integer insight beyond numbers

Downstream Demand for Copper and Substitution in 2011-2013: A Perspective from the Wire & Cable Industry

International Copper Study Group Meeting
Lisbon, Portugal, 26 April 2012

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Presentation Structure

- **Introduction**
- Global Wire & Cable industry
- How this links to refined copper demand – a review of India
- Globalisation and manufacturing clusters – review of China and Eastern Europe
- Substitution threats to copper
- Conclusions – questions & answer session

Integer Research Ltd – London office

- Founded in 2002
- We track range of industries, from cable, power systems, metals, mining, through chemicals and emissions
- We have 40 staff in London
- Team in Detroit, USA since 2009. We opened up offices in Beijing and Tokyo in 2011.
- More than 95% of our business comes from outside the UK

Substitution threats – discussion points

- Wide regional variations in usage of aluminium, copper.
- Historically, aluminium has been widely used where there has been either strong state control – India, former Eastern communist (ex-China), or market development work (Reynolds, Alcoa, Alcan) in North America in the 1960s and 1970s, aluminium has been widely used
- The high water mark has been aluminium use in building wire in India, USA and former eastern
- Exceptions have been China and the Middle East, where aluminium could take major market share in utility power cable. Both regions reluctant to shift, due to inertia, despite the disparity in price of copper and aluminium.
- Now seeing Middle East cable companies installing aluminium stranding machines.
- In Europe, major trend to start using aluminium drawing and stranding machines in the automotive wire sector. Leading companies like Leoni already developing new generation of thin wall aluminium cables for High voltage electrical systems in Electric Vehicles for weight saving.

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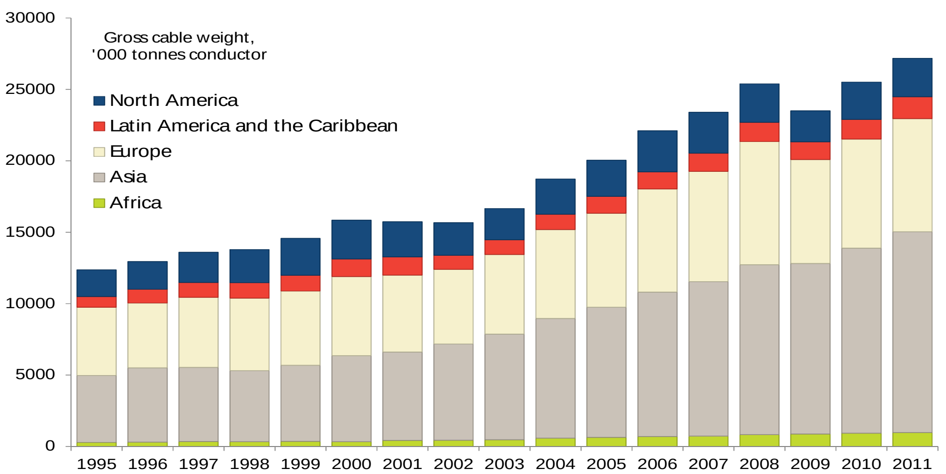
China cable sector has shown once in a generation increase, outstripping all other leading economies



Data: Integer Research Ltd, Chinese national statistics, IEEMA, Eurostar, US Bureau of Census

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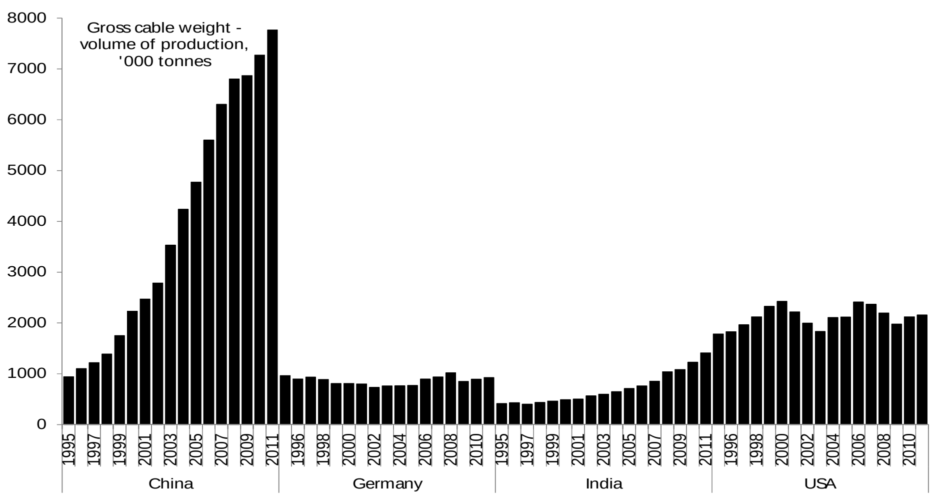

