achieved.	Disposal options & routes considered in design brief. Cost of disposal targets available but not always achieved.	Use of raw & recycled materials considered in design brief. Cost of raw materials targets available but not always achieved.	Distribution considered in design brief. Distribution cost targets available but not always achieved.
2	Resource usage in manufacturing considered in design brief. Limited benchmark resource usage targets available & achievement is variable.	Resource usage in use stage considered in design brief. Limited benchmark resource usage targets available & achievement is variable.	Disposal options & routes poorly considered in design brief. Limited cost of disposal targets available & achievement is variable.	Use of raw & recycled materials poorly considered in design brief. Limited raw materials usage targets available & achievement is variable.	Distribution costs poorly considered in design brief. Limited distribution cost targets available & achievement is variable.
1	Resource usage in manufacturing considered only in cost reduction element of design brief. No benchmarks for resource usage available or considered.	Resource usage in use stage considered only for publicity purposes. No serious benchmarks for resource usage available or considered.	Disposal options & routes considered only for publicity purposes. No serious benchmarks for cost of disposal available or considered.	Use of raw & recycled materials considered only for publicity purposes. No benchmarks for cost of raw materials available or considered.	Distribution costs considered only for publicity purposes. No serious benchmarks for distribution costs available or considered.
0	Resource usage in manufacturing is not considered in design brief.	Resource usage in use stage is not considered in design brief.	Disposal options, routes & cost of disposal not considered in design brief.	Resource usage in raw materials is not considered in design brief.	Resource usage in distribution is not considered as part of the design brief.
Score					

Energy and Sustainability Topics – Site Cost Review

Part 4: Materials

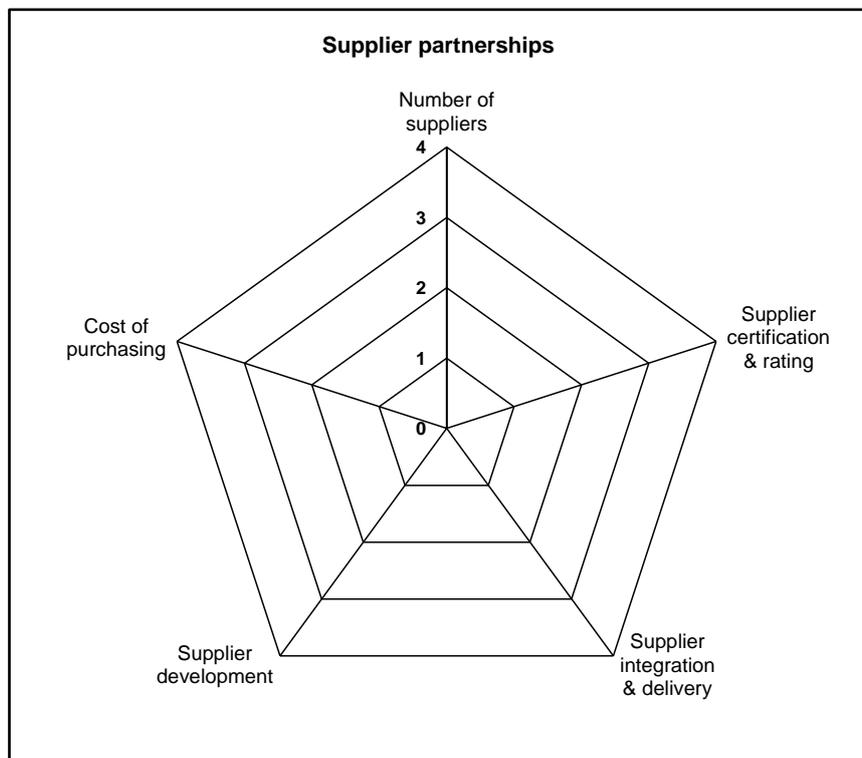
1. Supplier partnerships

Establishing supplier partnerships is one of the hardest tasks for the traditional purchasing function. Their whole ethos and history has been to treat the supplier relationship as a confrontational one. This has to change to realise the potential benefits of setting up a full materials team. The suppliers can have a valuable input into the whole process of reducing the materials cost.

Their input can be invaluable in looking at materials substitution, materials specification and above all, cost reduction. This does not mean that they do not need management and control, simply that the rewards for good management and control are well worth the effort.

Reducing the number of suppliers (to get volume discounts), adequately certifying and rating the supplier base and integrating the preferred suppliers into the cost reduction process will all lead to cost reductions in the long term.

Scoring



Energy and Sustainability Topics – Site Cost Review

Materials & suppliers - Supplier partnerships					4.1
Level	Number of suppliers	Supplier certification & rating	Supplier integration & delivery	Supplier development	Cost of purchasing
4	Minimal number of suppliers. Single sourcing encouraged & alliances/partnerships established.	High quality local certified suppliers preferred & used extensively. Feedback of certification & rating results to supplier & open discussion of these.	Suppliers integrated into processes & manage inventory from production demand by contract. Delivery to point of use is widespread & encouraged. Suppliers seen as partners.	Extensive supplier development program in place to bring suppliers into the process.	Cost of purchasing known, measured regularly & decreasing.
3	Low number of suppliers & actively being reduced. Dual sourcing is discouraged.	Supplier rating carried out to high level but little feedback of results or discussion with supplier. Suppliers rated & high ratings preferred.	Most deliveries to point of use by contract (blanket order). Synchronisation to production demand (not forecast) managed internally.	Moderate supplier development program in place for selected large suppliers.	Cost of purchasing known, measured regularly & increasing.
2	Very high number of suppliers. Action planned to reduce dual sourcing & number of suppliers.	Supplier rating carried out to moderate level. Some recording of performance but historical relationships greatly influence supplier choice.	Most deliveries to central location by specific order. Synchronisation to production demand (not forecast) managed internally.	Small supplier development program in place for very limited number of suppliers.	Cost of purchasing known but rarely quantified & increasing.
1	Large number of suppliers with significant amount of dual sourcing common on large volume products.	Supplier rating carried out at basic level. No recording & primarily anecdotal evidence. Little action taken on adverse rating & no preference for high rating.	All deliveries to central location by specific order. Little synchronisation to production demand & primarily to forecast.	No supplier development program in place or in development.	Cost of purchasing only vaguely known & not quantified.
0	No controls over number of suppliers. Dual sourcing common & encouraged.	No supplier rating carried out.	All deliveries to central location by specific order. Deliveries unsynchronised to production demand. Suppliers seen as enemies.	Suppliers seen as not worthy of development.	Cost of purchasing not known or measured.
Score					

Energy and Sustainability Topics – Site Cost Review

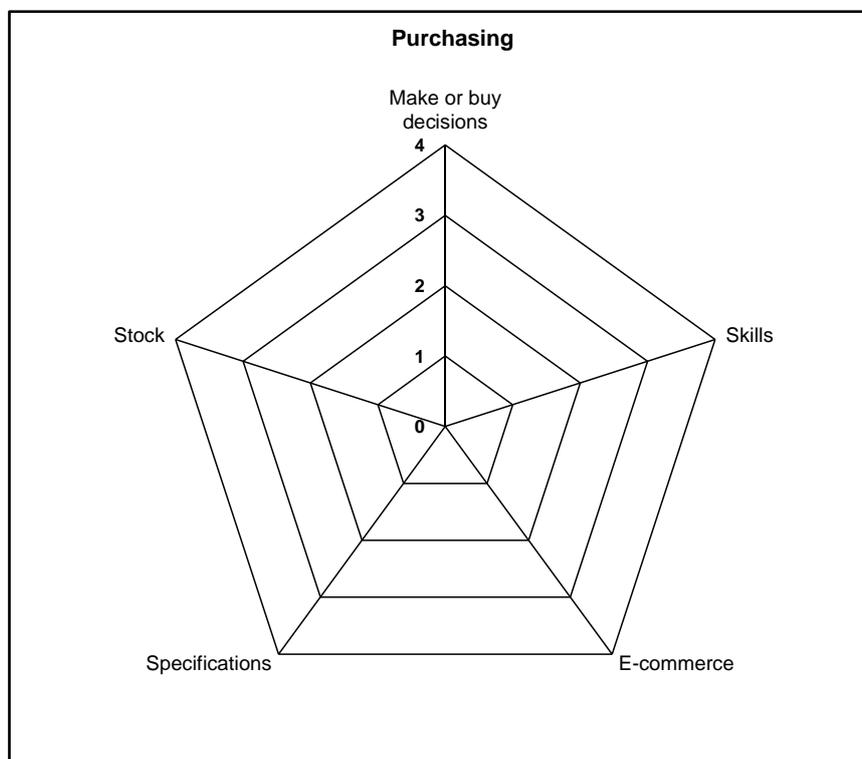
2. Purchasing

Purchasing is a key skill in reducing the materials cost in plastics processing. The purchasing professionals need to use their skills to integrate suppliers into the materials team whilst at the same time ensuring the actual price paid is both fair and reasonable.

Purchasing is not simply about prices, it is also about managing the stock (preferably minimised and devolved to the person who uses the item so that they really care about it), it is about getting the specifications adequately defined so that the supplier has a chance to both reduce prices and to use their skills to the best of their ability.

The rise of e-commerce and internet trading allows companies to reduce transaction costs but most plastics materials are highly specified and frequent changes in suppliers will almost certainly give production concerns. The technology should be used effectively, it should not be abused in a ceaseless search for the lowest-cost supplier.

Scoring



Energy and Sustainability Topics – Site Cost Review

Materials & suppliers - Purchasing					4.2
Level	Make or buy decisions	Skills	E-commerce	Specifications	Stock
4	'Make or buy' decisions taken at Board level based on strategic issues & company development.	High development of purchasing skills throughout. Purchasing is treated as a skilled value adding exercise.	E-commerce used extensively to reduce transaction costs.	Clear & concise delivery & quality specifications set in conjunction with supplier to use supplier's skills to best advantage.	Large use of 'consignment' stock where supplier manages the raw material stock on the processor's premises.
3	'Make or buy' decisions taken at operations management level based on short term tactics.	Good development of purchasing skills. Purchasing is seen as a cost reduction exercise.	E-commerce used for less than 50% of transactions but primarily for simplicity & not to reduce transaction costs.	Good delivery & quality specifications but little use of supplier's skills to best advantage.	Use of 'consignment' stock for more than 50% of raw materials by value.
2	'Make or buy' decisions taken at operations management level based on short term tactics & internal cost comparisons.	Average development of purchasing skills. Purchasing is seen as a cost reduction exercise.	E-commerce used for less than 10% of transactions & primarily driven by suppliers.	Delivery & quality specifications exist but considerable room for improvement in use of supplier's skills.	Small use of 'consignment' stock for very limited number of raw materials.
1	'Make or buy' decisions taken at low level based on internal cost comparisons.	Low development of purchasing skills. Purchasing is seen as a non-value adding activity.	E-commerce in planning or trials stage.	Poor & ambiguous delivery & quality specifications arbitrarily imposed on suppliers.	Use of 'consignment' stock planned for small number of raw materials.
0	'Make or buy' decisions taken at low level based on previous experience.	No development of purchasing skills. Purchasing is seen as 'order placement' activity.	E-commerce not used or planned.	Delivery & quality specifications are non-existent or vague. Frequent disputes with suppliers over quality standards.	No current or planned use of 'consignment' stock.
Score					

Energy and Sustainability Topics – Site Cost Review

3. Materials content and use

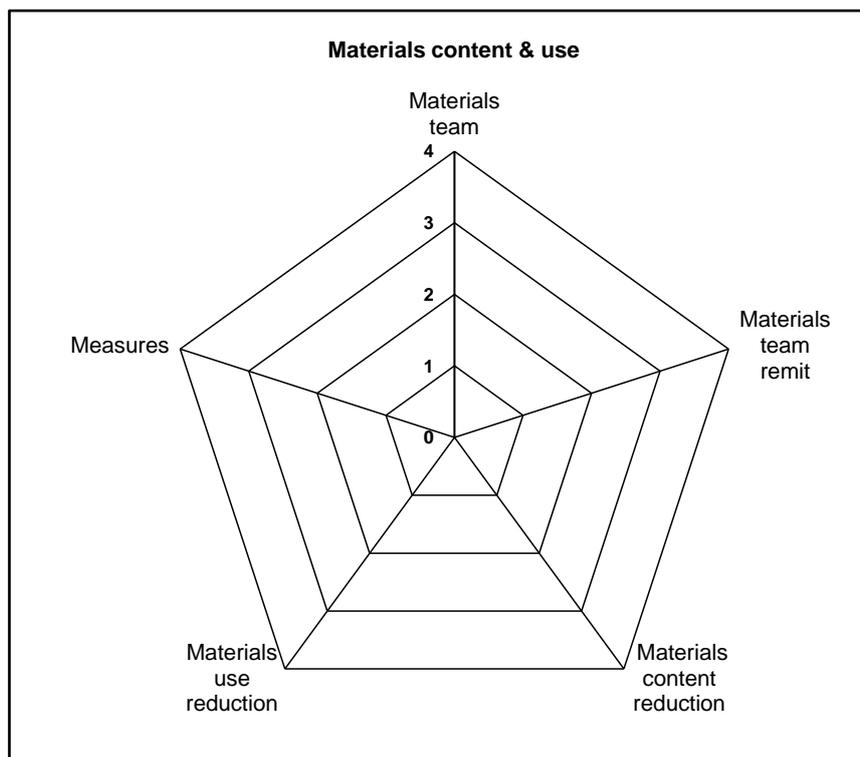
Materials costs need to be actively managed for effective cost management. This is not the same as watching the polymer cost indices and adjusting your expectations or attempting to adjust the prices. Taking material out of the product at either the design or production stage permanently reduces the product cost whatever the raw material prices do.

