

# IR Business Briefing Magnet wire business

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## Forward-Looking Statements

Projections of future sales and earnings in these materials are “forward-looking statements.”

Management offers these projections in good faith and on the basis of information presently available.

Information in these statements reflects assumptions about such variables as economic trends and currency exchange rates.

Forward-looking statements incorporate known and unknown risks as well as other uncertainties that include, but are not limited to, the following items.

- Economic trends in the U.S., Europe, Japan and elsewhere in Asia, particularly with regard to consumer spending and corporate expenditures.
- Changes in exchange rates of the U.S. dollar, euro, and Asian currencies.
- The Furukawa Electric Group’s ability to respond to rapid advances in technology.
- Changes in assumptions involving financial and managerial matters and the operating environment.
- Current and future trade restrictions and related matters in foreign countries.
- Changes in the market value of securities held by the Furukawa Electric Group.

Due to the above factors, actual sales, earnings, and other operating results may differ significantly from Looking Statements in these materials. In addition, following the release of these materials, Furukawa Electric Group assumes no obligation to announce any revisions to forward-looking statement in these materials

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# What is winding wire (British English) / magnet wire (American English)

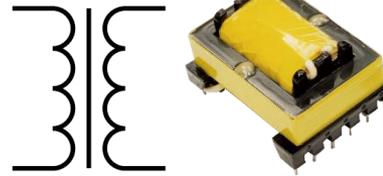
## As a component

Coil, antenna



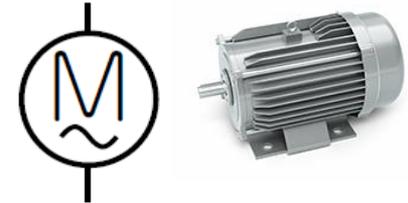
- As an inductor
- Electrical signal  $\leftrightarrow$  Electromagnetic signal

