

A Game Changer in Rare Earth Magnet Supply

Rare Earth-Free(MnBi) Ultra-High Power Density Motor

Compared to Rare-Earth Magnet Motors

Output Power: 2x Higher

Efficiency: 4 -5% Up

Material Cost: Down to 70%

CEO : Dr.-Ing. Dohyun Kang

Location : Changwon, Republic of Korea

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1. About VAM Inc.

2025	Supporting by AVL start-up program
2024	Grants by Korean Ministry of Defense in E-Ship “2024 Future Challenge Defense Technology Project”
2020	-Venture Company founded (VAM) Ultra High Power Density/Efficiency Motors by Principal Researcher Dr. Kang in Korea Electrotechnology Research Institute(KERI) -KERI Investment Company https://www.keri.re.kr/html/en/

❖ **Peoples:6 peoples with 4 Dr. degrees and 2 Master degrees**

❖ **CEO: Do-hyun Kang with Dr. –Ing degree Technical Uni. Braunschweig Germany**

2. Motor Market Background & Situation

❖ Motor is the Heart of Industry



❖ Requirement : High Power(Saving Space) and High Efficiency(Saving Energy)

❖ Rare Earth Magnet is Used for High Power and High Efficiency
(Rare Earth-Free Magnet Motor: Lower Power/Efficiency)

3. Rare Earth Magnet Motor Problem

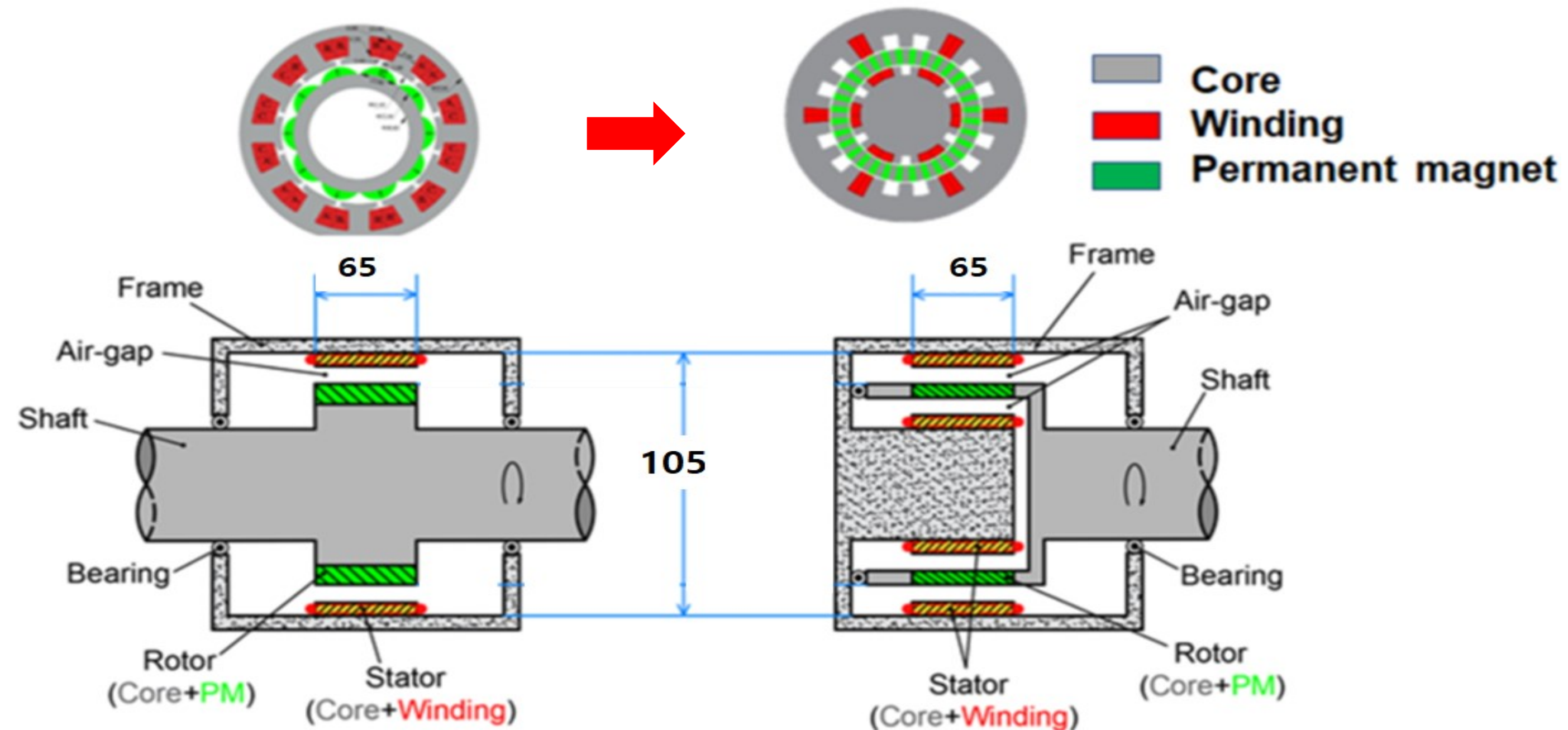
- ❖ Global Supply Chain: **Dependence from China**
- ❖ Price: Unpredictable Cost Spikes



