Dear Fellow Members and Friends,

With the New Year upon us, it’s time to reflect briefly both backwards on what we’ve accomplished and on what we hope to achieve in the future.

I believe we had an outstanding General Assembly in Penang, no doubt aided by the gracious hospitality of our hosts, Malaysia Smelting Corporation. For those that attended, I trust you found the individual sessions on our four subteams (e.g. website, meetings, staffing, and supply chain) to be informative and indicative of your Executive Committee’s determination to provide value for money to all members.

The most significant recent news is the appointment of Roland D. Chavasse as the first Director of the T.I.C. Further details are included in a related article in this issue. In addition, we have made demonstrable strides forward in various areas, whether it’s working with the relevant authorities on thefts on coltan last fall from the port of Dar es Salaam, reinvigorating our website, or improving further our relationship with the EICC/CFSI program, for example. Related articles on our website and on our work on tantalum smelter definition with the EICC are also in this issue.

I would once again urge our members to undertake proper due diligence and traceability efforts when sourcing tantalum feed materials. As mentioned in Penang, for example, the use of a Tanzanian certificate of origin is a clear “red flag”, as no coltan is produced in that country. Given the current tin and tantalum raw material market situation, we definitely need to improve our relations with the International Tin Supply Chain Initiative (or iTSCi). Towards that end, Roland Chavasse has assumed the relevant aspects of the Supply Chain Officer role, which are critical to the long term growth of our industries.

We also look forward this year to further improvement in such areas as administration, our financial situation, and our membership. We are only as strong as our membership and your willingness to contribute is sincerely appreciated. I look forward to seeing you all in Toulouse next October, but, in the meantime, would like to extend my personal best wishes for a happy, healthy, and prosperous 2016 to you all.

Warm regards,

David R. Henderson
President

President’s Letter

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Roland Chavasse, Director to the T.I.C.

The T.I.C. is pleased to announce that it has appointed Mr Roland D. Chavasse as its new Director, effective from January 1st 2016.

Mr Chavasse brings a wealth of specialty metals and metals trade association experience to the T.I.C., as he was the first General Manager of the Minor Metals Trade Association (or MMTA) from 2007 to 2011. In 2011, he joined Maritime House, a chemicals and metals trader and manufacturer, initially as a trader and then as General Manager. Since 2014, he’s been a Senior Associate Consultant at Roskill Information Services in London, where he has worked on various projects and reports, including on tantalum. He has a BA from Oxford University and an MBA from the Open University.

Mr Chavasse’s role will encompass various activities, such as running the daily operations of the T.I.C., representing the T.I.C. at government or regulatory government agency hearings or inquiries, and promoting the T.I.C. In addition, he will take an active part in overseeing matters relating to the supply chain of tantalum and niobium and, in particular, interacting with the International Tin Research Institute and the International Tin Supply Chain Initiative (or iTSCi) and serving on iTSCi’s Governance Committee.

He will be responsible to the Executive Committee of the T.I.C., represented by its President. Reporting to Mr Chavasse will be the T.I.C.’s Secretary General and Technical Promotion Officer.

The T.I.C. is delighted to retain an individual of Mr Chavasse’s calibre, given his experience in both the specialty metals industry and trade associations. Mr Chavasse will be based in London, UK. He can be reached on director@tanb.org.

EICC/CFSI Tantalum Smelter Definition Team

Over the last few months, as discussed in Penang, various members of the T.I.C. have been working with the EICC/CFSI’s Tantalum Smelter Definition Team.

These members include David Gussack of Exotech, David Henderson of Rittenhouse International Resources, Marc Hüppeler from H.C. Starck, Ian Margerison from Metalysis, Jean-Paul Meutcheho of Global Advanced Metals, Bill Millman of AVX, and Dan Persico of NEC Tokin/KEMET. Besides Leah Butler of the EICC/CFSI, whom many of you met in Penang, other non-T.I.C. members on the team include two downstream electronic component manufacturers, Blackberry and Plantronics.

As discussed at the General Assembly in Penang, the goal for this group is to more accurately define smelters, identify categories of smelters, and ultimately ensure that the CFSI includes the appropriate organizations in their audit program. The T.I.C. is grateful for the opportunity to volunteer its members and continue to be recognized as the world wide resource for information on tantalum and niobium.

David Gussack
Dispelling the myths around ‘coltan’

As part of the T.I.C.’s ongoing commitment to promoting the tantalum and niobium industry, in 2015 we commissioned Richard Burt, an independent consultant and former T.I.C. President (2009-2011), to write a report dispelling some of the myths that have attached themselves to our industry of late. The full article will be circulated to T.I.C. member companies shortly and will also appear on the association’s website (www.tanb.org).

An internet search provides us with data on almost any subject instantaneously and has been one of the greatest changes to how society shares information since humans first learnt to talk. However, an unintended consequence of the internet is that the easiest information to find is not necessarily the most accurate and myths can be portrayed as truths if they repeated often enough. Unfortunately tantalum and niobium are not immune to inaccurate, sensational myths masquerading as facts and part of the T.I.C.’s duty is to challenge falsities and promote a more balanced, accurate narrative of our industry.

Tantalum is a rare element on Earth and its annual production is minute relative any of the ‘major’ metals such as copper, tin or nickel. Unsurprisingly, tantalum’s public profile is relatively low and little understood by most people. But this misses the fact that tantalum, like niobium, is found throughout society and is at the heart of many modern technologies; anyone reading this newsletter on a smart phone or tablet computer while travelling in an aircraft is benefiting from the unique properties of tantalum whether they are aware of it or not.

Mr Burt’s article draws a line in the sand and says “let us examine the facts of the tantalum market” and is essential reading for anyone wishing to understand our industry. In particular he explains that:

- Africa is home to just 15% of the Earth’s reserves of tantalum ore (usually tantalite or columbo-tantalite, sometimes called ‘coltan’) rather than the widely reported myth of 80%.
- Tantalum minerals mined by rebel groups in conflict areas have never been the dominant supplier to the tantalum market and are unlikely to ever become such.
- Tantalum minerals mined in conflict areas during the civil war in the DRC (Congo-Kinshasa, 1997-2003) accounted for just 5% of total ‘conflict mineral’ mining by value, while 95% came from mining tin-, tungsten- and gold-bearing minerals.

Since 2009 the T.I.C. and T.I.C. member companies have been at the forefront of promoting more ethical supply chain policies, such as due diligence, within the tantalum and niobium industries. Primarily, but not exclusively, the T.I.C. has worked with ITRI, the international tin body, to support its work on iTSCi, a programme of traceability and due diligence, which was launched in 2010.

Pact, an NGO working to implement iTSCi on the ground, has estimated that since 2010 over 1,400 tin and tantalum mines employing over 80,000 miners have been approved as supplying conflict-free minerals. As Mr Burt concludes, today the tantalum market has broken the link between mining tantalite and funding rebel groups; an achievement of which our industry can be proud.

For the full article please visit the association’s website at www.tanb.org.
**Presenting the T.I.C.’s new website**

The website subteam has been very busy getting the new site up and running. As you can imagine, as with any new undertaking, we have run into a few minor issues which have set us back slightly from our original plan to go live in December.