This is a prize worth having and yet many companies fail to attack the problem with sufficient rigour or organisation.

The materials content and use process crosses too many departmental boundaries for companies organised along functional lines. The materials team is one way to organise the company to manage materials use and content issues but companies must accept the need for a cross-functional approach to this concern.

The materials team must be target driven and an initial target of an 8% total reduction in materials content and use for the same output of saleable product is recommended.

Scoring



Energy and Sustainability Topics – Site Cost Review

Materials & suppliers - Materials content & use					4.3
Level	Materials team	Materials team remit	Materials content reduction	Materials use reduction	Measures
4	Materials team formed & active for both current & new products. Materials content & use extensively & rigorously controlled.	Materials team has power & responsibility to make substantial changes to materials content & use.	Formal & aggressive materials content reduction target set (>4%). Target monitored & achieved.	Formal & aggressive materials use reduction target set (>4%). Target monitored & achieved.	Excellent measurement of materials cost reductions against aggressive targets. Excellent measurement of materials function performance against specific targets.
3	Materials team for content reduction for new & existing products. Materials use for current products is production responsibility only.	Materials team has power & responsibility to make only minor changes to materials content & use.	Formal but non-challenging materials content reduction target set (<4%). Target monitored but not achieved.	Formal but non-challenging materials use reduction target set (<4%). Target monitored but not achieved.	Good monitoring & targeting of materials cost reductions against moderate targets. Good monitoring of materials function against moderate targets.
2	Materials team for new product content reduction by design team. Existing products not considered. Materials use for current products is production responsibility only.	Materials team has responsibility for materials content & use but little power to actually implement decisions.	Informal & challenging materials content reduction target set. Target not monitored & rarely achieved.	Informal & challenging materials use reduction target set. Target not monitored & rarely achieved.	Some monitoring & targeting of materials cost reductions but against poorly defined targets. Few measurements of effectiveness of materials function & against poorly defined targets.
1	Materials content & use reduction is low priority & managed by single function.	Materials team has advisory role only. Team makes recommendations only. Recommendations often overruled by other managers.	Informal but non-challenging materials content reduction target set. Failure to achieve target is regarded as normal & acceptable.	Informal but non-challenging materials use reduction target set. Failure to achieve target is regarded as normal & acceptable.	Poor monitoring & targeting for materials cost reductions. Only vague idea of effectiveness of the materials function, i.e. some measurements available.
0	No central contact for materials content or use reduction.	No materials team in operation.	No targeting for materials content reduction at site.	No targeting for materials use reduction at site.	No monitoring & targeting for effective materials cost reductions. No cost monitoring or targeting for materials function, e.g. cost/purchase order.
Score					

Energy and Sustainability Topics – Site Cost Review

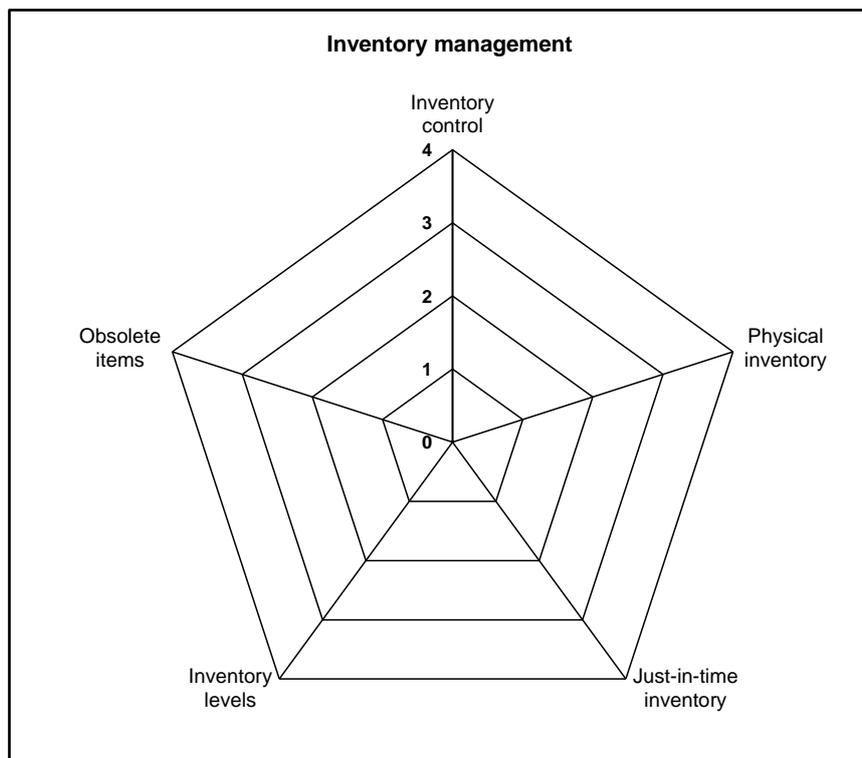
4. Inventory management

Inventory management is often ignored because of the assumptions we make about the levels of raw materials, WIP and finished goods we need to operate. Sometimes it is ignored simply because we put it into the 'too difficult' pile of things that we have to do.

Putting inventory into free-fall can be a frightening and unnerving experience but ultimately it is rewarding because of the amount of free cash it releases into the business. The benefits of reduced inventory are worth the trials and tribulations of the reduction process.

Companies need to challenge their received wisdom of how much inventory is really needed to operate the company. The rewards in terms of cash and space released to the business make inventory management an essential part of cost management.

Scoring



Energy and Sustainability Topics – Site Cost Review

Materials & suppliers - Inventory management					4.4
Level	Inventory control	Physical inventory	Just-in-time inventory	Inventory levels	Obsolete items
4	Excellent inventory control system. Cost of inventory calculated and minimised. Orders fulfilled within schedule (> 99.9% of line items).	All physical inventory in excellent condition, easily located & readily accessible.	Just-In-Time (JIT) inventory controlled by users based on demand.	Minimum inventory stocks held for strategic items only (based on actual demand).	Inventory contains no obsolete stock at all. All obsolete stock removed & disposed of as it becomes obsolete.
3	Good inventory control system. Cost of inventory known but not minimised. Most orders fulfilled within schedule (>95% of line items).	All physical inventory in good condition. Easy to locate most items.	Just-In-Time (JIT) inventory implemented for most items. Controlled by central system based on demand.	Moderate stock held only for important items.	Inventory contains minimal amounts of obsolete stock. Obsolete stock written down to scrap value on accounts.
2	Average inventory control system. Items occasionally out of stock. Cost of inventory not considered. Average order fulfilment (>90% of line items).	All physical inventory in good condition. Difficult to locate some items.	Just-In-Time (JIT) inventory partially implemented for some items. Controlled by central system based on demand.	Moderate stock held for most items.	Inventory contains small amounts of obsolete stock with plan for removal & disposal. Obsolete stock written down to scrap value on accounts.
1	Below average inventory control system. Items often out of stock for no apparent reason. Cost of inventory not considered. Below average order fulfilment (<90% of line items).	All physical inventory in poor condition. Easy to locate most items.	Just-In-Time (JIT) inventory considered but not implemented.	Substantial stocks held for a wide variety of items (irrespective of demand).	Inventory contains significant amounts of obsolete stock with no plan for removal or disposal. Obsolete stock written down to scrap value on accounts.
0	Poor inventory control system. Items often out of stock for no apparent reason. Cost of inventory not considered. Poor order fulfilment (<85% of line items).	All physical inventory in poor condition. Difficult to locate most items.	No concept of Just-In-Time (JIT) inventory.	Substantial stocks held for most items (irrespective of demand).	Inventory contains significant amounts of obsolete stock with no plan for removal or disposal. Obsolete stock held on accounts at original value.
Score					

Energy and Sustainability Topics – Site Cost Review

Part 5: Systems and people

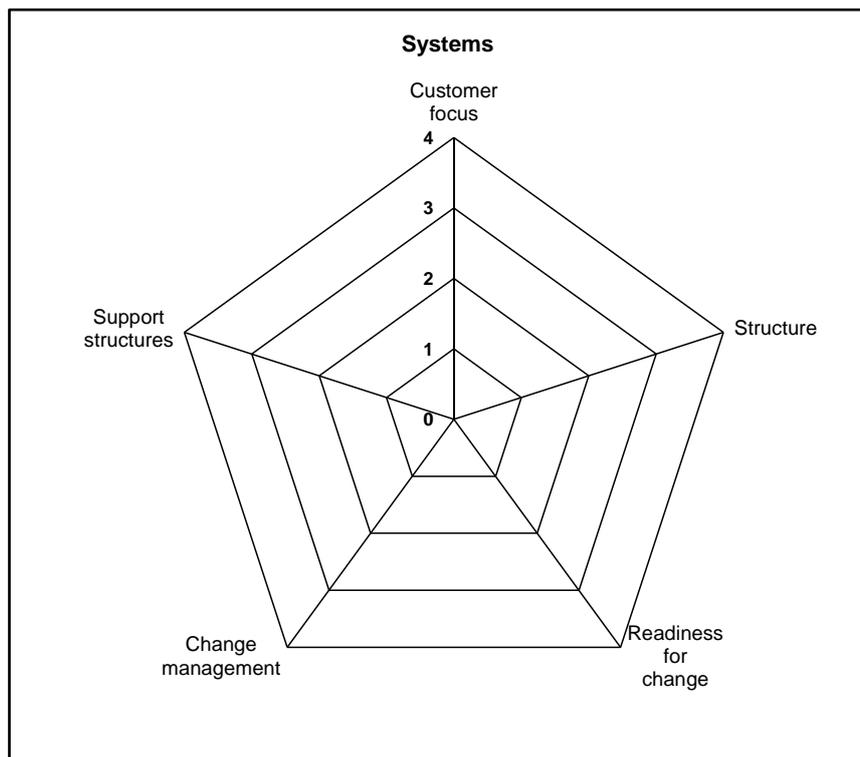
1. Systems

Most senior managers believe that their systems are excellent and do not get in the way of serving the customer. A few minutes of investigation will normally show that the systems are old, do not work properly and get in the way of the staff doing the things that we actually want them to do.

The real problems are the 'old' systems, the rise of the 'target culture' and the false information that is inevitably being fed back up the management chain to the senior managers. Senior managers need to get out and talk to the staff actually doing the work. Find out what is getting in their way and change it fast.

Getting our systems right can quickly improve customer service, dramatically improve staff satisfaction and substantially reduce costs. The real problem is that companies have to be ready for change; they have to have systems in place to actually manage the change and must provide appropriate support structures for staff during the change. How much of this are you actually doing?

