COBALT NEWS

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COMMENT

The metals market seems rather subdued currently as cobalt prices drift along, though ironically lower prices drive cobalt consumption as modest prices often encourage further uses of this metal! The cobalt market is more complex than most, being a by-product, and therefore dependent upon the fortunes of the mother metal.

We have undertaken considerable efforts in the defence of cobalt from an attempt by the EU to unnecessarily prioritise five cobalt salts for Authorisation under the REACH Regulation. This demonstrates a flaw in the process and we argue that it is imperative for there to be a full impact assessment of any metal that is considered in this way. This also illustrates a disproportionate application of the Regulation. Metals form the backbone of industry and are essential for innovation which underpins the green agenda being rolled out globally. It is of great surprise to the metal industry in general why so many metals are being focused on with regard to the Candidate List when few meet the main criteria such as PBT, vPvB and wide dispersive use. Volumes are also taken into account, but there is also an argument that measuring 'volume' of metal in tonnes is not comparable to organic compounds given the high density (and low volume!) of metals.

Regulatory developments regarding chemical management are taking place on a global basis and if you are affected or concerned about developments in your market or markets in which you do business then please contact: brigitte.amoruso@thecdi.com as we can provide guidance and support.

2012 First Half Production Statistics

Table 1 – CDI First Half 2012 Refined Cobalt Production Statistics (Tonnes)

	2005	2006	2007	2008	2009	2010	2011	2012
CTT, Morocco	824	709	742	836	825	729	910	688
Eramet, France	105	151	153	167	198	181	191	167
Gécamines, DRC	304	300	347	130	199	265	360	380
ICCI, Canada	1,740	1,558	1,772	1,625	1,876	1,744	1,838	1,947
OMG, Finland	3,930	4,160	4,220	4,310	4,177	4,157	4,880	5,345
QNPL/BHPB, Australia(1)	900	800	900	800	600	1,043	1,179	1,283
Rubamin, India (joined 2010)*	0	0	0	0	0	281	295	175
Sumitomo, Japan	227	453	543	559	507	1,041	926	1,246
Umicore, Belgium(2)	1,737	1,422	1,475	1,520	1,100	1,325	1,565	2,131
Vale, Canada	817	919	1,065	1,068	968	290	1,020	1,025
Xstrata, Norway	2,555	2,531	1,919	1,665	1,609	1,580	1,404	1,388
Zambia(3)	1,883	1,643	1,147	1,546	34	1,640	2,325	2,743
TOTAL	**15,022**	**14,646**	**14,283**	**14,226**	**12,093**	**14,276**	**16,893**	**18,518**

Notes: 1) QNPL from July 2009; 2) Includes production from China facility; 3) Chambishi Metals plc; *Estimate for 2012

Production

Table 1 illustrates refined cobalt production from CDI members for the first six months of each calendar year from 2005 to 2012. It can be seen that the 1st half production for 2012 from CDI Members totalled 18,518 tonnes and is some 10% higher when compared with the same period in the previous year. This is a higher increase than was the case between the equivalent periods in 2010 versus 2011. Of course the market had been significantly impacted by the global financial crisis in the 2008/2009 period which effects continue today.

We observe that there has been a general production increase across the CDI Membership with the main increases reporting with UMICORE, OMG, Sumitomo and Chambishi (Zambia). As usual, the figure for Umicore includes production from their Ganzhou Hengsheng subsidiary in China.

Table 2 – CDI First Half 2012 Refined Cobalt Availability (Tonnes)

	2005	2006	2007	2008	2009	2010	2011	2012
China(4)	5,250	6350	6,205	9,203	8,129	17,181	17,939	13,681
India**	398	665	600	448	427	310	360	360
Katanga, DRC(5)	0	0	0	120	1,083	1,776	1,298	1,071
Kasese, Uganda	298	330	338	331	339	314	327	269
Minara, Australia(6)	773	1,005	1,062	999	1,084	1,008	945	1,110
Mopani, Zambia(7)	877	769	850	710	693	600	600	180
Norilsk, Russia	2,325	2,311	2,201	1,161	1,157	1,241	1,205	1,147
RSA(8)	141	131	135	139	120	436	440	440
Votorantim, Brazil	581	448	568	490	399	655	732	846
TOTAL	**10,643**	**12,009**	**11,959**	**13,601**	**13,431**	**23,521**	**23,846**	**19,104**
DLA Deliveries	604	69	200	64	93	-8	0	0
TOTAL	**11,247**	**12,078**	**12,159**	**13,665**	**13,524**	**23,513**	**23,846**	**19,104**

Notes: 4) Excludes Umicore's refined production in China; 5) Production commenced end April 08
6) Murrin Murrin total production; 7) Estimates of production; 8) CDI estimates for RSA May-Jun
**Rubamin now included in CDI Member tonnage (NB - estimate for 1st half 2012)

Table 3 – CDI First Half 2012 Total Refined Cobalt Availability (Tonnes)

	2005	2006	2007	2008	2009	2010	2011	2012
CDI Members	15,022	14,646	14,283	14,226	12,093	14,276	16,893	18,518
Others	11,247	12,078	12,159	13,665	13,524	23,521	23,846	19,104
Total[9]	**26,269**	**26,724**	**26,442**	**27,891**	**26,617**	**37,789**	**40,739**	**37,622**

Notes: 9. Total does not include any estimates for producers not reporting their production

The Yabulu operations of BHP Billiton were sold to QNPL pty in July 2009, but for consistency we show the refined production here as arising from 'QNPL/BHPB' in the Table 1 above to allow for comparisons with previous years.

