

Establishing EU-Domestic **Rare Earth Supply Chains** for Energy Saving Applications by Inclusion in Innovation Fund



REIA's Position Paper in Support of ETS Directive Update's Proposed **AM-353 and **AM-1189****

Substituting Rare Earths is Easier Said than Done

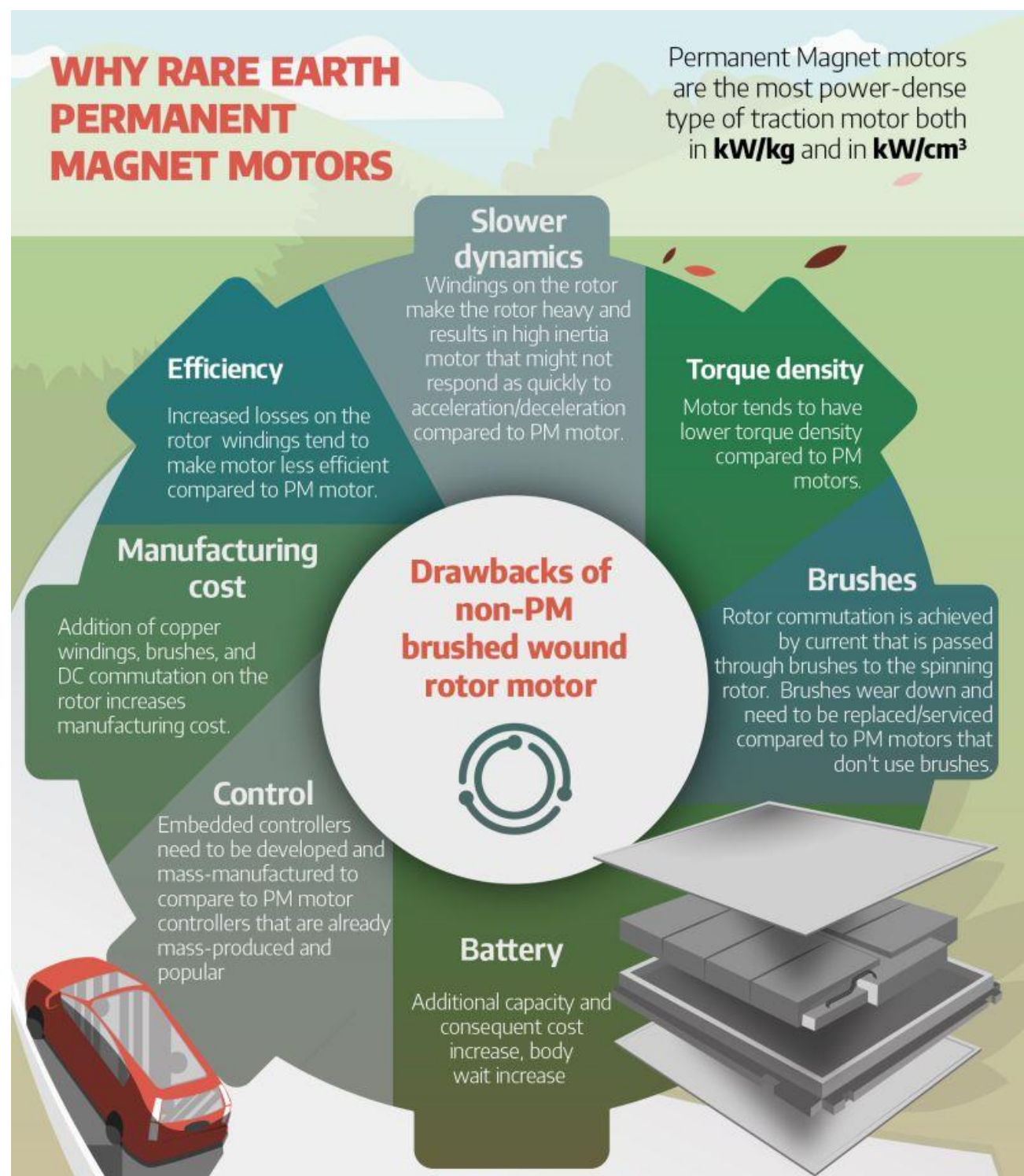
Rare-earth permanent magnets in the drivetrain motor of EVs yield the efficiencies that make the EV's battery economics work