Transformer



- High voltage  $\leftrightarrow$  Low voltage

Motor / generator



- Electrical energy  $\leftrightarrow$  Mechanical energy

## As a product

$\phi$  0.008

$\phi$  3.2

$\phi$  0.010

時計  
Watch



ステッピングモータ用  
Stepper motor

$\phi$  0.35 ~ 0.5

IH 炊飯器  
IH rice cooker



コイルヒータ  
Heater coil

$\phi$  0.6 ~ 1.5

冷蔵庫  
Refrigerator



コンプレッサモータ  
Compressor motor

$\phi$  1.0 ~ 1.5

エアコン  
Air conditioner



$\phi$  2.0

自動車  
Automobile

HV 車  
Hybrid vehicle



オルタネータ  
Alternator

モータジェネレータ  
Motor generator

$\phi$  0.050 ~ 0.1

携帯電話  
Mobile phone



スピーカボイスコイル  
Voice coil for speaker

$\phi$  0.1 ~ 0.25

HD



ピックアップコイル  
Pickup coil

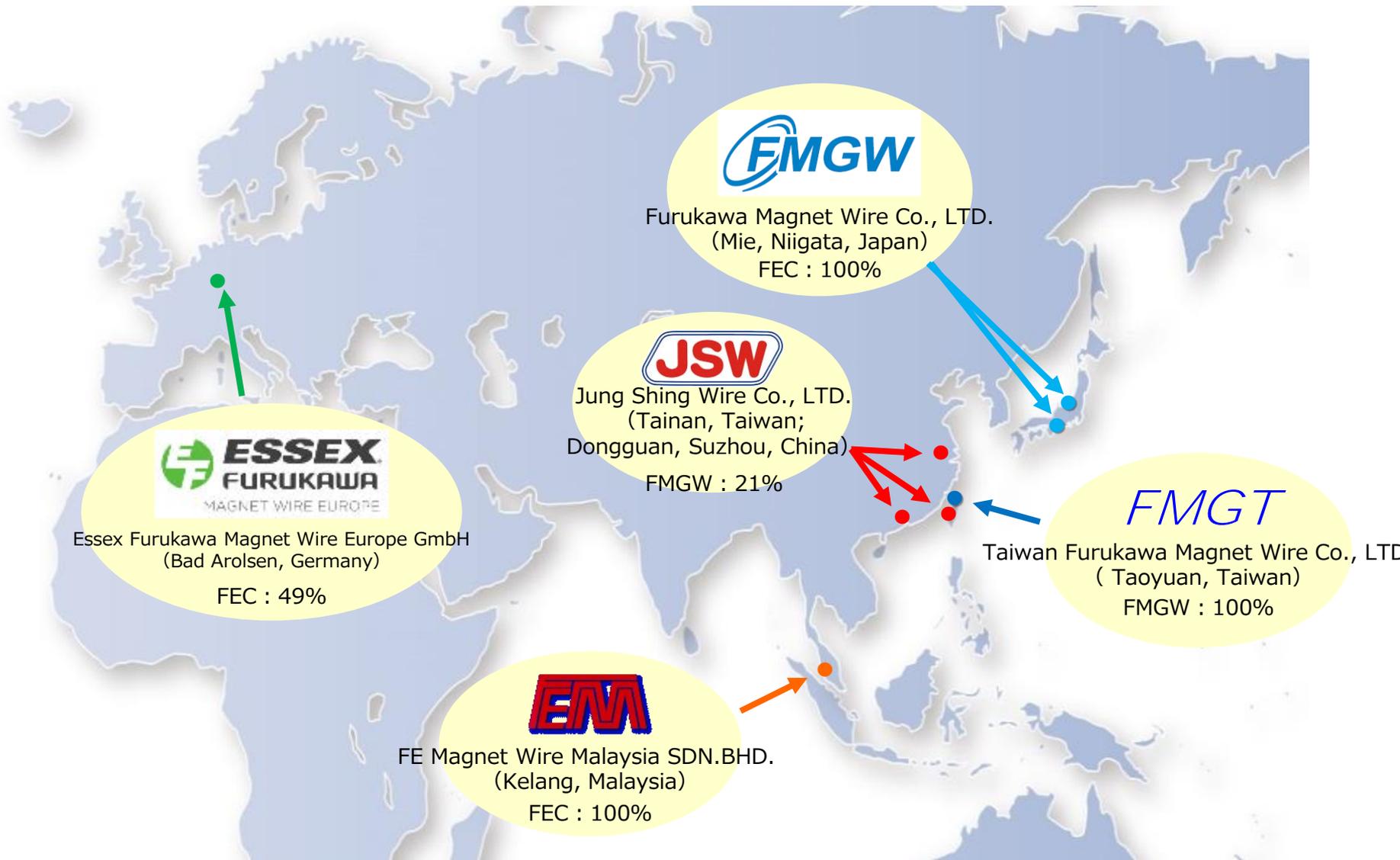
$\phi$  0.6 ~ 1.1

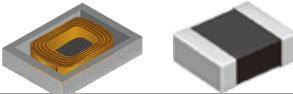
産業機器  
Industrial equipment



サーボモータ  
Servo motor

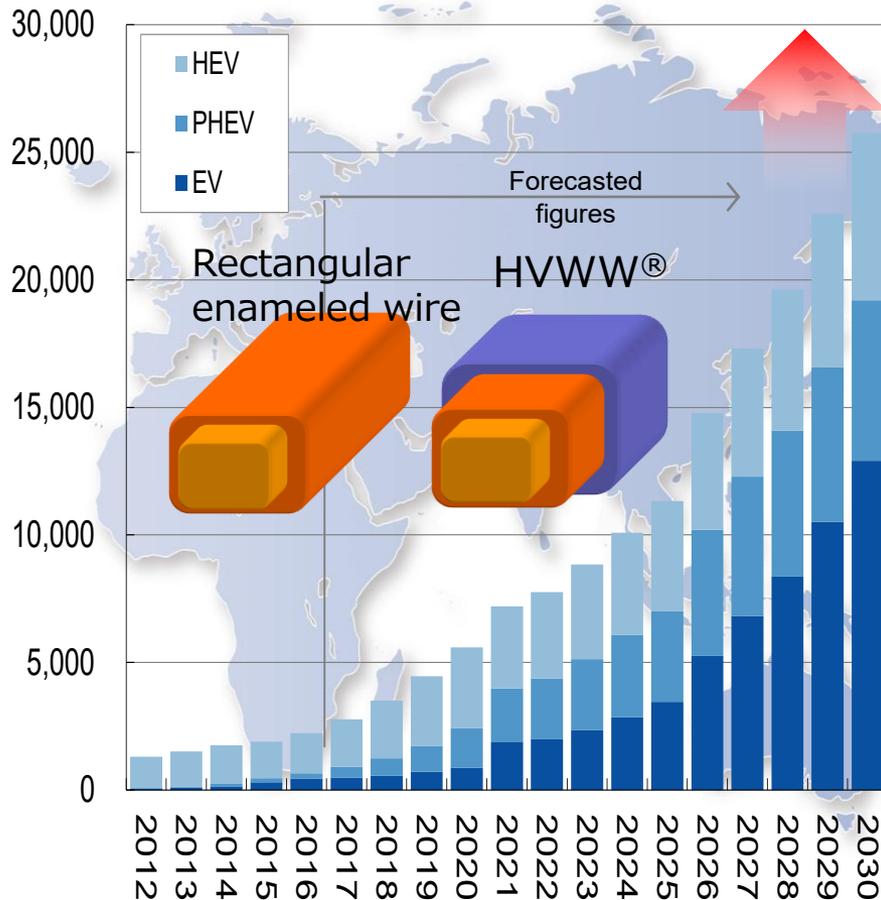
# Introducing the Magnet Wire Division -manufacturing bases



Business	Key products	Applications	Major customer segments	Main regions
Enameled wire	<ul style="list-style-type: none"> <li>• Enameled wire</li> </ul> 	<ul style="list-style-type: none"> <li>• Motors, <b>In-vehicle motors</b></li> <li>• Transformers, Inductors</li> <li>• <b>In-vehicle relays</b>, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial machinery manufacturers</li> <li>• Household appliance manufacturers</li> <li>• Electronic component manufacturers</li> </ul>	Japan Asia
	<ul style="list-style-type: none"> <li>• Rectangular enameled wire / HVWW<sup>®</sup></li> </ul> 	<ul style="list-style-type: none"> <li>• <b>Alternators</b></li> <li>• <b>Motor generators</b></li> </ul> 	<ul style="list-style-type: none"> <li>• Automakers</li> <li>• Electric component manufacturers</li> </ul>	Japan
	<ul style="list-style-type: none"> <li>• Ribbon wire</li> </ul> 	<ul style="list-style-type: none"> <li>• Inductors for smartphones and tablets</li> <li>• <b>In-vehicle inductors</b></li> </ul> 	<ul style="list-style-type: none"> <li>• Electronic component manufacturers</li> </ul>	Japan Asia
Enameled wire derivatives	<ul style="list-style-type: none"> <li>• TEX (Triple insulated wire)</li> <li>• SUS wire</li> <li>• PIT (Polyimide tubing)</li> </ul>	<ul style="list-style-type: none"> <li>• Various power transformers</li> <li>• <b>Braided tubing for emission gas</b></li> <li>• Mesh for screen printing</li> <li>• <b>Insulation sleeves</b>, Catheters for medical use</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic component manufacturers</li> <li>• Automotive product manufacturers</li> </ul>	Japan Asia