The subteam, Dale Gwinnutt, Ian Margerison, Ulric Schwela, Emma Wickens and myself (Dan Persico) have been engaged in proofing and scouring over the various elements of the site to make certain it is working as designed. In recent weeks the subteam has been working to populate the pages with the information from the original site. The new site will be up very soon. This does not mean we are done. We will now start a new project to update and enhance information (and its format) such that it has the look and feel we want moving forward. And with the recent addition of our new Director, Roland Chavasse, we now have an extra pair of fresh eyes to support and challenge the subteam as we continue to determine how to make this web site the "go-to" site for all things tantalum and niobium.

Once live we look forward to comments from the membership regarding how we can make the site better and more user friendly both from a content as well as an architecture perspective. From a future perspective, as we presented in Penang, we will consider adding functionality to assist accounting practices for membership fees, potential online registration for future General Assemblies, application for membership and the ability for members to share information with others. So, we are not done but have just started. At this point we expect to go live before the end of January. Delegates from all member companies will soon receive an email with their site username and password. Please keep a lookout for this information.

Dan Persico

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**Fifty-seventh General Assembly**

The Fifty-seventh General Assembly is scheduled to take place in Toulouse, France, from Sunday October 16th to Wednesday October 19th 2016.

A contract has been signed with the Radisson Blu Hotel Toulouse Airport, securing meeting space and a block booking of bedrooms. We plan to hold the Gala Dinner at the Aeroscopia Aviation Museum, recently opened in January 2015. On Wednesday October 19th, a guided tour will take delegates round the Airbus factory, to discover everything from the design stage through to the commercial service of the A380.

Toulouse is the fourth largest city in France, located in the Southwest region, and is also called the ‘pink city’ due to the colour of the traditional local building material. It is the centre of the European aerospace industry and a pole of excellence for the medical, IT and space industries.

Call for papers: please submit your proposals for papers for the technical sessions by March 31st.
The Tantalum-Niobium International Study Center held its Fifty-sixth General Assembly and associated Technical Meeting from October 25th to 28th 2015 at the Rasa Sayang Resort on Penang Island, Malaysia. A total of 180 people registered for the conference. Updates on the subteam initiatives currently ongoing within the T.I.C. and 14 technical presentations were given in four sessions, spread over Monday and Tuesday. Delegates and accompanying persons enjoyed a Welcome Reception by the rain trees in the garden on the Sunday evening.

On Monday evening, a Gala Dinner was held in a garden marquee, with entertainment provided by local musicians and singers. On the morning of Wednesday October 28th, delegates were given the opportunity to visit the facility of Malaysia Smelting Corporation, located in Butterworth on the Malay mainland. The host company invited all participants to a buffet lunch at the company’s Tin Club, a unique venue linked with the company's long history.

The accompanying persons enjoyed a sightseeing programme on Monday and Tuesday. The first day took them to visit the UNESCO World Heritage site of Georgetown including its fort, mosques, temples, churches and Chinese clanhouses, followed by hands-on crafting of a pewter bowl. The second day headed into the countryside with visits to a tropical fruit farm, a batik factory (this time making a colourful scarf) and a tropical spice garden.

**General Assembly**

The General Assembly was held on the morning of October 26th. Four companies were elected as new members of the association, while two companies had resigned and three memberships had been terminated. Four company name changes, two transfers of membership and the lifting of a membership suspension were also enacted by the Assembly. This brought the total membership of the association at the end of the General Assembly to 95.

Delegates visit T.I.C. member Malaysia Smelting Corporation (MSC) who hosted our General Assembly in Penang.

Networking is always an important aspect of General Assemblies.
Mr Itamar Resende did not stand for re-election to the Executive Committee. The other eleven members of the Executive Committee had confirmed their wish to stand for re-election. Two new candidates had also come forward. As the number of candidates for the Executive Committee exceeded the twelve positions allowed for by the T.I.C.’s Charter, a secret ballot was held. According to the Charter of the T.I.C., the Executive Committee may consist of between two and eleven people, plus the President. The Executive Committee is drawn from the membership and committee members may be, but need not also be, the delegates of member companies.

The Executive Committee that was approved by the T.I.C. members at the Fifty-sixth General Assembly consists of (in alphabetical order of member’s surname):

- Conor Broughton  
  conor@amgroup.uk.com
- John Crawley  
  jcrawley@rmmc.com.hk
- David Gussack  
  david@exotech.com
- Dale Gwinnutt  
  dalegwinnutt@elitematerial.com
- David Henderson (President)  
  dhenderson@rittenhouseir.com
- Marc Hüppeler  
  marc.hueppeler@hcstarck.com
- Jiang Bin  
  jiangb_nniec@otic.com.cn
- William Millman  
  bill.millman@avx.com
- David O’Brock  
  david.obrock@molycorp.com
- Candida Owens  
  candida.owens@btinternet.com
- Daniel Persico  
  danielpersico-rc@nec-tokin.com
- Alexey Tsorayev  
  tsorayevaa@ulba.kz

Of these twelve, Mr David Henderson was re-elected as President of the T.I.C. for the coming year.
A selection of speakers at the Fifty-sixth General Assembly

Chua Cheong Yong, Malaysia Smelting Corporation (MSC)
Hiroaki Yoshinaga, Advanced Material Japan Corporation
Stephen Krause, Global Advanced Metals Pty Ltd
Leah Butler, Conflict-Free Sourcing Initiative (CFSI)
Mike Loch, Responsible Trade LLC
Signe Ratso, EU Commission, Directorate General (DG) Trade

The tour for accompanying persons

Thanks to Sherlyn Wee and Yvonne Toh of Destination Asia for the photos
The use of tantalum, tin, tungsten and gold (3TG) in electronics has led the global electronics industry to take a leadership role in responding to armed groups involved in the severe humanitarian crisis in the DRC that is partially funded from the extraction and sale of conflict minerals. This is why in 2008, with support from the Global e-Sustainability Initiative, the Electronic Industry Citizenship Coalition (EICC) founded the Conflict-Free Sourcing Initiative, or CFSI, a program that helps companies make informed decisions about the sourcing of minerals in their supply chains. This program has grown into a respected resource for companies addressing conflict minerals issues in their supply chains. While CFSI’s membership began in the electronics industry, it has since broadened to include other industry sectors as the economy-wide impact of conflict minerals became evident. Today CFSI membership consists of nearly 300 companies and associations from electronics, aerospace, apparel, automotive, equipment, general manufacturing, jewelry, medical, retail, and extractives industry sectors whose products are sold in every country in the world.

CFSI’s core values and activities inform the common tools and resources we provide to improve companies’ abilities to source responsibly. At the core of our program are smelters and refiners, who are recognized as the critical pinch point in the 3TG supply chain. Smelters that wish to be validated as “conflict-free” may participate in the Conflict-Free Smelter Program (CFSP). The CFSP uses audit standards and procedures and third-party auditing system to assess smelters’ material procurement activities, sourcing policies, and management systems to determine if they have the systems and processes in place to demonstrate conflict-free sourcing. The smelters in our program have demonstrated the highest level of responsible sourcing management systems in the industry.

