Session 5: Prospects for Silver Supply and Demand

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Thank you to Stewart and the LBMA for the invitation to talk. I'm delighted to talk about silver. I've always been concerned that with my history as a gold analyst, I've been slightly typecast. Really, the VM Group now does not only base metals, precious metals, but we also do energy, renewable, carbon trading and soft commodities. So we are not Virtual Metals any more, we really are the VM Group, and it's nice to talk to an audience like this about something other than gold.

If we are talking about typecasting, I think silver has been a classic. It has always historically played second fiddle to gold in absolute price level terms and really how it is perceived as an investment vehicle. It has been seen as poor man's gold. There have been a number of reasons for this in the supply/demand balance and I'm going to address that today. But what I'm going to talk about today is that, in fact, the silver market is showing structural improvement. The state of affairs in the long term is going from strength to strength.

Before I show you where I think these strengths are coming from (and I think they are going to change the market irrevocably), let's just take a look at the historical structure of the silver market to see where these weaknesses have come about.

This is our line item of the silver supply/demand balance. In our research, we've identified three areas of chronic weakness and I've highlighted them here in red. It's on the primary supply side, on the recycling, particularly photographic, and it's on the photographic and the demand side of the equation, and I'm going to talk a little bit more about this.

I've also highlighted in green where we think the strengths are coming from, and in green, you see other industrial and investment. I'm going to return to this because this is really where the interest lies.

Our first weakness as we see it in the silver market is that 65% of my supply is either co- or bi-product production as a natural consequence of the mining of copper, lead, zinc and of course gold. This really means two things. Silver gets mined irrespective of the silver price. When the world wants base metals as it has done in the last five years, with copper, lead, zinc, and when the world wants gold, and it always seems to want gold, the silver output just happens. Secondly, as a consequence of this, you cannot construct a meaningful cost curve of primary silver production. It implies that it is not possible then to hone in on the marginal costs at producer level, which will give you an indication of the silver price, beyond which it is unlikely to fall, before mine production contracts in logical response.

The second weakness is the traditional end users of silver and the smoke-stacked industries. Over time, they have been

responsible for the generation of a lot of recycling, which comes back into the market. The most obvious sector is the photographic. This slide shows photographic since 1980, which we've modelled in a database. This sector has been relentlessly undermined by the technical substitution in the form of digital. This has been going on now for almost two decades. Originally, there were doubters who swore blind that this would have no impact on the demand for silver in this sector. But like waves undercutting the base of a sand dune, the consequences were inevitable, and this chart here shows what's been going on. Less and less silver has been consumed by this sector, and the chart shows our estimates for off take here. You will agree that this has not been a growth industry.

As I said, the photographic industry is also a very efficient recycler of metal, with the exception of medical x-rays, which have to stay on record for a certain number of years. Silver was and still is washed out of the film during the manufacturing and the processing of the film, and this can actually occur quite swiftly after the film has been manufactured. As this chart shows you, it's not only the photographic industry that is an effective recycler of silver; there are other industrial applications such as batteries and electronics, which do exactly the same. And of course, don't forget the generation of silver jewellery wearers, who tend to buy the stuff, wear it, recycle it, rebuy it, and you've got this circle going around and around of recycled metal in the industry.

So, on balance, we reckon that, annually, you're looking at probably 400 million ounces of silver returned from the recycling to the industry. Such are these levels of recycling that we have to accept that these sectors are not smoke-stack. The silver embedded in these sectors is readily available. It's liquid, and it's available for secondary return to the market. This has all weighed heavily on the price and countered against the metal over the years.

Note this market is adjusting, and while the current supply/demand balance has yet to reveal this evolution, there is a sea change which is detectable, and it's going to become more and more apparent in the next five to 10 years. The adjustment is not coming from the traditional producers and consuming sectors as we've discussed here. Much of that is ops normal, silver will remain a current, a co- and bi-product of other mining of metals. Silver demand in the photographic industry will continue to shrink, although the good news here is that, for every ounce, silver has less going into photographic, you've got less available for recycling from that sector. That really is very cold comfort.

So where are these changes coming from? They are coming from silver's unique properties as a biocide as well as superior conductivity of electricity current. The interesting thing is that there are many worries and woes in the world today; in fact, they are playing directly into the hands of silver. The metal seems to be in the right place at the right time. You take a look at it post-9/11, there are heightened security issues. World, particularly Western world, obesity is a major problem, as well as general healthcare issues. There is a drive to perfect cleaner sources of power and heating. There is a call for energy efficiencies and sources of cleaner water, and there is a general call to clean up the world as a whole. You look at these worries and you name them. Silver is there with a potential solution.

