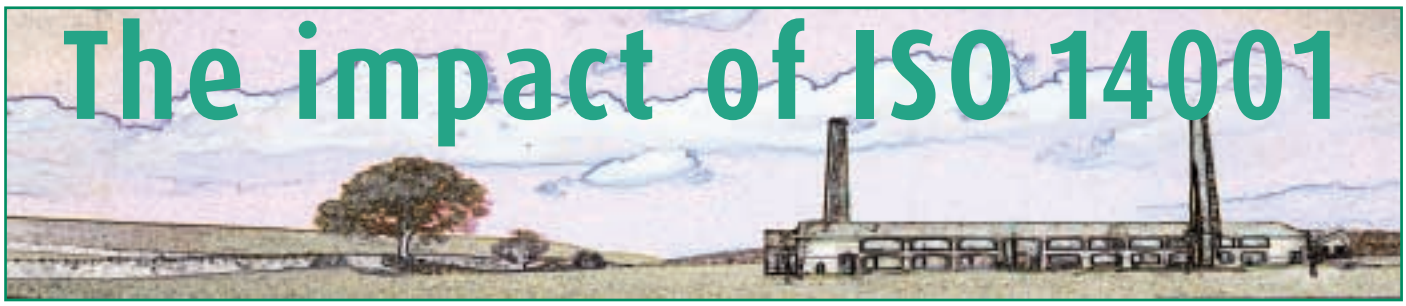
The impact of ISO 14001



ISO 14001: irrelevant or invaluable?

"ISO 14000 is a business issue, not a purely environmental one..." wrote Charles Corbett and co-author David Kirsch in the seminal article, "ISO 14000: an agnostic's report from the front line", which was published in the March-April 2000 issue of *ISO 9000 + ISO 14000 News* (now relaunched as *ISO Management Systems*). That does not detract from the fact that ISO 14000 is also very much an environmental standard. To put it bluntly, unless implementing an environmental management system based on ISO 14001 helps an organization to reduce the negative impacts its business activities might be having on the environment, then the standard is not much use. This is the central issue that Charles Corbett and Michael Russo – both professors in US business schools – address in the present article. Using original data from the US and from an ongoing international survey, they seek to answer the question as to whether an ISO 14001 certificate is mere window-dressing, or a pointer to concrete results in environmental performance.

BY CHARLES J. CORBETT AND MICHAEL V. RUSSO

"Doesn't that certificate look good on the wall!"

To its detractors, that is a capsule summary of the ISO 14001 story. Do what is necessary to obtain registration (certification), frame the certificate and place it in the most visible, public spot in the facility's lobby. Then go right on with business as usual.

One sometimes hears this type of skepticism from environmentalists. Suspicious of standards that specify processes and behaviours but not emissions or risk reductions, they sometimes see ISO 14001 as a handy method to deflect criticism while acquiring a stamp of legitimacy.

What is provocative, however, is the criticism coming from a second group of skeptics – environmental professionals themselves. "Costs without benefits," sniffed one interviewee, expressing a widely held belief among non-registrants. Indeed, there is a wide schism within industry on the merits of ISO 14001. The schism is largely the product of speculation, as a thorough analysis of the impact of ISO 14001 had – until recently – not been attempted. That smells like an opportunity to enterprising academics trying to answer the question of whether or not ISO 14001 actually leads to environmental improvements.

There is a wide schism within industry on the merits of ISO 14001

The impact of ISO 14001

Let us start by finding out whether ISO 14001 has generated enough interest to justify close study. After all, if the number of firms becoming registered is small enough, then there is no reason to care one way or another about the impact of ISO 14001. But the numbers suggest otherwise. Consider the early history of the ISO 9000 series, the only comparable standard. ISO 9000 was launched in 1987 and, in its first six years, almost 28 000 firms were registered[1].

By contrast, the ISO 14000 series, launched in 1996, already had almost 23 000 registrations by December 2000, only four years after introduction. While it is certainly unwise to extrapolate too far, these figures indicate that the initial global adoption rate for ISO 14001 is, if anything, *higher* than it was for ISO 9000.