CFSI operates within both the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas and Dodd-Frank Act frameworks to help companies meet legal requirements in the United States and the expectations of the global community. Under Dodd-Frank, US-listed companies that use 3TG in their manufactured products must undertake a Reasonable Country of Origin Inquiry (RCOI) to determine whether the 3TG was mined in the DRC or one of the surrounding countries (the “Covered Countries”). CFSI collects RCOI data from the CFSP, and provides this data to its members. The OECD Guidance recommends that downstream companies attempt to identify and review the due diligence process of the smelters in their supply chains, and assess whether the smelters adhere to due diligence measures aimed at supporting the procurement of conflict-free 3TG. In accordance with the OECD Guidance, downstream companies may participate in industry-wide schemes that assess smelters’ compliance, such as the CFSI, and may draw on the information these schemes provide to help them implement the OECD recommendations.
What are the results to date?

The total number of identified 3TG smelters is roughly 320. The first smelter was validated as CFSP compliant in 2010. Today, we are proud to say that 205 smelters from over 30 countries have joined the program, and are validated as having the systems and processes in place to support sourcing of conflict-free 3TG. An additional 42 smelters are in the process of becoming audited. Taken as a whole, 77% of identified smelters for all four metals are participating in the CFSP today. In terms of global metal supply processed by CFSP-compliant smelters: a rough estimate for tin is around 75-85% of global production while tantalum coverage is likely >95%. We continue to work on estimates for gold and tungsten. The value of this accomplishment cannot be overestimated. Our work is far from finished. Smelters continue to be identified as we learn more about the 3TG industry and as new links in the supply chain are discovered. The CFSI strongly believes that conflict-free does not mean Congo-free. Our system supports on-going market access for the legitimate mineral trade in the DRC. Among the CFSP-compliant smelters, 22 source from the Covered Countries, and of those, 14 source from the DRC. The CFSI does not encourage or condone company policies that ban purchases from the Covered Countries. We continue to receive requests for information from smelters that are interested in sourcing in-region but want to do so responsibly. Unquestionably, companies have shown that they can source 3TG without funding armed groups in the DRC and still source from the region.

The CFSI facilitates this process through its partnership with in-region traceability and due diligence programs that connect smelters to legitimate sources of 3TG. These include the Better Sourcing Program, ITRI Tin Supply Chain Initiative (iTSCi), Public-Private Alliance, Solutions for Hope, and the International Conference on the Great Lakes Region (ICGLR) Regional Certification Mechanism. In-region programs provide key documentation, oversight, and assurances of mineral traceability and risk assessment to smelters to help them undertake supply chain due diligence. These programs also help smelters meet the CFSP’s traceability and chain of custody standards. Without this or similar infrastructures in place, both smelters and downstream companies would be severely limited in their ability to identify and respond to risks in their supply chains and to support a legitimate trade in minerals that benefits all actors involved.

We provide other tools and resources for companies beyond direct smelter auditing. For example, we created the Conflict Minerals Reporting Template, abbreviated as CMRT, which is the emerging accepted standard for downstream companies to share data relative to the list of potential smelters that are in their supply chain. Companies can also use the CFSI to share and learn about best practices around due diligence and risk assessment, regulatory compliance, OECD conformance, and how smelters and members can better adopt the values of responsible sourcing.

2015 accomplishments

The CFSI recognizes there are some scenarios where the possibility of sourcing 3TG that directly or indirectly finances armed conflict in covered countries is exceedingly low. Based on data from the past five years of audits,
we developed a risk-based audit program that includes auditing of some smelters via a reduced audit frequency (every three years instead of every year). This change will help focus CFSI resources on high-risk sourcing scenarios while still providing a robust, credible list of conflict-free smelters. CFSI also created the CFSI Tantalum Subteam with the purpose of reviewing and improving the CFSP for tantalum to increase its effectiveness, impact, and value across the tantalum supply chain.

The subteam’s intended outcomes are to ensure the CFSI meets evolving conflict-free sourcing requirements set forth by law and by international expectations, reduce opportunities for non-conflict free material to enter supply chains, support consistent and appropriate CFSP eligibility determinations, contribute to technically sound and updated protocol details and definitions, and encourage continued uptake in CFSP participation. The subteam is currently conducting a review of the tantalum protocol scope and definitions to evaluate the need for alternatives and develop proposals, as needed.

This year, CFSI launched the Smelter Database, a web-based portal that encapsulates information on potential smelters with which CFSI and its members have come in contact. It provides members with up-to-date information on contact information, research notes, eligibility status, and compliance determinations for these entities. The database is also available in a downloadable excel format, where members can filter data in a manageable way.

Lastly, the CFSI’s eLearning Academy went live in 2015. The eLearning Academy is a great resource for auditees, auditors, and anyone who is interested in learning more about conflict minerals and the CFSP audit. Some courses are geared towards smelters, with modules explaining the CFSP and guiding auditees through the CFSP audit. Other courses include an auditor training, navigating the CFSP document library, and introductions to new CFSP programs. A number of the courses are available in Chinese, and we hope to continue to grow this resource in both English and other languages throughout the next year. The eLearning Academy is also available to the public.

2016 and beyond

The CFSI supports harmonized, efficient, and supportive mechanisms for assessing the mineral supply chain (mine to smelter). Accordingly, for gold, we serve as a complement to the London Bullion Market Association and Responsible Jewelry Council certification programs and cross-recognize the refiners that participate in those programs. We are currently evaluating the potential for further cross-recognition with emerging programs in China and the EU as well. This is a critical part of global efforts to ensure a responsible minerals trade while minimizing the private sector’s burden. The CFSI will continue to refine the audit protocols in 2016, focusing on the integration of conflict-free and due diligence concepts and a global application of conflicted-affected and high risk areas.

This is a key component of current developments with the CFSI to become more closely aligned to the OECD Due Diligence Guidelines, while also meeting the needs of companies reporting to the SEC. 2016 will see plenty of opportunities for continued learning for auditees, auditors, and members. As we grow our resources and tools, we also expand our opportunities for learning through webinars and in-person trainings. We constantly strive to improve, and continuously solicit feedback from our members and other stakeholders. The collaborative nature has allowed CFSI to become a leading interactive platform for companies to address conflict minerals in their supply chains.
**T.I.C. Statistics**

This paper covers what reporting companies are required to do and a review of the data for the discrete calendar years 2001 to 2014. Readers who are familiar with the statistics process can probably skip straight to the data, while others are encouraged to read and understand the background information in order to put the statistics data into the right context.

Member companies are provided with separate statistics reports on a quarterly basis, whereas statistics aggregated by calendar year are available to non-members on request and subject to a withholding period. Data up to a year old are only available to the T.I.C. members, therefore the figures for a full calendar year can only be released to non-members if at least one year old. The latest public release (currently 2014) may be purchased for a fee of EUR 500, while earlier calendar years are freely available.

