

## Turning good policies into good practice: Why is it so difficult?

Lisa Lee, Wendy Faulkner and Carme Alemany

### *Abstract*

In many countries, engineering stands out as a male-dominated occupation resistant to gender change. Many employers now have policies which seek to improve the recruitment, retention and progression of women engineers – by addressing family related issues, work-life balance and career development. However, a recent EU project reveals that the uptake and the impact of such policies is generally limited and often uneven; having a good set of *policies* on paper does not translate into *good practice* on the ground. This paper explores the reasons why. These concern, first, failings in the effective implementation of such policies; second, underlying issues of staff's awareness and attitudes to gender politics; and third, employers' commitment to gender change. We conclude that employing organizations need to undergo major 'culture change' if good gender equality and diversity policies are to be turned into good practice.

\*\*\*\*\*

Engineering stands out as one of the most male-dominated profession in many Western countries. It has proved remarkably resistant to gender change, in spite of three decades of public and private sector backed efforts to improve the representation of women in its ranks. A sizeable body of literature has established the main factors behind the poor recruitment, retention and progression of women in engineering. There is also a well established consensus about what kind of policies should help redress these. Indeed, increasing numbers of large engineering employers 'tick all the boxes' at corporate level. Time and again, however, one finds that having a set of good *policies* does not in itself guarantee that good *practice* is happening on the ground. This was a major conclusion of a recent EU-funded collaborative study of women in engineering research entitled Prometea (Genin 2008). Whilst we identified a wide range of potentially useful initiatives in both public and private sector organizations, the uptake and the impact of these policies was generally limited and often uneven. Why do 'good policies' in this sector so rarely translate into genuinely good practice? Are there failings in the effective implementation of such policies? Is the problem attitudinal, a lack of gender awareness or a resistance to gender change? Or is the organizational commitment simply inadequate?

This paper addresses these questions, drawing on research conducted for the Prometea project. The project involved researchers from eleven European countries – Austria, Finland, France, Germany, Lithuania, Russia, Serbia, Slovakia, Spain, Sweden, the UK – plus Chile.<sup>i</sup> The focus of the study was on the retention and promotion of women working in engineering research. Its 'core' elements sought to identify factors supporting or inhibiting women's careers, including organizational cultures in engineering research settings. This research effort was based on case studies in higher education, research institutes and business organizations in the partner countries. Amongst other things, these studies enabled us to audit the wide range of organizational (and national) policies geared to supporting women engineers, and provided insights into some of the strengths and weaknesses of these policies. This data was supplemented by eight case studies of relevant good practice, which sought to evaluate particular policies or packages of policies in more depth. The data for these case studies were collected between July 2006 and February 2007. This involved interviews with Human Resource (HR) managers and interviews or focus groups with staff targeted by the policies, thus allowing us to gain a better understanding of why and how policies are implemented in individual organizations, and of how these are experienced by women and men engineers on the ground. (The full analysis of this material is available in Lee et al. 2007.)

The paper starts with an overview of what we learnt about policies addressing key issues surrounding the poor retention and promotion of women in engineering: family related issues, work-life balance, career support and gendered workplace cultures. The remainder of the paper then discusses reasons for the gap between policy and practice revealed by our analysis. These concern, first, failings in the effective implementation of such policies; second, underlying issues of staff's awareness and attitudes to gender politics; and third, employers' commitment to gender change. We conclude that employing organizations need to undergo major 'culture change' if good gender equality and diversity policies are to be turned into good practice, and we make suggestions as to how this might be achieved.

First a terminological note: The term 'good practice' is typically used rather broadly, to encompass national laws, organizational policies and/or informal practice designed to meet a particular objectives. Precisely because this paper starts from the observation of a gap between stated objectives and actual outcomes, we have chosen to reserve the term good practice for any efforts – be they laws, policies or informal practices – which make a real progress towards the stated objectives, in this case (ultimately) improving the position of women in engineering.

