WOMEN AND ENERGY: We Were Always Part of This Story

When you picture energy: wind turbines, solar panels, high-voltage cables - who comes to mind? Probably a man in a hard hat. And yet the history of energy is also a history of women. Women who invented it. Who fought for electricity access in remote villages. Who are founding cooperatives and taking to the streets. Women you rarely hear about, because energy is supposedly "a man's topic." We hope that this article will change your mind.

The Inventors Who Made Modern Energy Possible

Let's start with women your school probably never told you about.

Mária Telkes (1900–1995) was a Hungarian-American biophysicist and inventor. Her most notable innovation was the invention of the solar distiller and the development of the first solar-powered heating system designed for residential use. Her colleagues nicknamed her **"The Sun Queen."** During World War II, she developed a solar-powered water desalination machine - deployed to save the lives of downed airmen and torpedoed sailors and her goal was to create a version for villagers in poor and arid regions of the world.

In 1948, alongside architect Eleanor Raymond, she built **Dover Sun House** - the first modern home heated entirely by solar energy. The house had 18 giant panels on one side; the collected heat was stored in canisters of Glauber salts, which melted at 37°C and released energy on cooler days. Franklinenergy It was a vision of the future, 75 years before solar homes became mainstream.

Equally foundational is **Katharine Burr Blodgett**, the first female scientist at General Electric's Research Laboratories and the first woman to earn a PhD in physics from

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Cambridge University. In 1938, she invented non-reflective, transparent glass that is now used in solar panels as a water-repellent coating that enhances cell efficiency. Without her discovery, modern photovoltaics would look very different.

And then there is a Polish scientist rewriting the future of solar energy *right now*.

Dr. Olga Malinkiewicz (born 1982, Wrocław) is a physicist, inventor and entrepreneur who has done something that seemed impossible: she figured out how to *print* solar cells. She is known for inventing a method of producing solar cells based on perovskites using inkjet printing, and is the co-founder and Chief Technology Officer of Saule Technologies.

The story starts during her PhD research at the University of Valencia, when she attended a conference and became captivated by perovskite, a mineral with extraordinary light-absorbing properties. She changed the architecture of perovskite cells, applying lessons from organic solar cells to create a sandwich structure that allowed fabrication at low temperatures and that completely changed the picture, because it enabled solar cells to be built on entirely different substrates.

What does that mean in practice? Perovskite can be dissolved to create a printable ink, making it possible to turn almost any surface into a source of clean energy, using less power to produce more energy than traditional silicon. The cells are ultra-thin, flexible, and so lightweight that a one-square-metre sheet can be effortlessly supported between two fingers. They can be integrated into building facades, windows, keyboards, even mobile phone chargers, including in spaces where heavy, rigid silicon panels would never fit.

The world's first factory producing perovskite photovoltaic cells opened on 1 June 2021 in Wrocław, Poland and it belongs to Saule Technologies. In 2024, Malinkiewicz became the first Polish woman to receive the European Inventor Award, presented by the European Patent Office - winning both the SMEs category and the Popular Prize chosen by the public.

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The Activists Changing Energy Policy

You don't need to be a scientist to reshape the system.

Luisa Neubauer (born 1996, Hamburg) is one of Europe's most recognised climate activists. She is the key organiser of Germany's Fridays for Future movement, a movement that mobilised millions for mass protests, contributing to Germany's coal exit and the first national climate law. In 2021, as the lead plaintiff in the landmark *Neubauer vs. Germany* case, she won a court ruling that insufficient emissions reductions violate the rights and liberties of young people, a pivotal moment for civil rights in climate policy. TIME named her to its TIME100 Next list in 2022.

But Neubauer's scope extends far beyond Germany. On the Global South, she calls openly for climate reparations and loudly criticises the Global North's continued financing of new fossil fuel expansion in Africa. This matters: energy activism is not just local politics, it is global justice.

In Poland and Czechia, young women are active in organisations like the Youth Climate Strike, Extinction Rebellion, and local movements pushing for coal phase-out. Poland still relies on coal for 51% of its electricity production, while the Czech Republic plans to phase out coal by 2033 - which means the fight over energy in our region is particularly urgent, and the need for women's voices in it has never been greater.

The "Solar Grandmother Engineers": Women Who Light Up the World

One of the most extraordinary stories in energy today comes from the **Barefoot College** in Rajasthan, India.

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Since 2005, more than 140 women from Africa: most of them grandmothers, almost all of them illiterate have trained at the Barefoot College in India. In six months, they learned how to fabricate, install and maintain solar-powered household lighting systems, and returned home to electrify their villages.

As the College's founder explained: "Illiterate grandmothers are humble and easy to teach. They have a vested interest in the village and have no desire to leave. Give a youth a piece of paper and he's off to the city."