Table 2 summarises refined cobalt production from non-CDI producers together with any deliveries from the DLA stockpile.

Chinese refined production shows a decrease compared to the same period last year, whereas for several years there had been significant increases. Production of refined cobalt in this market was 13,681tonnes (4,258tonnes or ~24%) lower than that recorded for the first half of 2011. This is no doubt in reaction to a slowdown in global demand, though we are aware that there is stockpiled cobalt in China (see the annual CDI statistics which appeared in the April 2012 edition of the Cobalt News). It is emphasised that Chinese production shown in Table 2 does not include Umicore's production in China which is included in Table 1. Overall, production from other non-CDI producer companies was somewhat below the same period in the previous year.

The DLA now reports its figures slightly differently and the figure shown is the 'change in uncommitted inventory' should be similar to the old DLA 'delivery' figure we have provided over the years. There have been no sales over the period and therefore the DLA inventory at the end of June 2012 remains at 301 tonnes. It is understood that the DLA cobalt Basic Ordering Agreement sales program has been deactivated until further notice (DLA Strategic Metals news release of March 11, 2011).

Total production from non-members of the CDI in the first half of 2012 was 19,104 tonnes, some 20% lower than the same period in 2011, due largely to significantly reduced Chinese refined production coupled with constrained production from Africa as a result of reduced power availability in the region. As there have been no sales from the DLA the net figure of refined cobalt availability from non-CDI sources was 19,104 tonnes.

The total availability of refined cobalt in the first half of the year from 2005 to 2012 is shown in Table 3. The figures show that overall availability in the first half of 2012 was 37,622 tonnes which is 3,127 tonnes (or ~8%) lower than the same period in 2011, largely as a result of the decrease in Chinese refined production, though compensated in some way from increases recorded by some CDI Members as outlined above. As in the past, we emphasise that the figures do not include production of refined cobalt from companies treating various cobalt-containing intermediate products and scrap that do not report their figures.

Demand

The CDI has published supply and apparent demand data in the WBMS/CDI "World Cobalt Statistics 2009-2011". The data were derived from worldwide import/export figures. The publication details apparent worldwide refined cobalt demand by geographical location. It can be purchased from either the CDI or WBMS. Please see website 'Publications' for details.

In 2011, apparent worldwide demand totalled around 75,000 tonnes, an increase of about 15 % over that of calendar year 2010. The Americas and Europe appear to have seen modest increases in consumption and Asia (including China) shows an increase in apparent consumption of about 18% over 2010. As mentioned, the publication can be purchased from either the CDI or the WBMS. See this website for details.

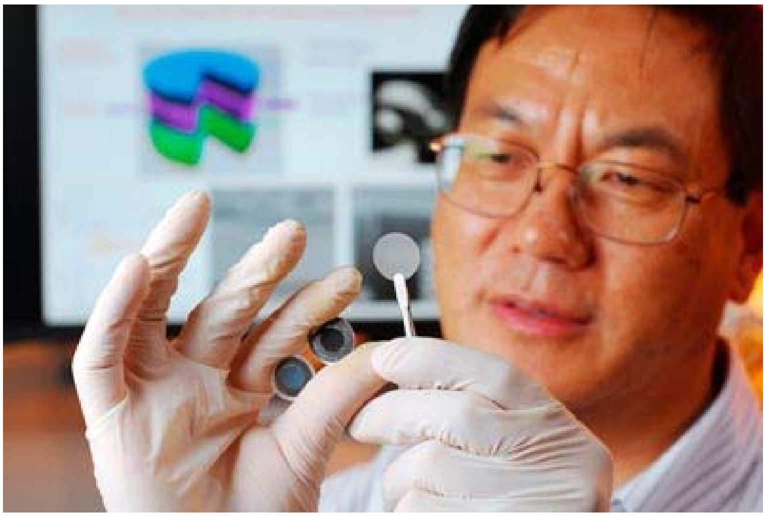
Price

The HG (LMB) price opened 2012 at US$14.70/lb (compared withUS$19.5/0lb for 2010) and at the end of September was US$14.00/lb while the LG price opened at just over US$14.00/lb (compared to US$18.28/lb in 2011) and at the end of September closed at US13.58/lb. The 2012 annual average HG price to end September is US$14.50/lb and for LG it is US$13.96/lb (the CDI takes the average bid/offer spread for both the HG and LG Metal Bulletin price quotation when calculating its average price).