Data: Integer Research Ltd, Chinese national statistics, IEEMA, Eurostar, US Bureau of Census

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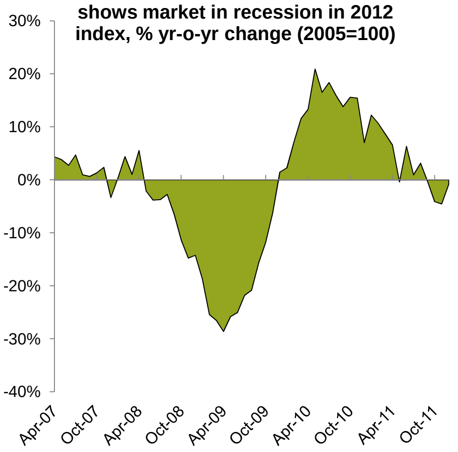
Recent trends show that European demand for copper rod likely to suffer, as Spain, UK and Greece fall sharply in 2012

Eurostat - European wire & cable production, year-on-year change through Q1 2012

Germany	6.8%
France	1.4%
Italy	-9.8%
Spain	-18.0%
Greece	-57.4%
Turkey	5.9%
EU-27	-0.9%

Eurostat EU-27 cable production data shows market in recession in 2012 index, % yr-o-yr change (2005=100)



Data: Integer Research Ltd, Eurostat

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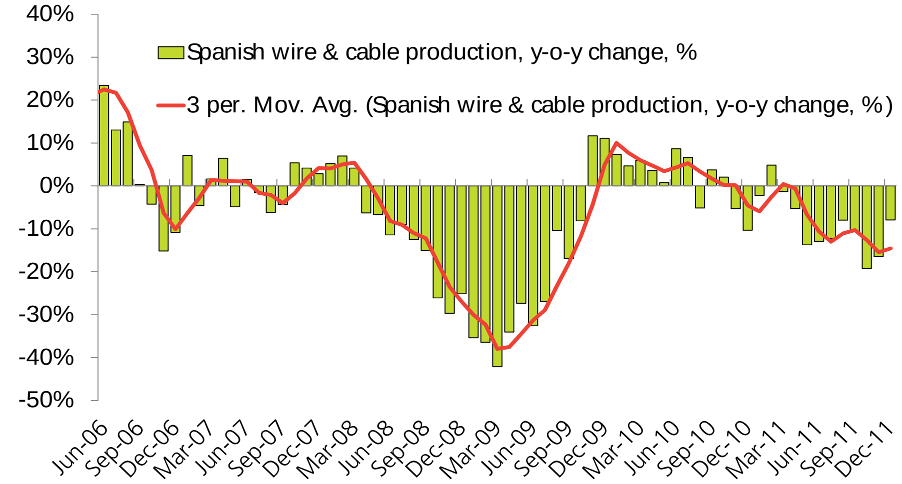
Weak Spanish cable production may mean consolidation of the cable makers, and the suppliers of copper rod and wire beyond 2013



Data: Integer Research Ltd, Eurostat

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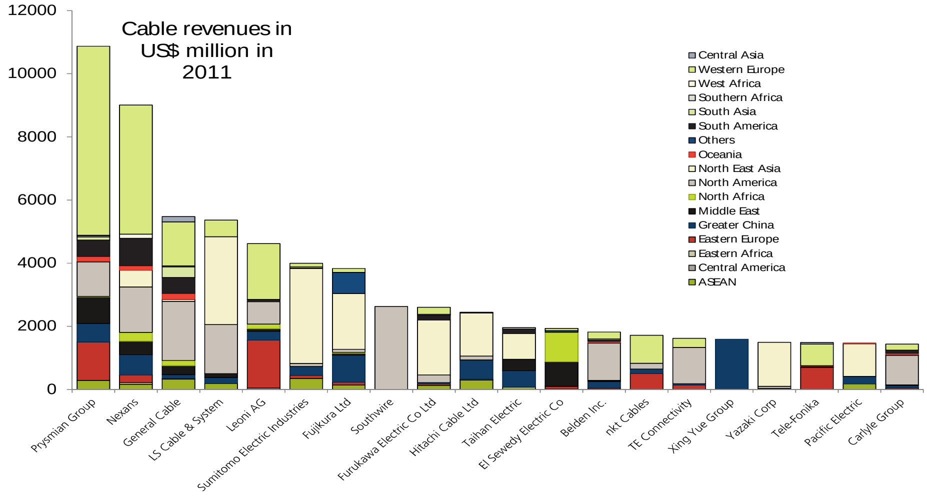
Integer tracks the leading 3000 cable companies globally and where they make cable, and also sell it