# Trends in the focal product markets

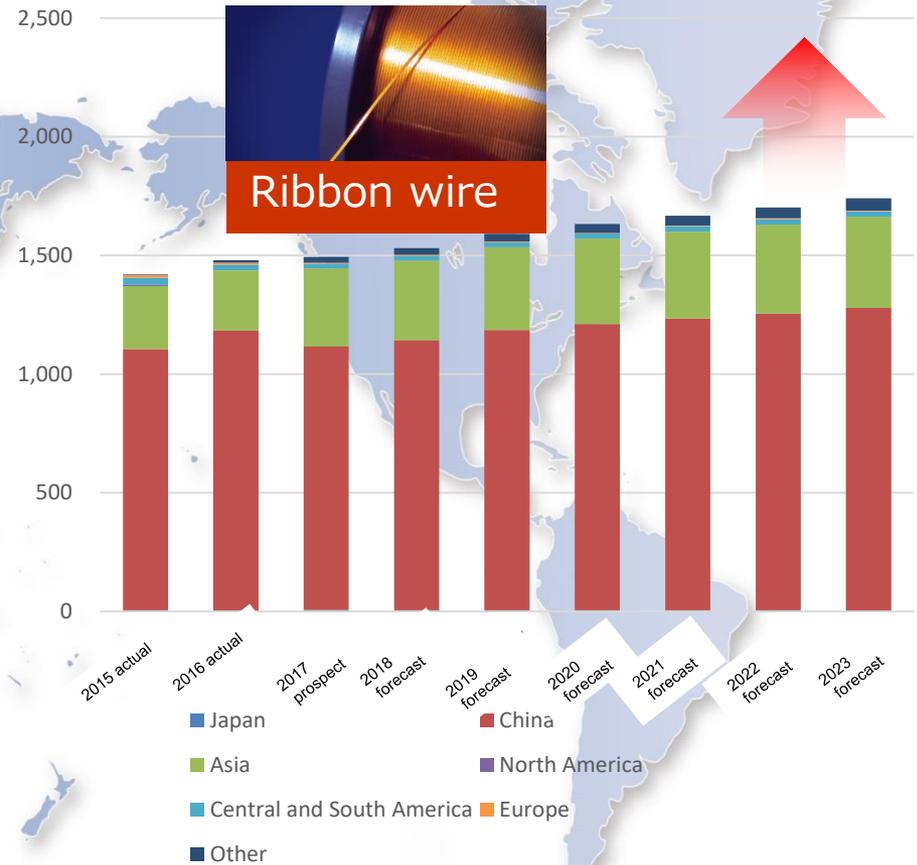
Changes in the vehicle electrification market (worldwide) (1,000 vehicles)



(Source) Created by the Mizuho Bank Industry Research Department based on materials from JATO JAPAN and various countries' automotive industry associations

(Note) Figures from 2017 were forecast by the Mizuho Bank Industry Research Department