Cobalt has traded on the LME since February 2010 with the 3M contract which was joined by cash trading in May of that year. The average LME cash price for 2012 to end September is US$13.68/lb (the CDI takes the average daily bid/offer cash spread for cobalt and averages this over the period). The C-3 spread varied between a US$750/tonne contango and a US$1,250/tonne backwardation with an average spread for the year in backwardation of just over US$87/tonne.

Power cell generates and stores energy in one step

Researchers in the US have created a power cell that directly converts mechanical energy to chemical energy, which can then be stored and converted to electrical energy upon demand. This new system is unlike other similar technologies that first convert mechanical energy to electrical energy, which is then stored chemically. By skipping the intermediate conversions, the team says that the system is more efficient. If the technology could be further improved, it could be used, for example, in the sole of a shoe, where it could charge a mobile-phone battery while the wearer is walking.



Zhong Lin Wang shows off his new self-charging power cell

We are using an increasing number of portable electronics every day and keeping all these devices charged can be a challenge. This is particularly difficult for infantry soldiers, who can operate for long periods of time away from reliable sources of electricity and therefore have to carry large numbers of batteries to keep communications, GPS and other devices running. As a result, researchers around the world are working on systems that can generate electricity from routine body motion. Footwear is an obvious place to start because soldiers do lots of walking and a small amount of energy could be extracted from each step by placing a generating device in the sole of a boot or shoe.

Hybrid approach

Several different approaches to shoe power are already in development and now Zhong Lin Wang and colleagues at the Georgia Institute of Technology have created a new technology in which generation and storage occurs within a single unit.
Their cell comprises a cathode made of lithium cobalt oxide and an anode of titanium-dioxide nanotubes that are grown perpendicular to a titanium surface. The electrodes are separated by poly(vinylidene fluoride) (PVDF) film, which is a piezoelectric material. When the cell is compressed, the PVDF creates a piezoelectric charge, which drives lithium ions from the cathode to the anode. This converts electrical energy to chemical energy, which is stored in lithium titanium oxide. When the compressing force is removed, the cell relaxes but the chemical energy remains stored. More energy can then be stored in successive compression cycles. This energy can then be retrieved as electrical energy by connecting an electrical load between the anode and cathode, allowing the lithium ions to flow back to the cathode, and the device is ready to be charged again.

Powering a calculator

Using repeated compressions at a frequency of 2.3 Hz, the team was able to increase the voltage across the cell by about 60 mV in 4 min. The cell could then deliver a 1 mA current for about 2 min. While this represents a tiny amount of energy when compared with what is needed to charge a mobile-phone battery, the team used several cells connected in series to run an electronic calculator for about 10 min.

To show that their integrated design was more efficient than separate generation and storage, the researchers also created devices in which similar components were used to first generate electrical energy and then use that energy to move ions in a separate cell. Such a system developed less than 5 mV in 4 min when subjected to the same compressions.

While the technology is still in a very early stage, Wang believes that there are several ways that its performance can be boosted. For example, the researchers believe that most of the mechanical energy of compression is being dissipated in the cell's coin-like steel shell, rather than in the PVDF film.

"When we improve the packaging materials, we anticipate improving the overall efficiency," explains Wang. "The amount of energy actually going into the cell is relatively small at this stage because so much of it is consumed by the shell."

Source: physicsworld.com. The research is reported in Nano Letters

Nautilus Minerals Defines 410 million tonne Inferred Mineral Resource*

**based on a 6kg/m2 abundance cut off*

Table 1: Inferred Mineral Resource Estimate for TOML Areas A-D within the CCZ

Abundance Cut Off (wet kg/m^2)	Abundance (wet kg/m^2)	Ni (%)	Co (%)	Cu (%)	Mn (%)	Polymetallic Nodules (x 10^6 wet tonnes)
4	8.9	1.2	0.24	1.1	26.9	440
5	9.1	1.2	0.24	1.1	26.9	420
6	9.4	1.2	0.24	1.1	26.9	410
7	9.8	1.2	0.24	1.1	26.8	370
8	10.4	1.2	0.24	1.0	26.7	310

Nautilus Minerals have announced that its 100% owned subsidiary, Tonga Offshore Mining Limited ("TOML") confirmed that Golder Associates Pty Ltd., ("Golder") has completed a maiden Mineral Resource estimate for TOML's Clarion-Clipperton Fracture Zone ("CCZ") polymetallic nodule project, located within the Central Pacific Ocean.

The Inferred Mineral Resource has been reported at a range of abundance cut-offs, and is summarised in Table 1.

Nautilus President and CEO Steve Rogers commented, "Our maiden mineral resource estimate for the CCZ again highlights the enormous potential of seafloor resources. We believe that the advance in processing and offshore technologies over the last 20 years now makes the extraction of these significant resources technically feasible."