Scoring



Energy and Sustainability Topics – Site Cost Review

Systems & people - Systems					5.1
Level	Customer focus	Structure	Readiness for change	Change management	Support structures
4	Internal & external customers are the highest priority. They are seen as the only reason for the existence of the operations. Staff are happy with their ability to serve the customer.	Structure encourages all staff to identify & solve problems. It encourages collaborative work across departments to solve problems & capitalize on opportunities.	High readiness for change at all levels. Company in constant state of change to adapt to changing markets. All staff see change as normal & examine systems for improvements.	Change management has a history of success even for significant changes. Change management is proactive, communicated & managed well.	Staff well supported by management in executing changes to systems. Management actively supports & encourages suggestions for changes to systems & operations.
3	External customers are seen as important but internal customers are not. Staff feel moderately able to deal with external customers due to internal systems & constraints.	Structure encourages information sharing but provides limited opportunity for collaborative work across departments to solve problems & capitalize on opportunities.	Moderate readiness for change at most levels. Key employees are negative in response to change & prefer security of business as usual.	Change has been well managed in the past but primarily for small changes. Experience of large changes is not universally positive but small changes communicated & executed well.	Staff well supported by management in executing changes to systems. Management support & encouragement for changes to systems is passive.
2	Internal issues & systems take precedence over external customers. Staff feel unable to deal with external customers due to internal systems & constraints.	Structure encourages information sharing but does not encourage collaborative work across departments. Moderate departmental 'Tribe' culture.	Low readiness for change at many levels. Middle management has poor expectations of success in change implementation & does not see this as their role.	Change has been moderately managed in the past but only for small changes. Little experience of major change but small changes communicated & executed well.	Staff moderately supported by management only in small changes to systems. High-level management approval needed for even minor changes.
1	Internal & external customers are tolerated. Internal systems & constraints positively hinder efficient dealings with customers.	Structure discourages information sharing & collaborative work across departments. Strong departmental 'Tribe' culture.	Poor readiness for change at all levels. Low expectations of success for any change in systems.	Change has been poorly managed in the past. Change is primarily a reaction to noise with little communication. Change management has been minimal or ineffective.	Staff poorly supported by management & systems. Systems do not help staff carry out tasks. Only changes suggested by management are authorised.
0	Internal & external customers are regarded as an imposition on normal working. Employees treat internal & external customers as 'the opposition'.	Structure & dynamics of business encourages a 'not my job' attitude. Staff are disinterested in their job & office politics is a costly & consistent problem.	Organisation is stagnant. All efforts to change meet with resistance & 'we tried that before' attitude. Previous change efforts have always failed.	Change management has been non-existent in the past. Management makes significant changes based on perception not facts, without communication & without attempting to manage the process.	Staff have no support from managers & systems. Systems stop them getting the job done. Management appears to have no interest in helping them to succeed.
Score					

Energy and Sustainability Topics – Site Cost Review

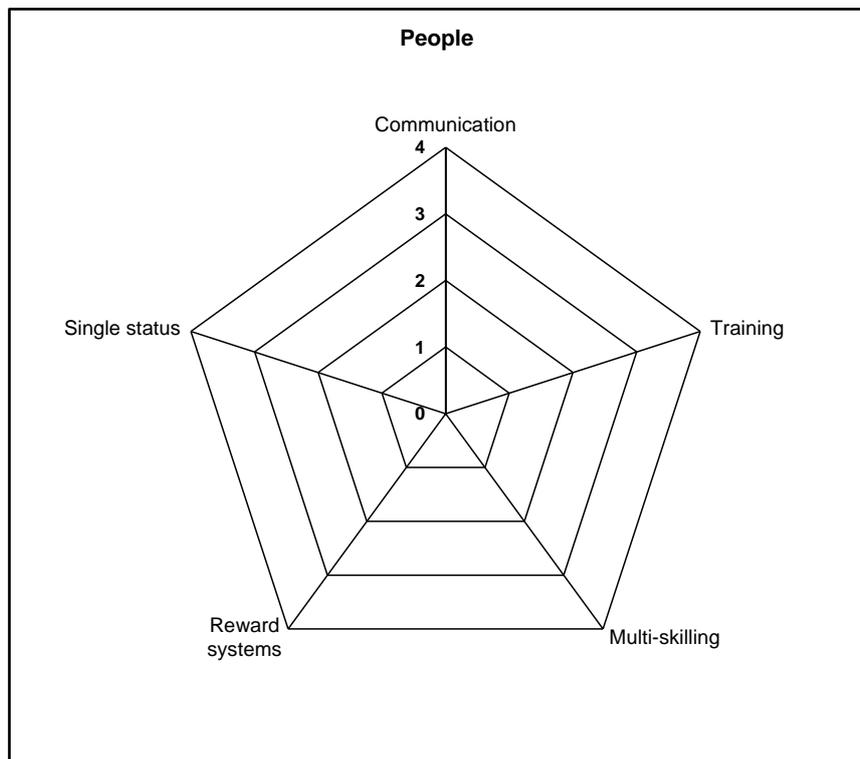
2. People

Whilst many companies have already made strenuous efforts to reduce people costs mainly by reducing staff numbers, this is not the same thing as making sure that your people are working to the best of their ability. In many cases, this means getting out of their way and removing barriers to let them get on with the job that they were hired for.

It means adequately communicating what is expected of them, giving them the training, tools and techniques to complete their tasks and making sure that they are adequately rewarded for what they bring to the company.

This is not just cost management; it is simple good management but it is so often ignored in the rush to reduce headcounts to achieve a crude 'cost-cutting' agenda rather than an intelligent 'cost management' agenda.

Scoring



Energy and Sustainability Topics – Site Cost Review

Systems & people - People					5.2
Level	Communication	Training	Multi-skilling	Reward systems	Single status
4	Regular communications throughout the company ensure that all staff understand issues & actions. Communication channels used for all issues facing the company.	All staff have clear plan for their development within the company & are supported by the company in their development.	Documented & well executed plan in place for multi-skilling of all levels of staff.	Reward systems fair, transparent & freely available. Systems based on skill/merit & clearly support company objectives. Rewards are both financial & recognition based.	All staff have equal terms & conditions of employment. No distinction between indirect & direct labour.
3	Moderate & consistent communication throughout company but important issues are sometimes poorly communicated.	Only senior managers have a development plan. Support from company is variable & primarily for task-specific training. Few staff have a personal development plan.	Good plans for multi-skilling of all staff but not well executed or completed.	Reward systems possibly fair but not transparent or freely available. Systems based on skill/merit but bear little relation to company objectives. No recognition of achievements.	Low current variation in terms & conditions of employment with remaining differences being rapidly removed.
2	Moderate but very sporadic communication throughout company but only on unimportant issues. Important issues generally not communicated.	Staff development is low priority & sporadic for limited staff (generally senior managers). No staff have a personal development plan.	Poor but current plans for multi-skilling of low level staff. Plans not well executed.	Reward systems variable & based on history rather than on skill/merit. Reward system does not encourage achievement of company objectives & has little relation to these.	Small current variation in terms & conditions of employment but plan in place to reduce differences between direct & indirect staff.
1	Poor communication in company.	No staff development or training carried out in the past but limited task specific training planned for the future.	Poor or out-of-date plans for multi-skilling but only of low level staff. Plans not executed.	Staff compensated in ad hoc manner with little consideration for skill or merit. Different rewards for staff doing the same job. Reward system has no relation to company objectives	Large current variation in terms & conditions of employment between staff groups but plans being made to reduce differences between direct & indirect staff.
0	No regular communications method used. Main source of internal information is 'coffee machine' gossip.	No staff development or training carried out in the past or planned for the future.	No plans in place for any multi-skilling.	Reward system based on personal preference of manager. Reward system positively discourages achievement of company objectives.	Large variation in terms & conditions of employment. Direct staff have inferior conditions to indirect staff. Named car park spaces & separate dining for senior managers.
Score					

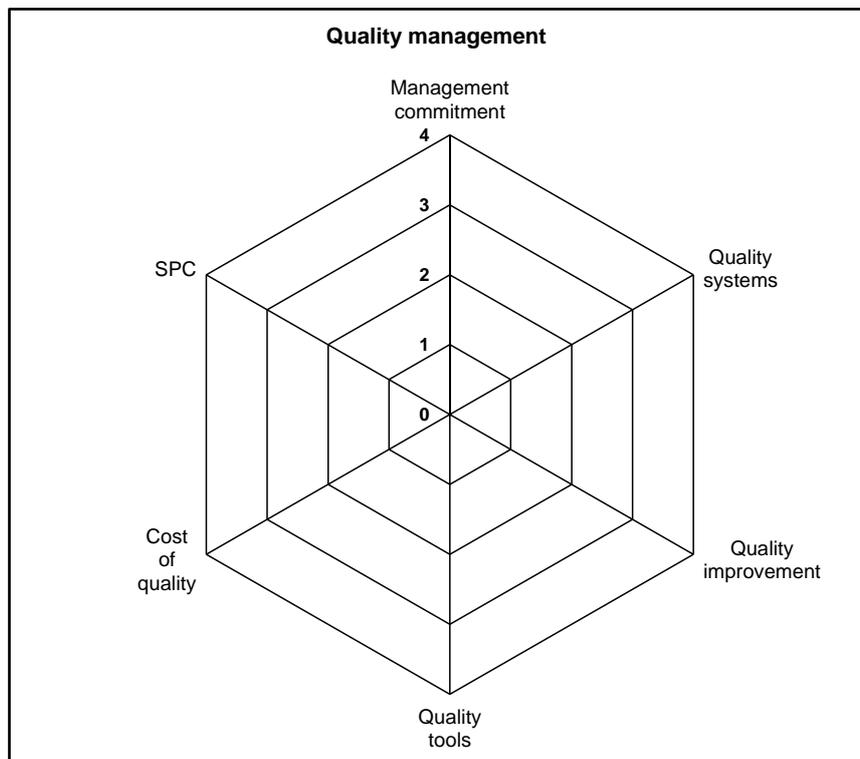
Energy and Sustainability Topics – Site Cost Review

3. Quality management systems

The search for cost-effective quality continues throughout the world. The rise of the ‘systems’ approach (or ‘if you don’t have it then we won’t buy from you’) also continues but this is not the secret to real quality. The systems provide a framework for the development of an effective method of delivering quality products but it is not the end of the journey.

True quality management demands more than a system (although this is important), it demands real management commitment, a real desire to improve the product and the customer experience, the use of quality tools, a deep knowledge of the cost of quality (to justify the necessary expenditure) and the use of statistical quality control. Without all of these additional components, the use of a system will be ultimately simply a process of filling out forms.

Scoring



Energy and Sustainability Topics – Site Cost Review

Systems & people - Quality management						5.3
Level	Management commitment	Quality systems	Quality improvement	Quality tools	Cost of quality	SPC
4	Management is totally committed. Quality policy is integral part of business, all resources provided, staff trained & have delegated authority.	Formal quality management system in place with full external verification of system. No major non-conformances found in last 2 years.	Quality improvement is a fundamental goal for market success. Improvement techniques used whether concerns present or not.	Full range of quality tools used to identify concerns, to determine root causes & to assess rectification actions.	Full cost of quality known widely. Upper management see quality as a positive cash benefit.	SPC used in all processes whether required by customer or not. SPC used for tooling & process equipment acceptance.
3	Management has moderate commitment. Majority of requirements are in place but enforcement is sporadic.	Formal quality management system in place with full external verification of system. No major non-conformances found in last year.	Quality improvement is an important business goal. Improvement techniques only used when concerns are present & visible.	Good knowledge & use of quality tools in analysis & problem solving.	Full cost of quality known but knowledge is restricted. Upper management not aware of benefits of quality management.	SPC used on many processes but only if customer requirement. SPC sometimes used for tooling & process equipment acceptance.
2	Management has low commitment & only really involved when problems occur. Basic requirements are in place but not enforced.	Formal quality management system in place with full external verification of system. Major non-conformances found in last year.	Quality improvement is a minor goal. Improvement techniques sometimes used when concerns are present & visible.	Some knowledge of quality tools & often used for analysis. Problems often solved but key concerns remain unsolved & reappear.	Cost of prevention & appraisal known from accounts. Failure costs known vaguely but with no accuracy.	SPC used on some processes but only if customer requirement. SPC not used for tooling & process equipment acceptance.
1	Management not committed. Some aspects of quality are in place due to middle management dedication but few resources available.	Formal quality management system in place but no external verification of system.	Quality improvement is not seen as a goal. Improvement techniques not used even when concerns are present & visible.	Little knowledge of quality tools & rarely used. When used they are not fully followed through to completion. Same concerns return time & again.	Appraisal costs known from accounts but concept of prevention & failure costs unknown & no data available.	SPC known but not considered for use.
0	Management not committed. No quality policy, no resources, no training & no delegated authority.	No formal quality management system in place.	Quality improvement is not seen as a goal. Getting the product out the door is the only goal.	No knowledge or use of quality tools.	Cost of quality unknown & all quality operations are seen as overhead for the business.	SPC not considered or used.
Score						