### **Main policies and problems encountered**

The 'core' research for Prometea confirmed the huge impact of having children on the working lives and careers of many women in engineering research (ref). This is not unique to engineering (Hakim 2004; Bagilhole 2006), but there are some extenuating factors in the sector (see below). Few workplaces we studied adequately accommodate or take into account childbearing and rearing, and traditional resistance to this is surprisingly widespread, in spite of the existence of many potentially valuable policies. Part of the problem is that family-friendly policies are seen as 'a women's issue' – even though far more men than women are parents (both proportionately and absolutely) in engineering as in academia! As a consequence of these barriers, the career outcomes for many women engineers who have children rely heavily on the goodwill and informal support of immediate colleagues and managers.

Policies to protect pregnant women and their unborn children, though welcome in principle, often serve to remove women from activities seen as central to their careers – laboratory research and travel – and relegate them to marginal, non-visible administrative tasks. Although maternity leave entitlements are enshrined in national laws, many women simply leave engineering once they have children. Returning to work in engineering seems to be more difficult than in other occupations, especially in fields that move quickly. Some organizations are developing creative ways of actively keeping in touch with women on maternity leave. Paternity leave is only taken up to any degree in the Nordic countries, partly because of financial disincentives and partly because of attitudinal barriers. Quality, affordable childcare is widely lacking; in the best cases, this involves the provision of subsidized and guaranteed places, plus emergency cover to help with last-minute 'childcare gaps'. The ability to travel (eg, for conferences), and to be geographically mobile for jobs, can be critical to career progression in engineering as in science (Ackers 2004). The Finnish Research Council has taken some exemplary initiatives in the support of parents: additional funding is provided to enable parents of young children to take their families with them on research trips, and grant payments to researchers on maternity/paternity leave are extended so that the period of funded research is not cut short.

Work-life balance is another key issue in the engineering sector, which is notorious for a 'long hours culture' (DTI 2004), often compounded by high expectations of availability and presenteeism (Valenduc et al. 2004). In a situation where women's domestic and family commitments are generally greater than they are for men (Hakim 2004; Carter and

Kirkup1990), this means that women tend to opt for positions that offer greater flexibility, such as teaching (Greenfield 2002: 62), or leave engineering altogether.

There have been efforts to remedy this, with provision of a range of flexible working practices as well as reduced hours. A key limitation of these practices is that they seem unable to alter the expectation and practice of long working hours. In the case of remote working options, they may actually intensify work and fudge the work-life boundary by insisting on staff being available even from home. Taking up flexible work options, especially part-time work, can also impact negatively on career progression. One positive development is that men, especially young men (**ref**), are increasingly viewing work-life balance as an issue with the result that flexible work practices are no longer entirely synonymous with mothers. In the case of one Spanish IT company, where flexible work practices were made available to men as well as women, this has encouraged and supported some men to take a greater share of their responsibility for childcare and domestic work.

In aggregate, women's careers progress less far and less rapidly than do men's in engineering (Carter and Kirkup 1990, McIlwee and Robinson 1992, Bagihole 1998, Greenfield 2002). Many of the women researchers we interviewed feel they have been overlooked for promotion in favour of men with similar or lesser achievements; and many end up in career dead ends – on fixed-term contracts or overloaded with teaching or administration. There are also glass ceilings blocking women's progression into more senior roles in engineering as in other occupations (Bagilhole 1998, Hakim 2004, Kjeldal et al. 2005). Our audit identified a wide range of relevant policies. Common amongst these, and of proven value, are the use of mentors, role models, networks and dedicated programmes to guide and empower women engineers in building their careers (see McCarthy 2004, Lee forthcoming). What seems to be largely absent is any orientation for line managers to provide ongoing guidance and support in career management and development for their women staff. Yet, as Prometea and other research reveals, individual line managers can have a huge bearing, positive or negative, on the career trajectories of their female engineering staff (**Prometea ref**, Faulkner 2005a, 2006).

Since the factors inhibiting women's career progression are various, efforts to tackle these issues must include a package of measures. Two Prometea cases stand out in this respect. One of these is the Finnish Research Council's *Equality Plan* (**ref**). It aims to ensure gender equality and non-discrimination of minority groups for those it funds, through a number of instruments:

- Open and transparent procedures in the evaluation of applicants for research funding.
- Equal numbers of men and women on the research panels that evaluate applications.
- Women explicitly encouraged to apply.
- An element of positive action: in cases where two candidates are judged to be of equal scientific merit, the Plan allows the minority group candidate to be appointed.
- Family-friendly research support: research funding is unaffected by periods of parental leave, and an additional 20% is paid on grants for recipients studying or working abroad with dependent children.
- A target of 40% of the minority gender for all appointments and progress routinely monitored towards this target.

