



Overview of the world nickel market

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International Nickel Study Group

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International Nickel Study Group

- Autonomous International Governmental Organization
- Co-located in Lisbon, Portugal with
International Lead & Zinc Study Group and
International Copper Study Group
- Enhance market transparency in the world nickel market
- Forum for discussions on nickel matters



INSG Member Countries

 Australia

 Brazil

 Cuba

 European Union

 Finland

 France

 Germany

 Greece

 Italy

 Japan

 Norway

 Portugal

 Russian
Federation

 Sweden

 United
Kingdom



INSG Publications

International Nickel Study Group



World Nickel Statistics – Monthly Bulletin

- The INSG Monthly Statistical Bulletin is generally recognised as providing the foundation for most of the analytical work undertaken on nickel by companies around the world
- Comprehensive and unique data gathered from INSG's extensive network of sources worldwide
- Contains monthly data by country on nickel mine production, primary nickel production, primary nickel usage, prices and stocks
- Includes detailed monthly trade data by country, by partner country and by HS code
- The one-year subscription (12 monthly bulletins) comprises 1 Yearbook (usually published in November) with annual data.
- It is complemented by an Online Statistical Database, where data can be visualized on screen or downloaded in excel-format
- The Monthly Bulletin is distributed by email in pdf-format and excel-format (only the summary tables)
- Price unchanged since 2006

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World Directory of Nickel Production Facilities



2017 Edition - Available Now

- A principal source of information on current and new developments in the nickel industry for 20 years
- Comprehensive and unique data gathered from INSG's extensive network of sources worldwide
- The World Directory with flowcharts has over 200 pages and includes:
 - 230 contact details in 40 countries
 - 187 nickel mines in 30 countries
 - 122 nickel smelters and refineries in 32 countries
 - New nickel industry developments:
 - 35 committed developments in 16 countries
 - 24 likely project developments in 10 countries
 - 110 potential project developments in 20 countries
 - Plus 25 NPI likely / potential project developments in Indonesia
 - 30 closures in 10 countries
 - 51 flowcharts
- Contains Summary Tables for World production and capacity, new nickel industry developments - committed developments, likely project developments and potential project developments – and industry flowcharts
- Price unchanged since 2006

Report on the Use of Nickel in Batteries



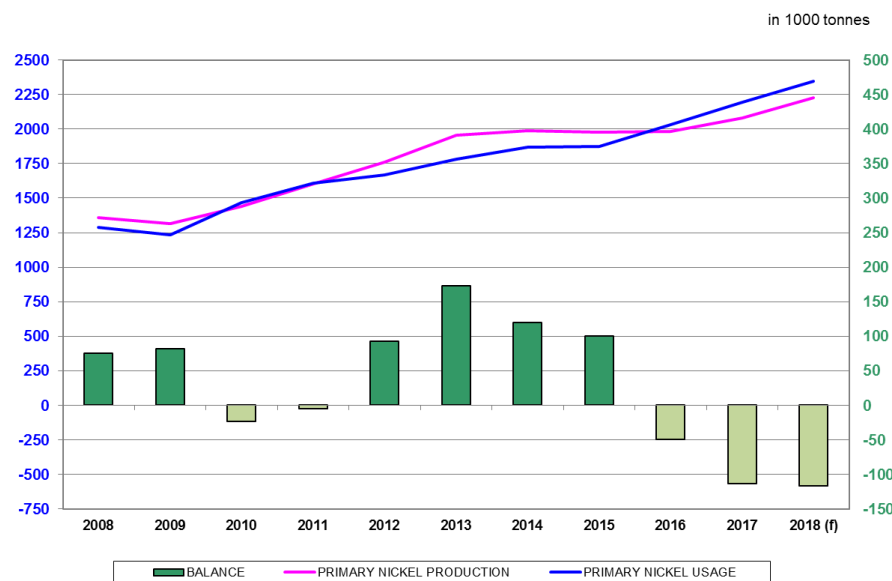
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Beijing Antaike Information Co., Ltd. was commissioned to produce this report by
International Nickel Study Group
April 2018