So let's take a quick look. What I'm going to do with these slides, I'm going to build up a projected demand in each sector. I'm going to build up a picture that will in the final slide give you a total of where we think the demand is coming from. Watch the left hand axis of all these charts in millions of ounces.

The first thing you have is on security and stock control. You have got silver used in what is called radio frequency identification tags. These are tiny little gizmos that are

taking over from bar codes. Apart from controlling stock of goods and the movement of those stocks, they are used now to track human beings.

The Chinese have just committed $6.0 billion to a massive programme to invest in these tags, not only in the ID for every single Chinese citizen, but also for the issuing annually of billions of transport tickets, to name a few of the applications in this huge programme.

China isn't the only country. You get a new passport from any of the EU countries today, you take a look, there's a little tag in it and all these contain a bit of silver.

We reckon that at current growth rates, these tags manufacture will exceed 30 billion units by 2020, up from approximately 7 billion units today. With the average loading of about 10 milligrams of silver per tag, this means more than 9 million ounces of silver committed, up from about 2.3 million ounces currently. Looking further beyond 2030, the use of these tags is likely to become universal, perhaps running into the hundreds of billions of units manufactured every year. So we're saying you're looking at minute amounts of silver going into each unit, but a huge amount of these units being manufactured.

Let's add to this another really big one. This is solar and mirrors. The solar panel industry recently has been showing exponential growth. With the drive to find clean sources of heat and energy, solar is without doubt in the running. Yes, we agree, the capital costs are still very high relative to traditional sources but the longer-term benefits are coming to the fore, and each crystalline silicon solar cell contains approximately 1.2 grams of silver per watt of energy. This sector, like all sectors, took a big hit in the recession, but since then, there have been announcements by the US, India and China to raise their respective solar energy capacity, and it seems to be lifting the market. This is where we are seeing this phenomenal growth. India has announced plans to increase its solar output to 20 gigawatts per annum by 2020 from virtually zero at the moment. The Chinese have announced plans to up capacity from 5.5 gigawatts to 30 gigawatts by 2020 and, in fact, the US has announced the same.

So global projections of solar generating capacity by 2020 are currently between 20 and 40 times that of today's 13 gigawatt capacity installed. We see some very optimistic forecasts saying that the solar power industry cold account for as much as 20% of global generation by 2050.

We can't offer an opinion about this, we think the jury is out. But what we have done is adopt a much more conservative approach to looking at the forecasts. We nevertheless do forecast that we're going to see an average compound growth rate of at least 15% per annum between 2010 and 2020, meaning that installed capacity in solar is going to quadruple at the very least.

This will require, after taking into account increasing market share of non-silver usage in solar, which there is, and the gradual improvement of silver loading efficiencies in these panels, we're looking at about 50 million ounces of silver per annum by 2020, up from currently about 18 million ounces. It is a big one.

Let's add to this another one. It's wood preservative. Plans to replace arsenic in wood preservatives have been afoot since 2004. This is not new. Back then, almost 10 years ago, the industry recognised in conjunction with the US Environmental Protection Agency, the need to phase out copper chromide arsenate (CCA). There were growing health concerns about the use of this product, because its primary constituents are chromium and arsenic. Silver is a leading contestant to offer a non-carcinogenic product, but one that still inhibits the growth of mold and fungi, and also kills termites that munch away at wooden constructions. This product has

already been ready for commercial roll-out for some time now, and it has been in for licensing with the US authorities. For some reason, the launch appears to be delayed and maybe Michael can talk more about that. We're watching this very closely. There is very little news forthcoming about this end use, and the market is incredibly tight-lipped about it. It's at the licensing stage and so no one really wants to talk about it. But if it's successful, it could be a really big market for silver, especially as regards to North America and Europe. In addition, we are also aware that there has been a lot of R&D work in trying to reduce the amount of silver that goes into this solution; the original solution took about 1% silver and there's been a lot of work done trying to get it to 0.5% or 0.1% silver in solution, with the same effectiveness as a wood preservative.

So our forecasts here for silver are extremely conservative. We have seen other people calling for at least 100 million ounces of silver into this sector annually, and as you can see from what we've done here – we've included it in yellow – we're a lot more conservative, but we are watching very closely to see what happens.