**Where do T.I.C. Statistics come from?**

The T.I.C. gathers statistics data on the niobium and tantalum industries to show the main trends in the quantities of niobium and tantalum produced and consumed. These data are considered to cover the vast majority of the industry, except for tantalum primary production from 2009 onwards due to the increased proportion of production outside the membership, in particular artisanal mining. Key features of the statistics collection include:

- Data are only obtained from T.I.C. members;
- For confidentiality, members report data directly to an independent collector;
- An aggregate report is provided by the independent collector to the T.I.C. for review;
- A final report is issued by the T.I.C. to all the member companies.
From the above it can be seen that the data accuracy relies heavily on the care and attention taken by the reporting companies. The T.I.C. provides advice to the member companies on how to complete the statistics, and members are always encouraged to contact the T.I.C. for any clarification related to the reporting process and which categories to use, however the T.I.C. may not request information that identifies individual company data.

Collection requests are issued quarterly, every January 1st, April 1st, July 1st and October 1st to facilitate a routine and timely response; results are then circulated as soon as available. The goal of the T.I.C. is to provide timely and dependable statistics to its member companies, however this relies on all members playing their part in reporting their data. By way of encouragement, there is a condition that a reporting member will only receive the final report if they first submit their own data, while ‘persistent non-responders’ that either don’t report or are consistently late, are brought to the attention of the Executive Committee.

T.I.C. Member reporting process

Essentially a company requested to submit statistics is required to:

- Report by the deadline indicated on the form (generally January 20th, April 20th, July 20th or October 20th);
- Check the reporting company lists to determine which figures to exclude, if any;
- Check the reporting rules to ensure figures are reported in the correct units;
- Complete and submit the forms provided, even if all results are ‘zero’ (0);
- Send the forms directly to the independent collector (i.e. not to the T.I.C.).

What is the need for a deadline?

Those companies that are late in submitting their forms hold up the final report for the rest of the membership; this is a disservice to the entire industry.

Why bother reporting if all the results are zero?

If the independent collector does not receive a form, all it knows is that the form has not yet been received. It can not make the assumption that a missing form equals zero. To put it simply:

No form = Missing form ≠ 0

What if I don’t submit my statistics?

Submitting statistics forms is a duty of membership and missing forms adversely affect the overall statistics. Those companies that don’t respond to the request for statistics are in turn not provided with the final report, in other words quid pro quo, or as another formula:

No submitted statistics = No final report

What do the T.I.C. statistics represent?

The following series of diagrams demonstrates the material flows which are represented by the T.I.C. data, and those flows that are not. Each diagram is a simplification of the companies involved in the supply chain, basically showing how Nb- or Ta-containing material flows from primary producers (the miners), via traders to processors, or to processors directly, and from processors to consumers (including final manufacturers and end users) downstream, and in the case of tantalum with a further intermediate step of capacitor producers.

1-The T.I.C. formerly used the accounting and auditing firm HLB Belgium, and now as of 2015 the accounting firm Miller Roskell, as an independent intermediary.
2-Volumes traded between member companies in the same segment are excluded to avoid double counting.
3-Those companies which are not given the report are informed of why this is done. No complaints about this procedure have been received.
Given the abstracted complexity at the processor level, note there is a return loop for intermediate products flowing from one processor to another, as well as return loops from the capacitor producers and consumers which represents process waste, residues and other scrap. For each of the three or four types of companies, there is also the corresponding level outside of T.I.C. membership, to demonstrate how certain material flows in or out of the membership are reflected in the T.I.C. statistics.

Niobium diagrams

For niobium there are thus three types of reporting company, using two types of forms:

- **Primary producer**: reports all raw material production using form Nb/RawMat
- **Trader**: reports raw material receipts also on Nb/RawMat
- **Processor**: reports product shipments using form Nb/Products

![Niobium Material Flow Diagram](image)

**Figure 1 - Overview of niobium material flow**

In this overview we see the three types of companies on the left hand side, reporting data for the coloured material flows using the correspondingly coloured form described in the centre. Each of these companies’ reporting is shown separately below.

**Niobium raw material production by primary producers**

The material flow represented by the unbroken black/yellow arrow highlights the reporting by primary producers, showing how all production is reported regardless of which company it goes to, whether inside or outside of membership. The production data are reported in two separate categories:

1. **Concentrates (pyrochlore, columbite)** *i.e.* where niobium is the main constituent of a mineral;
2. **Other Nb-containing** (*e.g.* tantalite, struverite, tin slag (over 2% Nb$_2$O$_5$)) *i.e.* where niobium is a minority constituent in other raw materials.

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4-Except not from other tantalum reporting miners or traders, in order to prevent double counting.
Niobium raw material receipts by trading

The material flow represented by the dashed black/yellow arrow depict the traders’ connections, but only the material arriving from outside the membership is counted in T.I.C. statistics since primary production by T.I.C. members is already reported. Traders do not report receipts from T.I.C. members in order to avoid double counting. Traders only report receipts from non-member companies.

The form and categories used for reporting are the same as for primary producers:

1. Concentrates (pyrochlore, columbite)
   *i.e.* where niobium is the main constituent of a mineral;
2. Other Nb-containing (*e.g.* tantalite, struverite, tin slag (over 2% Nb₂O₅))
   *i.e.* where niobium is a minority constituent in other raw materials.

Niobium product shipments by processors

Finally for niobium, the position of the processors is highlighted, showing how they report all production except that sent to other T.I.C. member processors (hence the return loop to the left of the green ‘processors’ box not being coloured in). Essentially T.I.C. niobium processors report only the material shipped to non-members.

The product shipment data are reported in five separate categories:

1. Niobium chemicals (*e.g.* Nb₂O₅, NbCl₅, NbC)
   *i.e.* all grades of chemical products, whether intermediates or high grades for *e.g.* optical, Chemical Vapour Deposition, or tool making applications;
2. Niobium in vacuum-grade FeNb, NiNb
   *i.e.* the highest grades of niobium alloys, for *e.g.* master alloy and aerospace applications;
3. Niobium metal (pure) in the form of mill products, ingot, powder, scrap
   *i.e.* intermediate and final metal products for *e.g.* chemical process equipment applications;
4. Niobium alloys, such as NbTi, NbZr, NbCu, in the form of mill products, powder, scrap
   *i.e.* alloys for specialist applications including superconducting magnets;
5. HSLA grade ferro-niobium
   *i.e.* High Strength Low Alloy applications in automotive and structural steels.

Tantalum diagrams

For tantalum the material flow is more complex, and there are four types of reporting company using four different forms in an asymmetric relationship:

- Primary producer: reports all raw material production using form *Ta/RawMat*
- Trader: reports raw material receipts also on *Ta/RawMat*
- Processor - uses two forms:
  - Reports receipts* using form *Ta/Receipts*
  - Reports product shipments* on *Ta/Products*
- Capacitor Producer: reports all receipts using form *Ta/Cap*

Compared with the niobium diagram, the tantalum diagram is immediately more colourful, due to the additional step of capacitor producers, and the additional report of processors’ receipts. Again these are described individually below.

