

**Engineering Automation Report  
The Expert's View  
by Mark Biagi**

**Emerging Environmental Product Policy**

***Introduction***

The pressure on engineers to consider sustainability of their designs is increasing. A recent 'Expert's View' discussed the ELV Directive. Now we consider the extension of these concepts into other product development areas. Recently the European Union proposed the Integrated Product Policy (IPP). This article summarizes the philosophy behind IPP and examines its potential impacts on the business of product development, in particular design.

***What is IPP***

Current patterns of production and consumption in industrialised countries are unsustainable. And if current patterns are unsustainable, then things are set to get a lot worse unless we have a complete rethink. Balancing environmental, social and economic needs is the ultimate goal of sustainable development.

IPP is a toolbox of environmentally-focussed product policies (EPP) intended to help create *green* markets by promoting a combination of mandatory and voluntary measures. IPP aims to contribute towards the goal of sustainable development, not just by reducing the adverse effects of products on the environment, but also by helping change people's attitudes to consumption, thereby influencing the demand for goods in our society. Hence, IPP is a toolbox of *green* consumption (demand side) and *green* production (supply side) measures

For example, voluntary demand side measures within IPP include schemes like the European Eco-label, which aims to make it easier for customers (B2B and B2C) to distinguish products based on their environmental performance. The ELV Directive, discussed in a recent edition, is an example of a mandatory measure to make automotive producers responsible for the reclamation and disposal costs of cars that have reached the end of their useful life. Two pilot projects are currently underway, involving Nokia and Carrefour, looking at how this life cycle thinking can affect product development.

***Impact of IPP on Design***

At the heart of IPP is the principle that the biggest improvements in environmental impacts of products can be made at design phase (front-of-pipe), rather than through process efficiency, cleaner production or pollution management (end-of-pipe). The EU estimates that over 80% of all product-related environmental impacts are determined during the design phase. Hence, increasing the awareness of environmental considerations during design should be the most effective way of improving environmental performance.

Under the banner of IPP, a raft of new legislation is emerging intended to have a radical effect on the way all products are designed and marketed. Already widely discussed in the media are the WEEE (Waste of Electrical and Electronic Equipment) and ELV Directives. Both are based on the principle of extended producer responsibility, requiring that manufacturers meet the costs of take-back and recycling of their own products. In theory this should lead to greener design, as producers who are smart about designing their products for ease of reclamation should see financial benefits.

***EuP***

However, one of the biggest product impacts results from the energy consumed during use. Hence, the EU is proposing a framework directive on eco-design requirements for energy using products (EuP). Eco-design means the integration of environmental considerations in the design process. EuP intends to regulate products, and the method of designing products, that consume energy (whether electricity, fossil fuels or renewable) to fulfil the purpose for which they were designed. The primary aim is to encourage producers to design with environmental impacts in mind throughout the entire product lifecycle, to give freedom of

## Emerging Environmental Product Policy

informed choice to the customer, and to create a level playing field within the EU for such products. EuP also aims to contribute towards the security of energy supply in Europe amid growing concerns about the over-reliance on imported energy.

EuP will apply to virtually any product that uses or converts energy, excluding motor vehicles given the large number of regulatory and voluntary agreements already in place. The directive will also apply to components and sub-assemblies of EuPs which are marketed as spare parts destined for end users, and whose environmental performance can be assessed independently.

In the early stages of adoption priority will be given to the most energy consuming appliances, including lighting, HVAC, office equipment and consumer electronics. Particular attention will be given to products with stand-by functions, where the energy consumed during stand-by is not significantly less than the energy consumed in use. Currently around 10% of total EU household energy consumption is due to stand-by losses of electrical equipment like TVs and DVD players, and this is set to increase.

Compliance of individual products with EuP will be sought through the European CE Marking process. In this way environmental concerns in product design will be elevated in stature, taking their place alongside product safety and electro-magnetic compatibility (EMC).

### ***Impact of EuP on design***

So, what are the implications of EuP on the design process for products intended for the EU? Among the requirements of EuP are: 1) the ability to demonstrate a structured Design for Environment (DfE) methodology, and; 2) to accompany each new product with a detailed Life Cycle Analysis (LCA). The life-cycle impacts at the various phases, from sourcing materials, manufacture, shipping, use and disposal must be communicated. Design measures, in accordance with best available practice, will have to be taken to reduce adverse impacts, and design solutions adopted must be explained and justified.

At present carrying out a detailed LCA is a very complex and laborious task, reliant on the creation of subjective boundaries and accurate material data. It is not an exact science. LCA tools are non-standard, esoteric and highly academic. Furthermore, LCA only takes account of first order effects (e.g. impacts in production, use and disposal of products). It does not take account of second order effects (e.g. efficiency gains through substitution of one product for another, like using the phone instead of driving to see someone), or third order effects (e.g. incomplete substitution of one for another, like a 'paperless' office where documents are still printed out). At best LCA is a comparative method, helpful in the design phase to determine whether one method is better than another. Nor are there formalised methods for carrying out DfE.

### ***Industry Responses***

The response to EuP from industry has been understandably nervous. Alongside the usual concerns over vague wording and loose definitions, the general feedback from the trade associations is that since EuP addresses product design, it directly addresses a producer's core competence, and as such is an extremely sensitive issue. Producers are also concerned about the levels of surveillance, and policing of imported goods, without which there could be a serious impact on competitiveness.

### ***Opportunities for CAD Vendors***

IPP, and in particular EuP, provides a major opportunity for design software vendors in two ways. Firstly, assisting with demonstration of compliance, and secondly assisting designers make informed design choices. Compliance with the proposed regulations requires a level of design consideration not currently catered for by mainstream packages.

Compliance with EuP requires information that is not readily available to designers. Despite the hype around Product Lifecycle Management (PLM) products, there remains a lack of

## Emerging Environmental Product Policy

integration of environmental tools on the desktop that would help designers make qualified evaluations of the impacts of their design choices.

With producers imminently required to provide detailed ecological profiles of their products, this represents an opportunity for mainstream CAD vendors. Generalist designers need integrated, DfE-specific, Knowledge Based Engineering (KBE) tools to provide the material composition, energy/resource consumption and end-of-life-management information they need up front.

In summary:

- To sell within Europe, US firms will need to comply with EuP
- Competitiveness of smaller producers will be hardest hit by regulations
- New eco-design tools could make compliance easier
- Compliance is already becoming a differentiator, especially B2B
- Regulatory demands are set to increase as IPP develops.