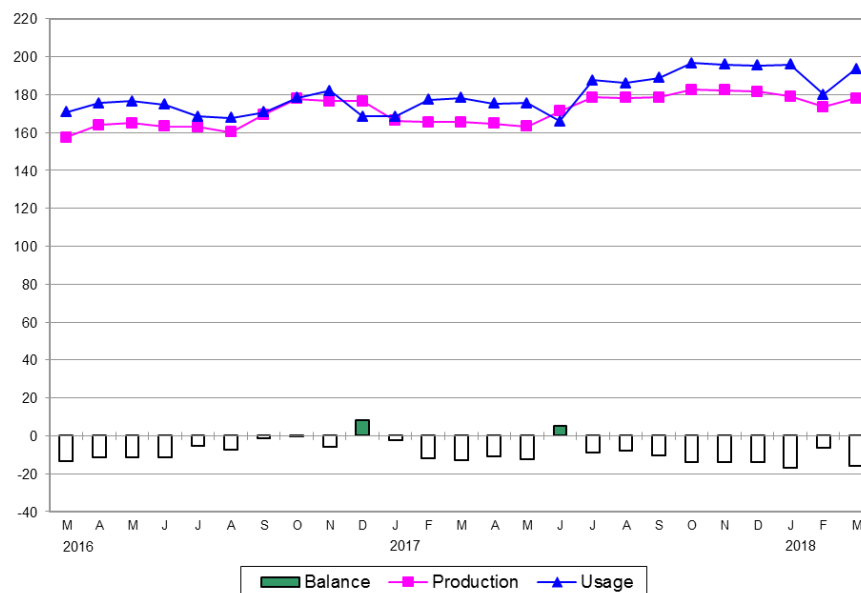
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The nickel market was in deficit in 2017 and is expected to remain in deficit in 2018