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6-Except not from other tantalum reporting miners or traders, in order to prevent double counting.
7-Except not receipts from other tantalum reporting processors, in order to prevent double counting.
8-Except not shipments to other tantalum reporting processors, in order to prevent double counting.
The reporting principle for tantalum primary producers is identical to that for niobium, i.e. that all production is reported regardless of which company it goes to, whether inside or outside of membership.

Tantalum production material flows (represented by the solid black/yellow line) are reported in three separate categories:
1. Tin slag (over 2% Ta$_2$O$_5$)  
   *i.e.* where tantalum reports in the slag by-product from tin smelting;
2. Ta concentrate (all where Ta is primary)  
   *i.e.* where tantalum is the main constituent of a mineral concentrate;
3. Other concentrates (columbite, struverite etc.)  
   *i.e.* where tantalum is a minority constituent in other mineral concentrates.

The dashed black/yellow arrow depicts the traders’ connections; only the material arriving from outside the membership is coloured. As primary production by T.I.C. members is already reported, traders do not report receipts from T.I.C. members in order to avoid double counting. Traders only report receipts from non-member companies.

The form and categories used are the same as for primary producers:
1. Tin slag (over 2% Ta$_2$O$_5$)  
   *i.e.* where tantalum reports in the slag by-product from tin smelting;
2. Ta concentrate (all where Ta is primary)  
   *i.e.* where tantalum is the main constituent of a mineral concentrate;
3. Other concentrates (columbite, struverite etc.)  
   *i.e.* where tantalum is a minority constituent in other mineral concentrates.
Tantalum receipts by processors

For tantalum processors, there are two reporting steps, the first one shown by blue arrows represents their receipts except that from other T.I.C. member processors (hence the return loop to the left of the blue-green ‘processors’ box not being coloured in).

The receipts data are reported in two separate categories:

1. **Primary raw materials** (*e.g.* tantalite, columbite, struverite, tin slag, synthetic concentrates)
   - *i.e.* any raw material\(^9\) containing tantalum;
2. **Secondary materials** (*e.g.* \(\text{Ta}_2\text{O}_5\), \(\text{K}_2\text{TaF}_7\), scrap)
   - *i.e.* intermediate products and scrap from other processors or downstream companies.

Tantalum product shipments by processors

The second reporting step for tantalum processors is shown by green arrows; for all their product shipments except those to other T.I.C. member processors (hence the return loop to the left of the blue-green ‘processors’ box not being coloured in).

The product shipment data are reported in six separate categories:

1. **Tantalum chemicals** (*e.g.* \(\text{Ta}_2\text{O}_5\), \(\text{TaCl}_5\), \(\text{K}_2\text{TaF}_7\))
   - *i.e.* all grades of chemical products, whether intermediates such as \(\text{K}_2\text{TaF}_7\) (a.k.a. ‘K-salt’) or high grades for *e.g.* optical, Chemical Vapour Deposition, or tool making applications;
2. Tantalum carbide (TaC)
   - *i.e.* carbide for tool making applications;
3. Capacitor-grade tantalum powder
   - *i.e.* high grade powder specifically formulated for the production of tantalum capacitors;
4. Tantalum ingot
   - *i.e.* as an intermediate for mill products, or for *e.g.* master alloy and aerospace applications;
5. Mill products of tantalum
   - *i.e.* various forms of tantalum including bar, powder, rod and tube for *e.g.* chemical process equipment applications, or wire for the production of tantalum capacitors;
6. Metallurgical-grade powder, unwrought metal, scrap, other
   - *i.e.* various intermediate products.

Tantalum receipts by capacitor producers

Finally for tantalum there is the additional step of capacitor producers, showing how they report *all* receipts regardless of where it originates (black/orange arrows).

The capacitor producers report receipts data in three separate categories:

1. Tantalum powder
   - *i.e.* high grade powder specifically formulated for the production of tantalum capacitors;
2. Tantalum wire
   - *i.e.* mill products in the form of wire for the production of tantalum capacitors;
3. Mill products (except wire)
   - *i.e.* all other mill products related to the production of tantalum capacitors, such as furnace parts, holding strips, sinter trays etc.

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\(^9\)-Note this category includes “synthetic concentrates”, which are produced from tin slag or recycled scrap.
Summary of what T.I.C. statistics represent:

- For both niobium and tantalum:
  - Primary producers report all raw material production
  - Traders report receipts from non-members only
- For niobium only:
  - Processors report product shipments, except not to other member processors
- For tantalum only:
  - Processors report receipts and product shipments, except not receipts from or shipments to other member processors
  - Capacitor producers report all receipts

What other statistics are there?

Customs agencies in each country compile data on imports and exports in order for their governments to levy relevant taxes. Data are compiled according to commodity specific codes, where the first six digits are in accordance with an international Harmonised System. Eight- or eleven-digit codes are country specific and are often not comparable between countries.

Examples of countries compiling relevant data, with links to Customs authorities or trade databases from where such statistics data can be obtained, are listed below:

<table>
<thead>
<tr>
<th>Country or Region</th>
<th>Website</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>abs.gov.au</td>
<td>2615.90.30 withheld (commercial confidentiality)</td>
</tr>
<tr>
<td>Western Australia</td>
<td>dmp.wa.gov.au</td>
<td>Provides tantalite tonnage up to 2008</td>
</tr>
<tr>
<td>Brazil</td>
<td>dnpm.gov.br</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>ic.gc.ca</td>
<td>Shows exports in USD for 261590 or 720293 FeNb</td>
</tr>
<tr>
<td>China</td>
<td>english.customs.gov.cn</td>
<td></td>
</tr>
<tr>
<td>DR Congo</td>
<td>douanes.gouv.cd</td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td>csa.gov.et</td>
<td></td>
</tr>
<tr>
<td>European Union</td>
<td>madb.europa.eu</td>
<td>Covers all 28 EU member states</td>
</tr>
<tr>
<td>Japan</td>
<td>mof.go.jp</td>
<td></td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>kyzylorda.stat.gov.kz/eng</td>
<td></td>
</tr>
<tr>
<td>Malaysia</td>
<td>customs.gov.my</td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>russian-customs.org</td>
<td></td>
</tr>
<tr>
<td>Rwanda</td>
<td>rra.gov.rw</td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td>search.customs.go.th</td>
<td>2615.9000.001 / 2615.9000.002</td>
</tr>
<tr>
<td>United Nations</td>
<td>comtrade.un.org</td>
<td>For all countries in the world, where data available; often less detail than individual countries</td>
</tr>
<tr>
<td>USA</td>
<td>dataweb.usitc.gov</td>
<td></td>
</tr>
</tbody>
</table>

The functionality or ‘user friendliness’ of these sites varies greatly, with some being easily searchable and providing a good level of detail, while some are not freely searchable by the public.
Are these comparable?

There are limitations due to Harmonised System codes not always being sufficiently specific, especially in the case of 261590 which includes three metals: tantalum, niobium and vanadium. In many cases this makes it almost impossible to determine the volume of Ta and/or Nb. While some countries provide greater detail by using 8- or 11-digit codes, these are not comparable between countries.