Whilst many people balk at anything that *seems* to involve 'positive discrimination' (see concluding discussion), we believe there is a case to be made for such a radical approach in order to 'make equality happen'.

The other notable case is a Spanish IT company, which has developed a number of initiatives to enhance both the recruitment and career development of women engineers. The latter includes:

- A 'fast track' programme for high potential young women recruits, who are given a mentor and opportunities to job shadow, gain encouragement and learn from, senior female managers.
- A reduction in working hours for women opting to pursue an MBA.
- Confidence-building initiatives to give women tools to increase their self-belief.
- Reminders to line managers not to forget women on maternity leave when drawing up lists for promotion.
- Support for senior women to help break the glass ceiling.
- Monitoring of male/female staff ratios at all levels, of staff turnover and of maternity leave, with the aim of understanding better reasons for any inequalities in order to achieve a (current) target of 25% of engineers being women and to ensure that salaries are fair.

Critical in all career development measures are efforts that seek not only to provide the skills required to progress one's career but also the confidence and self belief needed to do so. A key reason why confidence building is so important is what Faulkner (2005 and 2007) has called the *in/visibility paradox*, whereby women engineers are highly visible as women but not visible as engineers. This in/visibility is highly consequential; it creates issues for women engineers which their male colleagues rarely face. Being invisible as engineers means they have to work harder to (re)establish their engineering credentials (e.g. to prove they are not the secretary). In the absence of positive reinforcement, it can serve to reinforce stereotypes about women being less able engineers than men, and so undermine women's professional self esteem and motivation. It seems likely that this is one reason why many women engineers become disillusioned with their careers and lose ambition compared with their male colleagues. At the same time, being visible as a woman explains why women engineers are far more readily seen as responsible for matters of family than are men with children, and far more likely to experience sexual harassment.

The in/visibility paradox has a major bearing on the gender dynamics operating in engineering workplace cultures as well as on career progression. By workplace cultures we mean the various ways people interact routinely on the job: styles of greeting, topics of conversation, humour, social circles and so forth – which shape who is seen as 'belonging' or not (Faulkner 2005a). Engineering workplace cultures are gendered, and gendering, in many subtle ways, with the result that women are more likely than men to be marginal in engineering workplaces (Faulkner 2005b, 2006). They face the paradox of needing to fit into to a culture that is in many ways masculine – become 'one of the lads' – but at the same time 'not lose their femininity' (Carter and Kirkup 1990, Tierney 1995, Jorgenson 2002, Miller 2004, Faulkner 2006, Watts 2007). There is very little awareness – amongst HR staff, managers and engineers alike – of how these in/visibility dynamics affect women engineers, and none of the organizations we studied for Prometea had addressed this issue. Nonetheless, some engineering employers do undertake forms of diversity training which seek to nurture a more inclusive workplace culture – for example, by alerting staff to the impact of making sexist and racist jokes – and they are making headway.

### **Implementation of policies is not effective**

As noted in our introduction, the most striking finding of the Prometea research on good practice intended to support women in engineering is that of a significant gap between policies and practice on the ground. At the very least, this indicates that there is much to learn yet about factors inhibiting the effective implementation of good gender equality and

diversity practice in the engineering sector. We identified four common organizational failings on this front.

First, *policies are not adequately publicised and promoted*. Time and again we encountered staff, even managers, who simply did not know that the policies and procedures available to them existed. In one Swedish HE case, none of the three women interviewed were aware of its (apparently exemplary) career development programme, or had ever had a career planning conversation with their supervisor. Tellingly, the HR people responsible for the policies we studied were generally unaware of the extent of this ignorance. It seems that many organizations think that they have done enough if a policy is 'on the books'. They fail to follow through by making staff aware of specific measures and giving them an opportunity or point of contact to discuss any questions or issues they may have.