Data: Integer Research Ltd, Company Accounts, Bloomberg, Factiva, MINT

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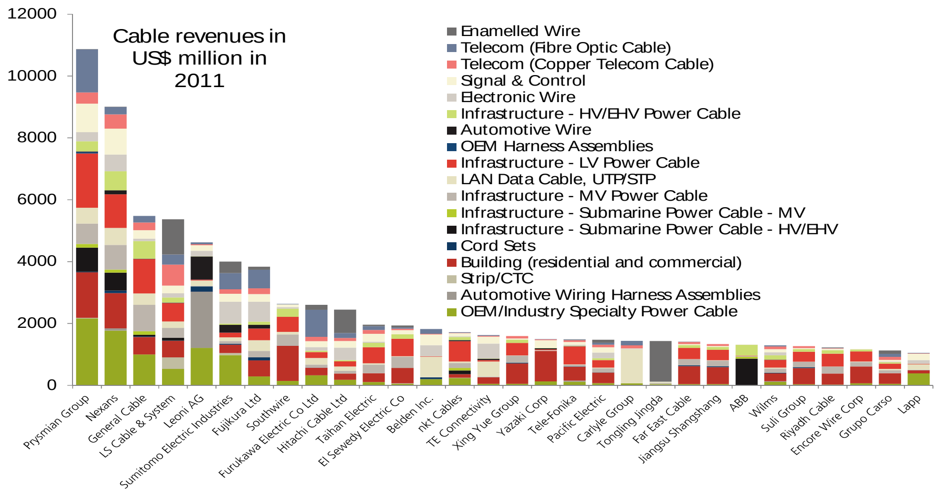
We also track in detail what they make at each plant, and where they sell it, helping us with our investment projects



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India has a well defined formal sector, but a number of Indian companies operate Chinese upward casters that make defining the market difficult

Copper Wirerod Production

India

'000 tonnes	2003	2004	2005	2006	2007	2008	2009
Sterlite Industries	95.0	117.0	124.7	149.8	228.1	221.1	202.6
Finolex Cables	16.8	17.8	18.2	17.1	24.9	32.6	35.3
Hindalco Industries	87.8	89.1	88.6	103.9	118.9	139.7	146.8
Hindustan Copper	28.6	27.6	32.9	41.5	54.5	53.4	44.4
Metdist Industries	15.0	18.8	20.0	16.3	15.0	15.0	15.0
Alchemist Metals (TDT)	9.8	6.5	6.0	1.5	0.0	0.0	3.8
Master Alloys	10.0	13.8	15.0	11.3	10.0	10.0	10.0
Hot Rolling	46.3	45.0	45.0	33.8	30.0	20.3	16.3
Upward casting	30.8	31.8	32.4	32.9	33.8	34.8	36.9
Total	**339.8**	**367.2**	**382.7**	**407.9**	**515.1**	**526.8**	**511.0**
Balance Item/Stock	*4.4*	*6.7*	*4.2*	*1.7*	*0.1*	*0.7*	*-0.1*
Wirerod Imports	9.5	19.1	32.2	25.2	25.8	28.3	34.6
Wirerod Exports	-28.0	-38.4	-86.8	-103.4	-106.8	-81.2	-35.2
Wirerod Consumption	**321.4**	**347.9**	**328.1**	**329.7**	**434.0**	**473.9**	**510.5**
Cathode production	375.0	399.0	477.0	614.0	713.6	669.2	680.6
- non wirerod usage	-18.8	-20.0	-23.9	-30.7	-35.7	-33.5	-34.0
Fire refined production	19.0	19.0	15.0	15.0	15.0	15.0	15.0
- non wirerod usage	-9.5	-9.5	-7.5	-7.5	-7.5	-7.5	-7.5
+ Cathode Imports	16.0	38.9	36.8	13.8	10.2	12.7	12.7
- Cathode Exports	-92.3	-111.0	-149.0	-236.4	-214.7	-169.9	-185.7
+ Scrap infeed	46.0	44.0	30.0	38.0	34.0	40.0	30.0
Wirerod Production	**335.4**	**360.5**	**378.5**	**406.1**	**515.0**	**526.1**	**511.1**