Customs data may not be easily accessible, or data may be presented in different units such as weight or monetary value. In both cases assumptions have to be made as to being gross weight and the average grade, as well as the historical market price, in order to obtain the nett weight contained. Given these and potentially other issues, care must necessarily be applied in using such data. Nevertheless these additional sources of data constitute a potentially useful source of information.

T.I.C. Statistics Overview

The statistics data collected from T.I.C. member companies on production, receipts and/or shipments of raw materials and metal products of niobium and tantalum are reviewed here in graphical form for the years 2001-2014. As only annualised figures can be made available to the public, the graphs presented here are correspondingly in annualised form. The original graphs presented at the Fifty-sixth General Assembly were in a six-monthly format and these original slides are available for members to download from the T.I.C. website.

All trends and percentage changes noted in this paper are based on the year-on-year difference between 2013 and 2014.

Niobium

Raw Materials

Figure 3 - Niobium raw materials ('000 mt Nb₂O₅ contained)

10 Members should note that the year-on-year trends presented in the GA56 slides were based on the 12-month periods 2013 H2 – 2014 H1 versus 2014 H2 – 2015 H1 in order to provide the most recent comparison, whereas the trends in this paper are necessarily based on
The primary niobium concentrates have consistently been derived from pyrochlore and columbite, accounting for 99% of the total, with a small amount from other niobium containing minerals.

Primary production of niobium increased in output up until 2007 when the global financial crisis began to hit, with 2009 production falling to levels of five years earlier. Production mostly recovered after this recession and has been fluctuating, with the latest year-on-year change being up 5% (from 11% drop from 2012 to 2013).

Looking at the secondary raw materials in isolation, i.e. those materials from which niobium is obtained as a minor constituent, the latest comparison nearly doubled with a rise of 97% (beating consecutive 31-32% rises the two years before). Note however that the first half of 2015 has shown a return to the levels of 2013.

**Product Shipments**
The breakdown in shipments across the five different product shipment categories has been fairly consistent over time, with HSLA ferro-niobium continuing to be the predominant contributor.

The latest distribution was 88% for HSLA ferro-niobium, 4% for niobium chemicals, 4% for vacuum-grade niobium master alloys, 3% for pure niobium metal and finally 1% for niobium alloys such as NbTi. This consistency is in marked contrast to the tantalum product shipments whose proportions according to type of material change much more from year to year.

Overall shipments stayed level, being up 0.1% from 2013 (from an 11% drop the year before), this despite HSLA ferro-niobium dipping by 0.8% (slowing a previous 10% drop).

Looking at the product shipments without the HSLA ferro-niobium, from 2013 to 2014 niobium chemicals dropped 2% (containing an earlier 27% drop), vacuum-grade niobium alloys jumped 21% (reversing a 12% drop), pure niobium metal rose a modest 11% (compared to the previous 124% rocket), while niobium alloys lost 23% (on top of a 48% decline the year before). The same data in Figure 6a can be seen in Figure 6b except in a stacked form.
Having figures for niobium primary production and for product shipments allows a comparison, which shows closely matching figures for most of the 2001-2014 period (black trend line), with peaks in raw materials compared to product shipments in 2002, 2007 and 2010. Overall there appears to be an average surplus of 10% in raw materials compared to product shipments. Over these 14 years the T.I.C. has recorded a primary production of near exactly 1 million tonnes of Nb₂O₅ contained, compared to product shipments for the same period totalling 920 thousand tonnes Nb₂O₅ contained equivalent, giving an apparent ‘surplus’ of 80 thousand tonnes Nb₂O₅; this apparent surplus may be due to a number of reasons, including direct raw material shipments to non-member processors.

Tantalum

Raw Materials

For tantalum primary production there are several key points which distinguish it from niobium:

- Production is broken down into three categories, splitting out the tin slag by-product from the tin industry, as this was once the most important source of tantalum and is still significant;
- The “Estimated” value for 2008, due to the figures from one of the major tantalum mines not being submitted for one reporting quarter;
- The vast predominance of primary tantalum concentrates up until 2008, and their modest contribution in the years immediately afterwards.

The last point is not the least. Prior to 2008 the tantalum raw material data were considered to cover the vast majority of the industry. As the global financial crisis impacted the tantalum industry this led to the closure of several key industrial producers of tantalum mineral concentrates, and opened up the field for increased production from artisanal mining\(^\text{11}\). Alas these artisanal mining sources are difficult to capture in the statistics unless routed through T.I.C. member traders, therefore the tantalum raw material data after 2008 is estimated to at times have covered as little as half of actual production from all sources (i.e. both T.I.C. and non-T.I.C.).

\(^{11}\) Artisanal mining is primarily in the form of tantalum mineral concentrates, with some secondary sources such as columbite; by definition there is no artisanally produced tin slag as this arises from an industrial process.
This even as tantalum mineral concentrates are climbing back to the fore among the raw materials; see also Figure 10. Nevertheless, the latest figures show the 2014 distribution of production was approximately 15% for tin slag (down from 21% in 2013), 59% for tantalite (up from 53%) and 27% for other concentrates such as columbite or struverite (previously 26%). Overall production increased by 26% (improving on the previous 24% increase), bringing the total close to the levels of 2007-2008. The increase is mainly due to primary tantalum concentrates jumping 40% (nearly repeating the previous 45% jump), while tin slag dropped by 14% (from a 5% rise the year before) and secondary concentrates climbed 31% (on top of a previous 8%).

Receipts by Processors

![Figure 9 - Tantalum receipts by processors (mt Ta$_2$O$_5$ contained)](image-url)
As mentioned earlier, tantalum processors also report receipts, across two categories. The first category is primary raw materials which includes all the three categories in Figure 8, plus the additional inclusion of synthetic concentrates (from re-treated tin slag and recycled scrap). The second category includes all secondary materials, including intermediates and scrap.\(^\text{12}\)

It can also be seen that the figures for processor receipts are more stable than for primary production, and that there is not a split between pre-2008 and post-2008 figures. In 2014 the breakdown between primary and secondary materials was 71% and 29% respectively, in line with the average for the fourteen years.

Total receipts recovered by 10% (almost countering the previous 10% drop), mainly due to primary raw materials climbing 25% (in contrast with the previous 16% drop), offset by a 26% drop in secondary materials (following a 9% uptick in 2013).

Figure 10 - Tantalum raw materials: production versus receipts (mt Ta\(_2\)O\(_5\) contained on the left; ratio on the right)

With the data for tantalum processor receipts, it should be possible to make a better comparison between primary production and processor figures than is possible for niobium. However this comparison is limited by the receipts of primary raw materials including synthetic tantalum concentrates.\(^\text{13}\)

Due to the primary production split across the pre- and post-2008 periods, we also end up with two separate comparisons against the processor receipts. As up until 2008 most primary production was by industrial mining and reported to the T.I.C., the relatively small difference between production and receipts during this period is mainly attributable to receipts of synthetic concentrates, and secondarily to receipts from traders outside of the T.I.C. membership. Post-2008 however, a number of factors came into play around the same time, with increased recycling and generation of synthetic concentrates from scrap, a drop in primary production with the closure of three industrial mines being replaced by artisanal mining, and also an apparent drop in processor receipts due to the resignation of a major processor.

