ISSN 2056-6735 (Online)

# The Crucible

## Granting China Market Economy Status

The Challenge of Governing Future Space Mining Frontiers

Update on Conflict Minerals and Union Customs Code

# MMTA NEWS IN BRIEF

**Baby Boom!**

There have been several MMTA babies over the summer: congratulations to Tamara Alliot (MMTA), David Gussack (MMTA Board and Exotech), Gregory Buchheit (MMTA Board and F.W. Hempel) and Colin Strang (CCMA).

**New MMTA Website and Crucible**

Over the coming weeks you will notice changes to the MMTA website and in particular to the format of the Crucible. Members will still receive their monthly print edition, and now that there's so much excellent content being produced every month, we want to allow members to search for past articles on specific topics of interest, and access the online content from any of the current and past editions easily. The new online format will no longer be a simple pdf, but will be an archive of our current edition and all our previous Crucible articles, as well as (in time) other materials of interest. Some of this content will still be freely available to our valued non-member readership, as we still want the wider community to be informed of what the MMTA and its Members are doing, but some content will now be Members-only in future.

We hope you like the changes, and look forward to hearing from you with any suggestions.

**REMADE Institute**

The MMTA is delighted to announce that it is to be an Affiliate Member of the REMADE Institute and is supporting its submission to the US Department of Energy. See below for more on the Institute's goals and remit. US Members wishing to offer their support to the Institute, should contact them directly for more information.

On June 20, 2016, the United States Department of Energy (DOE), under the National Network for Manufacturing Innovation (NNMI) program, released a $70M Funding Opportunity Announcement (FOA) to solicit proposals from industry-academic-government teams for the creation on of an industry-driven manufacturing institute focused on increasing material use efficiency manufacturing through reuse, recycling, and remanufacturing. RIT is leading proposal team under the name "The REMADE Institute" to submit a plan by the September 28, 2016 deadline. RIT's plan:

- addresses industry-defined, pre-competitive challenges, focus on the deployment and adoption of technologies deemed critical to U.S. manufacturing competitiveness (i.e., the institute will not focus on basic research but rather taking technologies that have been proven in a lab and deploying them to address material efficiency challenges;
- unifies the top industry and academic subject matter experts across the US on the development new tools, technologies and novel approaches to using fewer material resources and optimizing their use throughout the product life-cycle, including Idaho National Lab, Argonne National Lab, University of Illinois, and other leading universities, national labs and industrial partners, such as Purdue University, University of Utah, University of Wisconsin, Yale University, Oak Ridge National Lab, Xerox, and Caterpillar;
- will propose to make significant reductions in embodied energy and emissions **through** material use efficiency across all areas of manufacturing -- from design, production, and end of life via recycling and remanufacturing.
- targets four materials -- e-waste, fibers, polymers and metals.
- Includes a technical roadmap of manufacturing problems in reuse, recycling and remanufacturing present and identify foundational projects in the targeted focus areas and a plan to fund projects over the 5-year funding term that align with the roadmap
- will match the $70M in federal funding by 1:1 making at least $140M dedicated to the Institute mission.

If you are interested in becoming involved in the Institute or want to learn more about the benefits of joining – visit our website. Key benefits of Institute membership:

- **Engage** -- Get actively involved in important issues in the REMADE Institute's strategic planning, road-mapping, and development of projects.
- **Build New Relationships** -- Network with experts in the composites industry during our semi-annual members meetings.
- **Reduce Material Use Costs** -- Leverage investments of over $140 million focused on accelerating the development of advanced material use efficiency technologies over the next five years...

We hope you enjoy this month's Crucible. Best Regards, Maria

**Maria Cox,** General Manager

# UPCOMING MMTA EVENTS

## LAST REMAINING TABLES

**The MMTA's 43rd Anniversary Dinner**
Tuesday, 1st November, 2016
Lord's Cricket Ground, London
£105 MMTA Members and their guests/£150 Non Members/Optional tour £12 (+ VAT)

To Book online, go to www.mmta.co.uk/events

Alternatively, email admin@mmta.co.uk if you prefer to receive an invoice.

**The Drinks Reception is kindly hosted by Alex Stewart International**

**The Main Dinner is kindly hosted by RC Inspection Ltd**

RC INSPECTION

## Other 2016 Events:

### Brexit and REACH—17.00-20.00, 28th September, London

Expert legal panel Q & A with guest panellist, Sandra Carey of IMOA on REACH, followed by networking drinks, **kindly hosted by Penningtons Manches.** This event is free of charge (*registrations at the discretion of the host)

### Global Metals Outlook—16.30-19.00, 6th October, New York

Metal Bulletin's top analyst, Ed Meir of Int'l FC Stone, will be providing attendees with his assessment of the metals outlook followed by a Q & A and informal networking drinks, and **kindly hosted by HSBC** and is **free of charge to MMTA Members/$25 for Non-members**

### Topical Briefing & Networking Drinks, 28th November, Düsseldorf, Germany

Further details to follow shortly

### MMTA Christmas Lunch, 15th December, London

This year's event will begin with networking drinks and carols, and is followed by a festive 4-course lunch including wine. It will be—as always—a great way to end the year with industry colleagues and friends.

To register for any of these events, book online or contact admin@mmta.co.uk

## INSIDE THIS ISSUE



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The MMTA is the world's leading minor metals industry organisation.

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# THE MMTA'S INTERNATIONAL MINOR METALS CONFERENCE 2017

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The current fee for Non-Members is **£950** (+ VAT where applicable) for all registrations received by 11th January 2017

Non-Members have time to benefit from the excellent Member rate by applying for MMTA membership now.

To find out more, contact admin@mmta.co.uk

To register for the conference or for more information please visit www.metalevents.com or www.mmta.co.uk/conference, or alternatively email sales@metalevents.com

## MMTA Conference Golf Tournament, hosted by ICD Alloys & Metals LLC

ICD ALLOYS & METALS LLC

For our first golf tournament, taking place on **Monday 24th April** before the start of the conference, we will be at **the prestigious K Club, previous venue of the Ryder Cup**.

The tournament fee of EUR150 (+ VAT) will include transport by coach from and back to the conference hotel, breakfast on arrival, 18 holes of golf, electric buggy, and lunch

Registered conference delegates wishing to join this event, should contact admin@mmta.co.uk

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# Space Mining: The Challenge of Governing Future Mining Frontiers