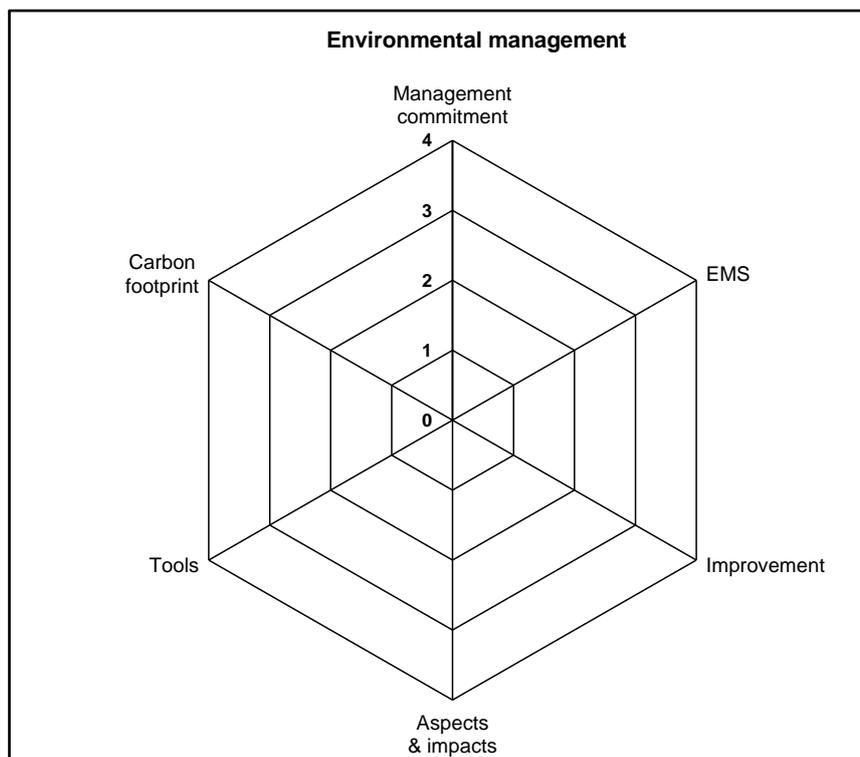
Energy and Sustainability Topics – Site Cost Review

4. Environmental management systems

Environmental management is becoming more and more important as customers and legislators demand improvements in environmental performance. Major customers, such as Walmart, are already signalling that they see environmental performance as a key factor in where they place their business.

Some companies see this as a negative and fail to see that good environmental management can not only reduce the costs of meeting these demands but also reduce overall costs by reducing waste and improving operations. Forward-looking companies also see the considerable PR and other benefits of improving their environmental performance. Simple environmental measurements such as the carbon footprint are already being used to report performance on a wider scale and companies need to be ready for these changes.

Scoring



Energy and Sustainability Topics – Site Cost Review

Systems & people - Environmental management						5.4
Level	Management commitment	EMS	Improvement	Aspects & impacts	Tools	Carbon footprint
4	Management is totally committed. Environmental policy is integral part of business, all resources provided, staff trained & have delegated authority.	Formal EMS in place with full external verification of system. No major non-conformances found in last 2 years.	Environmental improvement is a fundamental business goal. Improvement techniques used whether concerns present or not.	Full aspects & impacts assessment carried out. Active efforts to reduce major aspects & impacts.	Full range of improvement tools used to identify concerns, to determine root causes & to assess rectification actions.	Full carbon footprint known as part of formal EMS. Upper management see improving carbon footprint as a positive cash benefit.
3	Management has moderate commitment. Majority of requirements are in place but enforcement is sporadic.	Formal EMS in place with full external verification of system. No major non-conformances found in last year.	Environmental improvement is an important business goal. Improvement techniques only used when concerns are present & visible.	Partial aspects & impacts assessment carried out. Some efforts to reduce major aspects & impacts.	Good knowledge & use of improvement tools in environmental analysis & problem solving.	Full carbon footprint known but knowledge is restricted. Upper management not aware of benefits of improving carbon footprint.
2	Management has low commitment & only really involved when problems occur. Basic requirements are in place but not enforced.	Formal EMS in place with full external verification of system. Significant major non-conformances found in last year.	Environmental improvement is a minor goal. Improvement techniques sometimes used when concerns are present & visible.	No aspects & impacts assessment carried out. Some efforts to reduce main perceived aspects & impacts.	Some knowledge of improvement tools & often used for analysis. Problems often solved but key concerns remain unsolved & reappear.	Basic carbon footprint known but accuracy in some areas is poor. Work is underway to improve data collection in these areas.
1	Management not committed. Some aspects of environmental management are in place due to middle management but few resources available.	Formal EMS in place but no external verification of system.	Environmental improvement is not seen as a goal. Improvement techniques not used even when concerns are present & visible.	No aspects & impacts assessment carried out. Some efforts to reduce visible aspects & impacts (but possibly misdirected).	Little knowledge of improvement tools & rarely used. Improvements not fully followed to completion. Same concerns return time & again.	No current knowledge of carbon footprint but data available & work underway to calculate basic footprint.
0	Management not committed. No environmental policy, no resources, no training & no delegated authority.	No formal EMS in place.	Environmental improvement is not seen as a goal. Getting the product out the door is the only goal.	No concept of aspects & impacts of operations.	No knowledge or use of improvement tools.	No knowledge of carbon footprint & process seen as an overhead for the business.
Score						

Energy and Sustainability Topics – Site Cost Review

5. Health and safety management systems

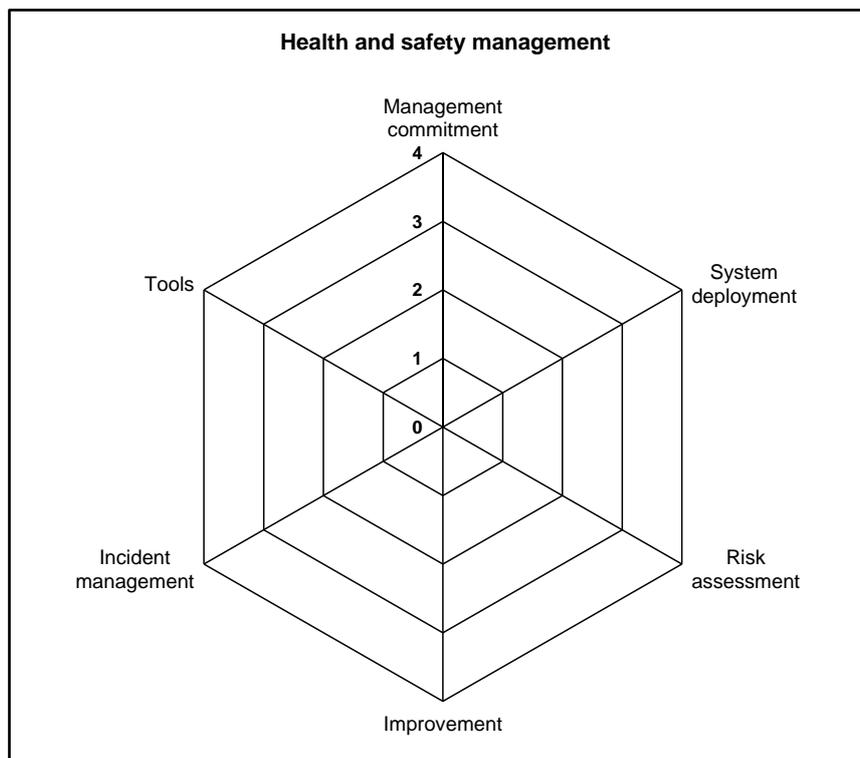
Health and safety systems are covered by legislation in most areas of the world and certain aspects will be mandatory. However, the benefits of a good health and safety management system are much more than simple compliance with legislation.

A good health and safety management system will protect a company's investment in their staff and also protect the general public.

If the health and safety system fails (for whatever reason) then the result can be either a minor or a major incident and a good health and safety management system will not only seek to prevent incidents but also include procedures for dealing with them if they occur.

Prompt and effective incident management can not only reduce the seriousness of an incident but also control and reduce the impact on the business.

Scoring



Energy and Sustainability Topics – Site Cost Review

Systems & people - Health and safety management						5.5
Level	Management commitment	System deployment	Risk assessment	Improvement	Incident management	Tools
4	Management is totally committed. H&S is integral part of business, all resources provided, staff trained & have delegated authority.	Formal H&S system in place with full external verification of system. No major non-conformances found in last 2 years.	All processes (major and minor) covered by full risk assessments. Action taken to minimise all risks identified.	H&S improvement is a fundamental business goal. Improvement techniques used whether concerns present or not.	Comprehensive incident management program in place. All potential incidents are covered by incident management plan.	Full range of improvement tools used to identify concerns, to determine root causes & to assess rectification actions.
3	Management has moderate commitment. Majority of requirements are in place but enforcement is sporadic.	Formal H&S system in place with full external verification of system. No major non-conformances found in last year.	All major processes covered by full risk assessments. Action taken to minimise most risks identified.	H&S improvement is an important business goal. Improvement techniques only used when concerns are present & visible.	Good incident management program in place. Most potential incidents are covered by incident management plan.	Good knowledge & use of improvement tools in identifying and reducing risks.
2	Management has low commitment & only really involved when problems occur. Basic requirements are in place but not enforced.	Formal H&S system in place with full external verification of system. Significant major non-conformances found in last year.	Some major processes not covered by risk assessments. Some identified actions not taken to minimise risks.	H&S improvement is a minor goal. Improvement techniques sometimes used when concerns are present & visible.	Poor incident management program. Few potential incidents are covered by incident management plan.	Some knowledge of improvement tools & often used for analysis. Problems often solved but key concerns remain unsolved & reappear.
1	Management not committed. Some aspects of H&S management are in place due to middle management but few resources available.	Formal H&S system in place but no external verification of system.	Most major processes not covered by risk assessments. Few actions taken to minimise risks.	H&S improvement is not seen as a goal. Improvement techniques not used even when concerns are present & visible.	No incident management program in place. Some informal procedures exist but not agreed or widely available.	Poor knowledge of improvement tools. Tools rarely used and when used are not fully followed through to completion. Some concerns return time & again.
0	Management not committed. No H&S policy, no resources, no training & no delegated authority.	No formal H&S system in place.	No risk assessments carried out. Actions taken to minimise risks are minimal.	H&S improvement is not seen as a goal. Getting the product out the door is the only goal.	No incident management program in place. Any incident comes as a surprise. Reactions are unplanned and uncoordinated.	No knowledge or use of improvement tools.
Score						

Energy and Sustainability Topics – Site Cost Review

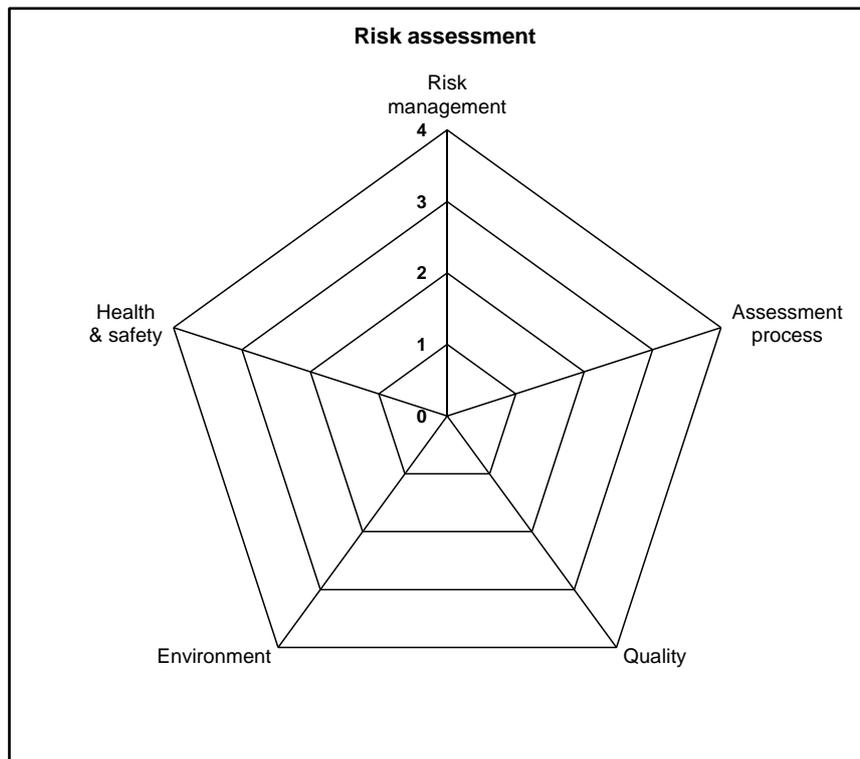
6. Risk assessment

Risk assessment is a vital tool that is much neglected in industry. It is also obviously neglected in other commercial activities areas given that the many recent financial events have resulted directly from failure to assess and control the obvious risks.