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\(^{12}\)Tantalum scrap is primarily from industrial end users, with only a small portion coming from end-of-life recycling; internal recycling by each processor and direct member processor to member processor recycling is not included, to avoid double counting.

\(^{13}\)Synthetic tantalum concentrates are partly generated from tin slags and partly from recycled scrap. Those from tin slags will appear equally in primary production (as tin slags) and equally in processor receipts (whether as tin slags to be converted to synthetic
The difference between production and receipts during 2009-2013 is thus accounted for by a combination of increased synthetic concentrates, artisanal mining production, as well as some limited non-T.I.C. industrial production, all three of which were not reported in the raw material figures.

In 2014 raw material production accounted for 59% of processor receipts (in line with the 58% in 2013) and the highest level since 2008. Over these 14 years the T.I.C. has recorded a raw material production of just over 17 thousand tonnes of \( \text{Ta}_2\text{O}_5 \) contained, compared to processor receipts for the same period totalling nearly 25 thousand tonnes \( \text{Ta}_2\text{O}_5 \) contained, giving an apparent ‘deficit’ of nearly 8'000 tonnes \( \text{Ta}_2\text{O}_5 \); this apparent deficit being due to i.a. excess stocks received by processors prior to 2001, artisanal mining not being reported in raw materials (especially post-2008), and due to synthetic concentrates from scrap being included in processor receipts of raw materials.

**Product Shipments**

![Tantalum product shipments (mt Ta contained)](image)

Tantalum processor shipments are sub-divided into six categories, the most important one traditionally being capacitor grade powder with an average 40% of total shipments during 2001-2008. During 2009-2013 capacitor powder only averaged 25%, possibly due to the absence of a processor considered to be a major producer of said powder, while in 2014 this proportion returned to 32% of the total, which may be due to the renewed membership of said processor.

The distribution of tantalum processor shipments has fluctuated considerably during 2001-2014, with the latest changes from 2013 seeing tantalum chemicals going from 15% to 17% of the total, tantalum carbide from 2% to 3%, capacitor grade powder from 30% to 32%, tantalum ingot from 11% to 9%, mill products from 22% to 18%, and metallurgical powder and scrap going from 21% to 22% (exceeding the previous year’s record high).

Overall, product shipments are up by 9% (nearly reversing the previous 10% drop), with a breakdown of the changes for each category provided below.
In Figures 12a and 12b the prominence of capacitor grade powder up until 2008 and its incipient return in 2014 are more evident, as well as the peak in tantalum chemicals seen in 2011. From 2013, tantalum chemicals recovered somewhat with a climb of 25% (from a previous 42% drop), while tantalum carbide jumped 37% (reversing a three-year slide last seeing a 58% fall). Tantalum capacitor powder rose 17% (on top of a previous 9% step up), while tantalum ingot slid 8% (further to the previous 25% drop). Mill products were also sliding down 8% (on a previous 5%), while metallurgical powder and scrap rose 11% (on top of a previous 30% jump).

The same data in Figure 12a can be seen in Figure 12b except in a stacked form.

Being able to further compare tantalum processor receipts with product shipments, we see the balance of material entering and leaving the processor membership (see Figure 13). There is a clear spike in receipts versus shipments in 2001, which can be attributed to processors overcommitting themselves to purchases of raw materials, followed by an appearance of parity until 2005 as long-term purchase contracts kept the processors stocked. From 2006 these stocks would then have been worked off, leading to a return to near-parity around 2010 onwards.
Overall, for the 2001-2014 period, some 35'000 mt of Ta₂O₅ were received, compared with 36'000 mt Ta₂O₅ in shipments, giving a modest difference of less than 2'000 mt Ta₂O₅ more shipments than receipts.

If we break this time period down into the segments of 2001-2005, 2006-2010 and 2011-2014, which loosely correspond to the above mentioned turning points that would have been expected to impact on the processor receipts, this shows that for 2001-2005 there was a 930 mt Ta₂O₅ surplus in receipts, while for 2006-2010 this was more than reversed with an apparent 3'000 mt Ta₂O₅ ‘shortfall’ in receipts, and finally for the period 2011-2014 there have been 400 mt Ta₂O₅ more in receipts. This last time period would indicate a near parity in processor receipts and shipments, averaging at 5% ‘surplus’ in receipts each year.

![Figure 13 - Tantalum processors: receipts versus shipments](image)

Receipts by Capacitor Producers

![Figure 14 - Tantalum receipts by capacitor producers (mt Ta contained)](image)
An additional segment for tantalum are the capacitor producers, which report their receipts of powder and wire for capacitors, as well as other mill products than wire e.g. furnace parts and sinter trays used in the manufacturing process. The distribution of capacitor producer receipts has averaged a consistent 85:15 split between powder and wire, with a small fraction for the third category.

While capacitor receipts peaked in 2010, since then the volume has continued to decline and from 2013 to 2014 lost a further 14% (down 22% the year before). Powder and wire have individually dropped by 8% and 52% respectively (previously down 20% and 35%). Note however that wire recovered 30% in the first half of 2015, somewhat recovering its 2014 drop.

In Figure 15, with the data for processor shipments of capacitor grade powder, we can compare these with the powder receipts by capacitor producers, which again show two distinctly different patterns before and after 2008.

The 2001-2008 period shows a consistent ‘surplus’ in capacitor powder production averaging 27%, which has been attributed to powder produced by T.I.C. members processors being shipped to a number of non-member capacitor producers.

This picture changed significantly at the end of 2008 with the resignation of a major capacitor powder producer, after which the surplus appeared reversed until 2013 when the T.I.C. regained the major capacitor powder producer, leading to an apparent surplus capacitor powder production of 21% in 2013. Further, at the end of 2013 a capacitor producer left the membership, further tipping the balance and leading to an apparent surplus capacitor powder production of 53% in 2014.
Figure 16 shows that capacitor consumption, or the shipments to capacitor users, echoes the processor powder shipments and capacitor producer receipts as one might expect, with the overall change from 2013 to 2014 holding steady at +0.3% (halting the four-year slide since 2010, last dropping 4% in 2013).

For the individual areas, the Americas saw a 1% uptick (previously down 17%), Europe climbed 10% (improving a previous 2% step up), while Japan held level with 0.0% (having previously fallen 33%). The majority production in the ‘rest of the world’ slipped 2% (having previously held with -0.2%).

Europe’s share of the total increased from 14% to 16%, the Americas recovered from 9% to 10%, Japan stayed at 5%, with the ‘rest of the world’ going from 72% to 69% of the total.

Statistics Conclusion

The niobium raw material production for 2014 is holding steady at just below 2007-2008 figures, with a further 12% rise in the first six months of 2015. Exactly the same picture presents itself for niobium processor product shipments, only with a 6% rise in 2015 H1. The distribution of niobium shipments remains consistent across the various categories, with HSLA ferro-niobium continuing to provide the vast majority of demand. There is also a good balance between production and processing activities, with niobium raw material production continuing to show a modest apparent surplus on processor product shipments, running at 9% in 2014.