Second, *a number of 'follow through' changes in organizational practice are often necessary in order to achieve policy objectives*. These might be quite trivial changes. For instance, shifting departmental meetings from a Friday to enable staff to use the 'nine-day fortnight' policy to take long weekends periodically. Or they might be more profound. For example, tackling the long hours culture so endemic in engineering requires a major organizational and cultural shift – to find ways of getting the same work done in fewer hours per employee, and entrenching an ethic that people should not work more than 'normal' hours. Achieving this means addressing meaningfully the often structural reasons why engineering employees work long hours, such a felt need to prove one's indispensability in a context of job insecurity (Kodz et al 1998: 9).

Third, *managers often impede the uptake of policies on the ground*. Line managers especially can be critical to the effective promotion and implementation of equality and diversity policies – as we saw above, in relation to family-friendly and career support policies. Similarly, Prometea research identified several department heads committed to improving work-life balance. They are more likely to support staff in finding appropriate solutions for their personal circumstances, and to be willing to alter existing working practices in order to facilitate greater flexibility. They are also more likely to set a good example over flexible work practices, for instance, by refusing to hold meetings after a certain time in the day in order that they and their colleague be free to spend time with their children. Leading from the top will tend to have a significant impact in relation to unpopular measures – as was illustrated by one senior male manager in who chose to work part time. By contrast, many of the managers we heard about block flexible work policies – which are, in any case, usually optional – because they do not see them as practical in their team, because they do not think it is relevant or because they themselves are trapped in the long hours culture.

To get managers on board and willing to 'lead from the top', organizations have two challenges: to win them around to the policy objectives, and at the same time provide training in any specific techniques or procedures needed to realise those objectives. A major priority in this regard must be to tackle those managers who simply fail to support adequately the career development of their female staff. A clear and (in principle) simple to address example of this is the sometimes disastrous handling of appraisals and promotions by department heads reported to us by some women in academia. Explicit training is clearly needed in constructive methods of staff appraisals that build up rather than undermine confidence and horizons. Managers might also be engaged in discussions about how best to translate objectives into practice, such as how to design promotion procedures and criteria to avoid penalising candidates for taking periods of parental leave or working reduced hours in order to look after children or a sick relative. Explicit in all such efforts, must be an underlying ethic that managers have an obligation to support *all* staff to realise their full potential, and that this is good for the organization as well as the individuals.

To recap, effective implementation of gender equality and diversity measures in engineering means that the publicising of specific measures needs to be followed through with policy awareness, discussion and training sessions – to help individuals and their managers understand the thinking behind the policy, to provide the necessary skills and information, and to identify any existing practices that might need to be changed in order to facilitate or support the uptake of specific measures. The language of rights and responsibilities can be helpful here. For instance, clear guidelines may be needed to ensure that working from home does not serve to stretch the availability of staff or get seen as an easy option – ‘It is real work, but managers and colleagues must respect the boundaries between work and home’.

The fourth organisational failing we identified in relation to the translation of good policies into good practice is *a widespread lack of any rigorous monitoring and evaluation of the implementation and impact of specific policies*. Generating and disseminating systematic evidence on this is obviously critical if organizations are to identify effective good practice and understand why some things work and others do not. Only with such evidence and learning can good practice be diffused across organizations. Prometea research indicates that this must include not only the monitoring of progress made towards set targets (male/female ratios, equal pay and so forth), but also the collection of qualitative feedback from staff as to what is or isn’t working on the ground. Self-evidently, all evaluations and feedback from staff must be followed through and acted upon, feeding results back to staff so that they remain engaged in the process as well as to those charged with developing good practice so that they learn how better to do it. It can help if organizations are made accountable for their progress (or lack of it) toward gender equality targets – as happens in the case of the Spanish IT company mentioned earlier, through its affiliation to the Government’s Optima Programme. They report their monitoring data regularly, and must demonstrate the impact of their efforts to reduce gender inequalities in order to receive accreditation every two years. It can also help if instances of good practice are rewarded and made visible for others to learn from: this can take the form of national or employer-level prizes.

So there are important organizational failings in the implementation of gender equality policies in engineering. Whilst it is vital that organizations address these, Prometea research indicates that there are, in addition, two major underlying factors behind the gap between policy and practice in this area, which need to be addressed if real progress is to be made: attitudes and awareness, and organizational commitment.