The reduced social disturbance associated with deep sea mineral production and the development of a strong regulatory framework by the International Seabed Authority since 1994 are key elements that set this project apart from large land based resource developments.

Steve Rogers added that, "At Nautilus Minerals we are hugely excited to be leading the development of this enormous, currently untapped potential on the seafloor. Our priority focus must remain with our high grade Solwara 1 seafloor massive sulphide ("SMS") project, and other prospective SMS systems in PNG and Tonga. With the immense polymetallic nodule mineral resources of the CCZ however, we have to start the engineering and evaluation processes now to realise this opportunity at the appropriate time in the future. There is the potential for a further update of this mineral resource estimate, in that approximately 30% of our licence area is not included in the estimate, but both of these areas are known to have nodules present from limited sampling work carried out to date."

General Background

The nodules occur within the CCZ of the tropical north Pacific, in water depths generally between 4,000 and 6,000 meters. They contain significant grades of manganese, nickel, copper and cobalt, and form by the precipitation of metals on the seafloor, either directly from ocean waters or via decomposing microorganisms and/or their effluent in benthic sediments.

Basis of the Mineral Resource Estimate

Golder has estimated the Mineral Resource for the TOML CCZ project using:

- Sample data collected by "pioneer contractors" (Deep Ocean Resources Development Company (DORD, of Japan), Association Francaise d'Etude et de recherché des NODules oceaniques (AFERNOD, of France), Yuzhmorgeologiya (state owned company of the Russian Federation)), and provided to TOML and Golder by the International Seabed Authority;
- Ordinary Kriging for nickel, cobalt, copper and manganese grades; and
- Inverse Distance for nodule abundance and tonnage.

Samples used for the resource were collected by the pioneer contractors during various exploration cruises, using free-fall-sampling devices. The resulting samples were stored on the vessel, and

Table 2: Summary of Historic Grab Samples Area A

(all ex-DORD)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	18	18	18	18	18
Minimum	21.46	0.15	0.71	0.46	2.68
Maximum	30.05	0.30	1.47	1.51	17.93
Mean	25.40	0.22	1.14	1.00	10.12
Median	25.50	0.21	1.15	1.02	9.19
Standard Deviation	2.44	0.04	0.24	0.35	5.08
Coefficient of Variation	0.10	0.18	0.21	0.35	0.50

then on arrival at port dried and crushed. Nickel, copper, iron and cobalt were normally assayed using atomic absorption, with manganese measured by photometric (electrometric) titration. The resulting sample locations and assay results were presented to the International Seabed Authority ("ISA") as part of the process whereby the pioneer contractors hand over half of their prospect areas (of equal value) to the ISA for inclusion in the "Reserve Area" set aside for developing nations such as Tonga.

The data provided by the contractors is not supplied with any quality assurance or quality control ("QAQC"), although some QAQC is known to have been performed at the time (there was no requirement however, to submit this to the ISA). TOML has accessed this data for the purpose of this Mineral Resource estimate. As part of the verification requirements Golder also contacted pioneer contractors directly to provide confirmation of the data sets and methodologies used. Checks were also undertaken; by comparison of the different data sets (those covering the TOML blocks) and by comparison of this data with the larger ISA dataset covering the entire CCZ (see Tables 2 to 8 for raw sample statistics). These checks showed that:

- Only four of the total 2,212 data points provided were suspected of being erroneous (and are likely data entry errors that occurred with the one contractor);

Table 4: Summary of Historic Grab Samples Area C

(all ex-AFERNOD)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	78	78	78	78	78
Minimum	22.01	0.14	0.93	0.71	1.35
Maximum	30.90	0.32	1.42	1.44	21.25
Mean	27.91	0.25	1.27	1.15	9.98
Median	28.55	0.25	1.29	1.19	9.17
Standard Deviation	2.13	0.03	0.10	0.15	4.20
Coefficient of Variation	0.08	0.13	0.08	0.13	0.42

- Box plots and log-probability plots comparing the various assay data and distributions show the TOML abundance, Ni, Cu, Co, and Mn data compare well with the full ISA data set. Variations between the data sets are attributed to both spatial variability and minor differences in sampling and assaying methods of the various contractors; and
- Quantile-Quantile (QQ) plots show the TOML abundance, Ni, Cu, Co and Mn data compare well with the total ISA data base, but with divergence at the tails of the distributions, while Co and nodule abundance tend to be biased slightly lower for the TOML data.

Assay data for the four key elements (Ni, Cu, Co, and Mn) are very consistent and widespread over large areas of the CCZ. The key variable for future resource classification is nodule abundance. Determining short range variability for nodules will be required to increase resource classification to higher levels of indicated and measured.