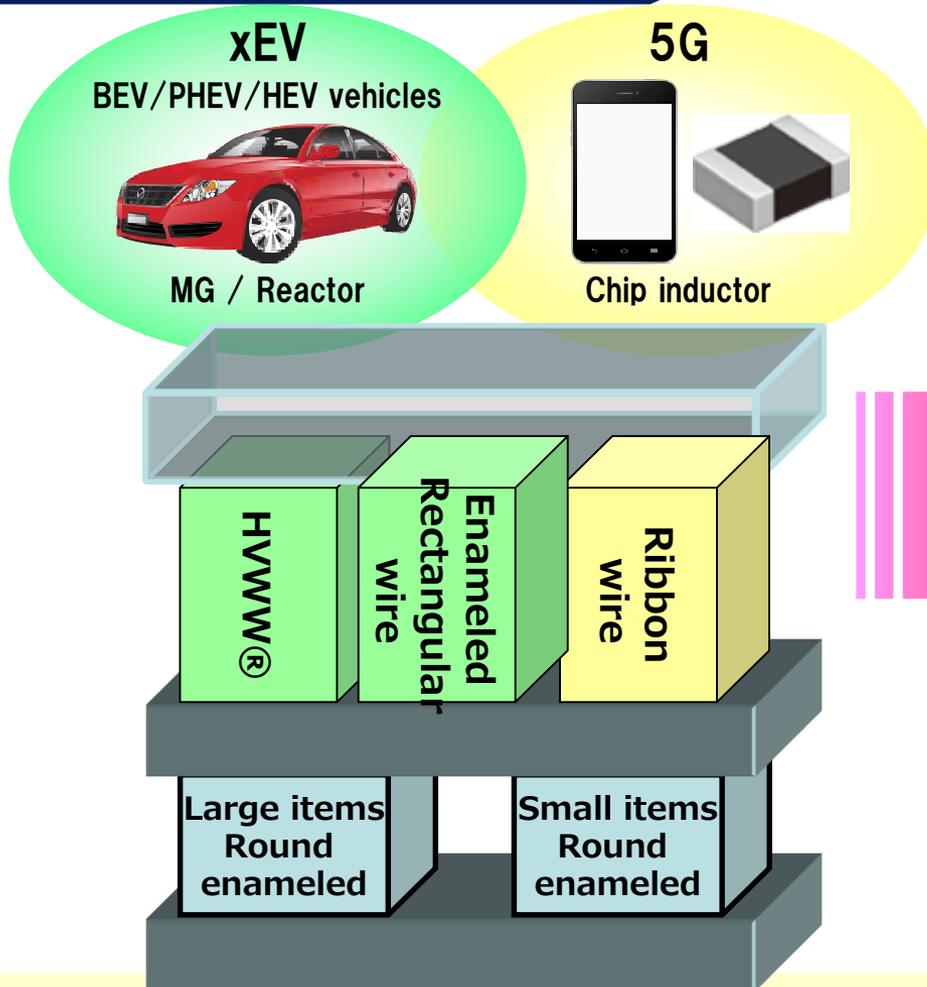
Smartphones – Actual and forecasted production by region (million units)



(Referenced materials from Fuji Chimera Research Institute)

Expand the business in accordance with the trends in the xEV and electronic components markets. A big wave is coming!

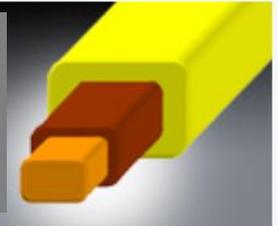
## Growth strategy of the Magnet Wire Division



## Shift from round to flat

Large items: HVWW®  
rectangular enameled wire

High voltage resistant  
rectangular wire  
HV rectangular wire  
(HVW)  
Enameled wire



Small items: Ribbon wire

Specialized magnet  
wire  
Ribbon wire  
Enameled wire



Shift to high value-added products  
that only Furukawa can supply

Structural reforms, product mix → Focus on profit, and move towards a growth strategy based on high value-added products

# Investment plan

## Major investments and venture capital financing for 2020 mid-term

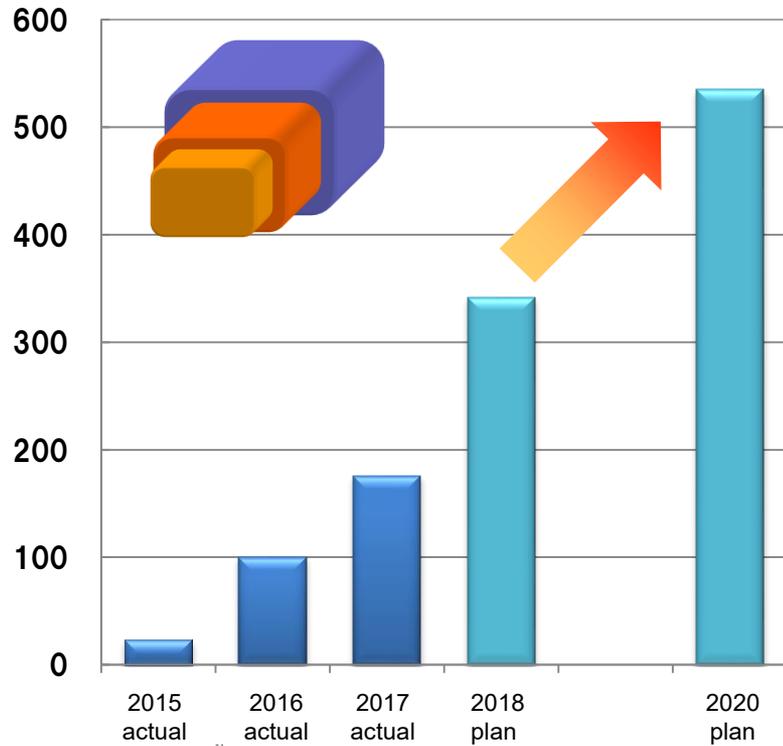
	FY2015-FY2017 actual	FY2018-FY2020 plan
<b>Capital investments in Japan</b> FMGW Mie Plant  FMGW Shirane Plant	<b>Increase production of HVWW®</b>  <b>Increase production of enameled rectangular wire for automobiles</b>  <b>Increase production of ribbon wire</b>	<b>Increase production of HVWW®</b>
<b>Overseas capital investments</b> FMGT Taiwan  FEMM Malaysia		<b>Increase production of ribbon wire</b>  <b>Increase production of enameled rectangular wire for automobiles</b>
<b>Venture capital financing</b> Overseas JV(Germany)	<b>HVWW® production network (EFMWE)</b>	