### **Attitudes and awareness**

The Prometea research revealed considerable resistance on the ground to gender equality goals and policies. The resistance can be overt or covert, and it is found across different types of organizations and across countries. Many women and men say that they don’t believe there is any gender discrimination, or that gender is in any way relevant to their careers. There is particular resistance to initiatives, such as career development programmes and networks, targeted specifically ‘for women’. Many women do not want to be part of women-only groups, for fear that this will be seen to set them apart from their male colleagues, and so create unwanted barriers. This is very understandable in light of the women’s strong motivation to ‘belong’ and to be taken seriously as an engineer noted earlier.

Women engineers also frequently face perceptions that they are getting ‘unfair’ preferential treatment in such initiatives – which understandably puts women off and makes some men see women as needing help to get on, thus reinforcing negative perceptions about their ability. Many men and women engineers are adamantly opposed to what they see as positive discrimination. We were shocked to discover this opposition even in organizations

that do not practice any kind of positive action (as we would prefer to call it). The widely voiced presumption is that women engineers are getting into the profession, and getting promoted, 'because they are women and not because they are good enough'. This view clearly brings into question women's competence, and so serves to further undermine the professional self esteem of women engineers.

The context of such resistance is of course that gender stereotypes and norms remain very current across engineering – along the lines of the in/visibility paradox discussed earlier. Traditional views about children and domestic work being women's responsibility – and hence family friendly policies being 'a women's issue' – are particularly acute in the East European organizations studied for Prometea and more muted in the Nordic countries. Less overt but nonetheless widespread is the belief that women make less good engineers or leaders than men. Underlying such views, our interviews in all the countries revealed an unhelpful tendency to dichotomise gender, thus playing up presumed differences between women and men engineers and playing down any differences amongst women and amongst men. As noted earlier, such stereotyped attitudes do contribute to fewer women reaching the top, which in turn merely serves to reinforce perceptions that women's abilities do not match those of men.

A common organizational response to the resistance is to make the policies available 'for all'. In three cases we studied, policies initially designed to support career planning and management for women were subsequently opened up to men as well. Quite apart from side-stepping any resistance to 'preferential treatment', there can be very positive reasons for adopting a 'for all' approach. It can create a 'win win' situation in which working conditions are improved for everyone. It also has the potential to prompt shifts in gender awareness, such as the common perception that children are 'a women's issue'. As we saw in the Spanish IT company, making flexible work options available to male employees has even lead to shifts in gender practices, in terms of the sharing of childcare and domestic responsibilities. But for all these very real benefits of 'for all' policies, many employers we have met, and analysts (eg, Rommes et al. 1995, Sørensen et al forthcoming: ch 9), believe that women-only initiatives are a necessary ingredient in gender inclusion strategies – not least, because they can be a powerful means of building up confidence and self belief.

Irrespective of the relative merits of 'for all' and 'for women' approaches, there is obviously a crying need to tackle head-on the persistence of stereotyped attitudes, and the lack of gender awareness, if employers are to overcome the resistance to gender diversity and equality measures. The challenge here is to 'win hearts and minds', to persuade staff (and their managers) about the reasons why are such measures needed, in order to get them to 'buy in' to helping make gender change happen. This may seem a tall order, but it is not impossible. Vivian Lagesen's (2007) study of the 'Women into Computing' initiative at the Norwegian National University of Science and Technology demonstrates that men can be persuaded to support even positive action measures *if* they understand the reasons for them and *if* the measures are seen as proportionate. Here the entrance requirement for women recruits was set very slightly lower than for men in order to increase the intake of women to a quota level. The men students and staff all accepted that getting more women on the computer science course was a good thing and very little resistance occurred.