By **Jack Swindon**, RJH Trading Limited

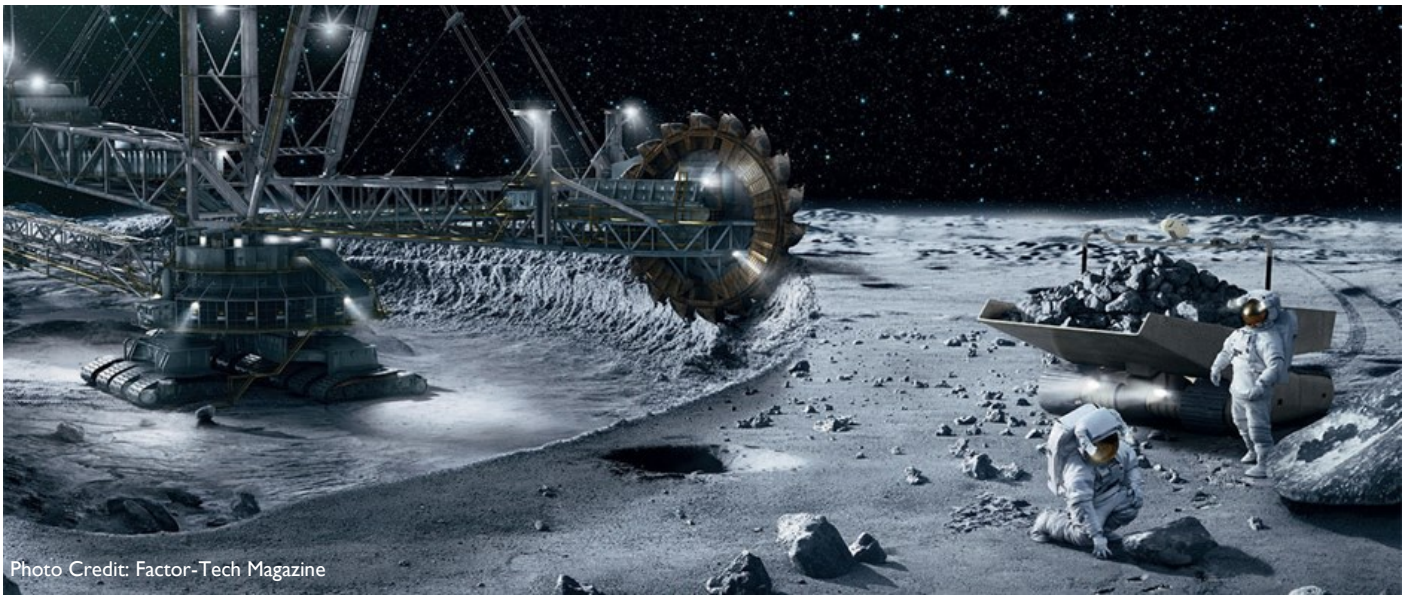

Photo Credit: Factor-Tech Magazine

The potential resources from space mining are limitless. Scientists have already confirmed that water is present on the moon. NASA says that frozen water in the dark recesses of polar craters can be extracted and split into hydrogen, which can be used for rocket fuel as well as conversion into oxygen for breathing. The potential for refueling in space opens up far greater possibilities for longer missions, more viable and economical space docking, and perhaps the potential for inter-planetary colonization.

Valuable deposits of titanium are present, and an abundance of high value platinum on the moon and in asteroids would dwarf the levels currently produced on Earth. Space law currently encourages exploitation of minerals, but this may change with the economic and environmental landscape. This is due to the advent of privately funded space programmes, along with potential concerns over the amount of matter being brought into the Earth's atmosphere and its unknown consequences. The Google Lunar X Prize has been set up to encourage growth of privately funded space programmes and is currently being competed for by 16 teams from around the world.

Space law will need to adapt to this changing landscape and will play a significant role in metal trading in the near future, with asteroid mining due to begin in 2020. The key questions which will need to be answered surround property rights. When the technology has developed to make space mining financially viable, the principles of the 1967 UN Outer Space Treaty, which currently forms the foundation of space law, will need to be updated.

Supplies of metals may be limitless, but the history of international law concerning space and property rights within it is tempestuous. The basis of space law is found in the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies ('Outer Space Treaty'). 140 countries are party to the Outer Space Treaty, and a further 24 who have signed it but are yet to ratify it. This treaty fundamentally established the principle that no nation can own the Moon. Article II of the Treaty states that Outer Space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means. The common consensus is that this principle is extended to individuals and private companies, such as Deep Space Industries and the Google backed Planetary Resources, which want to harvest resources to fund their permanent space development. India has already voiced concerns over the limited scope of the Treaty. Retired Air Marshall S. Krishnaswamy said in a speech at a New Delhi symposium on outer space that "India would like to appeal to [the] international community to see what holes must be plugged" and whilst he was primarily concerned with the militarisation of space, similar concerns could equally be raised about space mining.

China has plans to land a probe on the Moon later this year and astronauts by 2020. Because China's lunar plans are more ambitious than most, some fear they may get too much control of the moon. If the law remains stagnant and based on a first-come-first-served basis, then we run the risk of a 'second space race' between countries vying to be the first to exploit the commodities