Total capital investments over the next 3 years are planned to be 30% higher than last 3 years. Actively utilize the overseas bases in order to respond to the future market shift to EV.

## HVWW<sup>®</sup> volume

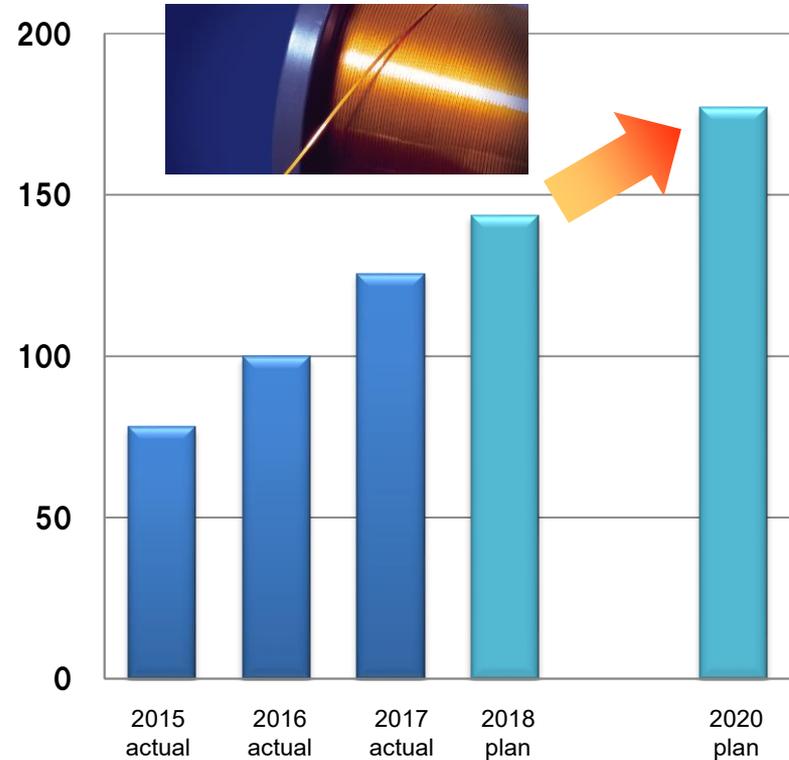
## Ribbon wire volume

### Second generation HVWW<sup>®</sup>



HVWW (Second generation, 2016 results=100)