We perceive three major elements to 'making the case' for gender equality and diversity policies. First, *people have to be persuaded that there is indeed inequality*. Data is a powerful but often missing prerequisite here. The Finnish Research Council's Equality Plan, for instance, frames the decision to prioritise women in light of evidence gathered on the extent of gender imbalances in research funding outcomes. Similarly, the UK Resource Centre for Women in Science, Engineering and Technology (see: <http://www.setwomenresource.org.uk>) offers a 'gender audit' as a first step in persuading organizations and their staff of the need for change and intervention. The point – which

should not be lost on engineers! – is to encourage more open and less trivialising discussions about gender, by providing ‘hard evidence’ demonstrating the extent, and location, of gender inequality. An especially important indicator here is what commentators frequently call the ‘leaky pipeline’ (Greenfield 2002): the differential loss of women and men to engineering organizations is a sure sign that something is wrong! Such data can only meaningfully be collected and analysed for individual organizations, and few bother.

Second, *people have to be persuaded that there are good reasons for seeking to change the situation revealed by the data.* Some engineers still have to be persuaded that there is indeed inequality and (by implication) discrimination – that the poor retention and progression of women engineers isn’t simply due to individual choices or (worse) differences in ability and inclination between women and men. For others, the very fact that the benefits of a good career in engineering are unevenly distributed is reason enough to support gender equality and diversity measures. In recent years, this ‘social justice case’ has been supplemented by variations of the ‘business case’ for equality and diversity – usually couched in terms of the need for a strong skill base and for the workforce to reflect the diversity of the market. Within this framing, one could point out that poor career progression is a significant reason why proportionately more women than men leave engineering, and that by failing to support adequately the career development and management of *all* engineers, the sector not only fails to utilise fully the talents of women staff in more senior positions, it also reduces the total pool of engineers available.

Third, and in addition to these general arguments, people need to be persuaded of the case for *specific* gender equality and diversity policies. By implication, this means increasing awareness of how gender inequality happens: e.g. the impact of gender norms and stereotypes, the in/visibility paradox, the career penalties for women of having children. On a more positive note, it also means promoting specific measures. The case for flexible work practices typically point to benefits for all: better work-life balance means healthier and happier staff, which in turn means a more efficient workforce for the employer and a better quality of life for the employee. The case for family-friendly policies, arguably, requires a profound change in the attitudes and practices of both individuals and organizations. In a situation where having children is viewed as solely a private choice, and where childcare is seen as ‘a woman’s issues’, any move to remove the career penalties for childbearing and childcare requires a radical shift in attitudes towards both the rights and responsibility of fathers but also the importance of children to society as a whole. In this as in all other areas, the aim should be to help people to think about how *they* individually might contribute to enhancing or inhibiting gender equality, how they might each make a difference.

### **Organizational commitment and resources**

In addition, to attitudinal barriers, the other underlying problem behind the failure to turn good policies into good practice is a lack of real organizational commitment to gender equality and, consequently, a lack of resources. Effective promotion and implementation of good practice with respect to equality and diversity costs money! All of the ‘follow-through’ activities identified in our research as necessary cost money: publicity and promotion, awareness raising and training, changing procedures and practices, evaluating measures and monitoring progress. Yet our good practice case studies revealed that lack of funding and other resources remain a major obstacle to the efforts made to improve the position of women in engineering.

Two of our good practice case studies emerged as exemplary in the terms of organizational commitment: the Optima-backed programme in the Spanish IT company and the Finnish Research Council’s Equality Plan. Although each has different objectives and domains, they share important similarities. Both have introduced a package of measures to address the issues; both devote considerable resources to these efforts; both are endeavouring to get

the support of the whole organization behind these measures; and both share a commitment to learning how to do and improve on good practice.

We have argued that embracing gender diversity and equality objectives requires significant changes in organizational cultures and practices. We have seen, especially with regard to work-life balance policies, that senior staff can have a significant impact in this regard by 'leading from the top'. Significantly, the uneven uptake of good practice often occurs in a situation where the policies are optional, where there is no injunction that they must be universally available or universally practiced in the organization. This suggests that a degree of compulsion may be needed in order to oblige employers, their line managers and staff to alter their practices. Of course, government legislation is the ultimate form of compulsion here. It is often argued that the wider dissemination of equality and diversity policies only occurs when these are required by legal frameworks. On its own, however, legislation is not sufficient – witness the failure of the UK Equal Pay Act to remove pay inequalities after 30 years! Legal requirements on employers tend to breed a 'compliance' mentality, of 'ticking the boxes', without necessarily generating any real commitment to change or any real understanding of why change is necessary or how to achieve it.