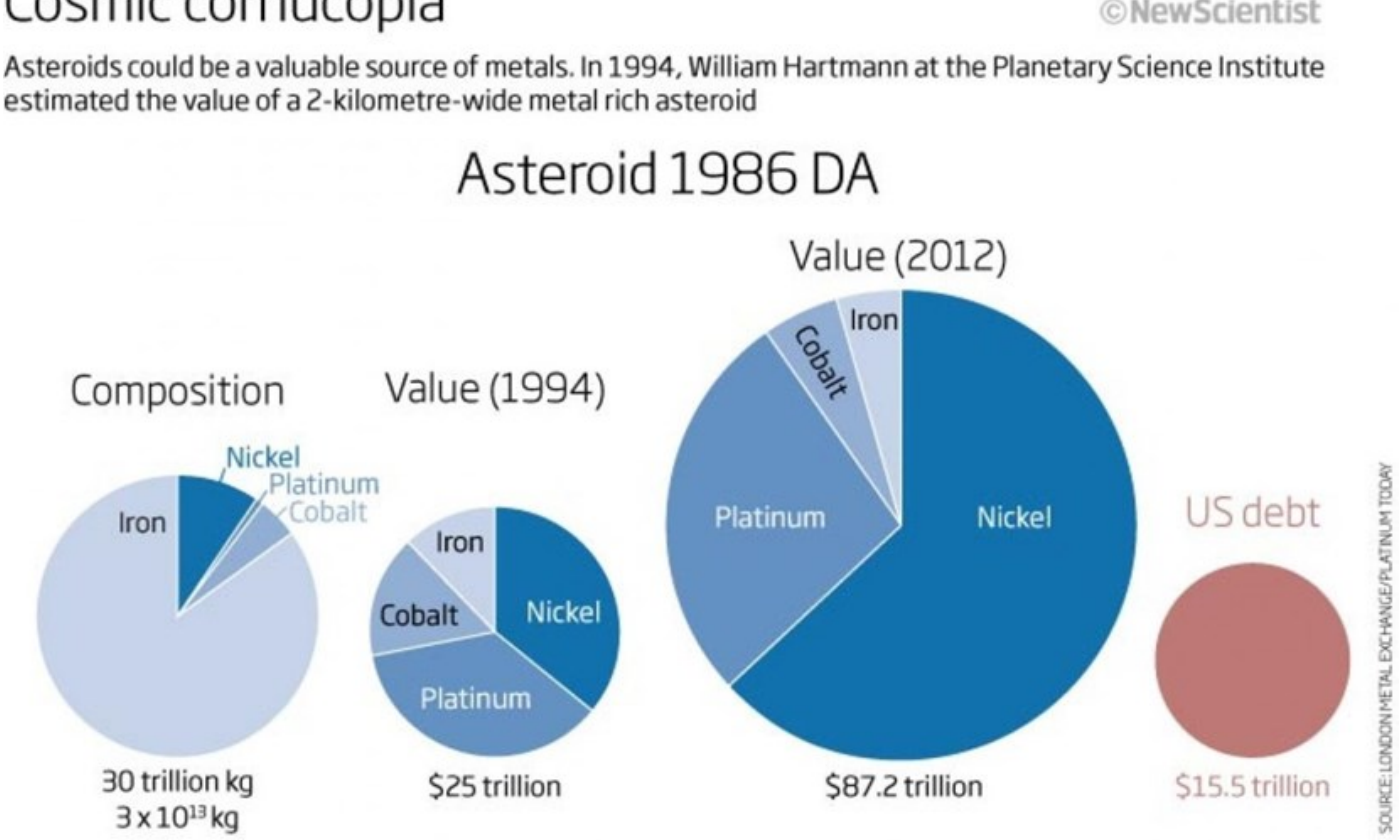


Photo Credit: World Economic Forum

of the moon and asteroids. This is exacerbated by further competition from private companies such as Deep Space Industries and the Google backed Planetary Resources. Other countries are investing in space mining, and Luxembourg in particular is investing heavily in asteroid mining and wants to establish itself as the European centre and 'Silicon Valley' of space mining. As the graph above demonstrates, the potential commercial advantages of asteroid mining are huge, and once this value is realised, then it will be more difficult for countries to agree on the direction for space law to take.

New legislation has considered the commercial aspect of space, whereas the Outer Space Treaty was more concerned with diplomacy and military factors. The US Commercial Space Launch Competitiveness Act of 2015 states that any materials discovered on the moon or on an asteroid by American companies is their property and they can do with it what they will. The consequence of this is that individuals are more likely to invest in space mining with the knowledge that they are free to keep what they discover. Legislation may have to be updated once competition increases and the unfettered profit making begins. This Space Act breaks from the spirit of the Outer Space Treaty which focused on the common good of scientific research and sharing of information and property in space. The inheritable right of sovereign states to use space for peaceful purposes was also stressed by the European Union in 2008 when it initiated a procedure to develop an International Code of Conduct for Outer Space Activities. Whilst this code is not intended to be legally binding, it aims to provide a set of principles and guidelines agreed to on a voluntary basis amongst states. The question remains, as stressed by India at the New Delhi Symposium, as to what will actually happen if a company or even a sovereign state encroaches on another entity's activities, as there are currently no enforcement mechanisms in place.

Countries such as USA, China and Luxembourg will be reluctant to ratify any UN resolutions when they have invested heavily under the principles of 'finders keepers' established in the Outer Space treaty. This is evidenced by the failure of the The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies ('Moon Agreement'). The Moon Agreement was a UN Resolution in 1979 that was meant to be a progression from the Outer Space Treaty and aimed to turn jurisdiction of all celestial bodies (including the orbits around such bodies) over to the international community.

Thus, all activities would necessarily have to conform to international law, including the United Nations Charter. The Moon Agreement has effectively failed, as it has not been ratified by any country that engages in self-launched manned space exploration or has plans to do so. Any new proposed treaty will need to allow enterprise whilst setting controls. This will need to be put in place soon, as the two biggest players in private space programmes have already set out their ambitions.

Deep Space Industries is already planning the deployment of 25-32 kilogram (55-70 pound) mini-satellites to asteroids with good prospects to better assess their resources and bring back samples. Planetary Resources has identified asteroids for exploitation using space telescopes placed in orbit last year. The two companies estimate that the new space gold rush could require several billion dollars over the next 10-15 years. Space law will also need to tackle the unknown variable of the environmental effects that space

mining will have on our atmosphere. Scientists predict that the mass amount of dust caused by space mining alone could have a disastrous impact, as it could find its way back to Earth, smashing into satellites and anything else orbiting the planet.

The economic impacts of bringing into our atmosphere large quantities of precious metals are that whoever was able to do it first would have a huge power to manipulate prices. However, the environmental consequences of bringing large amounts of matter into the Earth's atmosphere are unquantifiable. What this means is that the law cannot afford to fall too far behind innovation. It is foreseeable that it may be more economically viable to mine, process and use space resources in space. This would predominantly be for refuelling spacecraft and aiding scientific discovery and would play a part in any future interplanetary colonisation. This will cause its own problems of governing a jurisdiction beyond Earth. The Moon Agreement of 1979 and the reluctance of major space-faring nations to ratify it is an ominous reminder of the difficulty in forming a consensus amongst nations, especially once the disparities of scientific knowledge, levels of funding and the presence of private space companies are taken into account.

Sources:
United Nations for Outer Space Treaty website
BBC Magazine
Physics News
World Economic Forum
Factor-Tech Magazine
Physics.org
Space.com
Nuclear Threat Initiatives

# Tesla's Master Plan

On July 30th, the grand opening ceremony of Tesla's Gigafactory based outside Sparks, Nevada took place. Although nowhere near full planned capacity, this is a major step for Tesla moving towards their mission of accelerating the world's transition to sustainable energy. The plant will produce the lithium-ion batteries required to power the planned production rate of 500,000 cars per year by the end of this decade. Tesla alone will require today's entire worldwide production of lithium-ion batteries, and the company expects to be at full working capacity by 2020, with the first cell production commencing in 2017.

The Gigafactory will produce batteries for significantly less cost using economies of scale, innovative manufacturing, reduction of waste, and simply having the whole process under one roof. The expectation is that the per kilowatt hour (kWh) cost of the battery pack will be reduced by 30%.

This massive $5 billion investment is on a 3000 acre (12.14 SqKm) site and now employs 1,000 workers building seven days a week on two shifts in an effort to have lithium-ion batteries rolling off the manufacturing line earlier than originally planned. The current structure is still less than one sixth the size of the completed construction.

The popularity of lithium-ion batteries has been growing steadily over the last few years, but since the announcement of Tesla's plan to build the Gigafactory, the price of lithium has skyrocketed in the last year. The price of lithium carbonate surged 30% to around $8,000 a ton, with some spot market trades apparently hitting $25,000. This makes for a welcome change, certainly in traders' eyes, as the last ten years have not been been on a high. It is expected that market volatility will settle and supply will eventually creep above demand over the next few years.

http://etfdailynews.com/2016/08/14/tesla-might-have-a-big-problem-finding-all-the-heavy-metals-it-needs/

# LETTER FROM NORTH AMERICA

By **Tom Butcher**, Independent Consultant

Dear Members

I trust all of you have had excellent summers, whether away on holiday in parts far (near), or at home. We've had a tolerable summer here in New York, with only couple of stinking hot weeks when the temperature went up to high 90°s F and the humidity remained not much below 100%. It is, however, and thank goodness, a little cooler now.

Back at the beginning of May I wrote you about what the, then, two leading presidential candidates thought of both the Trans-Pacific Partnership (TPP) and the Transatlantic Trade and Investment Partnership (TTIP) with the EU.

Maybe I should not have bothered. As things currently look, each trade agreement now looks increasingly unlikely to be consummated. Here in the US, there has been a distinct shift in mood from the optimism at the start of the year that passage of TPP through Congress could be won, to pessimism that it would, now, fail to garner enough votes in either the House or Senate.