### Ribbon wire



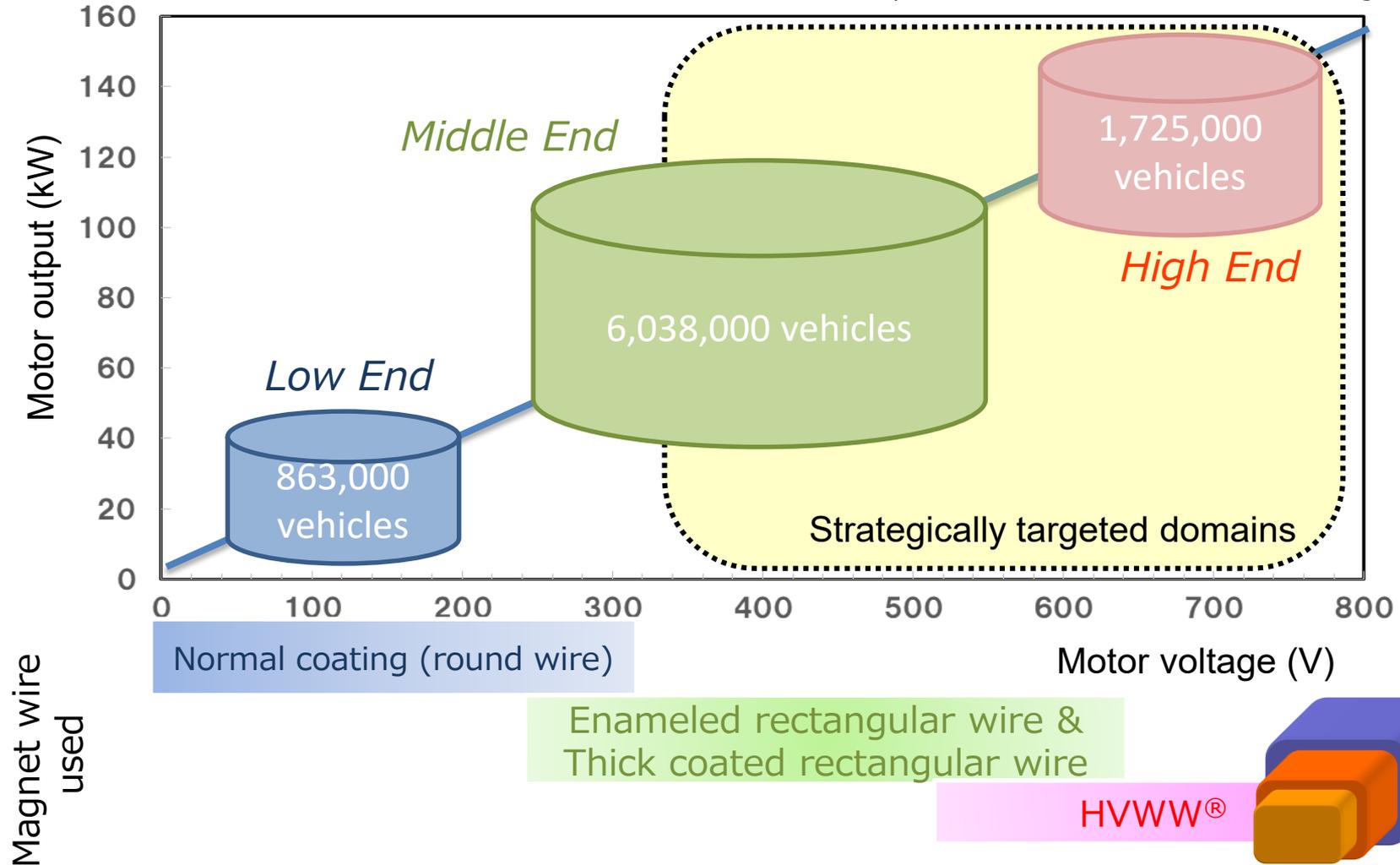
Ribbon wire (2016 results=100)

**HVWW<sup>®</sup> and ribbon wire will steadily grow and contribute to profits along with the expanding market!**

# Market that should be proactively targeted (Vehicle electrification market)

## Motor characteristics and market size in 2025

Volume: vehicles/year: Extracted from 2016 data from Sogo Planning



The Magnet Wire Division will grow by “riding the xEV wave and wave to 5G”!

Thank you!

***Bound to***  ***Innovate***