Data: Integer Research Ltd, Company Accounts, Bloomberg, Industry Sources

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We then compare the "top down" numbers, with what we see in real consumption

Country	Year		
India	2009		
Copper Wirerod ('000 tonnes)		Wirerod Diameter	
	Total	8mm	>8mm
Wirerod Production	511.0	488.0	23.0
- Wirerod Scrap in wirerod production	-5.1	-4.9	-0.2
+ Inventory decrease / (increase)	0.0	0.0	0.0
Wirerod Sales (internal or external)	505.9	483.1	22.8
+ Wirerod Imports	34.6	32.4	2.2
- Wirerod Exports	-35.2	-33.4	-1.8
Wirerod Consumption	505.3	482.1	23.3
+ Inventory decrease / (increase)	0.0	0.0	0.0
- Scrap (in wire & strip production)	-11.0	-9.6	-1.4
Bare Wire & Strip Production	494.3	472.4	21.9
Bare Round Wire	444.1	444.1	0.0
Bare Strip / Shapes	50.2	28.3	21.9

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Which helps our clients work out if there really is a “capacity gap”, to justify an investment

Wire & Cable ('000 tonnes)	Total Copper	Single Wire	Bunched or Stranded Conductors			single	bought	
			Total	In-house	Bought	of cons	of bunch / strand	
Wire Consumption - Insulated Wire & Cable	332.5	83.1	249.4	236.9	12.5	25%	5%	
Wire Consumption - Bare Strand	1.0	0.0	1.0	0.0	1.0	0%	100%	
Wire Consumption - Winding Wire	108.1	108.1	0.0	0.0	0.0	100%		
Scrap in stranding & insulating	-17.3	-4.8	-12.5	-11.8	-0.7			
+ Inventory decrease / (increase)	0.0	0.0	0.0	0.0	0.0			
Copper Content of Wire & Cable Production	424.2	186.4	237.8	225.0	12.8			
Scrap in stranding & insulating		2.5%	5.0%					% of production

Copper Strip & Shapes ('000 tonnes)	Total Copper	Winding Strip			Earthing Strip	Small Busbar	Other Strip & Shapes	CTC
		Total	Single	CTC				% of Winding Strip
% of total Strip & Shapes		79.0%			9.0%	3.0%	9.0%	
Bare Strip / Shapes Production	50.2	39.7	25.8	13.9	4.5	1.5	4.5	*35%*
+ Bare Strip / Shapes Imports	0.7	0.7	0.6	0.1	0.0	0.0	0.0	*10%*
- Bare Strip / Shapes Exports	-0.7	-0.4	-0.3	0.0	-0.2	-0.1	0.0	*10%*
Scrap in processing	-3.0	-2.7	-1.3	-1.4	-0.1	0.0	-0.1	
+ Inventory decrease / (increase)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Copper Content of Strip / Shapes Consumption	47.3	37.3	24.8	12.5	4.2	1.4	4.4	

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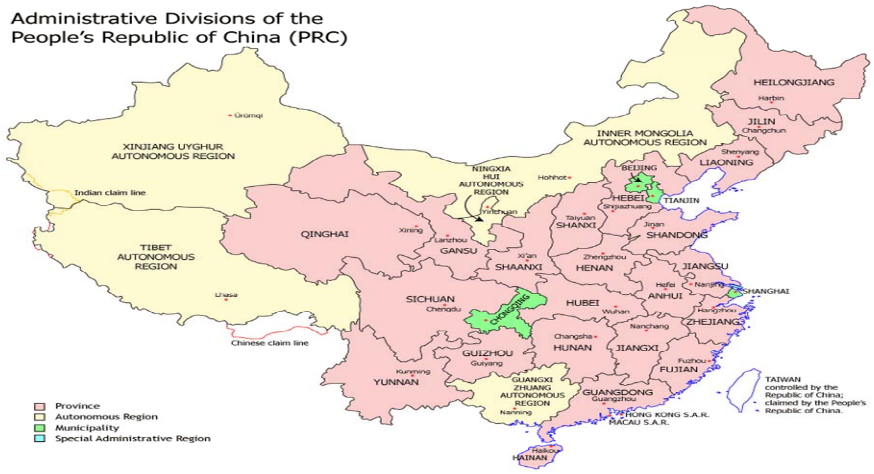
What has driven copper rod demand in China from the cable sector? We will look at the Consumer Electronics sector as an example