Table 3: Summary of Historic Grab Samples Area B

(all ex-Yuzhmorgeologiya)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	88	88	88	88	88
Minimum	10.30	0.02	0.53	0.40	0.03
Maximum	31.20	0.35	1.51	1.40	26.00
Mean	25.40	0.25	1.16	0.94	8.82
Median	26.55	0.25	1.23	1.02	8.09
Standard Deviation	4.19	0.06	0.23	0.26	5.87
Coefficient of Variation	0.16	0.22	0.20	0.27	0.67

The verification also involved review of the data by the independent Qualified Person Dr. Charles Morgan. Dr. Morgan has considerable experience in the CCZ nodules, having been a scientist on board the Lockheed Martin consortia program in the 1980s, and having been a consultant to the ISA in various capacities including as a member of the Legal and Techncial Commission, and in the preparation of resource estimates for the ISA. Golder considers the sampling data is suitably supported and maintained by the ISA for use in the calculation of an inferred resource.

The estimate is current as of September 18, 2012, and only incorporates blocks A to D of the TOML licence (approximately 70% of the licence area). Blocks E and F are known to host nodules from limited sampling, and represent significant exploration upside to the Mineral Resource (see tables 6 and 7). Additional elements are reported to be present in CCZ nodules, with Rare Earth Elements being of particular note, and these provide additional potential for the project. All of the blocks are located at a depth of between 4,000 metres and 6,000 metres below sea level.

Other Relevant Information

The ISA is an autonomous international organisation established under the United Nations Convention on the Law of the Sea ("UNCLOS") and the 1994 Implementation Agreement. The ISA regulates the "area" beyond national jurisdiction (the "AREA"), under the terms of UNCLOS and the Law of the Sea.

Table 5: Summary of Historic Grab Samples Area D

(all ex-DORD)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	42	42	42	42	42
Minimum	22.79	0.19	1.09	0.79	0.12
Maximum	30.45	0.30	1.44	1.36	16.37
Mean	28.52	0.22	1.31	1.16	7.68
Median	28.76	0.22	1.32	1.17	7.78
Standard Deviation	1.47	0.02	0.08	0.10	4.09
Coefficient of Variation	0.05	0.10	0.06	0.08	0.53

Table 6: Historic Grab Samples Area E

Longitude	Latitude	Water depth (m)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
-124.162	12.8331	4542	26.83	0.16	1.11	1.14	18.18
-123.669	12.8293	4497	24.04	0.21	1.01	0.88	6.73
-124.667	12.8284	4851	25.64	0.18	1.21	1.04	9.24
-125.163	12.8328	4577	27.5	0.16	1.29	1.13	9.2

Four samples only; ex-KORDI (Korean Ocean Research and Development Institute)

Table 7: Historic Grab Samples Area F

Longitude	Latitude	Water depth (m)	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
-118.33	10.35	4073	32.4	0.17	1.33	1.31	9.3
-118.33	10.35	4073	32.4	0.16	1.27	1.29	13.7

Two samples only; ex BGR (Federal Institute for Geosciences and Natural Resources)

Table 8: Summary of Historic Samples from the Reserved Areas outside the TOML Licences

	Mn (%)	Co (%)	Ni (%)	Cu (%)	Abundance (wet kg/m^2)
Count	2188	2188	2188	2188	2188
Minimum	4.14	0.05	0.15	0.12	0.01
Maximum	35.62	3.23	1.75	1.62	52.20
Mean	27.47	0.21	1.25	1.04	8.21
Median	28.47	0.21	1.30	1.09	7.10
Standard Deviation	4.06	0.08	0.20	0.24	6.06
Coefficient of Variation	0.15	0.40	0.16	0.24	0.74

As of 15 May 2011, UNCLOS has been signed by 162 parties, mostly independent states and the European Union. The only notable absentee signatory is the United States of America. Part XI of UNCLOS and its subsequent implementation Agreement of 1994, deals with mining of minerals from the seafloor in the AREA.

The ISA has also developed regulations for prospecting and exploration for polymetallic nodules, seafloor massive sulphides, and cobalt rich crusts within the AREA. On 11 January 2012, TOML signed a Contract for Exploration for Polymetallic Nodules with the ISA covering an area of approximately 75,000 km2, in six blocks within the CCZ. TOML is registered in the Kingdom of Tonga, is subject to the laws of Tonga, and is sponsored by the Kingdom of Tonga under the Law of the Sea. The Contract is for an initial term of 15 years.

The ISA, at its 18th session in Jamaica in 2012, started the process of developing regulations to cover the exploitation of nodules. Royalties and taxes payable on any future production from the property will only be finalised once the ISA has developed its exploitation code. The code will need to include the key principles of UNCLOS.