Most companies use an intuitive approach to risk assessment but using a formal approach can reveal not just the risks but also methods to control or reduce the risk or the end results of an event.

Risk assessment can reduce the costs of any type of business failure by providing a method to avoid the failure in the first place and by stimulating discussion on how to mitigate the results of failure.

Scoring



Energy and Sustainability Topics – Site Cost Review

Systems & people - Risk assessment					5.6
Level	Risk management	Assessment process	Quality	Environment	Health & safety
4	Comprehensive risk reduction & management program in place. Plans are up to date & appropriate.	Formal and well documented risk assessment process available and used extensively.	Full product and process risk assessments carried out. Assessments follow well defined process and are well documented.	Full environmental risk assessments carried out. Assessments follow well defined process and are well documented.	Full Health and Safety risk assessments carried out. Assessments follow well defined process and are well documented.
3	Limited risk reduction & management program in place for very specific events, e.g. environmental issues. Plans are up to date & appropriate/	Formal risk assessment process available but rarely used.	Full product and process risk assessments carried out. Assessments follow poorly defined or inappropriate process but are well documented.	Full environmental risk assessments carried out. Assessments follow poorly defined or inappropriate process but are well documented.	Full Health and Safety risk assessments carried out. Assessments follow poorly defined or inappropriate process but are well documented.
2	Limited risk reduction & management program in place for very specific events, e.g. environmental issues. Plans are out-of-date or inappropriate.	Informal risk assessment process in place but used extensively or for a majority of areas.	Full product and process risk assessments carried out. Assessments follow poorly defined or inappropriate process and are poorly documented.	Full environmental risk assessments carried out. Assessments follow poorly defined or inappropriate process and are poorly documented.	Full Health and Safety risk assessments carried out. Assessments follow poorly defined or inappropriate process and are poorly documented.
1	No risk reduction & management program currently in place but plans in place for implementation.	Informal risk assessment process in place but rarely used or used for a minority of areas.	Informal product or process risk assessment carried out for some areas but poorly documented.	Informal environmental risk assessment carried out for some areas but poorly documented.	Informal Health and Safety risk assessment carried out for some areas but poorly documented.
0	No risk reduction & management program in place and not planned.	No risk assessment process in place for any area.	No product or process risk assessment carried out at any stage.	No environmental risk assessments carried out.	No Health and Safety risk assessment carried out at any stage. NOTE: This could contravene local legislation.
Score					

Energy and Sustainability Topics – Site Cost Review

Part 6: Production

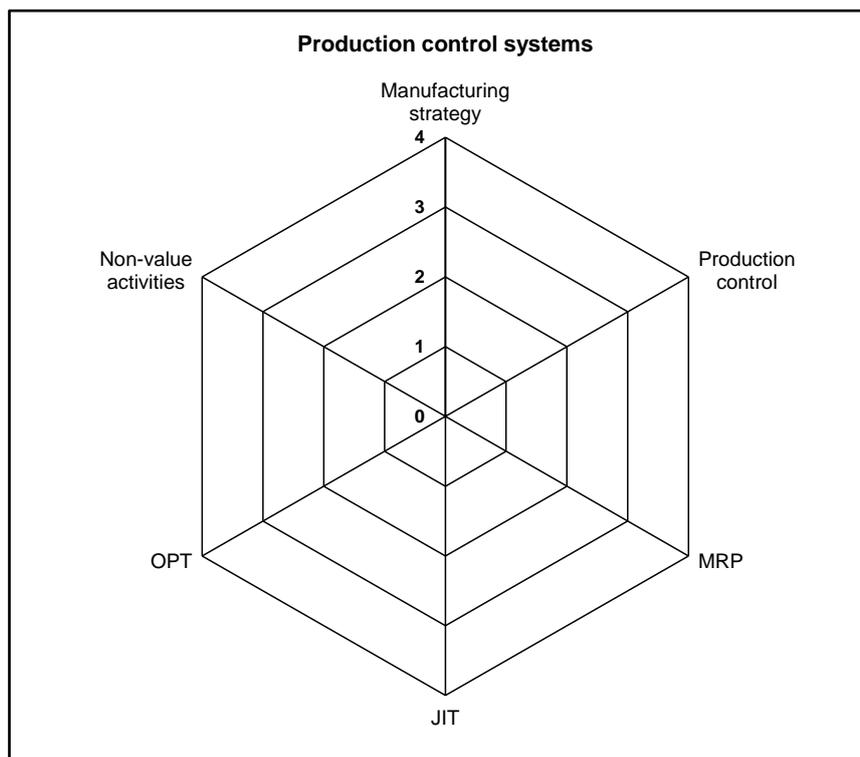
1. Production control

Deciding the basic production control system forces many of the other decisions about production management. MRP-type systems tend to lock the systems into computers and simulations, JIT-type systems require high levels of people skills and training and OPT-type systems focus on the top-level but can neglect the lower-level operations.

In the end, most plastics processors will use a 'mix and match' approach using MRPII /ERP for a broad prediction of purchase requirements, JIT for basic production management and OPT for bottlenecks and total system optimisation.

The important thing is to realise the advantages and limitations of each type of system and to critically examine the current systems being used in the company to check that they are applicable for what the production areas are being asked to deliver.

Scoring



Energy and Sustainability Topics – Site Cost Review

Production - Production control systems						6.1
Level	Manufacturing strategy	Production control	MRP	JIT	OPT	Non-value activities
4	Company has manufacturing strategy with defined & quantified goals. Goals are aggressive but achievable.	Computer system based on customer 'pull'. Meeting customer demand is primary driver.	Modified MRP system used for global forecasting with frequent updating of database & high inventory accuracy.	'Pull' used to drive production, minimal WIP, consistently low throughput time & highly integrated supplier base.	Bottlenecks identified & protected even if bottleneck moves with varying production mix. Site profitability optimised.	Minimal non-value activities. Non-value activities actively sought & eliminated by all staff (including operators) through process analysis.
3	Company has manufacturing strategy with defined & quantified goals. Goals are very conservative & do not stretch the company.	Manual system based on customer 'pull'. Meeting customer demand is primary driver.	Modified MRP system used with regular updating & good inventory accuracy.	Partial 'pull' system used with high WIP in some areas. Throughput time is variable depending on product mix.	Bottlenecks identified & protected for some products. Bottlenecks control output for other products but no effective action taken.	Few non-value activities. Elimination of non-value activities undertaken occasionally by specific nominated staff.
2	Company has outline manufacturing strategy but does not include defined & quantified goals.	Computer system based on sales forecast 'push'. System simply automated version of manual system.	Modified MRP system used with infrequent updating & average inventory accuracy (infrequent but major errors).	Push used to drive production, moderate amounts of WIP due to good controls but low supplier involvement.	Bottlenecks formally identified & partially protected. Bottlenecks control output but little effective action taken.	Significant amount of non-value activities. Elimination of non-value activities undertaken sporadically by specific nominated staff.
1	Company has a master strategic plan but no manufacturing strategy to support this.	Manual system based on sales forecast 'push'. Direct labour & machine utilisation are major drivers of production irrespective of actual sales.	Standard MRP system used with little updating of parameters & working entirely from forecast. Low inventory accuracy & frequent errors.	Push used to drive production, high amounts of WIP & low supplier involvement.	Bottlenecks informally identified but unprotected. Bottlenecks control output but no effective action taken.	High amount of non-value activities taking place. Elimination of non-value activities is rare even if identified.
0	Company has no master strategic plan or manufacturing strategy.	No formal system visible. Jobs allocated almost at random by production.	No system of global capacity planning used.	Load the machine schedules up & tell them to get on with it!	Bottlenecks not identified or protected.	High amount of non-value activity at site with no effort to identify & reduce.
Score						

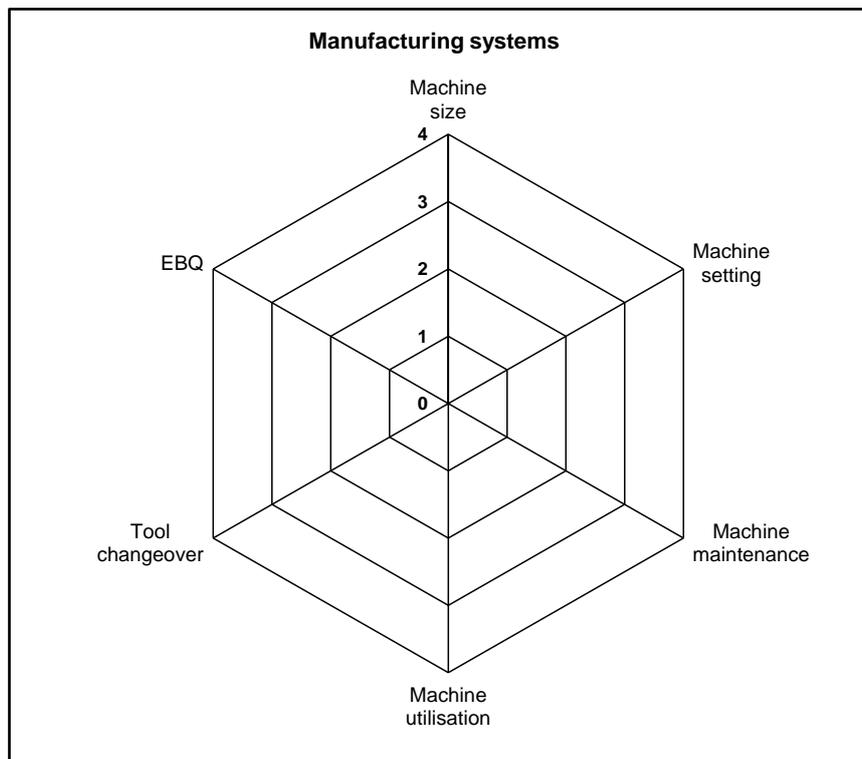
Energy and Sustainability Topics – Site Cost Review

2. Manufacturing systems

The choice of manufacturing system is not always as easy as it may seem. Most manufacturing control systems appear to be more designed for the accountants to control the numbers than for the production people to control the process.

I have witnessed the wholesale 'computerisation' of the process (the guilty companies will remain nameless) to provide excellent data to the accountants. The fact that it became almost impossible for the manufacturing people to order materials, schedule production and actually produce anything was secondary to the fact that the data were excellent. Great data, sorry about almost losing the company in the process (but it doesn't matter because they won't be around to complain about the fact that the process drove the company to the wall).