A thorough analysis of the impact of ISO 14001 had, until recently, not been attempted

Of course, you say, there are many good reasons why firms have embraced ISO 14001 more readily than they did ISO 9000. For instance, you might argue that ISO 9000 was the first standard of its kind and nobody had any experience with such a process standard. ISO 14001 is just riding on the coat tails of the widespread adoption of ISO 9000.

Or, you might observe that implementation of ISO 14001 is easier once you have ISO 9000 in place, so no surprise that it is accepted more quickly. Moreover, in the early days of ISO 9000, nobody knew how important the standard would become. By the time ISO 14001 came along, there were already more than 160 000 ISO 9000 certificates issued worldwide, so it was pretty clear that the ISO 14000 series at least had the potential to be used very widely.

ISO 9000 registration is often a requirement for suppliers and plays an important role in international business – no wonder, you say, that some of that rubs off on ISO 14001 too.

The Japanese experience

The case of Japan is perhaps the most striking example of some of these arguments. Interviewees at the Ministry of International Trade and Industry (MITI) in Tokyo indicated that ISO 9000 was not, at first, taken seriously because Japanese firms in the 1980's "ruled the world" with their approach to Total Quality Management. A quality standard perceived as coming from Europe was the last thing they needed and was received about as enthusiastically as the French might respond to an Asian standard for wine-making. Until, that is, customers in Europe and the US started requiring ISO 9000 registration of Japanese suppliers.

MITI organized a massive registration effort among Japanese firms to avoid losing export business to registered firms elsewhere. They also vowed never again to be caught unawares, so when the ISO 14000 series appeared as a natural "successor" to ISO 9000, MITI was again active in heavily promoting ISO 14001 registration in Japan. The result? By December 2000, Japan alone has over 5 500 ISO 14001 registrations, ranging from manufacturing and service firms to schools, universities and government agencies. The story in Taiwan is comparable: a government official seeking to promote proactive environmental management confessed to using the prior experience with ISO 9000 to "scare" firms into seeking ISO 14000 registration.

All that is very true – there are many reasons why it is not surprising that the initial growth of ISO 14001 is as fast as, if not faster than, that of ISO 9000. This early success does not

1) *The ISO Survey of ISO 9000 and ISO 14000 Certificates: tenth cycle – 2000* (ISBN 92-67-10336-9). A hard copy is available free from ISO national member institutes. The survey is also posted on ISO's Web site: **www.iso.org** In addition, the survey is available on a CD-ROM (ISBN 92-67-10337-7), price 44 Swiss francs, which includes country-by-country industry sector breakdowns.

necessarily indicate that there will ever be as many ISO 14001 registrations as there are ISO 9000 registrations today (over 400 000). But the fact that ISO 14001 is taking off so rapidly not only fully justifies the question, "What is the impact of ISO 14001?", but also makes it of great relevance to companies, governments and environmentalists alike.

Asking the users

One way to learn something about the impact of ISO 14001 is to ask the registered firms themselves. Researchers at The Anderson Graduate School of Management at UCLA[2] teamed up with collaborators worldwide to conduct a mail survey among ISO 14001-certified firms in over a dozen different countries. Though the responses are still coming in, some interesting observations can already be made.

Based on discussions with certified firms in the US and Taiwan China, it seemed likely that firms in the US would experience less environmental benefits from registration, simply because they have historically been much more tightly regulated than Taiwanese firms. And that is exactly what *Figure 1* confirms: the proportion

Figure 1: How would you assess the environmental improvements achieved from ISO 14001 certification?