TOML has agreed to a royalty with the Tongan government as part of its sponsorship agreement of US$1.25 per dry ton for the first 3 million dry tons of nodules mined per year, and US$0.75 per dry ton for all subsequent tons mined thereafter in that same year. Nautilus and TOML are parties to a contract with Nauru Ocean Resources Inc. ("NORI") and NORI's current shareholders, pursuant to which Nautilus increased its indirect ownership interest in TOML from 50% to 100% in exchange for its 50% indirect interest in NORI. That contract provides, among other things, a value normalisation process in respect of TOML and NORI's licences to explore polymetallic nodules in the AREA. The process is triggered by TOML and NORI achieving a resource pursuant to NI-43-101. NORI has not yet disclosed a resource estimate in respect of its licences.

Recommendations

It is recommended that future work on the TOML licences aim to determine an Inferred Mineral Resource estimate for Areas E and F and increase the resource classification for parts of the other areas to Indicated or Measured Mineral Resource. Additionally, key modifying factors will be constrained to a point where a Mineral Reserve may potentially be estimated. It is recommended that future work include:

Exploration Phase

- Exploration surveys for detailed bathymetry.
- Sampling on TOML Areas E and F to define Inferred Mineral Resources for these areas.
- Sampling at sufficient detail on the best of the defined Inferred Mineral Resources to define short range variability, assay variance and trends, density, and other critical data.
- Assaying of all samples collected for additional elements, including but not limited to REE, potential "contaminants", and any other elements that may aid economic studies.
- Widespread and detailed study of dry and wet density of the nodules on the TOML licence including study of free and crystallisation water contents.
- Side scan sonar survey of TOML licence areas where appropriate to image nodule occurrence.
- Baseline environmental studies.

Study Phase

- Engineering and metallurgical studies and design work for both the onshore and offshore components.
- Preliminary economic and commercial studies to provide scoping estimates for CAPEX and OPEX for mining, transportation and processing options.

Possible budgets required to complete the exploration phase over the next two years may total $US2 million to $US4 million. Nautilus has sufficient funds to undertake this work or may choose to look for a partner.

Mr Mathew Nimmo of Golder as independent Qualified Person has prepared the technical information that forms the basis for this press release.

Pursuant to NI 43-101, Nautilus Minerals will file an independent technical report within 45 days in respect of this mineral resource estimate.

Certain of the statements made in this news release may contain forward-looking statements within the meaning of the United States Securities Exchange Act of 1934 and forward-looking information within the meaning of applicable Canadian securities law. Forward-looking statements and forward-looking information include, but are not limited to statements or information with respect to the potential commercial extraction of seafloor resources in the CCZ, further development of TOML's CCZ territory and other potential resources in TOML's CCZ territory. We have made numerous assumptions about the material forward-looking statements and information contained herein. Please refer to the company's most recently filed Annual Information Form in respect of material assumptions and risks relevant to forward looking information. With respect to the CCZ, the "Exploration, Development and Operating Risks" section of the AIF should be read with the particular attributes of the CCZ, versus the Company's Bismarck Sea prospects, in mind. These include the fact that the ocean floor in the CCZ is at much greater depth, the fact that the CCZ is in the middle of the Pacific Ocean and the fact that the Company's plans for developing the CCZ are at a much earlier stage than its plans in respect of its Solwara projects. Even though our management believes the assumptions made and the expectations represented by such statements or information are reasonable, there can be no assurance that the forward-looking statement or information will prove to be accurate. Forward-looking statements and information by their nature involve known and unknown risks, uncertainties and other factors which may cause the actual results to be materially different from any future results expressed or implied by such forward-looking statements or information. Such risks, uncertainties and other factors include, among others as described in the most recently filed Annual Information Form, the risk that the amount of metals contained in the company's deposits may differ from estimates of resources, the risk that any permits required for development of the CCZ will not be available to the Company, risks associated with financing and executing the required work programs and associated studies, other risks associated with metallurgical properties of the resource, environmental studies, people retention, technology development, intellectual property, logistical support in the CCZ, political interference (from both within and outside the ISA), excessive and/or unwarranted non-government organisation attention and/or misinformation campaigns, risks associated with maintaining the companies TOML sponsorship. Should one or more of these risks, uncertainties or other factors materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in forward-looking statements and information. Although we have attempted to identify factors that would cause actual results to differ materially from those described in forward-looking statements and information, there may be other factors that cause actual results, performances, achievements or events to not be as anticipated, estimated or intended. Also, many of the factors are beyond our control. There can be no assurance that forward-looking statements or information will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly you should not place undue reliance on forward-looking statements or information. Except as required by law, we do not expect to update forward-looking statements and information as conditions change and you are referred to the full discussion of the Company's business contained in the Company's reports filed with the securities regulatory authorities in Canada.

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Industry News

India looks for rare earths under the sea
Cecilia Jamasmie | August 31, 2012

India is already building a rare-earth mineral processing plant in the east coast state of Orissa and will invest $135 million in a new exploration ship and the refurbishing of another vessel to mine minerals under its oceans.

Only last week, State-owned Rare Earths Ltd. (IREL) applied for approval from the Orissa state government for a rare earth exploration permit on a 2,500ha coastal land package at Bramhagiri in Puri district. IREL is hopeful the results of this exploration will help India meet its own demand for minerals.