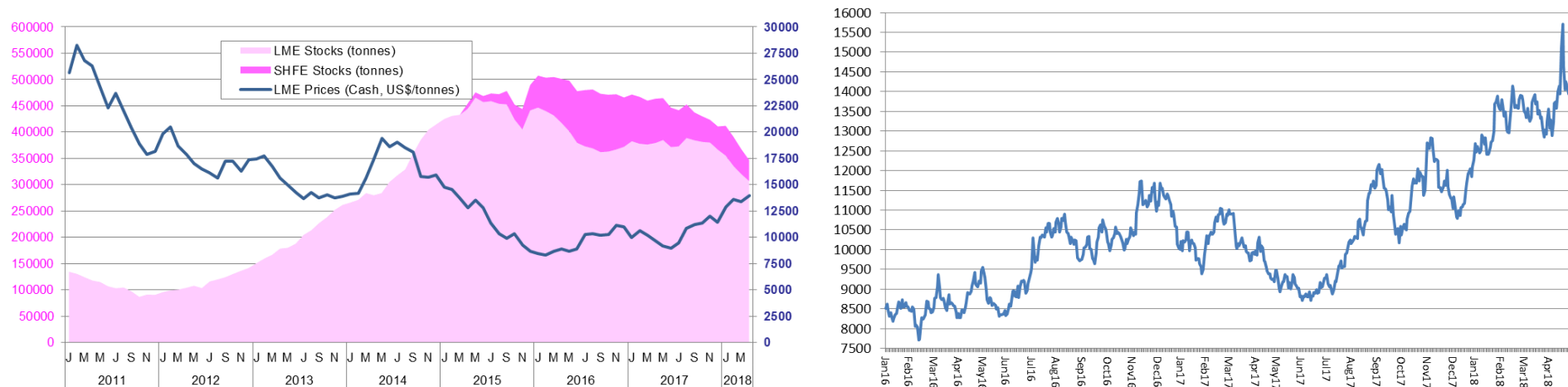


(f) forecast October 2017





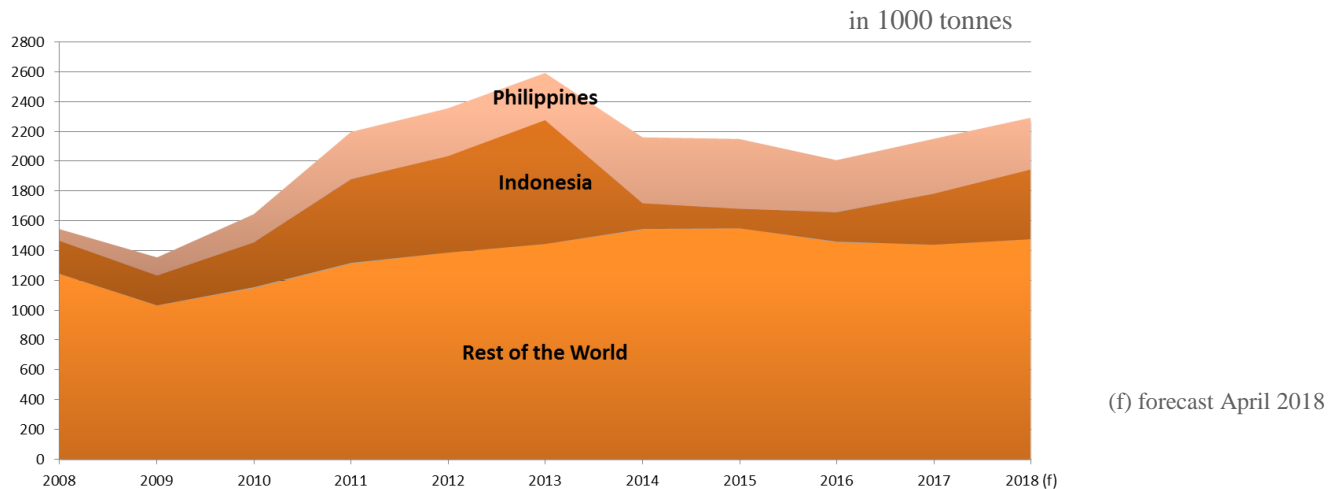
Prices have been increasing and stocks declining



- LME nickel price was 12,260 US\$/t at the end of 2017, representing a 22.5% increase.
- Prices averaged almost 14,000 US\$/t in April 2018, supported by firm usage (consumption) growth prospects.
- Combined LME and SHFE end-month stocks have been declining for almost 2 years. From 500kt, stocks were just below 350kt at the end of April 2018.



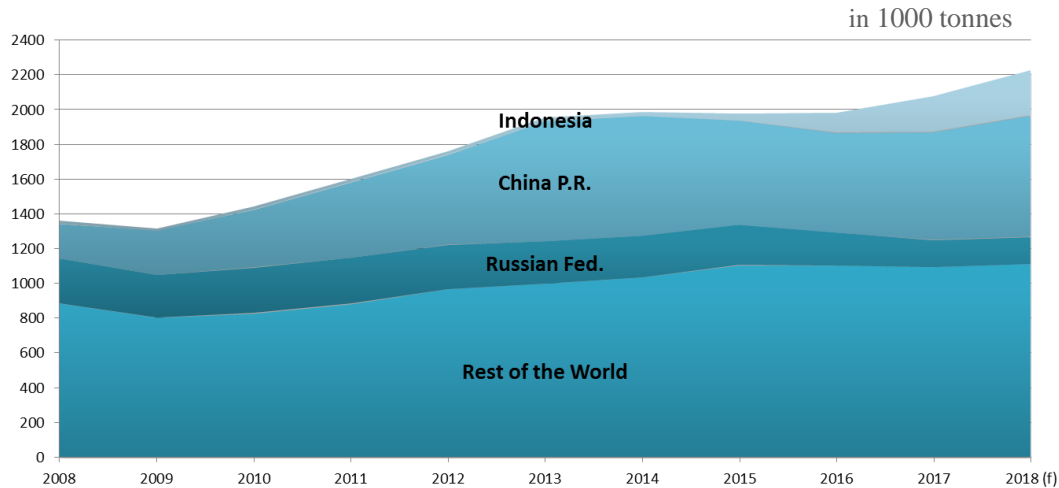
World nickel mine production has followed the developments in Indonesia and in the Philippines



- **World nickel mine production** decreased from 2013 to 2016, but increases in 2017 (+7.5%) and is expected to increase 2018 (+6.7%).
- In 2013, Indonesia and the Philippines produced 44%, but Indonesian production collapsed because of the export ban on unprocessed material.
- Indonesia increased mine production in 2017 and should continue to increase in 2018. The Philippines is revising their mining policy.