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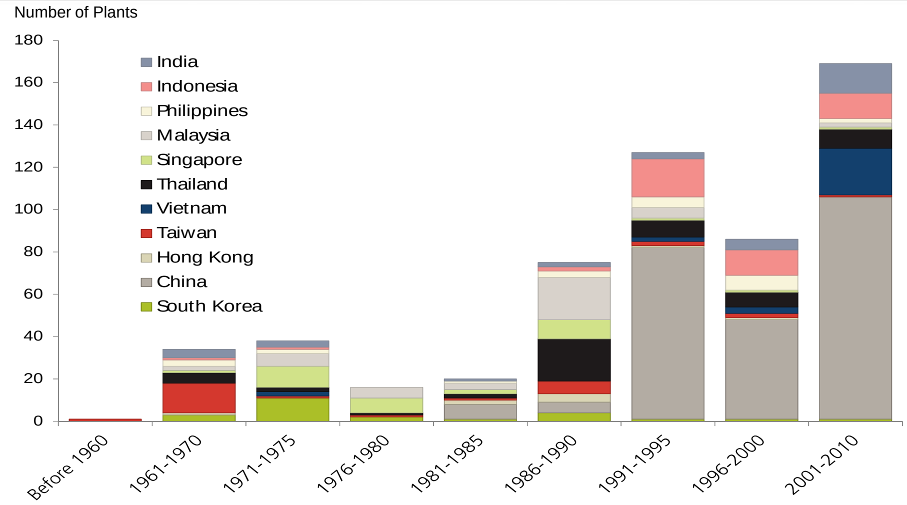
We can look at Japanese set maker investment in China – part of globalisation



Data: Integer, in part taken in part from paper by Toomo Marukawa – Investments in East Asia

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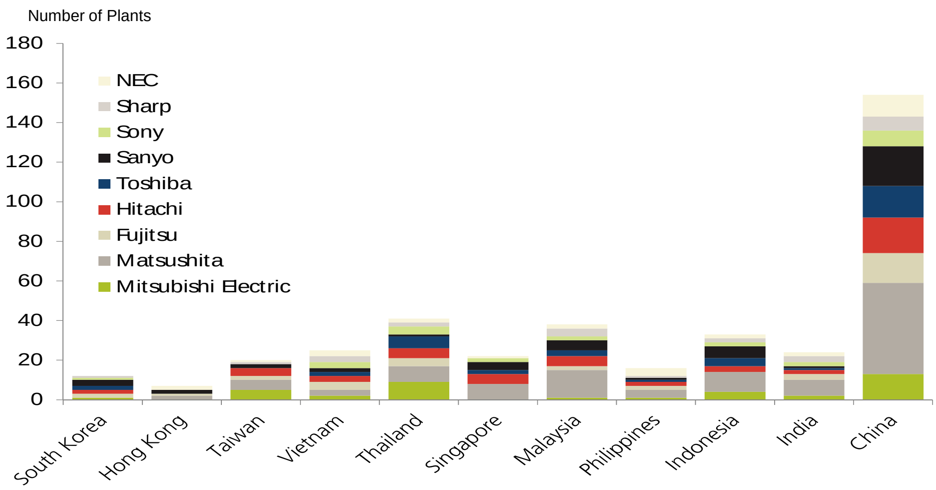
Japanese Set Maker investment by company in Asia – which drives electronic wire demand



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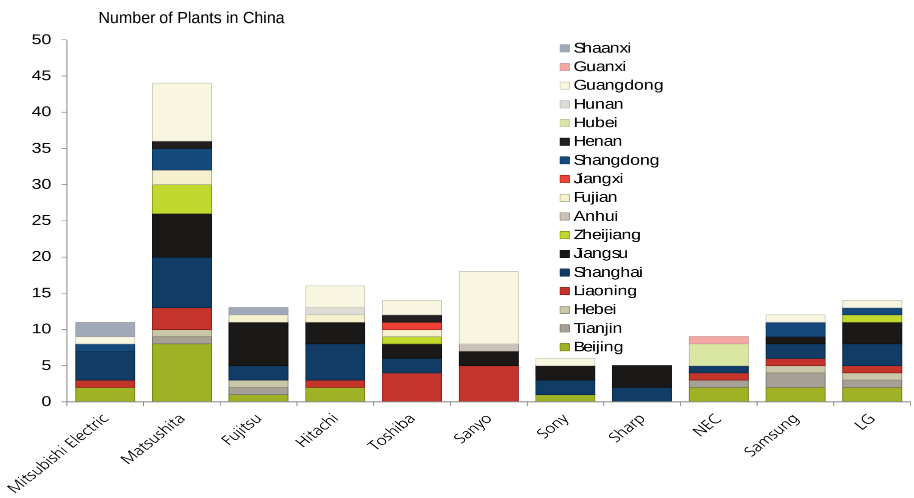
Set maker investment by province in China, 1960-2010