But maybe Clinton and Trump have, actually, contributed collectively

***"with the UK ex-Europe and not, therefore, accessible through TTIP, the deal might not look as attractive as it did to the US."***

to TPP's impending demise. Whilst Trump's position – virulently anti-TPP – hasn't changed much since my previous letter, Clinton's has hardened considerably. Indeed, a recent Wall Street Journal article reported that "*…aides to Mrs. Clinton say she now plans to tear up the pact and start over.*"

As for TTIP, well, European members probably know much more about it than I. But from what I can see, it, too, looks doomed – especially if Germany's economy minister, Sigmar Gabriel, is to be believed. And Brexit cannot have helped: on the one hand, the EU has lost the support of the UK as a member, and on the other, with the UK ex-Europe and not, therefore, accessible through TTIP, the deal might not look as attractive as it did to the US.

We shall have to wait and see on both.

To perhaps a more interesting topic. As you'll already know, I like to keep my eye out for interesting scientific advances using minor

***"a 1% penetration of the aluminium alloy market would "translate to 3,000 tons of cerium."***

metals. The result of some research, actually reported back in June, from the US Department of Energy's Oak Ridge National Laboratory recently caught my attention. I don't often mention rare earths, but the news from the DoE and its partners, Lawrence Livermore National Laboratory and Eck Industries (based in Wisconsin), was, I thought, particularly interesting. Together they have developed aluminium alloys that are "*both easier to work with and more heat tolerant than existing products.*" But, the really interesting thing is that the alloys contain cerium.

This could be really good news, not only for those who use the aluminium alloys, but also for producers of rare earths. Since, according to Oak Ridge, cerium accounts for up to half the rare earth content of many rare earth ores, and nobody wants to buy it, this could create both a useful and valuable market for the metal. According to one of the researchers, a 1% penetration of the aluminium alloy market would "translate to 3,000 tons of cerium."

The new alloys sound pretty attractive. They are low cost, they have exceptional high-temperature stability, they have reduced heat-treatment requirements and, significantly, they are highly castable. (This last is especially important as it is, I understand, more difficult to cast most alloys with exceptional properties.) With their high-temperature characteristics, used in internal combustion engines, the alloys could allow engines to run hotter and to be lighter, both ways to increase fuel efficiency.

I, for one, will be fascinated to see what happens with these new alloys.

And, on that optimistic note, I shall bid you farewell, whilst wishing you all the best from a rather pleasant New York.

Yours



Sources:

The Wall Street Journal: Diminishing Prospects for Trans-Pacific Partnership Cloud Obama Goals, http://www.wsj.com/articles/diminishing-prospects-for-trans-pacific-partnership-cloud-obama-goals-1471995574, ; August 23, 2016

Oak Ridge National Laboratory: New alloy promises to boost rare earth production while improving energy efficiency of engines, https://www.ornl.gov/news/new-alloy-promises-boost-rare-earth-production-while-improving-energy-efficiency-engines; June 3, 2016

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# New Metal 'four times tougher than titanium'

By **James Walsh**, MMTA

The search for new hard materials is often challenging, but the vast application potential is a strong incentive to continue this pursuit.

One recent success lies with scientists in a lab at Rice University in the US where a super-hard metal has been made, by melting together titanium and gold.

The alloy, beta-Ti3Au, is the hardest known metallic substance compatible with living tissues and has potential for making longer-lasting medical implants, a trait it claims from the spontaneous build-up of an inert and stable oxide layer.

Current knee and hip implants have to be replaced after about 10 years due to wear and tear.

Evidence from wear experiments reveal that this enhanced hardness is associated with a low coefficient of friction (COF).

The other beneficial economic factor comes with the ability of this compound to adhere to ceramic parts which can reduce the weight and cost of medical components.

Preparation of the compound is an important aspect of the superior properties, and temperature can make a big difference. Making the beta-Ti3Au alloy, which is three parts titanium and one part gold, at high temperatures produces an almost pure crystalline

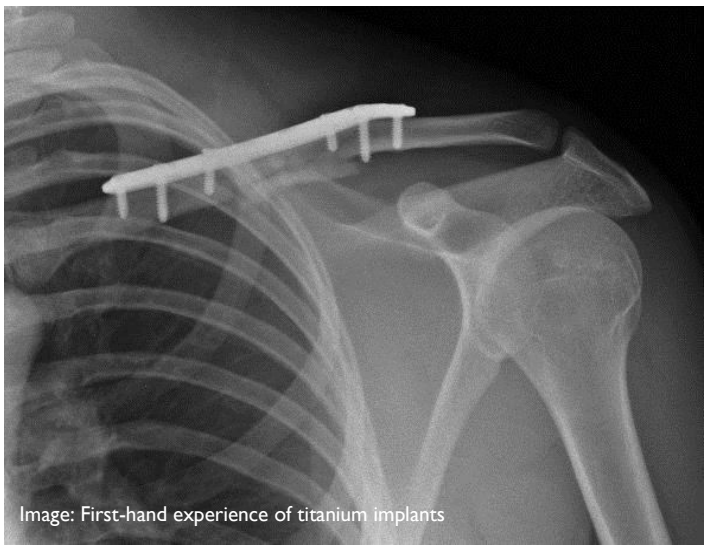

Image: First-hand experience of titanium implants

form of the alloy, and it is this crystal structure that is four times harder than titanium. At lower temperatures, the atoms arrange in another cubic structure, called the alpha structure, which is about as hard as regular titanium.

Titanium is known to be the most bio-compatible metal due to its resistance to corrosion from bodily tissues and fluids, its bio-inertness, high fatigue limit and capacity for osseointegration, which refers to the direct structural and functional connection between living bone and the implant.

This new alloy may also have applications in the drilling and the sporting goods industries, among many other potential fields. The challenge now, is to bring this material to market and identify how viable it will be for new manufacturing techniques such as 3D printing.

Sources

http://www.bbc.co.uk/news/science-environment-36855705
http://advances.sciencemag.org/content/2/7/e1600319

## GKZ Collaborative Agreement

The MMTA is delighted to announce that it has signed a cooperation agreement with German Geokompetenzzentrum (GKZ) in Frieberg. GKZ is a triple helix network of industry, research, and administration operating in the fields of mineral raw materials along the whole value chain.

The head office is located in Freiberg, Saxony, a raw material science and business hot spot in the Federal Republic of Germany. The objective of GKZ's business is the initiation of R&D and coordinated support actions including exploitation and market surveys, as well as close partnership with international organisations in technical and development cooperation, in order to strengthen the members' technology development and market entry.

GKZ is putting together teams to develop funding bidding groups, and ultimately to solve industrial problems. Through the collaboration of experts from different fields, the aim is to solve a range of contemporary problems, including in the areas of exploration, mining, environmental and resource management, processing and recycling. As a non profit organisation, GKZ's aims also include training and education, as well as raising raw material awareness in society.

We very much look forward to exploring mutually beneficial areas of collaboration with Dr Wolfgang Reimer and his team at GKZ for the benefit of the memberships of both associations.

For more information about the work of GKZ, please visit http://gkz-ev.de/

# Granting China Market Economy Status

By **James Walsh**, MMTA

China's accession to the WTO (World Trade Organization) in 2001 saw them being recognised as a non-market economy in transition, meaning that unless Chinese firms could prove they were operating under market economy conditions, alternative methodologies could be used to assess the Chinese normal value of its exports to WTO member countries.