China P. R. has become the top primary nickel producer, but some new production will come from Indonesia

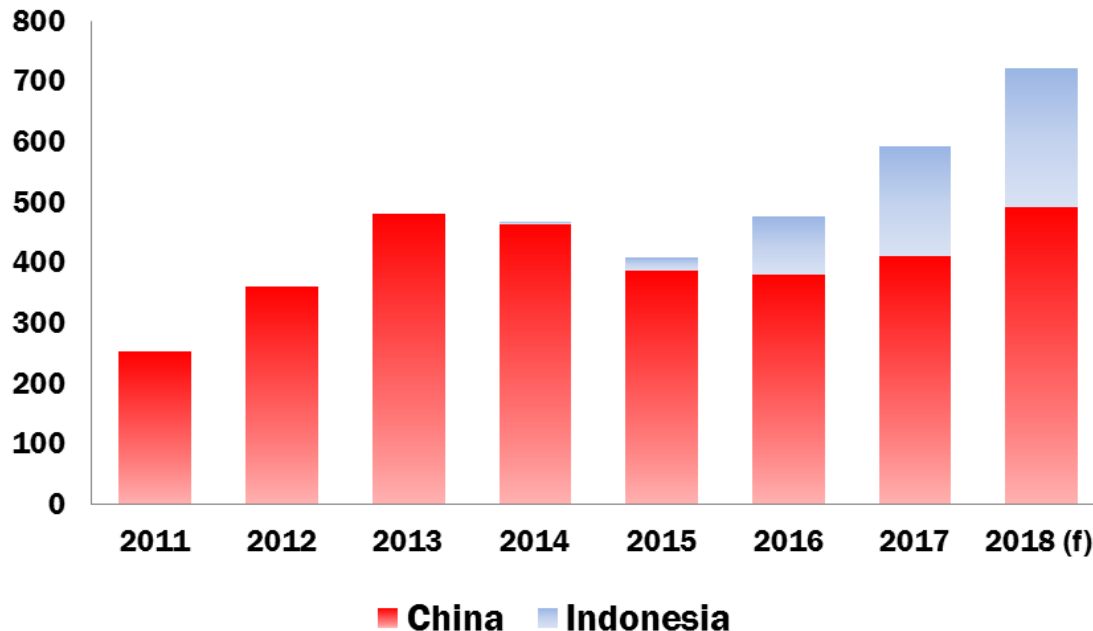


- **World primary nickel production** increased since 2009. In 2017 increased +4.4% and in 2018 is expected further +7.3%.
- Chinese production and now Chinese projects in Indonesia have been driving the market.
- The World ex-China has had very little growth for more than a decade.



NPI Production in China and Indonesia will increase

in 1000 tonnes



Sources: INSG, Antaike, *et al.*

Indonesia:

- new projects are ramping up

China:

- NPI output has not decreased as anticipated and may increase to ~500kt
- Possible less feed from the Philippines but more from Indonesia (so far, export quotas of 32 million tons have been approved + more requests)



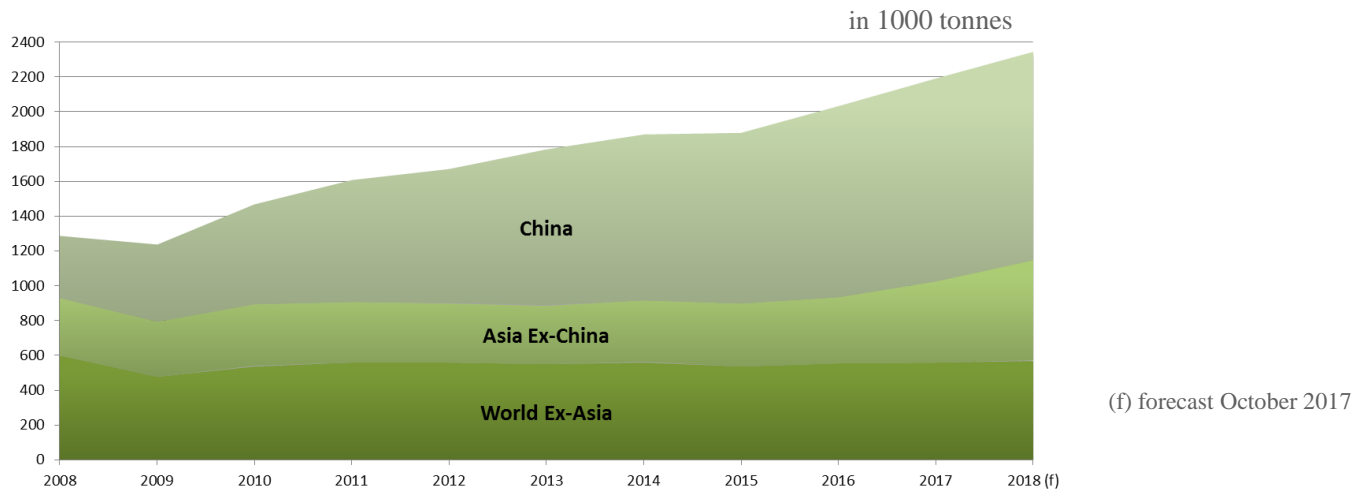
The nickel industry has been adjusting over the last few years