But according to The Guardian India's ocean exploration program is around two decades old. The country, says the report, has already tested seabed mining to a depth of 512 metres and it's now targeting depths up to 6,000m.

Other than rare earths, India's underwater exploration plan focuses on nickel, copper, cobalt, and rare earths, which are particularly abundant in the Central Indian Basin.

In 2011 the Papua New Guinea Government granted permission to Canada-based Nautilus Minerals Inc. (TSX:NUS)(OTCQX:NUSMF) (AIM:NUS) to start the world's first deep-sea mining project.

Nautilus' gold and copper Solwara 1 project has been facing some issues recently, as the company is battling authorities in regards to its obligation to complete the agreement reached in March last year.

Source: Mining.com

H.C. Starck and Japan New Chisso Corp. join forces for future market electromobility

Developed in Germany, manufactured in Japan: CS Energy Materials joint venture started production of cathode materials for high performance lithium-ion batteries.

In June 2012, the newly built production facility of CS Energy Materials (CSEM) in Minamata (Japan) has been inaugurated by representatives of both joint venture partners H.C. Starck and the Japanese chemical company Japan New Chisso (JNC) Corp.. Immediately after completion of the facility construction, the plant successfully commenced test operations.

With the German-Japanese joint venture CSEM, the two joint venture partners H.C. Starck and JNC Corp. have secured a good starting position to enter one of today's most important future markets: In the near future, the CSEM plant in Minamata will manufacture cathode materials for high-performance lithium-ion batteries. This type of batteries is a key technology in the electric and hybrid vehicle market, which is expected to have above average growth rates worldwide. Thanks to a new and patent-pending manufacturing technology, CSEM will be producing cathode materials with extremely high performance quality. Research and development of the cathode material and the manufacturing technology take place at the CSEM site in Goslar (Germany), at H.C. Starck's registered office.

"The on time completion of the first CSEM plant came true thanks to the hard work of many participants at H.C. Starck and Japan New Chisso, and thanks to the support of the local government authorities," said Kazuyuki Marukawa, Senior Executive Vice President of CS Energy Materials. "Our intensive efforts in research and product development, planning and testing of the production technologies at our sites in Goslar and Minamata are finally paying off: First test results from several big customers attest our cathode materials excellent quality."

CS Energy Materials was founded in September 2010. The foundation stone was laid for the production plant in Minamata about a year later. With the newly built plant, CSEM will be able to deliver industrial-scale volumes of high-quality cathode materials to the electric and hybrid vehicle industry.

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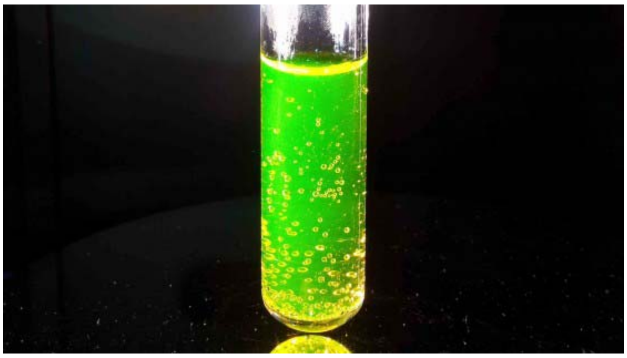
Scientists produce H2 for fuel cells using an inexpensive catalyst under real-world conditions

Scientists at the University of Cambridge have produced hydrogen, H_2, a renewable energy source, from water using an inexpensive catalyst under industrially relevant conditions (using pH neutral water, surrounded by atmospheric oxygen, O_2, and at room temperature).



One of the first stages of developing the new renewable energy source under an industrially relevant environment.

Lead author of the research, Dr Erwin Reisner, an EPSRC research fellow and head of the Christian Doppler Laboratory at the University of Cambridge, said: "A H_2 evolution catalyst which is active under elevated O_2 levels is crucial if we are to develop an industrial water splitting process – a chemical reaction that separates the two elements which make up water. A real-world device will be exposed to atmospheric O_2 and also produce O_2 in situ as a result of water splitting."

Although H_2 cannot be used as a 'direct' substitute for gasoline or ethanol, it can be used as a fuel in combination with fuel cells, which are already available in cars and buses. H_2 is currently produced from fossil fuels and it produces the greenhouse gas CO_2 as a by-product; it is therefore neither renewable nor clean. A green process such as sunlight-driven water splitting is therefore required to produce 'green and sustainable H_2'.

One of the many problems that scientists face is finding an efficient and inexpensive catalyst that can function under real-world conditions: in water, under air and at room temperature. Currently, highly efficient catalysts such as the noble metal platinum are too expensive and cheaper alternatives are typically inefficient. Very little progress was made so far with homogeneous catalyst systems that work in water and atmospheric O_2.