In a NME (Non-Market Economy), domestic prices are assumed to be unreliable in determining the normal value of the good in the exporting country, as central government intervention may have a distorting effect on market prices. In such cases, international trade law allows for the use of alternative methodologies for the calculation of normal values in anti-dumping (AD) investigations against firms located in NMEs. As China is a transition country, evolving toward becoming a full market economy, some importing countries have taken the decision to grant MES as part of bilateral trade relationships.

The use of NME methodologies to calculate the normal value can lead to higher anti-dumping duties, and in view of these higher duties, China has used foreign policy instruments to ensure that market economy treatment is granted to its firms in the case of AD investigations.

Several WTO members have agreed to recognise MES for China earlier, for a range of reasons, including the conclusion of trade, investment or loan agreements with China. The main exceptions are the EU, the US, Canada, Japan, Mexico and India. Argentina and Brazil, although recognising China's MES, have not implemented that political decision and still treat China as an NME for AD purposes.

In July 2016, the 18th biannual EU-China Summit was held in Beijing. The summit drives the relationship between the EU and China at the highest level, and is accompanied by an EU-China Business Summit, underlining the importance of business and economic factors to these summits. Representatives of the EU Institutions, as well as the Chinese government, such as Presidents Jean-Claude Juncker and Donald Tusk, as well as Premier Li Keqiang, attended the meeting and discussed issues on the EU-China agenda.

Topics that dominated the agenda included the implications of Brexit with regards to trade and investment relations, as well as the question of whether or not China should be granted Market Economy Status (MES) by the EU. The latter has been the subject of vigorous debates for the past few months, with a decision due by the end of the year.

The current debate addresses two points: the definition of MES; and the implications of the expiry of Article 15 (a)(ii) of China's accession protocol to the WTO. On the one hand, no universal definition for MES exists, and China's accession protocol to the WTO does not explicitly mention MES. On the other hand, the importance of the expiry of this sub-paragraph is demonstrated in the WTO's

Image Hong Kong harbour Source Shutterstock

treatment of China in anti-dumping investigations after December 2016. Currently, the 52 anti-dumping measures in force cover a number of European industries, in particular steel, silicon, and aluminium. These measures would have to follow different rules and stricter employment criteria if China is granted MES.

EU decision-makers and institutions are divided on how to cope with these issues, however the greatest divisions can be found between the Member States. Their positions cannot be explained by a purely economic analysis of their trade relations with China. Rather, the importance of Chinese economic diplomacy and positive long-term relationships appear to be the main factors to be considered.

For instance, Germany has a very strong manufacturing base and was, next to Finland, the only EU country with a trade surplus with China. Although many of its industries, such as steel, are very vocal in their opposition to MES for China, Chancellor Angela Merkel publicly positioned herself, in principle, in favour in October 2015.

The UK, having a larger trade deficit with China and a focus on Chinese Foreign Direct Investment rather than trade, has traditionally been a strong advocate of trade liberalisation and a supporter of China within the EU. Despite being in favour of granting China MES, Germany and the UK are potential losers when taken on a purely economic level, according to a prominent study by the Economic Policy Institute (EPI).

France and Italy, also cited as losers in the EPI study and running comparable trade deficits to the U.K., come to different conclusions. France, with a trade deficit of around €10 billion and exporting less than a third of Germany's volume, has refrained from taking a position on China's MES, whereas Italy, (trade deficit of around €18 billion), strongly opposes granting China MES.

Therefore, instead of focussing purely on trade volumes, efforts to promote strategic relationships, combining bilateral trade, investments, and long-term positive economic relations, seem to play a significant role.

Frictions exist between the European Institutions themselves. There is consensus that China does not fulfil the five relevant EU criteria for MES, and after much debate, there also seems to be a consensus that the expiration of sub-paragraph (a)(ii) does not result in an automatic granting of MES to China. However, it remains to be seen if and how the EU will grant MES to China; whilst modernising its

trade defence legislation in order to protect its industries. At the EU -China Summit in Beijing, Juncker explicitly linked China's overcapacities in steel production to the question of MES. Whereas the Commission's legal service issued an internal analysis that suggested China should be granted MES, the European Parliament recently issued a non-legislative resolution calling for China to fulfil the five criteria for MES and thereby denying any automatic applicability by December 2016.

China has been pursuing MES predominantly on a legal basis, relying almost exclusively on its WTO accession protocol. Since EU member states are divided, the December 2016 deadline raises the question of what strategies China might pursue.

To date, China has pursued four approaches. Firstly, China cooperated in investigations under EU law that assessed its progress toward obtaining MES in 2004, 2008, 2010, and 2011, after which China ceased to cooperate. Secondly, Premier Wen Jiabao publicly mentioned in September 2011 that the EU could grant China early MES in exchange for further support of the struggling European economy. However, President Xi Jinping has been more reserved. Thirdly, at a WTO meeting in late 2015, China warned that it would take WTO action against countries that refuse to acknowledge China as a market economy after December 2016. Finally, the Chinese approach seems to be centred on lobbying of governments or through company investments rather than through a formal negotiation process.

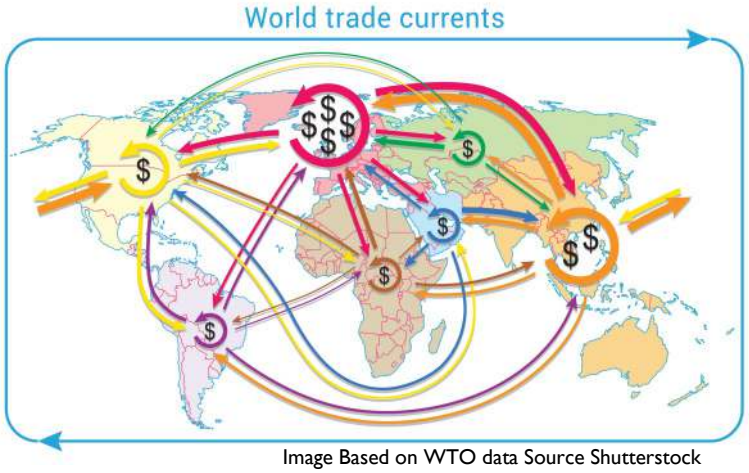

Image Based on WTO data Source Shutterstock

There is some concern as to China's reaction if MES is not granted. China is currently deliberating the size of its contribution to the European Fund for Strategic Investments (EFSI) and could react to what it perceives as unfair treatment by limiting that contribution or even further restricting parts of its domestic market to foreign competition. Alternatively, China could enact similar anti-competitive measures to the same effect. These are only options, and any contraventions to WTO law would likely further damage the spirit of international economic cooperation.

Contrary to the infamous solar panels case in 2012, in which China launched investigations into European products, MES has an impact across many industries and nations. Given that only 1.38 percent of EU imports from China are subject to anti-dumping, so it could decide that the negative impact of fighting the denial of MES would outweigh the gains of MES, damaging relations with trade partners in the process. It should be noted that since joining the WTO, China's overall trade has soared, despite its non-market economy (NME) status, indicating that MES is not such an acute issue, and perhaps not one worth damaging relations with trade partners over, especially in the midst of an economic slowdown.