Regions	Countries (companies)
Africa	Botswana (BCL closed); Zimbabwe (ASA/Bindura closed/refurbishment; RioZim/Empress closed/reopen with partner?); several projects on hold
Americas	Canada (Vale mines closed), Brazil (Votorantim closed; but Horizonte Araguaia new project), Venezuela (Loma closed/reopen?), Dominican Rep. (Falcondo closed/sold/reopened), Cuba (production cuts)
Asia	Vietnam (AMR Ban Phuc closed), India (import tax reductions), Indonesia, Japan (Sumitono batteries), Philippines, China P. R.
Europe	Finland (Talvivaara/Terrafame restructure), France (Eramet – feed from Boliden), Russian Fed. (Norilsk restructure; Ufaleynickel closed), Spain (mine closed), FYRO Macedonia (FeNi closed/sold/reopen?)
Oceania	Australia (QNI Yabulu closed; several junior mines closed; BHP sulphate), New Caledonia (export permits; VNC sell?), Solomon Is. (Axiom new project)

and more



China P. R. has been the engine of world primary nickel usage growth



- **World nickel usage** increased since 2009. In 2017 increased +7.8% and in 2018 is expected to increase +7% supported by the SS production and also with some additional demand from the battery sector.
- The World ex-China had virtually no growth for a long period of time.
- The stainless steel sector is the most important first-use market for nickel (~70%), but batteries have the potential to make a structural change in the nickel industry in the coming years.