This point underlines the need to 'win hearts and minds', through explicit promotion of the case for equality and diversity measures – along the lines indicated above. Given the evidence about the level of resistance to such measures, and the impact which individual managers can have on their outcomes, it is clear the support for gender equality and diversity, and awareness about it, is needed across the whole organization. At the same time, commitment from the very top of organizations is needed to ensure that gender equality and diversity occupy a central place in the organizational agenda, rather than remaining on the margins. For this to happen, it is necessary to *integrate* gender equality and diversity measures and objectives into the organization's core activities – as we saw with the Finnish Research Council Equality Plan or the various efforts to 'mainstream' career support by making them open to all.

### **Conclusion: The need for 'culture change'**

In sum, many engineering organizations have useful policies, concerning family matters, work-life balance, career support and (to a lesser extent) workplace cultures. However, good practice with respect to furthering the position of women in engineering does not happen simply because the 'right' policies are in place. A whole set of 'follow-through' measures needs to also be in place if such policies are to be effectively promoted and implemented. There are two key underlying barriers to the effective translation of policy into good practice: gender attitudes and awareness, and a lack of real organizational commitment to equality and diversity backed up by proper resources.

The central conclusion of our study is that good practice with respect to furthering the position of women in engineering – and in any traditionally male-dominated occupations – must embrace the need for 'culture change' signalled by Sonia Liff and Ivy Cameron (1997) over ten years ago. Echoing closely the evidence and analysis presented here, they argued for a more proactive approach to gender equality recognising the "need to win hearts and minds rather than just achieve reluctant compliance" and "based on the view that *it is organizations not women* who have the problems" (Liff and Cameron 1997, emphasis original). The slogan 'culture change' is now commonly used by women into science and engineering organizations in the UK and elsewhere. It is useful because it signals – as Prometea research does – that policy change will have only limited impact unless it is backed up by a change in both attitudes and practices throughout the organization.

So far, the call does not seem to have been heard by most engineering employers (or employees). But ultimately the challenge of 'winning hearts and minds' cannot be dodged.

We have suggested that this must involve the following elements: demonstrating the need for intervention by using 'hard evidence' to illustrate the extent of gender gaps at all levels of engineering organizations; highlighting the business and organizational benefits of gender equality and diversity as well as the social ones; increasing awareness of how gender inequality happens and promoting specific measures, so that all members of the organization become part of the solution. Only if people embrace the need for gender equality and diversity measures will they be willing to change their own attitudes and practices accordingly. Effective good practice in this area needs the 'buy in' not only of key players like senior and line managers, who are in a position to lead by example and shape outcomes, but also of 'rank and file' staff in labs and offices, who may be resistant to change.

Crucially, as we have signalled, the needed 'culture change' encompasses a shift in wider gender awareness and practices, as well as changes in workplace culture and organizational practice. Culture change in this sense is inevitably a long-term project, demanding sustained and concerted efforts to reach all sections and levels of an organization. But it is achievable.

## References

- Ackers, L. (2004) 'Managing Relationships in Peripatetic Careers: Scientific Mobility in the European Union', *Women's Studies International Forum* 27: 189-201.
- Bagilhole, Barbara (1998) 'Negotiating the Glass Ceiling', *Journal of Social Policy* 27: 582-3.
- Bagilhole, Barbara (2006) "Family-friendly Policies and Equal Opportunities: A Contradiction in Terms?", *British Journal of Guidance and Counselling* 34(3): 327-43.
- Carter, Ruth and Kirkup, Gill (1990) *Women in Engineering: A Good Place to Be?*, Basingstoke: Macmillan.
- DTI (2004) *Flexible Working in the IT Industry: Long Hours and Work-Life Balance at the Margins?*, Report to Department of Trade and Industry and the Women in IT Forum carried out by Flexexecutive. London: DTI.
- Faulkner, Wendy (2005a) *Becoming and belonging: Gendered processes in engineering*, pp **XX-XX** in J. Archibald, J. Emms, F. Grundy, J. Payne and E. Turner, (eds) *The Gender Politics of ICT*, Endfield, UK: Middlesex University Press.
- Faulkner, Wendy (2005b) *Workplace cultures in Engineering*, public lecture ...
- Faulkner, Wendy (2006) 'Genders in/of Engineering: A Research Report', ISSTI Working Paper, University of Edinburgh, March.
- Faulkner, Wendy (2007) "'Nuts and bolts and people": Gender-troubled engineering identities', *Social Studies of Science* 37(3): 331-56.
- Genin, Ann-Sophie Godfroy (2008)(ed) **ref**
- Greenfield, Susan (2002) *SET FAIR: A Report on Women in Science, Engineering and Technology*, London: DTI.
- Hakim, C. (2004) *Key issues in Women's Work: Female Diversity and the Polarisation of Women's Employment*, London: Glasshouse Press.