There is no shortcut to resolving the Critical Minerals supply chain conundrum – it takes a holistic approach of including all minerals and incentivizing heavily the processing of both primary and recycled materials in the EU. If one type of Critical Minerals (e.g. rare earths) is not addressed appropriately, then the policy prescription for Battery Materials – that has been successful so far – becomes inadequate.

Why Rare Earth Permanent Magnets (REPMs) are practically difficult to substitute for EVs: REPMs provide the most energy-efficient technology solution for the drivetrain motors of EV. For an EV to achieve a given range without using rare-earth permanent magnets in the drivetrain motor design, the energy loss will be higher, and therefore the battery will have to be circa up to 30% larger.

Required Magnitude of Rare Earth Supply for European Electric Vehicles:

For the average passenger Electric Vehicle to be competitive enough in terms of performance to average passenger Internal Combustion Engine Vehicle, it would require 2 kilograms of rare-earth permanent magnets used in its drivetrain motor. In effect, to satisfy the EU's target of [30 million EVs manufactured and used by 2030](#), there is a demand of approximately 60,000mt cumulatively of rare earths magnet (60,000mt x 31.5% = ~19,000mt of which is rare earths) only for European EV manufacturers.



What Prevents Private Sector from Proceeding with Large-Scale Rare Earth Projects

Lack of the correct type and magnitude of EU funding options for both CAPEX and OPEX, in order to create a meaningful level-playing field

When it comes to developing policy that shapes supply chains and mobilizes the required private capital for establishing local production of rare earths, there are three risks that require management:

1. **Market Risk Management:** Addressed by European Green Deal, setting expectations for industry to converge to EU's 2050 climate targets.
2. **Technology Risk Management:** Addressed by EU HORIZON funding programs incentivizing innovation and R&D collaboration.
3. **Financial Risk Management: Not addressed** adequately yet for Rare Earths. For the European automotive manufacturing transition from ICE to EV transition to be successful, and for the corresponding automotive manufacturing jobs to be safeguarded as opposed to be offshored, the EU needs to ensure domestic resilient supply chains of critical raw materials.

There are two main technologies involved that require critical raw materials: batteries and drivetrain motors.

- The **batteries' lithium/cobalt/nickel** supply chain issues have been addressed by the European Battery Alliance. The solution was an IPCEI, which allows member states to lever their national budgets to provide direct state aid to strategic assets for the EU's broader benefit.
- The **drivetrain motors' rare earth permanent magnet** supply chains, however, are a much more challenging case. Unlike the case of batteries, the supply chain challenge and the corresponding solution does not lie proportionately within member states. The EU member states that are hosts to most automotive jobs tend to be larger countries, whereas the EU member states that are host to the EU's most strategic rare earth assets tend to be smaller Member States. Therefore, applying the same IPCEI policy prescription for Rare Earths might not work that successfully, as smaller EU member states that have the most strategic rare earth assets do not have the ability to leverage their national budget to tackle the financial risk of the solution they are host to, in order to solve the problem that is located in larger member states.

What it takes to address the Financial Risk for Rare Earth business cases in EU: Financial support for rare earth supply chains in the magnitude and in the unique ability of the EU Innovation Fund to support both CAPEX and OPEX. It takes support of this kind to unlock the business cases of such strategic asset in smaller EU Member States— a funding tool that has the unique ability to support both CAPEX and OPEX with sustainability-linked outcomes.