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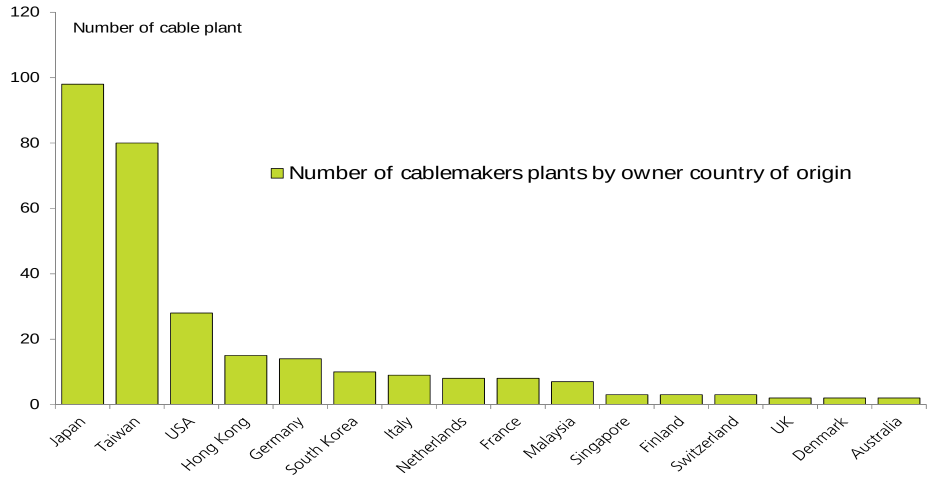
Japan and Taiwanese cable makers have dominated inward investment in China



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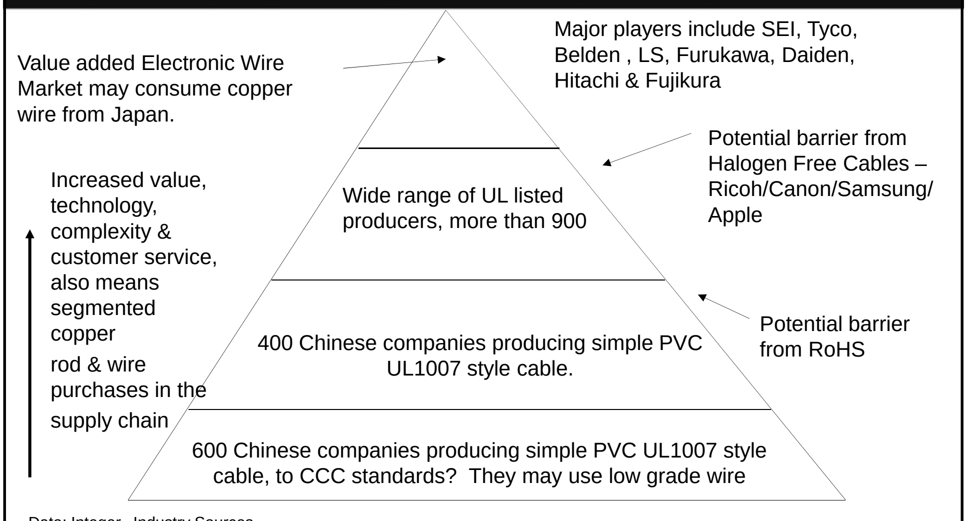
Structure of the Electronic wire market in China



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Renewables driving demand for a range of transformers and switchgear – potentially some of this will be aluminium

Data: Integer, ASTA/Metrod

Key Comments

- A range of shaped products are used in transformers.
- There are a limited number of producers of flat strip globally, which is then consumed by transformer producers worldwide.
- There are a limited number of producers of high voltage, power transformers, although there has been a large increase in production in China in the last decade.
- Renewables will drive utility fixed investment in a range of products, such as switchgear, transformers, power cable, aluminium overhead conductors, and range of low cost HVDC power interconnect cables.

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