

SUMMARY OF MASTER'S DISSERTATION

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<p>Title</p> <p style="text-align: center;">Estimation on Sustainability for Copper Domestic Supply by Considering Recycling Flow</p>			
<p>Abstract</p> <p>Coppers have been used for many products in our life due to its abundant supply and high performance in electric conductivity and thermal conductivity. However, copper supply shortage is potentially estimated in addition to rate metal shortfall due to the increasing demand today and in the future. It is true that copper is generally supplied from scrap metals but little assessment has been made for copper resource sustainability considering the recycle flow in the future.</p> <p>The purpose of this paper is to estimate and assess a future state of domestic copper demand and supply in industries of automobile, electric appliance and construction from a viewpoint of sustainability toward 2030 by dynamic material flow model.</p> <p>The simulation result illustrates that copper stocks in the market in 2030 is estimated to be 4 million tons and it reproduces 100,000 tons of recycled copper resources again to the market. Furthermore, copper demand in 2030 is expected to increase 1.5 times to 2008 and it will causes drastic shortage of copper resources as much as 61,000 tons in 2030 if there is no change in domestic copper supply. The shortage is likely to cause difficulty for producing 2 million clean energy vehicles. The result also shows that housing industry become a source of copper supply while automobile industry greatly suffer from the shortage in the future according to the category-based analysis,</p> <p>In addition, the author found that the shortage of copper resources decrease as much as 40,000 tons even considering improvement of the recycle systems or developing alternative technologies, and this result evidence that it is important to promote recycling and develop alternative technologies abreast.</p> <p>Therefore, the author believes that the proposed simulation model enables to design a social system considering resource circulation by conducting sustainability assessment in any other industries and products. The simulation can be improved by disclosure of detailed information on copper usage and disposal distribution per product.</p>			