REACH and the Metals Industry – Unintended Consequences Causing Concern for Cobalt

David Weight
General Manager, The Cobalt Development Institute
Director, Cobalt REACH Consortium Ltd

The EU's chemical management policy for the Registration, Evaluation and Authorisation of Chemicals (or REACH) has many ambitions and compelling aims to protect EU citizens and workers from exposure to chemicals, and these are supported by Industry. However, we are also seeing that there are many unintended consequences of the application of the Regulation, in particular it is becoming evident that REACH is creating a barrier to trade for cobalt and it is also inhibiting the innovation platform so prized by UK industry.

The metals industry has spent several years organising for participation in REACH, by forming Consortia and planning extensive work programmes. Significant funds have been committed towards fulfilling their REACH obligations, and there are expected to be substantial further costs for Industry.

REACH was not designed initially to encompass metals, the focus being on organic Persistent, Bioacumulative and Toxic substances (PBT) and very Persistent and very Bioaccumulative (vPvB) substances, however metals were included and here the problems began. First of all the metal industry is essentially data rich as it is already controlled through existing legislation. Secondly, the methodologies used to measure human and environmental effects are not easily adapted to metals and the industry has devoted considerable resources to developing new methodologies. Thirdly, because metals are naturally occurring they exist in the environment, and therefore should not be categorically linked with the PBT substances. In fact certain metals such as cobalt, which is an oligo element, are required by humans and animals for vitality and growth (vitamin B12 has cobalt as a co-factor).

Where Industry experiences the problems is in the application of the regulation which is far too complex, inflexible and in some cases disproportionate, inadequately defined and applied heavy-handedly. The goalposts are constantly moving – for example the issue of intermediates under strictly controlled conditions is a point in question where the European Chemical Agency (ECHA) amended the guidance mid-term when the whole of industry had already embarked on Registration of their substances. This important matter is still not adequately resolved and some of the implications for the metals industry are dire – the surface engineering industry is under particular threat. Also, the application of the REACH Regulation is 'hazard' focused even though Industry has explained the difficulties with such an approach. In short Industry strongly supports chemicals management based on Risk not Hazard.

The UK is an important user of cobalt and there are a broad base of industries that are dependent on cobalt and cobalt compounds, from superalloys (eg aerospace and land based gas turbines; hard wearing castings in renewable energy applications), catalysts (clean fuel technology and removal of harmful gases such as NOx), digital storage (essential in computer processing), industrial cutting tools (eg high speed steels and hard metals), driers in paints and pigments, rechargeable batteries (mainly Li-ion systems), high strength permanent magnets (eg for wind turbines) and many other applications. Cobalt is very much

a technology enabling metal and is important to achieving the stated ambitions of the UK Government's 'Green' agenda.

Cobalt is a minor metal and is essentially a by-product of copper and nickel mining. Cobalt also has a broad range of highly specialised and important uses. However, cobalt is not an obvious metal like copper as it is only ever used in small amounts to alloy with other metals to considerably improve operating characteristics and attain greater operating efficiencies, or it is used in a chemical form for many critical applications ranging from safety in radial tyres to energy storage in rechargeable batteries. Out of sight often means out of mind and this seems to be an area that the Regulators failed to consider fully when including the metals industry in the REACH Regulation.

Of course such considerations are outside the ECHA remit but when embarking on such an ambitious Regulation it would have been advisable to have undertaken an impact assessment as, without such analysis, the risk of unintended damaging consequences for industry, employment, and the environment is high. In REACH of course each substance, if called to be Authorised, has to provide this information in evidence to justify usage – however the cost of preparing such a defence for any cobalt substance which might be subject to Authorisation is very high. Given the small tonnage and broad range of uses involved, this will probably not be sustainable for the economic survival of some chemical compounds. A case in point is the disproportionate treatment of cobalt salts in the REACH Authorisation process.

The criticality of supply of strategic metals (and minerals) is another issue. The UK Department of Environment, along with the USA Department of Energy and the EU with the Raw Materials Initiative, seem to have suddenly discovered that cobalt is actually critical to their base industry, and so they wish to work with industry to protect the position. DG Enterprise is also tasked to look at improving the competitiveness of EU industry. Most regrettably there appears little joined up Governance here as the application of REACH could inhibit or even prevent the utilisation of some cobalt substances in the EU because of the cost of compliance, and other unintended consequences of the Regulation, and cobalt is not alone.

All the issues that the REACH Authorities believe they had with the import and manufacture of substances will doubtless move towards other (non-EU) countries where regulations and controls are nowhere near as effective as those in the EU (even before REACH!). In simple terms, this amounts to an off-loading of the responsibility for safer chemicals management, without any guarantee that this can be accomplished in practice.

Substitution is the end game of REACH for substances prioritised for Authorisation, and this could be the case for several cobalt salts. However, it is notoriously difficult to substitute cobalt substances without suffering serious reductions in efficiency and/or performance. In the catalyst sector this is particularly apparent as well as for high performance alloys and in other technology enabling processes. For some critical applications for example there are no substitutes that could provide the advantages offered by use of cobalt substances. For example in the catalyst industry, 1 kg cobalt contributes to a SOx emission reduction of 25,000 tonnes and a NOx emission reduction of 750 tonnes per annum. If substitution provided enhanced characteristics or better economy then industry would automatically do this. With cobalt it is not appropriate just to talk about substitution as a means to an end as this could cause serious economic damage to the sector and at the same time cause a reduction in efficiency of some important processes and applications. The substitution approach of REACH pre-supposes that this hasn't been considered before. There is little credit given to the fact that industry has already spent many years and significant investment to identify their substances of choice. The cobalt substances used today in many specialised applications have resulted from earlier programmes, and now the future technology developments are being cast into jeopardy!

The costs of REACH are a major factor affecting the current and future plans of industry, and we will undoubtedly see some chemical compounds dropped, without any appreciation of what damage this could ultimately do to the overall UK (or EU) industry. The Cobalt Industry under the REACH Consortia will have expended some 7 million Euro[1] (and counting!) in preparation of the registration dossiers. Evaluation of these dossiers demonstrates that there is negligible Exposure[2]. It is therefore most surprising that of all the substances that could be proposed to the Candidate list for Authorisation, five cobalt salts were selected, even though there are many compelling reasons why they should not go forward, such as, being covered by existing legislation, largely intermediate and no consumer exposure. Consequently we believe this illustrates a disproportionate application of the REACH Regulation to the cobalt sector. The cost of this process will be levied on part of an industry with a global refined production of 76,000[3] tonnes, not the 20 million tonnes of copper or 40 million tonnes aluminium or the 1.4 Billion tonnes of crude steel[4].

These are the practical problems associated with a well meaning Regulation that has become too complex and overbearing for the metals industry. REACH should be part of a regulatory Agenda which seeks to improve the real health and safety of its citizens as well as the competiveness of industry by working in conjunction with other important initiatives. It should be applied proportionately, fairly and in a non-discriminatory manner. For cobalt, with its unique technology-enabling properties, there is a risk of seriously damaging the innovation platform which is essential for the Research and Development initiatives and vital for the wellbeing of UK industry and for the environment.

(1) CDI/CoRC Consortia Costing Estimate;

(2) Cobalt Reach Consortium Extract of Exposure Scenarios from Registration Dossiers;

(3) CDI Cobalt News April 2011;

(4) World Bureau Metal Statistics for 2010