Stainless and Alloys represent ~85% of the world nickel first-use



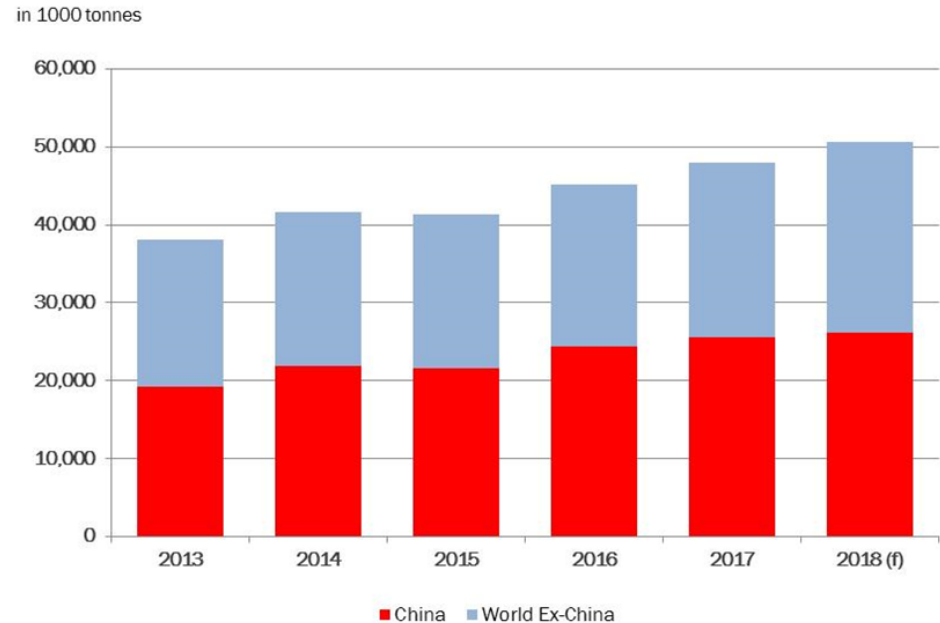
Stainless Steel
~70%



Other
~5%



Nickel Alloys
~15%



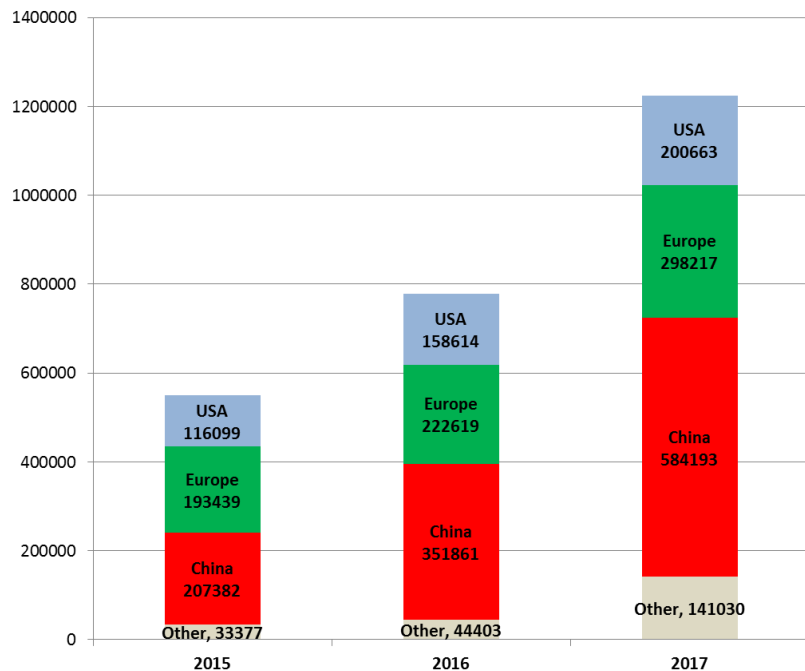
Source: ISSF, INSG

- World SS production is expanding since 2016. In 2017, grew +5.8% and is expected to continue to grow at around 5% in 2018.
- Strong growth of 300-series, especially in China.
- Indonesia became a producer and other Asian producers are already feeling more competition.
- US trade tariffs may have an impact on SS production and trade.

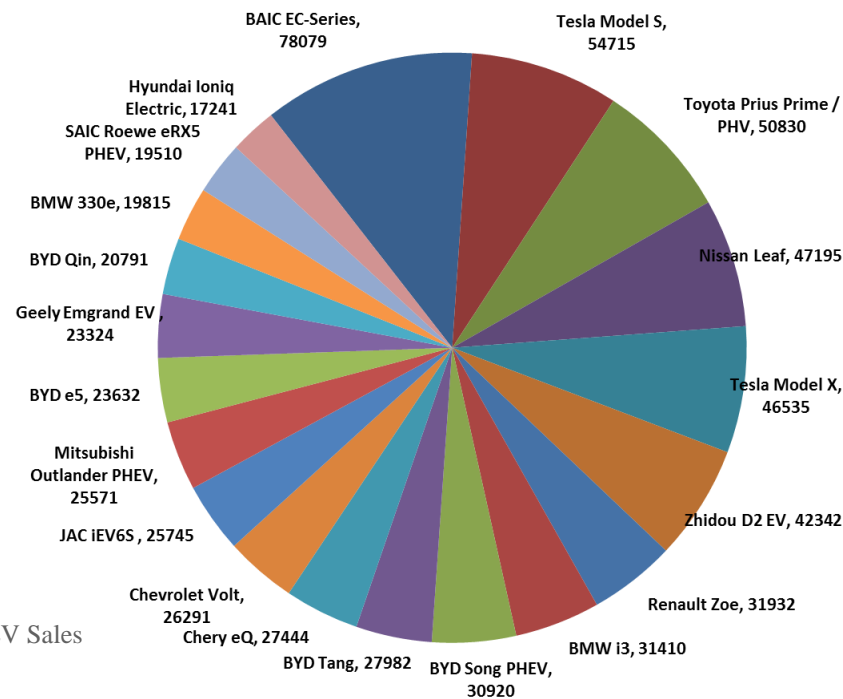


Electric vehicles sales are accelerating worldwide

EV world sales



EV world sales – Top 20 in 2017



Source: EV Sales

- Electric vehicles (EV's) sales have increased 72% in 2015, 41% in 2016 and 57% in 2017.
- More than 300,000 EV's sold in the world in 2018Q1 (+66.6%)
- Almost 200,000 EV's sold in China from Jan to Apr 2018 (more than doubled).



Challenges and opportunities for the nickel industry

- Decreasing ore grades
- Profitability – prices vs costs
- Batteries – “new” market, transitional?
- Dependence on other raw materials (chromium, cobalt)
- Substitution – scrap, non-nickel SS, other metals or plastics
- Political decisions (e.g. export ban and quotas in Indonesia, mining policy in the Philippines)
- Trade restrictions (e.g. USA)
- Environmental issues
- Technological, transportation, energy, human resources, etc.



International Nickel Study Group

Next INSG Meetings

Location: Lisbon, Portugal

1-3 October 2018





INTERNATIONAL NICKEL STUDY GROUP

**Many thanks for your
kind attention!**

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