Considering the above, neither economic nor legal arguments give a clear indication of what the decision in December 2016 will be, and the risk of a "trade war" remains low. Hence, the decision is particularly political when it comes to weighing the possible consequences in the context of the overall relationship of EU states and other important partners such as the US and Japan with China.

There are however several aspects influencing the EU's decision. First, the indecisiveness of the EU Institutions might have grave consequences for the outcome. China's lobbying of individual member states will prove much more effective if there is no clear position from Brussels. Second, the debate reflects more general difficulties in EU decision-making, especially regarding community competences. Third, whatever decision is taken by the EU will send a message about its reliability and legal compliance in international regimes. All of this will inform and impact the relationship of the EU, not only with China, but also with its other global partners. While denying China MES may negatively impact the negotiations for the EU-China Bilateral Investment Treaty, granting MES may provoke discontent among other trading partners with whom the EU is currently negotiating agreements, such as the US or Japan.

The US has adopted a similar position to the EU in not granting China automatic recognition as a market economy. Current US law gives huge discretion to the US administration to determine MES, and if granted, it could still be revoked if successfully challenged. The determination of MES or NME status is based on six factors:

1) the presence of currency manipulation,
2) determination of wages following free labour market dynamics,
3) openness to joint ventures and foreign investments,
4) the extent of government ownership and control of production means,
5) the extent of government control over the allocation of resources,
6) any other relevant factor.

It is not long before the key date of 11 December, with tensions sure to increase ahead of the final decision.

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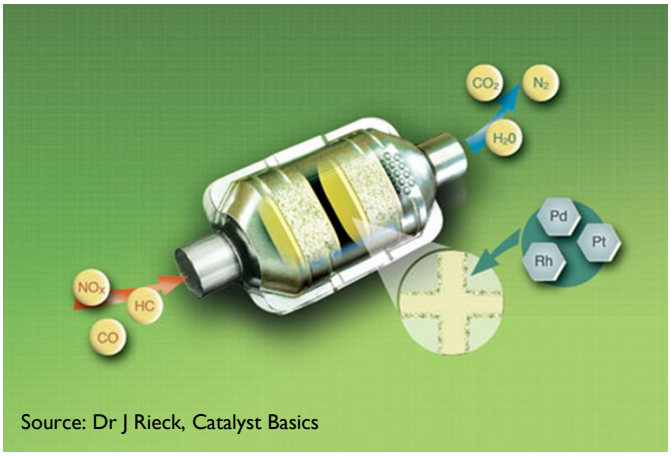
# Rhodium

By **Maria Cox,** MMTA

Source: Dr J Rieck, Catalyst Basics

The major use of rhodium is in catalytic converters for cars (80-85%), where it reduces nitrogen oxides in exhaust gases.

In brief, exhaust gases contain three harmful pollutants, created by the fuel combustion process.: hydrocarbons (HC), carbon monoxide (CO) and nitrogen oxide (NOx). In order to minimize the effect of these pollutants on human health and on the environment, catalytic converters were introduced, with the key active components being platinum, palladium and rhodium. These platinum group metals have unique abilities, described by Dr Jeff Rieck of Johnson Matthey as facilitating "the reactions of HC and CO with oxygen to produce water and carbon dioxide ($CO_2$) and to promote the reaction of CO with NOx to convert the NOx into harmless nitrogen gas". Rieck states that it is theoretically possible to completely remove these pollutants. The below diagram demonstrates the process undergone within the converter.




Source: Dr J Rieck, Catalyst Basics

The key property of rhodium is that it is most effective of the three metals in removing NOx from the exhaust, as well as contributing to the oxidation of HC and CO, as well as very good resistance to the poisons within the exhaust emissions. Cost has historically been one of the limiting factors as to how much rhodium has been used within the matrix of the three platinum group metals, however during 2015, reductions were seen in the values of all three. Despite ongoing efforts to find cheaper alternatives to the use of platinum, palladium and rhodium, tighter Original Equipment Manufacturer emissions standards mean that any potential loss of performance through use of substitutes would be deemed completely unacceptable. It seems therefore likely that they will continue to be key components of catalytic converters for some time to come.

As reported recently in Recycling International (*Smaller scrap dealers 'burnt' by PGM market hiatus*), one of the side effects of the drop in price of PGMs has been that scrap dealers have been holding onto their stocks of catalytic converters in the hope of seeing a reverse in the steep falls in prices of platinum, palladium and rhodium (drops of 25%, 29% and 50% respectively). The volume of recycled rhodium from spent catalytic converters in 2015 was 288,000 ounces, and some growth is predicted for the 2016 figure as the market adapts to the 'new normal' prices for PGM, and global vehicle sales continue to increase.

## Other Uses of Rhodium

- Alloyed with platinum and iridium, it gives improved high-temperature strength and oxidization resistance, and is used, for example, in furnace windings, pen nibs, and electrodes for aircraft spark plugs.
- Due to its brilliance and tarnish resistance, rhodium is used to plate jewellery and the reflectors of headlights, as well as to coat optic fibres, optical mirrors, for crucibles and thermocouple elements.
- It is also used in the glass industry to produce fiberglass and flat-panel glass.
- It is used as an electrical contact material as it has a low electrical resistance and is highly resistant to corrosion.
- Rhodium is also used as catalysts in the chemical industry, for making nitric acid, acetic acid and hydrogenation reactions.

Rhodium is the rarest of all non-radioactive metals. along with other platinum metals, in river sands in North and South America. It is also found in the copper-nickel sulfide ores of Ontario, Canada. Production comes from South Africa, Russia, North and South America and Canada.

Rhodium is obtained commercially as a by-product of copper and nickel refining. World production is up to 30 tonnes per year.

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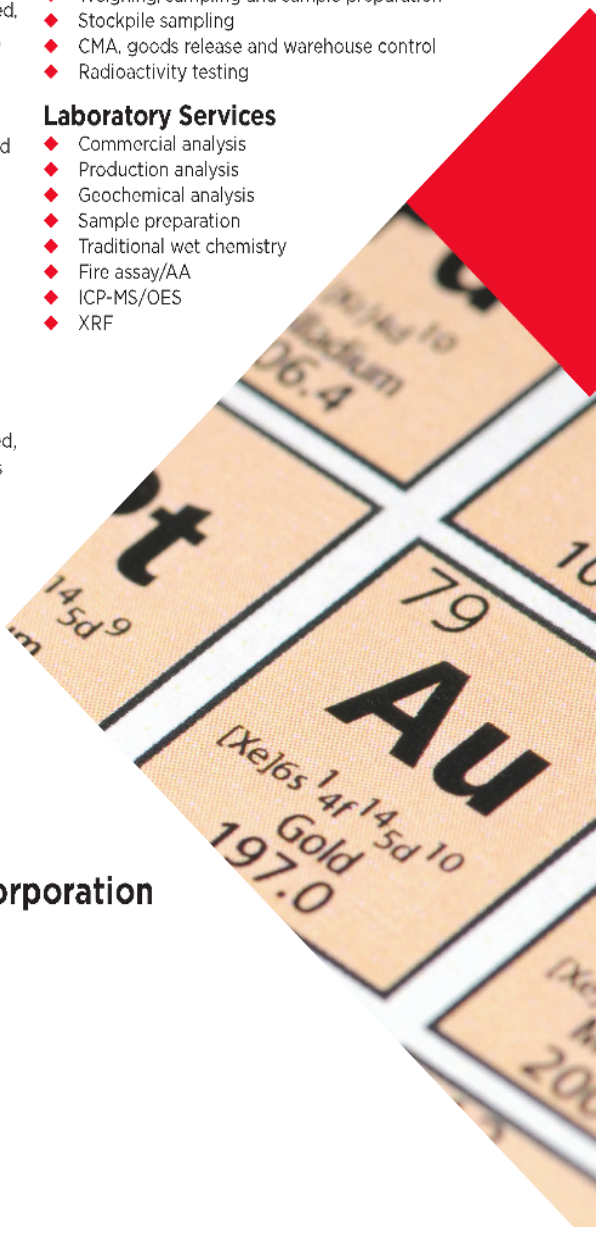