- Jorgenson, J. (2002) 'Engineering Selves: Negotiating Gender and Identity in Technical Work', *Management Communication Quarterly* 15(3): 350-380.
- Kjeldal, S.E., J. Rindfleish and A. Sheridan (2005) 'Deal-making and Rule Breaking Behind the Façade of Equity in Academia', *Gender and Education* 17(4): 431-447.
- Kodz J., B. Kersley, M.T. Strebler and S. O'Regan (1998) 'Breaking the Long Hours Culture', IES Report 352, Brighton: IES.
- Lee, Lisa (forthcoming) 'Women's networks in ICT' in Sørensen et al. ...
- Lee, Lisa, Wendy Faulkner and Carme Alemany (2007), 'Report on the Identification and Evaluation of Good Practice', Prometea: Empowering Women Engineers in Industrial and Academic Research, Deliverable No 18; ISSTI Working Paper, University of Edinburgh.
- Liff, Sonia and Ivy Cameron (1997) 'Changing equality cultures to move beyond "women's problems"', *Gender, Work and Organization* 4(1) 35-46.
- McCarthy, H. (2004) *Girlfriends in High Places*. London: Demos
- McIlwee, J.S. and J.G. Robinson (1992) *Women in Engineering: Gender, Power, and Workplace Culture*, New York: SUNY Press.
- Miller, G.E. (2004) 'Frontier Masculinity in the Oil Industry: the Experience of Women Engineers', *Gender, Work and Organization* 11(1): 47-73.
- Rommes, Els, Wendy Faulkner & Irma van Slooten (2005) 'Changing Lives: The Case for Women-only Vocational Technology Training Revisited', *Journal for Vocational Education and Training* **XXXX**
- Sørensen, K, W Faulkner and E Rommes (forthcoming) *Technologies of Inclusion: Gender in the Information Society*.
- Tierney, Margaret (1995) 'Lads...' pp. **XX-XX** in K. Grint and R. Gill (eds) *The Gender-Technology Relation: Contemporary Theory and Research*. London: Taylor and Francis.
- Watts, J.H. (2007) 'Porn, Pride and Pessimism: Experiences of Women Working in Professional Construction Roles', *Work, Employment and Society*, 21: 299-316.
- Valenduc, G. **et al.** (2004) *Widening Women's Work in Information, Communication and Technology Work*. Namur: Fondation Travail-Université.

## NOTES

---

<sup>i</sup> We are grateful for the funding from the European Commission which supported the research reported in this paper. We would also like to thank our project partners in the participating countries for their contributions to the Prometea research on good practice. This article is based on their results and analysis. In Austria: Birgit Hofstätter, Anita Thaler and Christine Waechter, in Chile: Dámaris Fernández Donoso, Claudia Paz and Sonia Yáñez, in Finland: Liisa Husu and Paula Koskinen, in France: André Béraud, Anne-Sophie Godfroy-Genin, Cloé Pinault, Yvonne Pourrat and Jean Soubrier, in Germany: Jennifer Dahmen, Gaby Hoeborn and Felizitas Sagebiel, in Lithuania: Ala Kovieriene, Diana Saparniene and Virginija Sidlauskiene, in Russia: Elena Myasina and Vera Uvarova, in Serbia: Jovan Dudukovic, Jelena Jovanovic and Sanja Vranes, in Slovakia: Oto Hudec and Natasa Urbancikova, in Spain: Carme Alemany, in Sweden: Helen Peterson and Minna Salminen-Karlson, in the UK: Wendy Faulkner, Lisa Lee and James Stewart.