However, Cambridge researchers found that a simple catalyst containing cobalt, a relatively inexpensive and abundant metal, operates as an active catalyst in pH neutral water and under atmospheric O_2.

Dr Reisner said: "Until now, no inexpensive molecular catalyst was known to evolve H_2 efficiently in water and under aerobic conditions. However, such conditions are essential for use in developing green hydrogen as a future energy source under industrially relevant conditions.

"Our research has shown that inexpensive materials such as cobalt are suitable to fulfil this challenging requirement. Of course, many hurdles such as the rather poor stability of the catalyst remain to be addressed, but our finding provides a first step to produce 'green hydrogen' under relevant conditions."

The results show that the catalyst works under air and the researchers are now working on a solar water splitting device, where a fuel H_2 and the by-product O_2 are produced simultaneously.

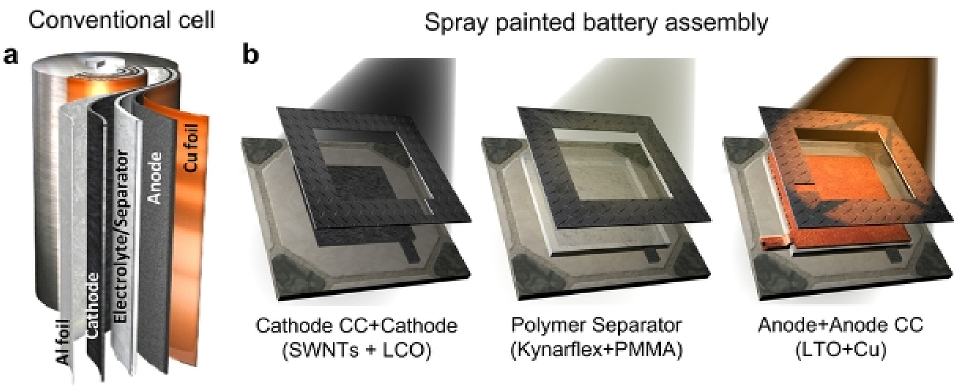
Fezile Lakadamyali and Masaru Kato, co-authors of the study, add: "We are excited about our results and we are optimistic that we will successfully assemble a sunlight-driven water splitting system soon."

The research was funded by EPSRC, the Christian Doppler Research Association and the OMV Group. Their research was published today, 23 August, online in the journal *Angewandte Chemie International Edition.*

Dr Erwin Reisner is an EPSRC research fellow and head of the Christian Doppler Laboratory at the Department of Chemistry.

Source: University of Cambridge
http://www.cam.ac.uk/research/news/scientists-produce-h2-for-fuel-cells-using-an-inexpensive-catalyst-under-real-world-conditions/

Building a Battery with a Spray Gun



The concept of hybrid PV-energy storage devices has been explored and investigated by several universities and research institutes around the world; however, Rice University engineers have recently introduced a paintable battery that has the potential of revolutionizing future energy storage.

Researchers at Rice University in Texas have recently succeeded in inventing a rechargeable lithium ion battery that would enable "a widespread renewable energy capture, storage, and utilization," according to Rice University engineers [2]. This revolutionary technology is created by tightly rolling up the various battery components in layers before encasing them in a typical rectangular or cylindrical battery packaging. After years of dedicated research, the engineers have come up with a unique version of battery by painting these individual battery components (i.e current collectors, a cathode, an anode, and a polymer separator) onto a select surface in layers. These layers included paints made from lithium cobalt oxide (a positive electrode), lithium titanium oxide (a negative electrode) and conductive single-walled nanotubes (a current collector). Another feature that sets this lithium battery apart from the others is the special polymer paint blend that helps the battery achieve superior conductivity by forming the micro-porous layer required in a lithium battery.

This unique approach to battery manufacture yields the possibility of flexible battery technology. The paper, published in *Nature Scientific Reports*, explains that by breaking down the different components of a battery — the electrodes, separator, electrolyte and current collectors — and rendering them into liquid form that could be painted on any surface, we could revolutionize the way we power our devices. Rather than being tied to fixed shapes and sizes, batteries could one day take on practically any form, and be applied almost anywhere including on ceramic, glass, and metal. [3] The possibilities provided by this new technology are, to some, no cause for celebration or recognition. Many researchers argue the usage of lithium in lithium ion batteries is a misguided endeavor. With most of the known available resources of lithium depleted, many scientists are looking to explore battery storage without the use of lithium. Some even at UC Berkeley are researching batteries composed of different metals such magnesium or zinc. Their criticism may be a little too harsh, as new development in this field has used less and less lithium. Also recycling the known storage of lithium has made the lithium ion battery a possible long-lasting method to store energy. For now, only time will tell if the painted lithium-ion batteries can penetrate future markets.

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Posted in Energy Storage

Source: The Berkeley Energy Review
http://ucs.berkeley.edu/energy/tag/cobalt/

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