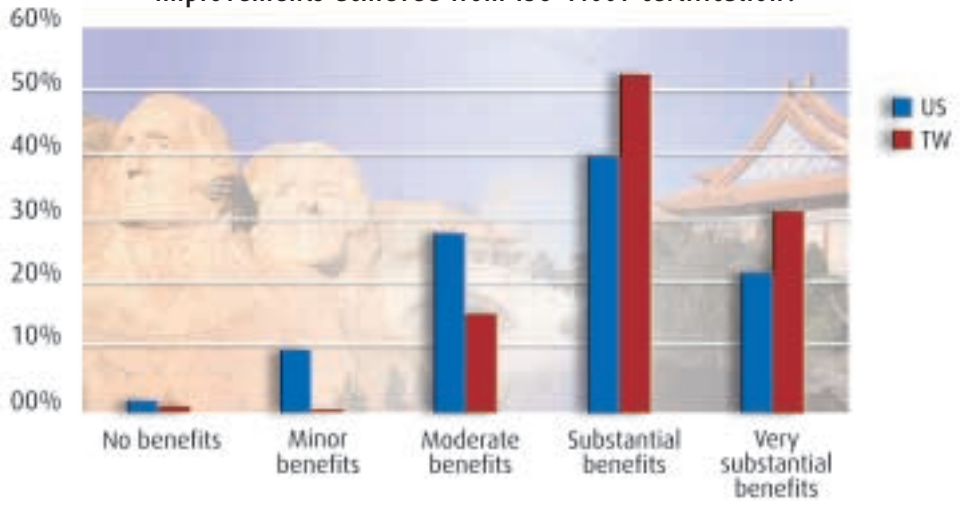
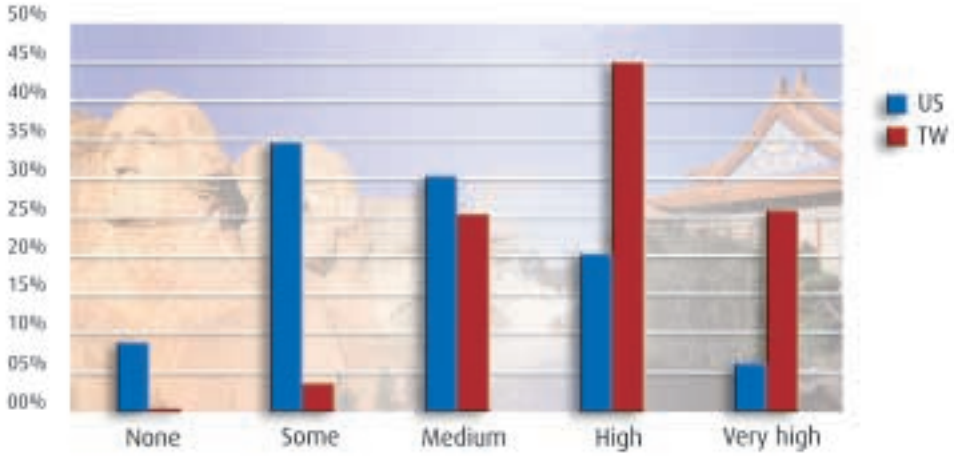


Figure 2: How much importance do you assign to capital investment in implementing ISO 14001?



2) With funding provided by the University of California Pacific Rim Research Program and the Center for International Business Education and Research (CIBER) at UCLA.

of US respondents reporting "moderate" or less environmental benefits from ISO 14001 registration is higher than that in Taiwan, while the proportion of respondents reporting "substantial" or "very substantial" environmental benefits is higher in Taiwan than in the US.

One possible reason for this is suggested in *Figure 2*: Taiwanese firms report that capital investment was a more important part of the ISO 14001 registration procedure for them than it was for US firms, indicating that they made more actual physical process changes. Based on the interviews, it seems likely that many of the Taiwanese firms were forced, for the first time, to identify what legislation applied to them and to comply with it. US firms, on the other hand, often needed only to focus on documentation and procedures, as compliance (and hence absolute levels of environmental performance) was already satisfactory.

While obviously simplistic, these analyses suggest that the environmental impact of ISO 14001 may be greater in Taiwan than in the US, which in turn suggests that there may be some truth in the notion that ISO 14001 does more for less environmentally advanced firms.

Despite this, any organization considering registration would do well to keep the Japanese experience with ISO 9000 in mind. It is striking how often we hear US executives proclaim that, "We don't need ISO 14000, the Environmental Protection Agency already regulates us closely enough." It is also striking how similar that sounds to, "We don't need ISO 9000, we lead the world in TQM practices"...

Measuring the real impact

Much stronger and more direct evidence is provided by researchers at the University of Oregon's Lundquist College of Business[3], who sought to put ISO 14001 to the test with a broad sample of facilities in the electronics industry. The goal was to answer a simple question: does ISO 14001 lead to emissions reductions?

