2014/09/25

The Janssen Report

Silver Demand from Solar

Investment Idea

Solar power is about to become cheaper than conventional energy. This will lead to a dramatic increase in the production of solar panels. Since panels need traces of silver, the demand for silver will increase significantly. With little room for increasing the silver supply, the price of silver will skyrocket.

Reasoning

The following paragraphs are meant to answer whether the above idea makes sense or not.

A recent report (1) claims that solar is as cheap, or cheaper, than conventional energy sources. Such reports should always be taken with a grain of salt. It is better to look at actual investments in new power plants. If it is true that solar is as good as conventional energy *some places*, it will not necessarily be so other places. This depends on the local climate, the local price of natural gas, regulations, taxes, subsidies, and so forth. But if it is the case that solar rapidly declines in price, and that it all ready is competitive some places, we shall expect to see an increase in new installations as more locations turn economical.

The number of installations has indeed increased (2). The increase is almost exponential, except for a decline from 2011 to 2012. This is explained by a decline in Europe. All other regions have had an accelerating increase – especially in recent years. Europe's decline is caused by reduced subsidies. Increase in all other regions can be explained by solar increasingly being the economic choice.

The cost of production has declined rapidly (3). It is likely that the technology will continue to improve in years to come, which means that the cost will decline further unless raw materials go up in price or the production capacity is limited. If the latter is the case, the producers will be able to cheaply manufacture panels that will be sold dearly. They'll control a bottle neck and make a fortune. If production, however, can be up-scaled, panels will be sold close to the production cost. Only the best manufacturers will thrive. As the price of solar drops, demand increases, and a shortage of silver may develop. May silver become the bottle neck, which means that solar producers will bid up the price of silver to such a high level that the cost of silver make panels more expensive, which in turn sets the market equilibrium?

Let's first discuss whether production capacity is limited. It probably is so only in the very short term. Producers are increasing their capacities and should be able to continue doing so. There are plenty of producers worldwide, so it is unlikely that these ever will collude on keeping capacity down, If you invest in producers you'd be aware that all of them may make good profits *for a short while* but only the best will survive in the long run.

A shortage of silver is likely a bottle neck unless producers find a way to discontinue its use. Silver Institute claims that 90% of photovoltaic solar cells use silver paste (4). Since some panels don't use

silver at all, it is obvious that its use could be totally eliminated. The reason it hasn't been all ready is the economic tradeoff. Silver is expensive, hence its use is kept at a minimum, but it also increases the efficiency of the panels. It is likely that the silver use per panel will drop as technology improves, but this also make silver more likely to be used even when the price is higher. For example, if the production of panels go up tenfold and the use of silver per panel drops to one fifth, the total use of silver will double. If the price of silver doubles, the cost of silver per panel will be less than half of what it is now.

About a billion ounces of silver is produced every year (5). 800 million ounces come from mines and the rest from recycling. The global mine production (6) has increased by 38% from 2003 to 2013. Last year it increased by 2%. It is likely that the silver production continues to increase, but only slightly. Seventy percent of mined silver is a by-product of lead, zinc, copper or gold (7). The amount of mined silver is therefore relatively unaffected by the price of silver.

About 600 million ounces are consumed by industry annually (8). Photographic demand has declined from 180 million ounces a decade ago to 50 million ounces now. It should continue to decline, but in absolute terms it will be less as the level is all ready low. Demand for silver coins and bullion has increased from about 50 million ounces to 250 million ounces.

A potential supply is selling from investors. However, governments do not have large holdings anymore and coins are unlikely to be melted down. The impacts to look for are changes in the coin demand, and selling or buying from ETFs. In any case, silver should be thought of a as a market with 100-200 million ounces (two to four billion dollars) of available supply every year. The rest is certain to be absorbed by industries, for jewelry and for coins.

For this reason even a slight increase in demand from solar can potentially make a huge impact on the price. The current use is about 100 million ounces. If the solar sector quadruples, there simply won't be enough silver around. The way the market works is that the price then skyrockets, which forces producers to use less or switch to other metals.

Conclusion

The investment idea makes sense. With exponential increase in solar installations the shortage should occur within few years. It will press up the price of silver, either slightly as industry finds alternatives or dramatically as silver becomes the bottle neck in the solar revolution.

Sources

1 http://www.greentechmedia.com/articles/read/5-more-charts-that-prove-wind-and-solar-just-keep-getting-cheaper
2 http://cleantechnica.com/2014/04/13/world-solar-power-capacity-increased-35-2013-charts/
3 http://solarcellcentral.com/cost_page.html
4 https://www.silverinstitute.org/site/silver-in-technology/silver-in-green/solar-energy/
5 https://www.silverinstitute.org/site/supply-demand/silver-supply/
6 http://minerals.usgs.gov/minerals/pubs/commodity/silver/
7 http://www.silverusersassociation.org/silver/mining.shtml
8 https://www.silverinstitute.org/site/supply-demand/silver-demand/