One participant from Malawi, **Stella**, reflected after completing her training: "I never imagined that technical knowledge like this would be open to women who were illiterates, like us. But coming here has given us this confidence that we can learn about new things and make our lives better."

To date, Barefoot College has trained 884 women from the world's poorest communities, who have electrified over 40,000 households in 410 villages across 96 countries.

A sister initiative is **Solar Sister**, a social enterprise operating in Nigeria, Kenya and Tanzania. Its model places local women at the core of the solution: they become entrepreneurs who distribute solar lamps and clean energy products in their own communities. Since 2009, Solar Sister has supported over 10,000 women in launching their own clean energy businesses.

This is the economics of energy justice with women as protagonists, not afterthoughts.

Energy Cooperatives: Power for People, Not Profit

Europe has a rich tradition of citizen-owned energy cooperatives — and women are present in them, though still too rarely in decision-making roles.

In **Belgium**, the cooperative **Ecopower**, founded in 1991 in Flanders, today has around 67,000 members and supplies 100% green electricity to its shareholders. Every member: regardless of the number of shares held, has one vote in the general assembly. In 2020,

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Ecopower initiated a solar project in Leuven, installing panels on 10 public rooftops and giving citizens the opportunity to become co-owners of the installations.

Research on cooperatives including Ecopower reveals a persistent challenge, however: in Ecopower, women remain underrepresented and the board of directors is male-dominated, in stark contrast to the Italian cooperative ènostra, where the president is a woman and both genders are nearly equally represented.

In **Denmark**, the renowned **Middelgrunden** wind cooperative in Copenhagen gathers nearly 8,000 members and stands as one of Europe's flagship examples of democratic citizen energy. Danish and German energy cooperatives serve as the reference point for the entire continent, while in Poland, energy cooperatives are still in their infancy, struggling with legislative barriers.

In **Germany**, research points to a structural problem: women participate in energy cooperatives less frequently than men, partly because technical domains have historically been coded as "male," and partly because cooperative work often relies on voluntary labour, which women have less time for due to their disproportionate burden of domestic and care responsibilities.

These are structural barriers, not a lack of interest or competence. Change requires both inclusive policy design and women who consciously push their way into these spaces.

Research on European cooperatives shows that renewable energy communities are more women-friendly than the rest of the energy sector, and yet we are still far from parity. They employ more women, but struggle to attract female members, especially vulnerable women, since people with modest incomes remain mostly excluded from cooperatives due to participation costs, even though they are the most likely to understand and articulate their own energy needs.

What the Data Says

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According to IRENA, women represent only 32% of the renewable energy workforce and 22% of the oil and gas industry. Within renewables, women are more likely to hold administrative positions (45%) than engineering roles (28%).

An analysis by the European Commission's Joint Research Centre shows that women are often more exposed to energy poverty than men, due to structural socio-economic factors including lower average disposable income and their overrepresentation in single-parent households.

This means women pay the highest price for a broken energy system. And they hold enormous potential to fix it.

How You Can Get Involved — as a Woman Interested in Energy

You don't need an engineering degree to be part of the energy transition. Here are concrete entry points:

1. Join an energy cooperative. In Poland, the first energy cooperatives are active in cities like Kraków, Serock and Raszyn. In Belgium, Denmark and Germany, you can become a co-owner of a wind farm or solar installation for a few hundred euros. Joining a cooperative is a vote in decisions about local energy.

2. Activism and advocacy. Fridays for Future, Extinction Rebellion, local climate organisations in every country of the ELY project, groups exist that need women's voices. Your story and your perspective carry a value no expert can replace.

3. Energy education. Programmes like the **Energy Literacy for Youth (ELY)** project train facilitators who then educate others. Become a knowledge multiplier in your community, at school, at university, in a migrant support organisation, at a community centre.

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4. A career in renewable energy. The renewables sector is growing rapidly in Poland, Germany, Denmark and Belgium and it needs not just engineers, but specialists in communications, law, finance, education and project management.

5. Support for women in the Global South. Organisations like Barefoot College and Solar Sister welcome volunteers, donors and institutional partners. Your support literally turns on a light in someone's home.

Energy is not "a man's topic"

Energy is your electricity bill in winter. It's the factory that burns coal in your city. It's the kerosene lamp choking someone's children. It's the solar panel that transforms a village. It's the climate policy that either protects you or leaves you behind.

Women have always known this — because they are the ones who most often pay for bad energy decisions. It's time they were also at the front of the good ones.

*This article was produced as part of the **Energy Literacy for Youth (ELY)** project, a European Erasmus+ initiative aimed at building energy literacy among young adults, with particular focus on marginalised groups. The project is run by Fundacja Otwarty Plan (Poland), MigLAB (Germany), Youth and Environment Europe (YEE) and INFORSE-Europe (Denmark).*

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