The initial global adoption rate for ISO 14001 is, if anything, higher than it was for ISO 9000

The analysis began with a careful sampling procedure. The last thing that researchers should do to analyze a question like this is to collect information only from facilities that have been registered to ISO 14001. Their emissions might go down, but so might those of non-registered companies. Remember *In Search of Excellence*, by Peters and Waterman? They made this mistake, firstly by choosing successful companies and then claiming that those firm's attributes drove success. There was no way of knowing whether or not unsuccessful companies also had those attributes, since none were included in their study.

To avoid this problem, it was important to sample facilities randomly. After creating a sample of 1 009 electronics manufacturing facilities in the US, a total of 316 were reached that answered all of the questions posed. Very few facilities who were reached refused to participate and most that were not included did not respond after numerous call attempts. The environmental quality officer at each facility was contacted by trained interviewers who then asked them a pre-determined set of questions.

This information was used in a statistical analysis[4]. Up-front theorizing suggested that facilities would register if they did not have formal environmental management systems (EMS) in place prior to the registra-

3) With funding provided by the Industrial Ecology programme of the National Science Foundation, jointly funded by Lucent Technologies (NSF Grant 9814409).

4) The complete study is posted at the following Web location: **http://lcb1.uoregon.edu/mrusso/ISOStudy.htm**

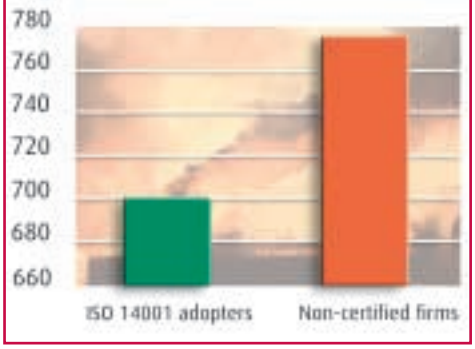
tion process (which would then require an EMS). Embarking on an ISO 14001 registration programme allows facilities without an EMS to achieve a number of benefits:

- install a management system that will, in time, generate significant advantages;
- conform to the latest thinking on methods for environmental management, and
- send a signal to stakeholders that the facility's operators care.

In this sense, ISO 14001 registration may in effect be a way to "catch up", permitting those facilities without formal environmental management systems to "get with it", environmentally speaking. Indeed, facilities without EMS's were more likely to seek ISO 14001 registration. *Figure 3* shows that ISO 14001 adopters were much less likely to have an EMS in place prior to the registration process.

Figure 3: Percentage of firms with an EMS in place

Figure 4: Toxic Release Index for certified and non-certified firms



Further evidence that ISO 14001 is best seen as a "catch up" strategy came from the key analysis, which considered whether or not ISO 14001 registration led to subsequent toxic emission reductions. There was clear evidence that it did, even when accounting for a number of other factors that you would expect to be associated with toxic emissions, such as the age and size of the facility, whether or not an established EMS was in place, and the segment of the electronics industry in which the facility operated.

Although it is too early for any definitive conclusions, this is very encouraging indeed: the research suggests that implementing an ISO 14001 registration programme actually leads to reduced toxic emissions in the US. The news gets even better when we recall our US-Taiwan comparisons. Taiwanese firms, after all,

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reported more capital investment and higher environmental benefits than US firms, so, in all likelihood, the true environmental impact of ISO 14001 is even greater in Taiwan than in the US.

But here is where it gets interesting.

As it turns out, in the electronics industry, not all facilities create enough waste to cross the threshold that triggers reporting of emissions to the Evironmental Protection Agency's (EPA) Toxic Release Inventory (TRI). So, two analyses of toxic emissions were conducted: one that included only TRI-reporting facilities and one that included all facilities, using modelling techniques that allowed us to include even those facilities that did not make a TRI report.

ISO 14001 registration may in effect operate as a way to 'catch up' ...environmentally speaking

In the first group, the "dirty" facilities, there was a strong ISO 14001 effect. It is difficult to distill the results into a simple chart because the analytical techniques used simultaneously account for the impact of many variables. But *Figure 4* shows that toxic emissions were significantly lower for ISO 14001 adopters than for others in the sample of firms that reported emissions to the TRI[5].