For tantalum, the raw material production figures have almost recovered to the levels of 2007-2008, although down 6% in the first half of 2015. Tantalum processor receipts have been fluctuating at a consistent level 2010, although also dipping 8% in 2015 H1.

Raw material production in 2014 accounted for 59% of processor receipts, the highest level of the post-2008 period as it combines increased primary production with a dip in processor receipts. This apparent shortfall of some 40% can be attributed to a combination of synthetic concentrates from scrap and minerals from artisanal mining received from companies which are not T.I.C. members and so not reported in primary production.
Tantalum processor shipments have followed processor receipts quite closely, with a peak in 2011 and 2014 being close to the average for the post-2008 period. On a more positive note half-yearly results for the first half of 2015 show a 10% increase in product shipments.

Despite the recovery in tantalum capacitor powder shipments, the receipts by capacitor producers are showing their lowest level since 2001, partly due to the loss of a capacitor producer from the membership at the end of 2013. The 53% apparent surplus in capacitor powder for 2014 indicates there is a considerable demand for tantalum capacitor powder outside of the T.I.C. membership.

Finally on the subject of tantalum capacitors, the capacitor consumption estimates appear to have bottomed out for 2012-2014, although the latest six-month figures show a renewed 8% drop.

Overall, the figures for 2014 indicate a mostly stable picture for both niobium and tantalum, with modest fluctuations. The greatest changes are in tantalum raw material production where tantalum mineral concentrates are gradually recovering their previous pre-eminence and improving the comparison with processor receipts, while the apparently continuing decline in capacitor producer receipts may be explained by a further loss in membership and is in any case counterbalanced by the continuing recovery in processor shipments of capacitor grade powder.

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**Comment on ‘gaps’ in tantalum statistics**

At various points in the text, references are made or implied as to ‘gaps’ in the T.I.C. tantalum statistics, *i.e.* that the data are incomplete due to the absence of a number of companies from the membership, even if the data are considered to cover, in most cases, the majority of the volume of tantalum.

Where is this ‘missing’ tantalum then? It’s out there, only it can not be included in the T.I.C. data as these are based entirely on figures reported by the T.I.C. members, and the T.I.C. can and should not make any adjustment to the members’ figures.

Nevertheless the author may attempt a personal opinion. The areas where there are believed to be gaps in the T.I.C. statistics are, with the author’s personal percentage estimate:

- tantalum raw material production, a gap up to 30% of the actual volume
- tantalum capacitor producers’ receipts, a gap up to 35% of the actual volume

While the gap in raw material production has reduced somewhat, it remains significant. There is very little in the way of industrial mining by non-members, therefore most of the ‘missing’ material is believed to be from artisanal mining.

There is also a considerable gap in capacitor producer receipts, mainly due to various capacitor producers that remain outside of the membership.
Four companies were elected to membership by the Fifty-sixth General Assembly:

**Better Sourcing Program**

Address: 9a Burroughs Gardens, London NW4 4AU, England  
Nominated delegate: Mr Harrison Mitchell  
Tel.: +44 7761326884, +1 347 587 8680  
Fax: none  
Email: harrison@bsp-assurance.com  
Website: www.bsp-assurance.com

**Imerys Ceramics France**

Address: 154 Rue de l'Université, 75007 Paris, France  
Nominated delegate: Mr Dominique Duhamet  
Tel.: +33 (0) 4 70906701  
Fax: +33 (0) 4 70904533  
Email: dominique.duhamet@imerys.com  
Website: www.imerys-ceramics.com

**Resind Indústria e Comércio Ltda**

Address: Rodovia 265 Km 264, Distrito Industrial São João del Rei, Minas Gerais 36315-000, Brazil  
Nominated delegate: Mr Almir Clemente  
Tel.: +55 32 33741112  
Fax: +55 32 33741116  
Email: almirclemente@resind.com.br  
Website: www.resind.com.br

**Yano Metals Co. Ltd**

Address: Tokyo office: 1-19-11, Dogenzaka, Shibuya-ku, Tokyo, 150-0043, Japan  
Nominated delegate: Mr Masaya Abe  
Tel.: +81 3 5784 4040  
Fax: +81 3 5784 4042  
Email: m_abe@yanokinzoku.co.jp  
Website: www.yanokinzoku.co.jp/en/index.html

Membership of the T.I.C. is open to companies and organisations actively involved in the entire niobium and tantalum supply chains, from explorers to miners, traders and processors, through to end users and suppliers of goods and services to the industry.

To apply for membership, please complete the membership application form on our website (www.tanb.org).
Re-instatement of membership

The Fifty-sixth General Assembly voted the lifting of the suspension for the company King-Tan Tantalum Industry Ltd, resulting in re-instatement of its full T.I.C. membership. The delegate to the T.I.C. for this company is Ms Zhang Huijun. She can be contacted on tanb@king-tan.com.

Transfers of membership

The Fifty-sixth General Assembly approved the following transfers of membership:

- from Heraeus Materials Technology GmbH & Co. KG to Heraeus Deutschland GmbH & Co. KG
  The delegate to the T.I.C. remains Mr Bernd Spaniol (bernd.spaniol@heraeus.com).

- from H.C. Starck Ltd to H.C. Starck GmbH
  The delegate to the T.I.C. remains Mr Marc Hüppeler (marc.hueppeler@hcstarck.com).

Resignations from membership

The following companies have resigned from the Association since issue 163 of the Bulletin was released: Advanced Alloy Services Ltd, BEH Minerals Sdn Bhd, Eramet, Exxelia Tantalum, Paumanok Publications Inc., Plazaminerals, Trademet S.A. and Tranzact Inc.

Changes in member contact details

Minerals Resources International AG

Minerals Resources International AG has advised a new address: Zugerstrasse 74, 6340 Baar, ZG, Switzerland. The delegate to the T.I.C. remains Mr Girish Malik and he can be reached on info@mrinternational.ch.

Solar Applied Materials Technology Corporation

Solar Applied Materials Technology Corporation has nominated Mr Harry Liao to represent the company within the T.I.C., in the place of Dr Ma. He can be contacted on harryliao@solartech.com.tw.

Thailand Smelting & Refining Co. Ltd

Mr David Wilkinson will be leaving Thailand Smelting & Refining Co. Ltd at the end of January, to pursue another opportunity. The delegate to the T.I.C. for the company will become Mr Nicholas Thorne. His email is nick.thorne@amcgroup.com.

Tinco Investments Ltd

Mr Louis Ichikowitz has become the delegate to the T.I.C. for Tinco Investments Ltd, in the place of Mr Brian Menell. His email is lmi@ichikowitz.com.

Zimmer – Trabecular Metal Technology

Mr Steven Seelman, delegate to the T.I.C. for Zimmer – Trabecular Metal Technology has advised a new email address: steve.seelman@zimmerbiomet.com.