Scoring



Energy and Sustainability Topics – Site Cost Review

Production - Manufacturing systems						6.2
Level	Machine size	Machine setting	Machine maintenance	Machine utilisation	Tool changeover	EBQ
4	Machine sizes & tooling cavities appropriate to sales needs. Production makes to order. Multiple machines provide backup.	Machine setting by experiment & logical process by fully trained setters. Settings regularly examined. Setting sheets current.	Maintenance based on needs, with condition appraisal used for all equipment affecting energy efficiency. Results acted upon.	Utilisation is regarded as less important than meeting customer orders on time. Actual utilisation is in the region of 80% to allow for maintenance.	One Touch Exchange of Dies (OTED) implemented.	EBQ is minimal for all products & production quantities are equal to order quantities. Products always made to order & not for stock.
3	Machine sizes & tooling cavities appropriate to sales needs. Production can make to order but there is no backup in the event of tool or machine failure.	Machine setters experienced in setting process. No examination of effectiveness of current settings. Good setting sheets but some outdated.	Regular condition surveys carried out on equipment affecting energy efficiency. Action undertaken for most defects identified.	Utilisation is over 80%. Utilisation decreases when customer orders decrease.	Single Minute Exchange of Dies (SMED) implemented.	EBQ is low for most products & production quantities are generally similar to orders. Products are sometimes made for stock rather than order.
2	Machine sizes & tooling cavities out of balance with sales demand but machines rarely operate when no sales demand.	Machine setters have no external training. Machines set to 'traditional' settings with no examination of effectiveness. Poor setting sheet discipline.	Condition surveys carried out regularly on all equipment affecting energy efficiency. Remedial work constrained by budgets.	Utilisation is over 85%. Utilisation decreases when customer orders decrease but only after considerable stock has been produced.	Set-up time not relevant for most products (constant running) or set-up time reduction carried out to basic level for majority of products.	EBQ is high & production quantities are always much higher than order quantities. Products routinely made for stock.
1	Machine sizes & tooling cavities out of balance with sales demand. Machines sometimes operate when no sales demand.	Machine setting unchanged from original tool commissioning settings. No records of how settings were established.	Condition surveys carried out occasionally, prompted by failure or safety considerations. Remedial work only carried out on major defects.	Utilisation is over 90% & is driven by accounting procedures. Utilisation does not decrease when customer orders decrease.	Set-up time reduction carried out to basic level for minimal number of products.	EBQ calculated from on actual set-up times for specific tooling. Production planning considers EBQ but primary aim is to meet demand.
0	Machines are large & tooling is multiple-cavity when sales demand is not high. Machines often make for stock to keep operating.	Machine settings changed often by a variety of staff (mostly at shift changes). No records of changes made to settings. No machine setting sheets.	No regular surveys or maintenance carried out.	Utilisation is near 100% & is seen as a key ratio for the site. Utilisation is high even when no orders are being filled & output is going into stock.	No consideration of changeover time reduction. EBQ dominates production thinking but no action taken to reduce.	No real EBQ data available. High nominal EBQ calculated from standards with little real justification. EBQ dominates production planning.
Score						

Energy and Sustainability Topics – Site Cost Review

3. Performance measurement

Measurement drives performance and the measures used are critical in improving manufacturing performance.

Measure and praise the number of coffee breaks taken and pretty soon the number of coffee breaks taken will increase. This is probably not what you want so you wouldn't measure and praise it.

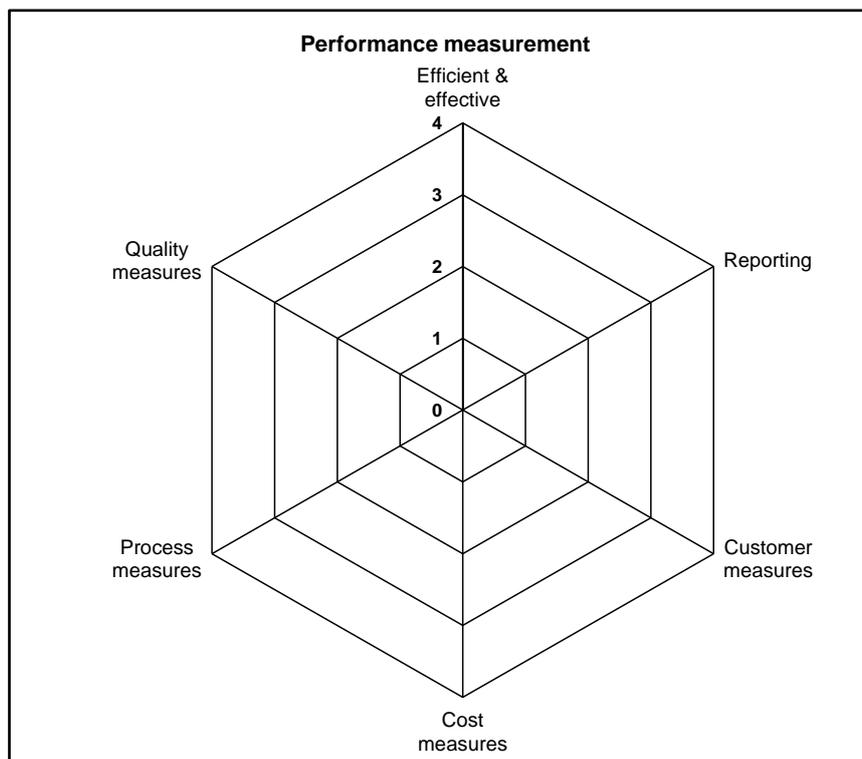
If this is the case then:

- Why do we measure overall machine utilisation when what counts is the bottleneck machine utilisation?
- Why do we all talk about the customer being king and yet the measures of customer satisfaction are rarely reported to production (the only people who can really improve them)?
- Why do we have loads of accounting measures that have no relation to actually running production?

It is time that the performance measurement systems (at all levels) were aligned with what we actually want to achieve.

Start doing it today.

Scoring



Energy and Sustainability Topics – Site Cost Review

Production - Performance measurement						6.3
Level	Efficient & effective	Reporting	Customer measures	Cost measures	Process measures	Quality measures
4	All measures are effectiveness measures that concentrate on doing the right things.	Reporting is an operational function using measures that reflect the company goals. Weekly reporting with mostly non-financial measures.	Customer measures are very important. Measures include delivery conformance, customer perception & customer profitability.	Cost measures used where relevant for improvement. Measures include value-added, WIP & inventory turns & waste measures.	Process measures used extensively for improvement. Measures include cycle times, set-up times, distance travelled & lead time reduction.	Quality measures are significant part of measurement. Measures include supplier performance, cost of quality & customer satisfaction.
3	Most measures are effectiveness measures that concentrate on doing the right things	Reporting uses mainly operational measures with few standard accounting measures.	Moderate number of customer measures included in reporting but little effort to improve.	Moderate number of cost measures included in reporting.	Moderate number of process measures included in reporting but little effort to improve.	Moderate number of quality measures included in reporting but little effort to improve.
2	Measures are equally split between effectiveness & efficiency measures.	Reporting is equally split between operational measures & standard accounting measures.	Some customer measures included in reporting but no effort to improve.	Cost measures are the main measures reported but a significant number of measures are for operational improvement.	Some process measures included in reporting but no effort to improve.	Some quality measures included in reporting but not used to improve.
1	Most measures are efficiency measures that concentrate on doing things right	Reporting uses mainly standard accounting measures with few operational measures.	Minimal customer measures included in reporting.	Cost measures are the only measure with some directed at operational performance.	Minimal process measures included in reporting.	Minimal quality measures included in reporting.
0	All measures are efficiency measures that concentrate on doing things right.	Reporting uses standard accounting measures. Monthly reporting with only financial measures.	No customer measures included in reporting.	Cost measures are the only measure but all are utilisation or variances.	No process measures included in reporting.	No quality measures included in performance measurements.
Score						

Energy and Sustainability Topics – Site Cost Review

Part 7: Overheads

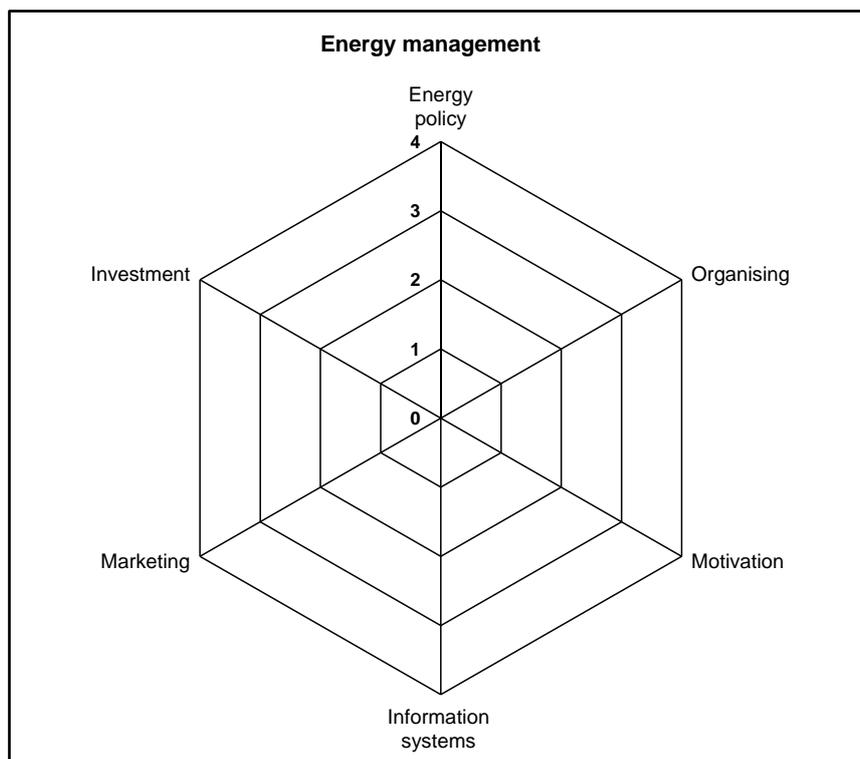
1. Energy management

Energy management is a new skill for many companies. The cost of energy has not previously been an issue and it is only in the last 10–15 years that energy has become a major financial cost. Energy cost rises are a feature all over the world and this is being driven not only by supply issues but also by taxation issues.

Cost is not the only driver for reducing the amount of energy used. The rise of the new words and issues such as 'carbon footprint' and 'sustainability' have also been drivers for energy use reduction.

These new issues are an opportunity for companies to not only reduce costs but to also become 'greener'. There is no conflict, you can be green and reduce costs!

Scoring



Energy and Sustainability Topics – Site Cost Review

Overheads - Energy management						7.1
Level	Energy policy	Organising	Motivation	Information systems	Marketing	Investment
4	Energy policy, Action Plan & regular review have commitment of top management as part of an environmental strategy.	Energy management fully integrated into management structure. Clear delegation of responsibility for energy consumption.	Formal & informal channels of communication regularly exploited by energy manager & energy staff at all levels.	Comprehensive systems set targets, monitor consumption, identify faults, quantify savings & provides budget tracking.	Marketing of energy efficiency & energy management performance both internally & externally.	Positive discrimination in favour of 'green' schemes with detailed investment appraisal of all opportunities.
3	Formal energy policy, but no active commitment from top management.	Energy manager accountable to energy committee representing all users, chaired by a member of the managing board.	Energy committee used as main channel together with direct contact with major users.	M&T reports for individual premises are based on sub-metering, but savings not reported effectively to users.	Program of staff awareness & regular publicity campaigns.	Same payback criteria employed as for all other investment.
2	Unadopted energy policy set by energy manager or senior departmental manager.	Energy manager in post, reporting to ad hoc committee, but line management & authority are unclear.	Contact with major users through ad hoc committee chaired by senior departmental manager.	Monitoring & targeting reports based on supply meter data. Energy unit has ad hoc involvement in budget setting.	Some ad hoc staff awareness training.	Investment using short-term payback criteria only.
1	An unwritten set of guidelines.	Energy management is the part-time responsibility of someone with limited authority or influence.	Informal contacts between engineering staff & a few users.	Cost reporting based on invoice detail. Engineer compiles reports for internal use within technical department.	Informal contacts used to promote energy efficiency.	Only low-cost measures taken.
0	No explicit policy.	No energy management or any formal delegation of responsibility for energy consumption.	No contact with users.	No information system. No accounting for energy consumption.	No promotion of energy efficiency.	No investment in increasing energy efficiency.
Score						

Energy and Sustainability Topics – Site Cost Review

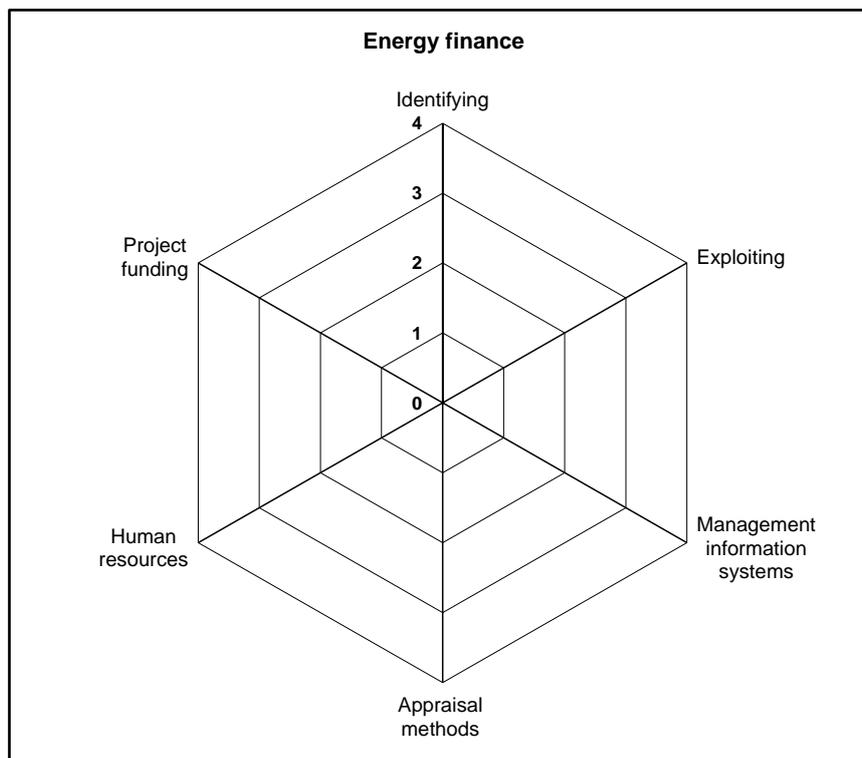
2. Energy – financial management

Energy management is the same as any other project or process – starve the process of adequate and appropriate investment and it will fail. All projects, even nominally no-cost and low-cost projects need investment in staff time and much progress can be made in these areas.

