**PRESS RELEASE**

**New method to recycle rare earth elements: Marie Perrin in top 10 innovators of the Young Inventors Prize 2025**

* **Mining rare earth elements could generate up to 2 000 tonnes of toxic waste per tonne extracted, according to the Harvard International Review**
* **Marie Perrin’s REEcover technology retrieves europium from old fluorescent lamps using a nature-inspired process**
* **Marie Perrin is one of the ten innovators for the Young Inventors Prize, awarded by the European Patent Office (EPO) on 18 June 2025**

**Munich, 6 May 2025** – Rare earth elements (REEs) are critical for modern devices, from smartphones to wind turbines, yet their extraction is environmentally damaging, highly wasteful, and their supply is usually bound to geopolitical interests. According to the [Harvard International Review](https://hir.harvard.edu/not-so-green-technology-the-complicated-legacy-of-rare-earth-mining/), REE mining could generate up to 2 000 tonnes of toxic waste per tonne extracted, including radioactive by-products. **Marie Perrin (28), a French-American chemist, founder of REEcover, has developed a method to retrieve europium—a key material for LED screens and energy-saving lights—** in a faster, cleaner and more sustainable way than traditional techniques. Her technique reduces waste and makes recycling these valuable materials more efficient. Perrin is now one of the ten global innovators **in the Young Inventors Prize 2025**, **known as Tomorrow Shapers,** selected from 450 candidates worldwide.

**Making rare earth recycling easier and cleaner**

The supply of rare earth elements is heavily dependent on mining, but less than 1% of REEs are currently recycled, according to [an article in Nature](https://www.nature.com/articles/d41586-023-02153-z#ref-CR4). Traditional methods to recover REEs are energy-intensive, rely on toxic chemicals and involve many complex extraction steps. Marie Perrin’s innovation uses a **nature-inspired method involving small sulphur-based molecules (tetrathiotungstate ligands) to selectively recover europium from e-waste**, like discarded fluorescent lamps.

The process begins by disassembling fluorescent lamps to extract the phosphor powder, which is then dissolved in acid, creating a solution rich in REEs. The europium solid is filtered out and treated to produce europium oxide, completing the recycling process. Unlike traditional methods, REEcover isolates europium in a single step, reducing both chemical waste and energy use. **The process removes harmful mercury**, recovers europium efficiently, and enables the material to be reused in new electronic products.

**Bringing scientific discovery to real-world impact**

Perrin began her work at ETH Zürich, where she pursued a PhD in Chemistry, initially researching water purification technologies before shifting to rare earth elements recycling. With the support of ETH’s Technology Transfer Office, she **patented her method with her PhD supervisor, Prof. Victor Mougel, and co-founded REEcover to scale the technology for industrial use.**

The production and import of fluorescent lamps were recently banned by the European Union, to cut emissions by 50% by 2030. Perrin’s method can be applied directly to used fluorescent lamps without any pre-treatment, giving the process a critical relevance.

"*Very little is known about rare earth elements, even though there are huge geopolitical and environmental challenges behind them”*, explained Perrin. “*Our main challenge at first was to find industrial partners. We realised that many industries do not have power over their supply chain, which was a hard reality to face and that we wanted to address”,* she added.

REEcover is currently working with industry partners to scale up the technology and expand its applications to rare earth magnets like the ones used in electric vehicles and wind turbines, targeting the recovery other rare earth elements.

**The Young Inventors Prize celebrates worldwide innovators 30 and under using technology to address global challenges posed by the United Nations Sustainable Development Goals (SDGs).** Perrin’s innovation supports SDG 12 (Responsible Consumption and Production) and SDG 15 (Life on Land) by making it easier to reuse resources instead of relying on new mining.

**The prizes of the 2025 edition will be announced during a ceremony** [**livestreamed**](https://www.epo.org/en/news-events/young-inventors-prize/2025-event?mtm_camp=pressrelease&mtm_key=yip2025&mtm_med=press) **from Iceland on 18 June 2025.**

Find more information about the invention’s impact, the technology and the inventor’s story [here](https://www.epo.org/en/news-events/young-inventors-prize/marie-perrin?mtm_camp=pressrelease&mtm_key=yip2025&mtm_med=press).

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**About the Young Inventors Prize**

Aimed at individuals 30 and under, the Young Inventors Prize showcases the transformative power of youth-driven solutions and recognises the remarkable young people paving the way to a more sustainable future. Established in 2022, trophies were first handed out during the European Inventor Award ceremony. From 2025 onwards, the Prize will move up a gear with its own dedicated event, held separately from the Award. Among the 10 Tomorrow Shapers selected for each edition, three will be awarded a special prize: World Builders, Community Healers, and Nature Guardians. In addition, a People’s Choice winner, voted by the public online, will be revealed. Each Tomorrow Shaper will receive EUR 5 000, the three special prize winners will each receive an extra EUR 15 000. The People’s Choice winner will be awarded an additional EUR 5 000. [Read more](https://www.epo.org/en/news-events/young-inventors-prize?mtm_camp=pressrelease&mtm_key=yip2025&mtm_med=press) on the Young Inventors Prize eligibility and selection criteria.

**About the EPO**

With 6,300 staff members, the[European Patent Office (EPO)](https://www.epo.org/?mtm_camp=pressrelease&mtm_key=yip2025&mtm_med=press) is one of the largest public service institutions in Europe. Headquartered in Munich with offices in Berlin, Brussels, The Hague and Vienna, the EPO was founded with the aim of strengthening co-operation on patents in Europe. Through the EPO's centralised patent granting procedure, inventors are able to obtain high-quality patent protection in up to 46 countries, covering a market of some 700 million people. The EPO is also the world's leading authority in patent information and patent searching.