On average, the toxic emissions index constructed for the analysis was approximately 10 % higher for non-certified firms. For the second group, which included all of the facilities – both "dirty" and "clean" – the picture got cloudy. The effect of ISO 14001 as an emissions-reducer weakened, while the effect power of the environmental management system to reduce emissions became stronger. This indicated that the presence of an EMS, whether or not it was part of an ISO 14001-registered system, was the key to pollution reduction when all of the facilities were considered together. In short, this again points in the direction of the earlier hypothesis: ISO 14001 does more, in environmental terms, for dirtier facilities than for cleaner ones.

What does all this mean for professionals and policy-makers? Bearing in mind that we need to confirm that our findings extend to other industries and countries, a few observations emerge from the study:

Observation 1

If you are running a clean facility compared to your industry cohorts, the immediate benefits of ISO 14001 in terms of directly reducing emissions may be limited. Naturally, if a key customer requires you to have an ISO 14001 system, that is another story. It is outside of this analysis, but if registration is necessary to retain or gain customers, the cost of registration may be well prove a savvy investment.

Again, when we recall the Japanese experience with ISO 9000, we see the folly of viewing ISO 14001 exclusively from an environmental perspective. Moreover, there could well be indirect environmental benefits. One interviewee remarked that the procedures implemented as part of the ISO 14001 process had made his job significantly easier, giving him more time to go hunting for opportunities for environmental improvements rather than focusing on paperwork. If all suppliers to a customer standardize their environmental management systems, it might help to pinpoint how similar facilities reduce emissions and waste. (How do you know how well you are doing compared to other firms? If you have facilities in the US, check your emissions, as reported to the EPA, at **www.scorecard.org**).

5) To measure toxic emissions, one needs to account for the fact that the toxicities of the various substances vary greatly. So emissions of each chemical were weighted by the inverse of the EPA's reportable quantity; these figures were then aggregated across all chemicals released at a facility. The resulting numbers were then used in calculations. Thus, the numbers in Figure 4 are best seen as a measure of the total toxicity of a facility's emissions, not simply the volume of substances emitted.

Observation 2

If you are running a facility that exceeds industry average emission levels, you should consider ISO 14001, especially if you do not have a formal environmental management system. ISO 14001 offers a great opportunity to adopt best practices for the industry and most likely will pay off in terms of lessened risks, lowered emissions and a number of intangibles, such as improved employee morale. The chain that begins with ISO 14001 registration and ends with lower turnover and employee start-up costs has many links, but there is circumstantial evidence that those links do indeed exist.

ISO 14001 does more, in environmental terms, for dirtier firms than for clean ones

Observation 3

If you are a policy-maker, be wary of making ISO 14001 registration mandatory, unless the mandates apply only to dirtier facilities. But let us say you that are considering doing just this. Now another problem arises: what is a dirty facility? In our US-based study, crossing the TRI reporting threshold was a handy guide, but unless regulators can identify a bright line between dirty and not-so-dirty facilities, any mandates might be seen as unfair burdens. Worse, industries span a broad spectrum in terms of their baseline "dirtiness," so the luxury of using TRI thresholds as an index might not work.

Clearly, in countries without some reporting requirement comparable to TRI, a different approach altogether is needed. But if you could somehow find that bright line, there is one reason for you to enter the picture: the dirtier facilities are the most likely to benefit from ISO 14001, but they may also need more incentive to move. After all, they are dirty for a reason. Like smoking cessation and weight loss, those most likely to gain from new behavioural patterns might be the least likely to join the programme! The challenge for policy makers, then, is to target incentives for dirty facilities, without creating the appearance of rewarding failure.

In conclusion, like a teenager, the adolescent years of ISO 14001 will be important and help to determine how it will mature. This analysis suggests that – pimples and all – ISO 14001 has the potential to reduce toxic emissions for a great number of facilities, especially those that now lag behind global best practices in their industries.

That ISO 14001 certificate on the wall might mean something after all!

Image Bank