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# Mufulira Medical Elective

By **David Clayton**, Medical Student

Medical electives are an important and hugely exciting part of the medical curriculum – offering a chance to observe and get engaged in healthcare systems round the world and compare experiences to the services we are used to in the UK. Being at the end of my third year of studies at the University of Glasgow medical school it was time to begin the arduous process of organising one of these fabled electives which many students in years above had waxed lyrical about. I had heard stories of jungle clinics in the Amazon; sports rehabilitation medicine in Los Angeles; mountain medicine in the Himalayas – the opportunities seemed endless. Yet due to the specialised nature of medical electives, many of these exotic experiences require a host of local contacts in the country; extensive paperwork and more often than not large sums of money.

After several weeks of searching I was resigned to defeat – I wasn't aiming for an elective with extravagance comparable to some of the aforementioned examples but merely an opportunity to work in a developing healthcare system and observe adaptations that are made to work in a more resource-poor environment with the inequalities in heath that exist in the world today.

Having lived in Glasgow all of my life – a city in which as little as a mile in distance can mean a difference in life expectancy of almost 20 years – I am constantly exposed to and reminded of the inequalities in health that exist within a developing country as our own. I have always been struck by the fact that even such a developed country as the UK with national healthcare and welfare systems can feature such stark inequalities in health throughout and take a huge interest in the multiple socioeconomic factors that contribute to one's health. Thus, experience in a developing healthcare system would allow me to transfer this idea of regional health disparity into a more global setting.

As the deadline for elective proposals loomed, I stumbled upon the Minor Metals Trade Association Bursary which offered an organized placement in the town of Mufulira in the Copperbelt region of Zambia and a generous £750 towards travel and sustenance there. I immediately applied and was overwhelmed to hear I was successful and put into contact with my host Dr Charles Chiponda – the District Medical Officer for the Mufulira region.

Time raced by and after several exams and placements it was finally June and time to begin my journey to the Copperbelt with several flights, stopovers and unexpected delays along the way – yet after around 2 days of travel I finally stepped off the plane at Ndola and realised the journey was over. I remember feeling slight trepidation from the lack of information I had and from being alone in a very unfamiliar environment but as soon as I met Dr Chiponda I felt instantly welcomed into this sub-Saharan country so far from home. With some time to rest and recuperate before I began my placement – the Chipondas welcomed me into their home for some traditional Zambian cuisine such as *Tshima* and took me round Mufulira to visit many of the healthcare facilities where I would be placed, meeting many friendly faces along the way.

It was difficult to know what to expect from the placements – I had spent most of the past year in various hospitals around the West of Scotland in very modern, well-resourced facilities with much of my training thus being Western-centric - ie: having seen perhaps hundreds of patients with coronary heart disease but not one with malaria – one of the leading causes of death in Zambia. I expected I would struggle to begin with and in the first few days I did indeed so everything was very new and so completely different from anything I had been taught or experienced before. It was very challenging start with many of the first evenings spent reading on hugely unfamiliar topics such as HIV-related infectious complications; tropical parasitic infections and the Zambian prescribing regimens for various illnesses. Moreover, many of the patients were not fluent in English and much of the clerking I performed was through a nurse translating from English to a regional language such as *Bemba* or *Nyanja* and back again. There were many challenges like these stemming from unfamiliarity and a difference of backgrounds but these were challenges that I relished throughout and made every day more exciting than the next.

My supervisor was Dr Tumba – a clinician of indefatigable willpower and determination who would ensure I was challenged constantly yet given a sensible amount of responsibility within my means. On the first day I was merely shadowing and learning the system; by day two I was clerking patients in the ward and presenting them to her and by day three admitting them from outpatient clinics; following them up and suggesting treatments. Dr Tumba accommodated my vision of pushing myself into unfamiliar territories but doing so in an ethical way so that all my experiences were properly supervised and thus I was never unsupported or expected to perform tasks I wasn't capable of.

I was based mainly in the Ronald Ross General Hospital – a medium-sized Government-run general hospital in the town of Mufulira that featured male and female medical and surgical wards alongside a maternity ward with various out-patient clinics and a pharmacy that ran alongside. However I also spent time in Kaumachanga District Hospital – a smaller primary care hospital just outside the town; the private Malcolm Watson hospital run by the local mining company and some of the clinics that ran for distributing Anti-Retroviral therapy to chronic HIV patients.

This allowed for a very diverse look at Zambian healthcare and the spectrum of quality of care that could be sought by financial means. Although I got to experience a large variety of healthcare environments in Mufulira - I spent most of my time in the under-funded and understaffed medical wards of Ronald Ross as it


provided a perfect environment to experience and learn about healthcare in a deprived setting and adaptations that are made to suit patients in that poorly resourced setting.

Around 14% of adults in Zambia are HIV-positive and this percentage is reportedly higher in more rural, low income communities such as Mufulira thus the majority of patients I saw in my time were HIV-positive and presenting with a range of the huge variety of complications associated with a weakened immune system such as Tuberculosis; infections from everyday pathogens like Cryptococcus and HIV-related cancers such as Kaposi's Sarcoma.

I became more aware of the social issues associated with tackling HIV/AIDS in countries such as Zambia – encountering several patients that had stopped their anti-retroviral therapy due to intervention from their church; patients that had opted instead for traditional medicine practices such as sewing of herbal remedies in patches underneath the skin and the associated underlying stigma associated with HIV which allows it to remain as a main factor towards the immitigable detriment of the Zambian healthcare system as a whole. With weekends off, I travelled the length and breadth of the country down to the bustling capital of Lusaka and to the idyllic Livingstone and Victoria Falls at the border with Zimbabwe in the South. Placement throughout the week and travelling at the weekends meant that by the end of the four weeks I was completely exhausted but hugely fulfilled at having learned so much. I had felt like part of the community of Mufulira with the welcoming nature of all I met and felt like I had made a new home in such a previously foreign part of the world for me.

'Life changing experience' is a phrase often seen as a cliché by many but my time in Mufulira has fostered a huge interest in HIV for me and as a result I will be pursuing an intercalated honours degree in Immunology with a HIV-research project starting this September at my university with a and a view towards a future career as a physician for HIV-affected patients thus I feel like the phrase is truly applicable to my elective this Summer. I will always have endless gratitude towards the clinicians at Ronald Ross Hospital; the MMTA for funding this bursary; the Chipondas for hosting me, and the people of Zambia for being so welcoming and allowing me to learn far more than anything I could ever gain from just reading a textbook.