Policy Options Under Consideration

The financial support of the Innovation Fund unlocks large-scale business cases to address the policy challenge as swiftly as possible

Policy Option	Comment
Innovation Fund Inclusion of Rare Earths	The only already legislated EU funding program that has the capacity to support the CAPEX and OPEX shortfall for domestic production of rare earth permanent magnets in the EU. Requires AM-353 and AM-1189 in ETS Update Directive now.
Circular Economy Mandate	OPEX support for the retention of End of Life (EOL) products containing rare earth permanent magnets in Europe (including processed EOL magnet scrap). Would require OEMs to buy magnets with a minimum amount of EU-recycled rare earth metals content.
OEMs Procurement Mandate	Tax incentives (capital Gains or corporate) for automotive OEMs and energy REPM buyers if they procure from EU-made sources could be effective, but they need to match in magnitude a 20-30% premium over imported China prices.
IPCEI for Rare Earths	IPCEIs will end up helping primarily 2-3 companies – at best – in large EU member states. Relative smaller member states, such as Estonia or Slovenia, will face with an unfair challenge to find in their national budget the funds required to participate in a Rare Earth IPCEI, despite having some of the most strategic assets already to built on
R&D Grants HORIZON 2027	Always important and helpful to share R&D risk – we very much endorse this and look forward to working with universities and civil society to develop such projects.
ESG Criteria	We strongly support this proposal. However, it is not enough to affect either unit economics of production or market pricing – it does not create a level-playing field with magnet imports from China that get a 13% VAT rebate advantage.
Raw Materials Investment Vehicle	State-supported investment and procurement organisation acting as lead buyer and pooler of raw materials demand across European countries, similar to JOGMEC which does direct investment or is guarantor of private sector investments. The challenge is time-to-implementation.
EIB and EBRD Low-Cost Credit	Low-cost credit is welcome, but it does not change the cost structure or market pricing of rare earth permanent magnets that would be domestically produced in the EU.

Expanding Scope of Innovation Fund

Critical Legislative Step for Establishing a Competitive European Rare Earth Separation & Permanent Magnet Manufacturing Supply Chain

Rare Earth Strategic Assets in EU Member States: Currently, Estonia has the only industrial-scale commercially-operating rare earth midstream facility in the “western world”. Unless the right economic incentives are created for development of magnet-making plants in Europe, European automotive, wind turbine and industrial pump manufacturers are facing consequential supply chain risks. To accomplish this expansion, there is an urgent need for both large size CAPEX support and OPEX support to develop an independent rare earth value chain in EU. There is the policy conundrum:

1. current EU grants for CAPEX cannot add up to the scale required and Just Transition Fund allocations are capped, and
2. the Innovation Fund is the only grant mechanism that has legislated OPEX support.

Why an IPCEI alone cannot help in this case: In effect, the IPCEI is a competition law exemption for EU member states to provide direct state aid to industries of strategic European interest – without this IPCEI exemption, state aid is not allowed. This direct state aid though comes from the national government budgets, not from EU sources. This works well for large-budget member states (e.g. Germany, France, Italy, Spain etc.), but it is a very steep challenge for member states with smaller (or constrained) national government budgets that have already established strategic assets of rare earths to build on (e.g. Slovenia and Estonia).

Expanding the EU Innovation Fund offers a quick, win-win, and politically non-contentious solution: The EU Innovation Fund has the uniquely legislated exemption to allow for both CAPEX and OPEX funding. The rare earth industry does not qualify for the EU Innovation Fund because the growth in our industry is driven from Electric Vehicle manufacturing – i.e. green mobility. By contrast, the EU Innovation Fund’s evaluation criteria are constrained by the current Cost Fraction formula for GHG Avoidance.

Two proposed Amendments on ETS Directive, currently under consideration at ENVI in EU Parliament:

1. AM 353:

https://www.europarl.europa.eu/meetdocs/2014_2019/plmrep/COMMITTEE/ES/ENVI/AM/2022/03-22/1245924EN.pdf

2. AM 1189:

https://www.europarl.europa.eu/meetdocs/2014_2019/plmrep/COMMITTEE/ES/ENVI/AM/2022/03-22/1249629EN.pdf



For media requests or to meet with REIA's members to discuss the reasons to support the proposed AM-353 and AM-1189 within the ETS Directive Update, please contact:

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