Let's move on to another thing. Wound care and the medical sector. This is another huge potential market. Obesity makes headlines every day. It's not pretty, and as people in the Western world tend to live on average for longer years, these populations are also getting fatter and, as a consequence, more sedentary. This is obviously a major problem throughout North America and increasingly throughout Europe. What is happening is the sedentary lifestyle of very obese people is causing chronic skin problems, which need to be treated on a long-term basis. Silver as a healing biocide is proving very effective for these band-aids and care products, but also for bandages over large surface skin area. Reports confirm that skin lesions of this nature heal much faster and cleaner under silver bandages. Of course, the application was very swiftly moved into the realm of not just the sedentary and the obese. If you go to your local pharmacy, you will find a range of silver-based healing products, which, in fact, are not that much more expensive than your traditional products.

Apart from wound care, silver is finding medical applications in a whole host of other equipment. It's astonishing. It's in catheters, pacemakers, heart valves, suture rings, feeding tubes, orthopaedic implants, even through to silver-impregnated surgical clothes and hospital bed linen. This sector is becoming a massive consumer of the metal and we think this is really going to begin coming into its own from about 2014 onwards.

While we're talking about things like silver-impregnated bed linen, you go automatically into the textile industry. Silver-impregnated textiles were originally introduced into the foot sector. Silver inhibits the bacteria that causes body odour generated by heat and sweat. Sorry to be so basic this morning, but you know, it's a fact of life. The benefits of this were soon introduced into the much wider leisure wear sector and consumer demand for these products has been enormous recently. So you can now get non smell-generating shoes, socks, insoles, boots, gloves, sleeping bags, back packs – you name it. More recently, the textile industry has been producing advanced fibres as thermal insulators, and therefore opening up a whole wide new potential market in commercial and domestic protective clothing, particularly in cooler climates.

Here again, our forecast for silver demand, which we show in this slide in green, in the textile industries is very conservative. We just don't know yet what the potential is, but the applications are there and they are starting to come through now.

If you take a look now at the figure, we are almost up to accumulatively 350 million ounces of silver per year, by the year 2020. The next one is food hygiene, which is becoming a very important consumer of the

metal. Again, silver is acting as a very effective biocide, through the slow release of silver ions supplied to the exposed surfaces. Silver coatings, as they control the spread of bacteria, are being applied not only to kitchen surfaces but also to vending machines, mass-market food production packaging units, and the technology is now being applied to the inside of food containers and storage. So, you've got it now in paper cardboard cartons, plastic and paper food wrappers, and even the inside of milk cartons. Again, the amount of silver going into each of these industrial products is absolutely minute – it's measured in microns on a surface area – but your potential surface area is absolutely enormous, and the mass roll-out of this sort of equipment in goods implies a good deal of silver every year destined into these sectors.

Finally, as part of the food hygiene, I have to refer to water purification. In a sense, it isn't a new one, but it has been used for a long time in the purification of drinking water as well as swimming pool water, particularly in the US. The market is big and there are millions of semi-portable water purifiers sold in the US annually, and what these things do is just remove the bacteria, the chlorine, the lead and the particulates to render it potable.

We have actually maintained that potable water in the right place at the right time is going to become probably one of the world's next big issues, and the global need for quality water in the right quantities is going to become an increasingly pressing concern. Could silver be better placed in this situation? No, it is ideally placed.

So there you have it, there's our demand coming through on our forecast with these end users. In fact, what I've done is left the best until last. The strongest argument for a better silver market and a stronger price is that these end users are set to pick up the demand slack left by the shrinking photographic industry. But unlike photography, these end users will not generate vast amounts of recycled metal. If you take a look at them, it's just impractical to try and recycle these things. Hospital waste is incinerated, it is not recycled. Wood preservative can't be scraped off the wood and recycled. The same applies for fibres and textiles. Clothes tend to be trashed and not recycled, and so on. So what we're saying is we've got smoke-stack industries evolving here, and this means that the metal is going to be taken off the market for good.

You superimpose this good news onto the tonnages that have gone into the ETFs and you can see from this slide the underlying strength of the market that is now being emoted, and why this is now justifying higher prices and prices that could be sustained.

This price chart is probably very familiar to all in this room. Yes, it took a cold shower during the financial crisis as all commodities did, but the important thing about this chart is how the silver price has subsequently recovered.

What is the upshot? What is VM Group saying about the whole silver supply/demand balance? We say it is showing structural improvement. Yes we still have a problem with mine supply, which is not price elastic, and there's still a lot of recycling – there's no doubt about that – but what we're seeing is a broad range of new end users coming in, which do not add to levels of recycling and they also begin to start looking like they are going to take large volumes of silver off the market. We expect, therefore, that the gold/silver price ratio is going to contract and narrow. Most importantly, we actually maintain that the higher silver prices that we're seeing are indeed sustainable in the long run.

Thank you.