*Building on MMTA links with Mufulira, the MMTA has established a scheme to offer a maximum (at present) of two bursaries of £750 per year to individual medical students to assist with travel expenses on their elective trip overseas to Mufulira. These bursaries do not come out of general funds but are offered by individual members via the MMTA. Any member wishing to sponsor a medical student should contact the MMTA to learn more.*

# The EU takes stock of its new customs rules

By **Jung-ui Sul**, Sidley Austin LLP

The EU's modernized customs rules came into effect in May 2016. We reported on the key changes in the new rules in the March 2016 issue of the Crucible. Now that the new rules are in place, have companies noticed any benefits? Or have there been only problems? Trade associations representing exporters, importers, transporters and forwarders came together in a conference in Brussels on 7 September 2016 to take stock of the changes. The European Commission also attended the conference to respond to industry's concerns and to give the regulator's perspective.

***Moving in the right direction***

Overall, the conference speakers agreed that the new Union Customs Code (UCC) had taken the EU in the right direction for modernizing customs. They did not raise any serious problems in making the transition to the new rules. However, they also recognized that there was a long way to go until the EU would have a truly efficient customs clearance system that would work efficiently across all Member States.

***Trade facilitation vs. Security & Safety***

From the trade associations' perspective, the UCC simply did not go far enough in facilitating trade. They pointed to several ways in which the UCC could have done better: for example, by raising the threshold for small-value shipments that are exempt from customs liabilities, by expanding the scope for small and medium-sized enterprises to self-assess their customs liabilities, and by reducing the administrative burden for companies that have 'trusted trader' status (called Authorized Economic Operators or AEOs).

Countering the trade associations' criticisms, the European Commission pointed to customs' role in ensuring security and safety of products in the EU. Trade facilitation is an important objective for customs, they acknowledged, but it is not necessarily the most important one. They emphasized that customs controls also serve food safety, counter-terrorism, intellectual property protection, and a host of other public objectives. Nevertheless, they were keen to move ahead in modernizing and facilitating customs in the EU.

***Issues to watch out for in the new UCC***

This conference kept to a high-level discussion and did not delve into specific issues that companies are dealing with. In other forums, companies have been raising plenty of specific concerns with the new UCC. For example, companies are struggling with how various Member States interpret the rules on inward processing, temporary storage, guarantees, repayment of import duties and VAT, transit of excise goods, and the potential liability of transporters.

The European Commission and national customs authorities are open to resolving problems that may have arisen from the new UCC. Such problems may be obvious to the company involved, but may not be so visible to the regulators. If a MMTA member is experiencing difficulties, we suggest that they contact their national customs authority to take this up.

*The views expressed in this article are exclusively those of the author and do not necessarily reflect those of Sidley Austin LLP and its partners. This article has been prepared for informational purposes only and does not constitute legal advice. This information is not intended to create, and receipt of it does not constitute, a lawyer-client relationship. Readers should not act upon this without seeking advice from professional advisers.*

## IN BRIEF:

### Norway's Electric Vehicle Future

It has been reported that Norway's 4 leading political parties have agreed to stop the sale of gas-powered cars by the year 2025. About 1 in 4 cars sold in Norway is already electric, spurred on by generous state subsidies and incentives, which have been a big factor in the country reaching its target of 50,000 electric vehicles by 2018, 2 years early. Norway is also one of the world's biggest oil exporters.

(Source: Quartz)

### Recycling and the Circular Economy

According to Euric President Dominique Maguin, "at a time when the European Commission proposes to shift towards a circular economy, the recycling sector is paradoxically enduring a major crisis. Record low commodity prices render the recycling of a number of streams uneconomical." He stressed the importance of focussing on measures to make recycling a more attractive option, given the environmental benefits it brings to both the economy and society. Suggestions for such measures included greater investment opportunities for SMEs, better enforcement of existing legislation in order to level the playing field.

(Source: Recycling Magazine)

# Conflict Minerals After Brexit

By **Ian Weekes,** Crowe, Clarke, Whitehill

**EU announces agreement to curb the trade in Conflict Minerals**

The EU has announced that agreement has been reached in negotiations between the Commission, Council and Parliament over a framework to stop the financing of armed groups through trade in conflict minerals.

The full text of the proposed legislation is still to be developed and is unlikely to be published until the final quarter of 2016. The EU Parliament press release of 16 June 2016 does indicate the more significant areas where changes have been agreed:

•compulsory due diligence checks for importers of tin, tungsten, tantalum and gold **other than the smallest importers**

•**exclusion** from the regulations **for existing EU stocks and recycled materials**

•**voluntary disclosure** of sourcing practices **by end users with more than 500 employees** will be encouraged

•**guidance on 'conflict-affected and high risk areas' to be provided via a Handbook for the operators** to be developed by the EU Commission.

We generally welcome these proposals. The move to compulsory due diligence, in our view, reflects what would have become the industry norm under the Commission's proposal. The resistance of a compulsory due diligence obligation for end-users has prevented a substantial increase in the compliance burden placed on business. The development of a voluntary reporting obligation for end users with more than 500 employees does seem to have set the bar quite low in comparison with the U.S., where the obligation applies to SEC registered corporations. As a result, we question the likely level of take up.

**The Impact of Brexit**

The timescale for approval of these regulations and the anticipated implementation period are likely to result in these regulations becoming effective around the time of Brexit.

The UK has been actively involved in the development of the OECD guidance, and there is general acceptance amongst the population of the principles underlying the guidance. We believe that it is therefore likely that there will be regulation covering this area in the UK.

Some indications of whether and how these regulations might apply to the UK can be gleaned from the operation of the Registration, Evaluation, Authorisation and Restriction of Chemicals Regulations (REACH). This regulation is overseen by the European Chemicals Agency (ECHA), on which representatives of all member states sit. The ECHA works via designated competent authorities in each member state. Norway, as a member of the European Economic Area (EEA), sends representatives to meetings of the ECHA and imposes REACH regulations as a requirement for access into the single market, but Norway does not have a vote at the meetings of the ECHA.

If a similar model were adopted for conflict minerals and the UK sought a relationship similar to that of Norway with the EU, it would be unable to vote on future developments of the regulations but would have to comply with them.

If the UK were to remain outside the EEA with no access to the single market, it would either have to go through a period of developing its own regulations, in which case the market would remain uncontrolled for a period of time, or choose to adopt the EU regulations as a matter of expediency. In either of these cases export to the EU would require due diligence in line with EU regulations, to be conducted when the metal or mineral were imported into the EU.

## MMTA Comment

The MMTA argued, along with other business associations:

- That in introducing this legislation, particular consideration should be given to the level of compliance burden placed on SMEs;
- That existing industry schemes should be taken into consideration as part of any compliance requirements, to avoid costly duplication,
- That recycled material should be excluded from the scope,
- That guidance should be given as to what constitutes a conflict affected or high-risk area (this was originally to have been left to the responsibility of affected companies to determine for themselves).

We will continue to take opportunities to suggest measures to make this regulation manageable for companies of all sizes, and, as always, welcome any comments from members.

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