- ❖ EU: Rare Earth Magnet(NdFeB) Critical and Strategic Raw Materials

4. VAM Solution

❖ Double Stator Vernier Motor with 6 Patents(EU, USA, China, Korea)



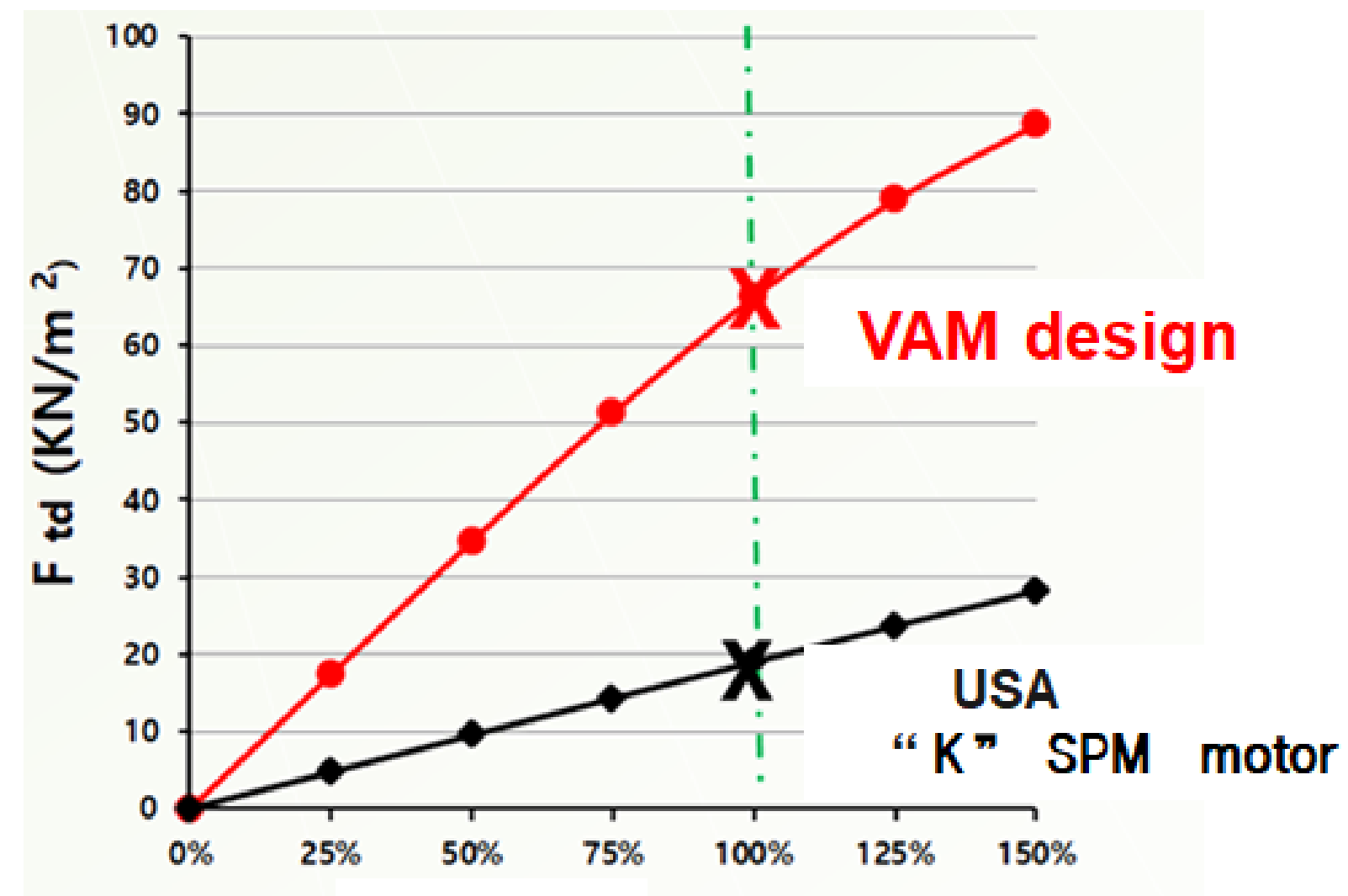
USA "K"
SPM Motor

VAM
Double Stator Vernier Motor

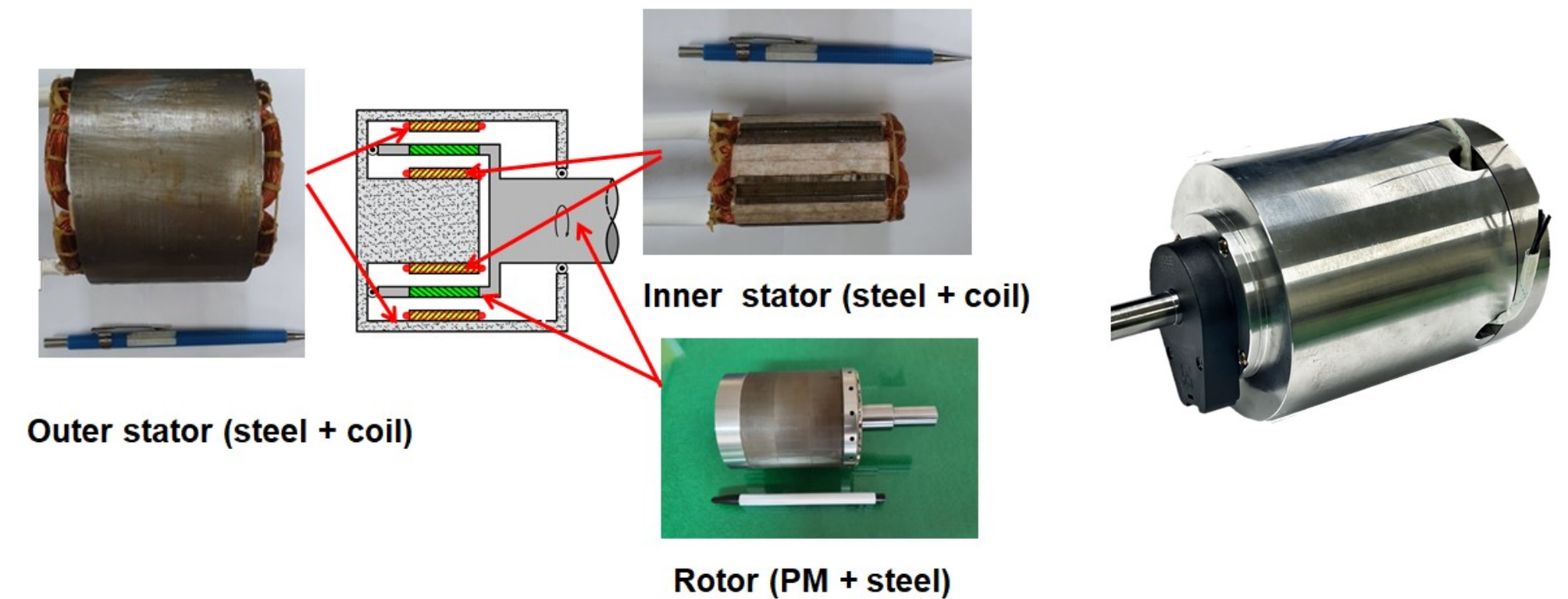
SPM Motor : Surface-mounted Permanent Magnet Motor