Eventually, the process will exhaust the no-cost and low-cost projects and the process will require financial investment of some magnitude and this must be justified before progress can be made.

Energy management does not require preferential funding. Most energy management projects can easily meet the standard investment hurdles and analysis that are in place at most sites. The main concern is that energy management receives the appropriate level of funding for the benefits that it can deliver.

Scoring



Energy and Sustainability Topics – Site Cost Review

Overheads - Energy finance						7.2
Level	Identifying	Exploiting	Management information systems	Appraisal methods	Human resources	Project funding
4	Detailed energy surveys regularly updated. Opportunities already costed & ready to proceed.	Formal requirement to identify the most energy-efficient option. Decisions made on the basis of life cycle costs.	Full MIS enabling identification of past savings & further opportunities for investment.	Full discounting methods using internal rate of return & ranking priority projects as part of an ongoing investment strategy.	Board take a proactive approach to long-term investment as part of a detailed environmental strategy in full support of the energy team.	Projects compete equally with other areas. Full account taken of indirect benefits, e.g. marketing opportunities, environmental factors.
3	Energy surveys conducted for areas likely to yield largest savings.	Energy staff required to comment on all projects. Energy efficiency options often approved but no account of life cycle costs.	Promising proposals are presented to decision-makers but insufficient information (e.g. sensitivity or risk analysis) results in delays or rejections.	Discounting methods using the organisation's specified discount rates.	Energy manager presents well-argued cases to decision makers.	Projects compete for capital along with other business opportunities, but have to meet more stringent requirements for return on investment.
2	Regular energy monitoring / analysis used to identify possible areas for saving.	Energy staff notified of all proposals that affect energy usage. Proposals for energy savings are at risk when capital costs are reduced.	Adequate management information available, but not in the correct format or easily accessed.	Undiscounted appraisal methods e.g. gross return on capital.	Occasional proposals to decision makers by energy managers with limited success & only marginal interest from decision makers.	Energy projects not formally considered for funding, except for very short-term returns.
1	Informal ad hoc energy walkabouts conducted by staff with checklists to identify energy saving measures.	Energy staff use informal contacts to identify projects where energy efficiency can be improved at marginal cost.	Insufficient information to demonstrate whether previous investment has been worthwhile.	Simple payback criteria are applied. No account taken of lifetime of the investment.	Responsibility unclear & those involved lack resources to identify projects & prepare proposals.	Funding only available from revenue on low risk projects with paybacks of less than one year.
0	No mechanism or resources to identify energy-saving opportunities.	Energy efficiency not considered in new-build, refurbishment or plant replacement decisions.	Little or no information available to develop a case for funding.	No method used irrespective of the attractiveness of a project.	No-one in organisation promoting investment in energy efficiency.	No funding available for energy projects. No funding in the past.
Score						

Energy and Sustainability Topics – Site Cost Review

3. Energy – technical management

The plant is the thing

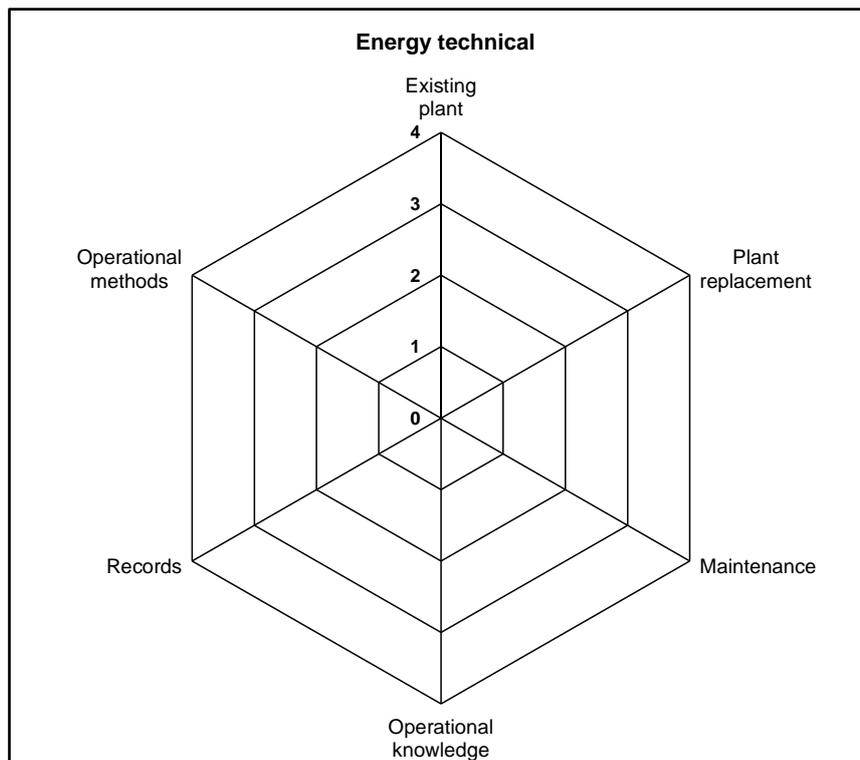
The distribution of energy use in plastics processing is very different to that in an office, the major energy users are the services and the plastics processing machinery and this is where the efforts must be concentrated.

This requires good technical knowledge of the services and processes used and good technical management of the processing itself.

This chart tries to provide an assessment of these technical aspects of energy management.

Even when the majority of the operational plant was not originally designed with energy efficiency in mind there are many simple actions that can be taken to improve the energy efficiency of existing plant. These range from good maintenance action, where simple low-cost tasks, such as the alignment of motor drives, can easily reduce energy use for existing plant through to involving the operators to reduce energy use.

Scoring



Energy and Sustainability Topics – Site Cost Review

Overheads - Energy technical						7.3
Level	Existing plant	Plant replacement	Maintenance	Operational knowledge	Records	Operational methods
4	Majority of existing equipment uses best practice energy-efficient features, is correctly commissioned & well maintained.	Equipment chosen is the most appropriate for application. Life cycle costs & energy efficiency are major factors in selection.	Maintenance is based on needs, with condition appraisal used for all equipment & fabric elements affecting energy efficiency. Results acted upon.	Staff know how their actions affect energy efficiency & take positive steps to minimise energy use. Staff have targeted training in energy issues.	Detailed descriptions of systems, plant control & operation. Detailed schedules of all plant, instrumentation & controls.	Operational methods & settings for energy efficiency well defined & implemented. Full utilisation of feedback from monitoring.
3	Equipment & plant is appropriately selected, energy efficient, commissioned for low energy consumption & well maintained.	Equipment is appropriate for application with energy efficiency considered. Life cycle costs & energy efficiency are evaluated.	Regular condition surveys carried out on equipment & fabric elements affecting energy efficiency. Action undertaken for most defects identified.	Staff are aware of how they affect energy use & take all good housekeeping measures to save energy. Training on a regular basis.	Detailed descriptions of plant control & operation, & outline systems. Reasonable schedules of all plant, instrumentation & controls.	Operational methods & settings for energy efficiency poorly defined & implemented. Informal use of information from monitoring.
2	Most equipment is not specifically energy efficient, but either was commissioned or is being regularly maintained for low energy consumption.	Equipment selected to be fit for purpose, bearing in mind likely life cycle costs & energy efficiency factors.	Condition surveys carried out regularly on all equipment & fabric elements affecting energy efficiency. Remedial work constrained by budgets.	Most good housekeeping practices are adhered to in an attempt to reduce energy usage. Occasional energy efficiency training received.	Basic descriptions of plant control & operation. Basic plant, instrumentation & control schedules for most control systems.	Targets set against realistic budgets, & maintained through financial procedures.
1	Equipment is not energy efficient, but has been commissioned for economy & undergoes periodic maintenance.	Power efficiency data on products obtained as part of selection process.	Condition surveys carried out occasionally, prompted by plant failure or safety considerations. Remedial work only carried out on major defects.	Energy-saving techniques are only adopted where they can be easily accommodated within traditional working practices.	Minimal or poor plant control & operation. Plant instrumentation & control schedules for only some of the plant & control systems.	Targets set by default through budget setting procedures.
0	Energy performance has not been considered during the procurement, commissioning or maintenance of existing plant & equipment.	No consideration of energy efficiency in product selection.	No regular surveys or maintenance carried out.	No consideration is given to energy efficiency during working operations.	None available.	No targets set.
Score						

Energy and Sustainability Topics – Site Cost Review

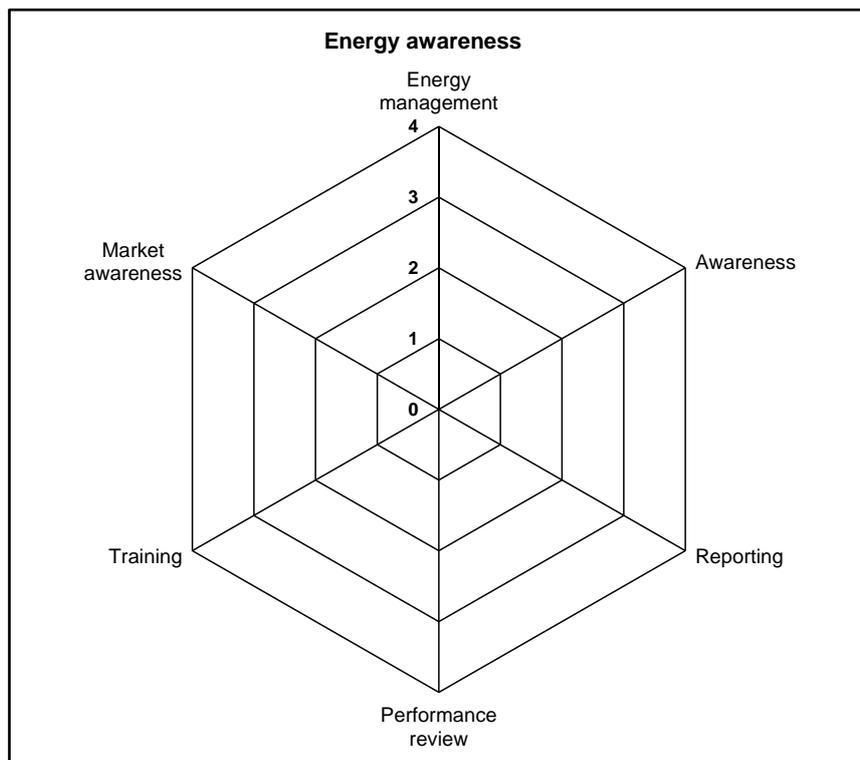
4. Energy – awareness

As with any new area there is a need to both specify what people are going to do and to ensure that they are aware of their responsibilities.

One of the keys to energy management is ‘show results to get resources’ and there is a need for clear reporting of successes in energy management both to get resources and to motivate the team. Equally there is a need to provide all staff with training and development opportunities. A training course on variable speed drives may appear a luxury but if it saves real money then it is a good investment in both the staff and the company.

Energy management is a rapidly developing field and there are very few people with experience or understanding of this area – keep staff well trained and up-to-date with the latest market developments.

Scoring



Energy and Sustainability Topics – Site Cost Review

Overheads - Energy awareness						7.4
Level	Energy management	Awareness	Reporting	Performance review	Training	Market awareness
4	Lists of responsibilities & their assignment exist & are comprehensive & regularly review ed. All staff have responsibilities.	Energy performance regularly given to all staff. Full use made of publicity. All methods used to promote new measures for saving energy.	Wide reporting of status compared with best practice, on regular basis & aimed at a range of audiences. Full support to public statements.	Progress regularly review ed. Performance compared against internal & external benchmarks. Ideas actively sought.	Training resourced for technical & premises staff. Active technical library. Staff access to energy efficiency information.	Keep abreast of technological developments by monitoring of trade journals, literature & other sources on issues affecting energy efficiency.
3	Lists of responsibilities & their assignment exist for key energy staff & all departments.	Energy efficiency status presented to all staff at least annually. Occasional but widespread publicity to promote energy saving.	Annual status reports issued to shareholders & staff. Impartial performance reporting to staff & departments on a regular basis.	Frequent energy efficiency review s using monitored consumption & cost data. Analysis is regular, wide-ranging but ritualistic.	Continuous professional development for technical & premises staff. All staff are aware of & have access to an energy efficiency library.	Regular studies carried out on trade journals, literature & other sources to assess current developments impacting on energy efficiency.
2	Some staff & departments have w ritten responsibilities.	Energy performance presented to staff on a regular basis. Occasional use of publicity to promote energy saving.	Occasional issue of energy efficiency status reports. Concentrates on good new s.	Occasional technical energy efficiency review s. Regular cost checks with exception reporting. Analysis of limited scope.	Technical & premises staff development by professional & technical journals. Occasional initiatives to train staff in energy efficiency.	Trade journals, literature & other sources scanned on an ad-hoc basis for information on the latest developments relating to energy efficiency.
1	Unw ritten set of responsibility assignments.	Energy performance occasionally reported & know n to very few staff. Energy-saving measures are rarely promoted.	Reports only issued if prompted by a business need. Most reports w ill contain only good new s.	Energy review activity based on revenue costs. Limited exception reporting only.	Few staff have know ledge of energy efficiency techniques & facts. Little training in energy efficiency for staff.	Trade journals, literature & other sources studied for energy implications w hen a purchase is imminent.
0	No evidence of assignment of energy efficiency tasks & duties.	No staff have explicit responsibilities or duties.	No reporting.	No monitoring activity to underpin review processes	Staff have little, if any, know ledge of energy efficiency. No attempt to inform staff of techniques & benefits of energy efficiency.	Energy efficiency not a consideration w hen keeping up to date on products or technology.
Score						

Energy and Sustainability Topics – Site Cost Review

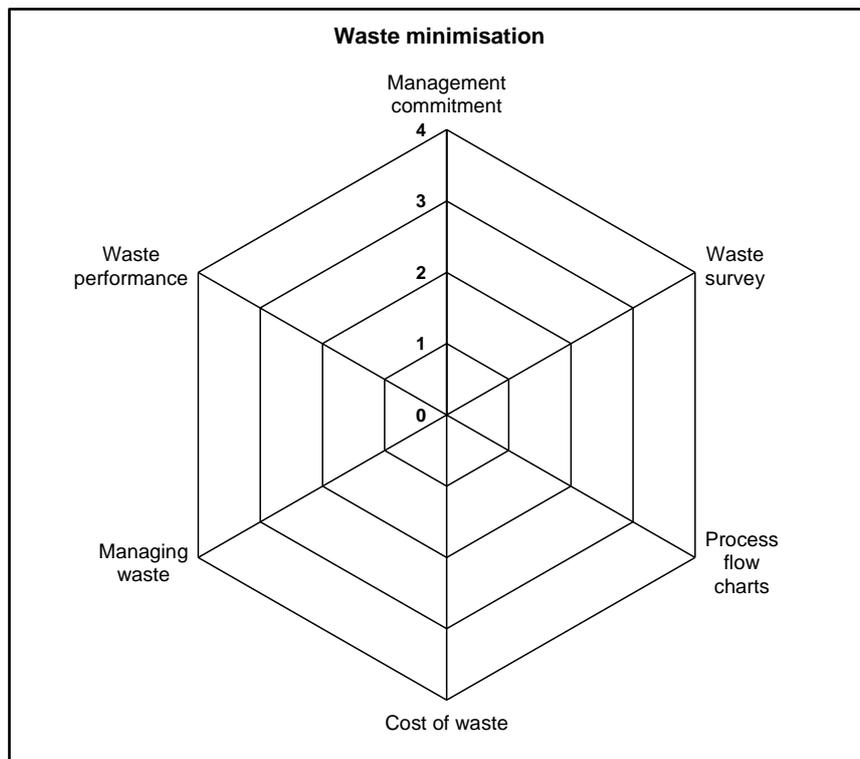
5. Waste minimisation

Waste is a major overhead that is rarely treated with any seriousness by most management teams. Waste is seen as 'what is in the skips' and not in the broader sense of anything that does not add value to the process or the product.

Simple but organised action to reduce waste can reduce operating costs by 10% and the company can also become 'greener' by reducing waste and discharges to the environment. Waste of materials is very similar to waste of energy. They are both the result of management failing to notice that the world has changed and that the cost of direct labour is no longer the only key component of the cost of operations.

Failing to have a plan to reduce the cost of waste is not only bad for sustainability but also financially bad for most companies.

Scoring



Energy and Sustainability Topics – Site Cost Review

Overheads - Waste minimisation						7.5
Level	Management commitment	Waste survey	Process flow charts	Cost of waste	Managing waste	Waste performance
4	Waste management is seen as important to improving profits & environmental performance. Action taken on all identifiable concerns.	Regular waste surveys carried out to identify new opportunities. Action taken on all opportunities identified.	Full process flow charting for complete site (including office processes) to enable waste targeting. No code words accepted for waste.	Full cost of waste assessed, targets set & monitored for performance.	Full waste management program in place. Program has proven effective in reducing costs.	Waste performance is visibly better than the industry average. Monitoring & targeting used to further improve performance.
3	Waste management is an explicit & stated business goal. Action taken on easily visible concerns.	Initial waste survey carried out. Action taken on all of the opportunities identified but no further survey carried out.	Good process flow charts developed for all processes. Processes have few areas that are not considered.	Full cost of waste assessed but no targets set for performance.	Full waste management program in place. Program effectiveness in reducing costs is not yet proven.	Waste performance is slightly better than the industry average. Monitoring & targeting being introduced to improve performance.
2	Waste management is not an explicit goal. Sporadic action taken when concerns are very visible.	Initial waste survey carried out. Action taken on some of the opportunities identified.	Good process flow charts developed for most processes. Processes have some areas that are not considered.	Good knowledge of the cost of waste for most areas.	Partial & largely ineffective waste management program in place.	Waste performance is similar to the industry average. Monitoring & targeting being introduced to improve performance.
1	Waste management is not a goal. Visible & obvious waste is openly tolerated by management. No improvement techniques used.	Initial waste survey carried out. No action taken on opportunities identified.	Outline process flow charts developed for some processes. Processes have considerable areas that are not considered.	Vague knowledge of the cost of waste. Knowledge is primarily in the cost of disposal.	No waste management program in place but planned for implementation.	Waste performance is slightly worse than the industry average. No monitoring & targeting used.
0	Waste management not considered by management. Getting the product out the door is the only goal.	No waste survey carried out.	No process flow charts produced.	No concept of the cost of waste to the company.	No waste management program in place & no plans for action in the future.	Waste performance is visibly worse than the industry average. No monitoring & targeting used. High use of 'code words' for waste.
Score						

Energy and Sustainability Topics – Site Cost Review

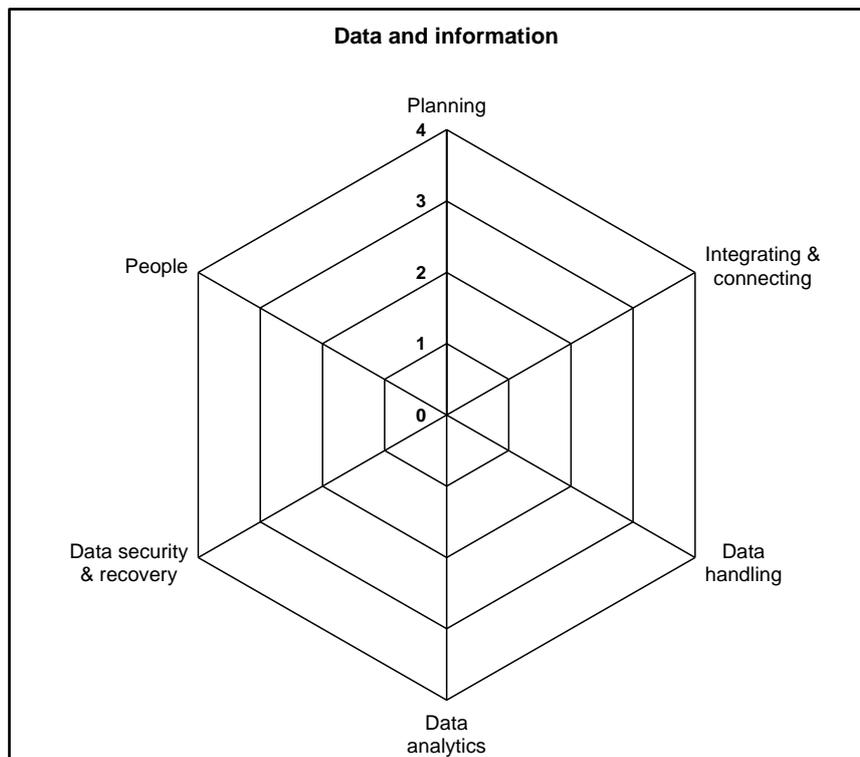
Part 8: Data and information

1. Data and information

The development of the smart factory will not happen overnight but getting the basics right is essential in making the transition cost-effective. The transition will not be pain-free but it offers some huge cost advantages to those who make it successfully.

The vision is there, the basic standards are in place, the machines are being produced and the infrastructure is being defined. The next step is for plastics processors to start the process of converting their existing 'dumb' factories with 'islands of automation and data' into connected and integrated factories and to reap the benefits of cost reductions on a scale not seen in the industry before.

Scoring



Energy and Sustainability Topics – Site Cost Review

Data and information						8.1
Level	Planning	Integrating & connecting	Data handling	Data analytics	Data security & recovery	People
4	Company has data & information strategy for smart factory with defined & quantified goals. Goals are aggressive but achievable.	Systems are designed & integrated at all levels & operations. All machines connected to the systems for data transfer & control.	Excellent data plan & implementation. Data flow is well controlled. All data examined & converted to information for action.	Good data analytics used to examine data & provide business insights. Data analytics is part of the business.	Excellent machine & data security policies with good implementation. Back-up & recovery in place & tested. Business at very low risk.	Personnel plan to recruit new staff with smart factory skills. Plan includes retraining of existing staff in new technology.
3	Company has data & information strategy with defined & quantified goals. Goals are very conservative & do not stretch the company.	Most systems integrated but some gaps in integration. Some machines connected to systems for data transfer & control.	Good data plan & implementation. Data flow is good but some areas uncontrolled. Some data converted to information for action.	Limited use of data analytics to examine data but good use of data analysis for business insights. Data analytics is low priority.	Good machine & data security policies with variable implementation. Back-up & recovery in place & occasionally tested. Business at low risk.	Good personnel plan. No plans to recruit staff with smart factory skills. Good plans to retrain existing staff in conventional & smart factory.
2	Company has outline data & information strategy but does not include defined & quantified goals.	Some systems integrated but many gaps in integration. Most machines not capable of connection for data transfer & control.	Poor data plan & implementation. Data flow is poor with many areas uncontrolled. Some data examined & converted to information for action.	Good concept of data analytics but little real progress. Most data analysis is manual & low priority.	Machine & data security policies available but poor implementation. Back-up & recovery in place but rarely tested. Business at medium risk.	Conventional personnel plan. Plan concentrates on conventional skills. Some plans to retrain existing staff.
1	Company has a master strategic plan but no data & information strategy to support this.	Little integration of systems & many 'islands of data'. Some machines capable of connection but not connected.	Basic & poor data plan. Little data processed into management information.	Little concept of data analytics but some basic data analysis takes place.	Machine & data security policies but very poor implementation. Back-up & recovery available but never tested. Business at high risk.	Poor personnel plan. Plan concentrates only on conventional skills. No plans to retrain existing staff.
0	Company has no master strategic plan or data & information strategy.	No integrated systems or connected machines. All data handling with spreadsheet with poor control. No connected machines.	No data plan available. Company has masses of data but no plan to convert to management information. Data gathers 'digital dust'.	No concept of data analytics (or even analysis).	Machine & data security virtually non-existent. Back-up & recovery very poor. Business at very high risk.	No personnel plan for any area.
Score						