4. VAM Solution

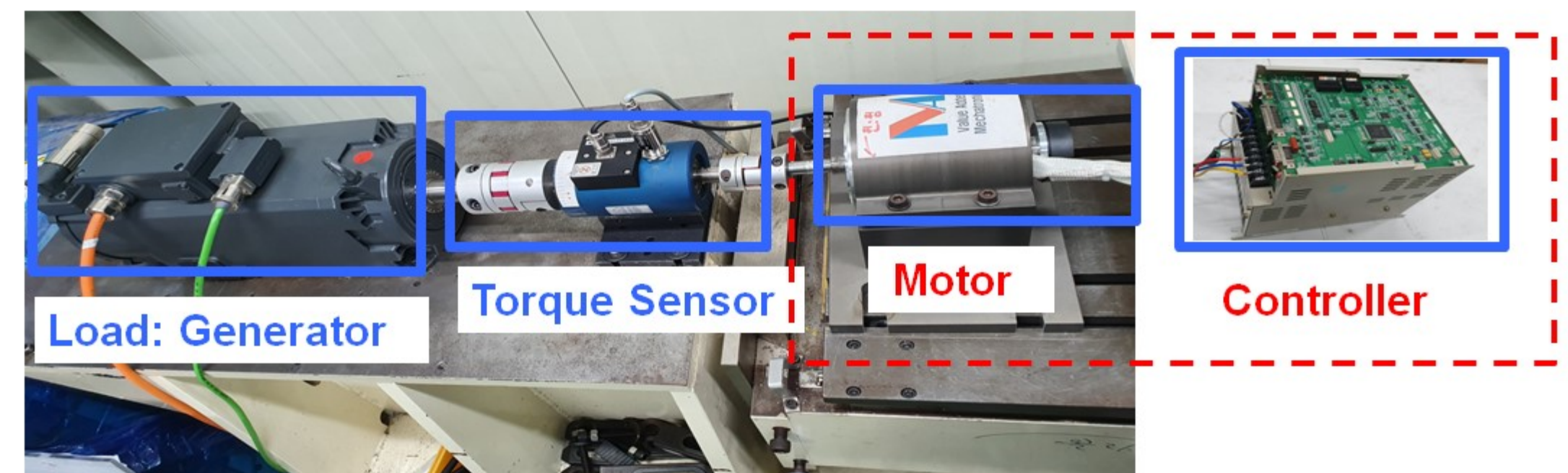
❖ Simulation , Prototyping and Test



Current -Torque



Prototyping

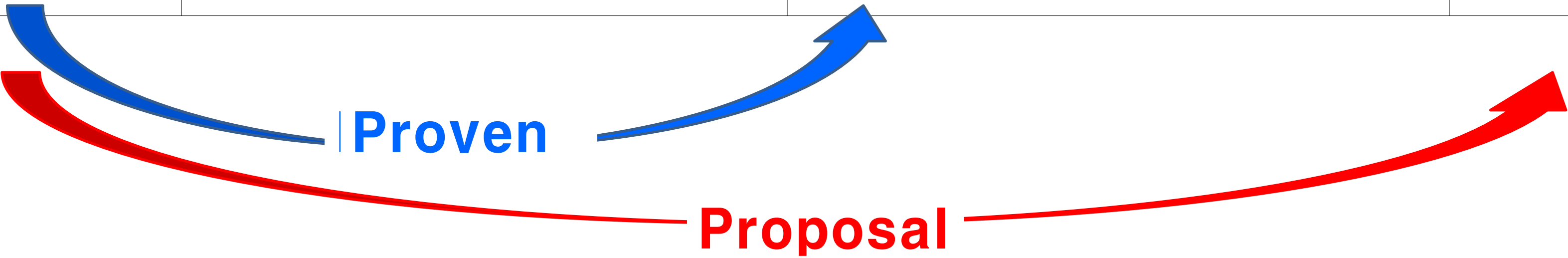


Test

4. VAM Solution

❖ Conventional **Rare Earth** Motor and VAM **Rare Earth-Free** Motor

Conventional Motor		VAM Motor	
NdFeB 1.2T Magnet (Simu. and Test)	MnBi Magnet (Simu.)	NdFeB 1.2T Magnet (Simu. and Test)	MnBi 0.6T Magnet (Simu.)
Power 1x	Power 0.64x	Power 3.96x	Power 2.13x
Efficiency 83.26%	Efficiency 79.34% (3.92% Down)	Efficiency 93.56% (10.30% Up)	Efficiency 90.10% (6.84% Up)



5. Projects We Are Interested In

❖ Motor/Generator with High Power and High efficiency

Cluster 4
Digital, Industry and Space

2027-01-MAT-PROD-06
Circular innovative advanced materials

2027-01-MAT-PROD-61
Breakthroughs in industrial technologies

2027-01-MAT-PROD-22
Interdependencies on Critical and Strategic Materials(Rare Earth Magnet)

2027-04-DATA-09
Energy efficiency AI data Center

Cluster 5
Climate, Energy and Mobility

2026-09-D3-03
Wind energy systems(Generator)

2027-02-D3-09
Improve wave and tidal energy systems (Generator)

2027-03-D5-14
Energy saving measures of ships

2027-03-D5-18
Enhanced electric operation

2027-06-D6-08
Enhancing Mobility for All

5. Projects We Are Interested In

❖ Motor/Generator with High Power and High efficiency

a) Reducing Rare Earth Magnet Usage per Unit Output to 1/4.

b) Boosting Output and Efficiency Using Recycled Rare Earth Magnet.

c) Achieving Superior Output and Efficiency Using Rare Earth-Free MnBi or Fe₁₆N₂ Magnets Compared to Conventional Rare Earth Motors.

6. What We Are Looking For

Coordinator

Experienced coordinator for EU Horizon

R&D Partners

- Rare Earth Magnet Recycling**
- Rare Earth-Free Magnet(MnBi, Ferrite and Etc.)**

Industry Partners

- Motor/Generator and Controller Manufacturer**
- Companies Utilizing High-Power/Efficiency Motors & Generator as Core Components**