

"Electrical energy is the new gold"

The energy turnaround and the associated transition from fossil fuels to renewable energies are essential to effectively combat climate change. Steel – in particular **powercore®** electrical steel – plays a central role as the **backbone of the energy infrastructure**. How exactly it does so is explained by Georgios Giovanakis, CEO of thyssenkrupp Electrical Steel in an interview with steel^{compact}.

Text Jan Ritterbach

Mr. Giovanakis, what leverage does switching our energy supply to renewable energies offer for the turnaround in climate policy?

Industrial CO₂ emissions are a major cause of climate change and the associated shock headlines that we read almost every day all over the world: torrential rain, floods and heatwaves – and we in Germany are now also directly affected. So if we want to combat climate change effectively, we need to drastically cut global CO₂ emissions from the current level of around 40 billion metric tons per annum. The biggest lever here is to replace fossil fuels such as gas, coal, and oil with renewable energies. Unfortunately, solar parks, wind turbines and hydroelectric power plants are usually built at a great distance from the industrial centers where large amounts of renewable electricity are needed. This is why gigantic investments in new grid infrastructure are required.

What dimensions are we talking about here?

The International Energy Agency (IEA) has looked into the issue, and its analysis indicates that we will have to expand our power grid from its current 80 million kilometers to at least 160 million kilometers over the next 20 to 30 years. If we want to make the Paris Climate Agreement binding, global investment in the power grid must be tripled from its current level of around 300 billion euros annually. And it is precisely for such investments that the regulatory framework conditions must now be created on the political side – for example with a view to faster approval procedures, the economic viability of green electricity and protecting systemically relevant resources.

How can steel help to gear up the energy infrastructure for the future?

Steel is a key material for the energy turnaround. For one thing, steel production is responsible for around seven percent of global CO₂ emissions. Consequently, the decarbonization of steel production is one of the biggest and most economical levers for reducing CO₂ emissions. For another, steel is the backbone of the infrastructure for renewable energies.

What exactly do you mean by that?

From the base and tower of a wind turbine to generators and transformers that feed electricity into the grid – steel is indispensable. Grain-oriented electrical steel (GOES) is particularly important, because it is used in the cores of transformers. Our top grades of the powercore® brand enable the efficient conversion and transportation of electrical energy, and thus make a decisive contribution to the performance and reliability of the entire energy supply.

What makes electrical steel of the powercore® brand so efficient?

For one thing, it is the excellent magnetic properties that maximize the efficiency of transformers. Our top grades are among the best grades on the global market. With them, it is possible to extract the maximum amount of electricity from the wind turbines, while minimizing losses during transport to the consumer. And we are already developing the #nextgeneration TOP grades. Because electrical energy is the new gold. This is why ever more efficient transformers are required for the necessary grid expansion. We are continuously working on further reducing hysteresis losses and enabling our customers to

powercore® – key material for the future

Grain-oriented electrical steel is the optimum material for the heart of transformers

Soft magnetic properties form the basis for highly efficient magnetization of the transformer core

A highly complex manufacturing process aligns the crystal axes of the grains in one direction

Thin top grades enable maximum energy efficiency and a smaller transformer size

continue complying with the efficiency requirements for transformers described in the EcoDesign regulation. We also focus on CO₂-reduced manufacturing in the production of our electrical steel strips, which further strengthens our contribution to sustainability.

How do you achieve this reduced-emission production?

We have taken several measures and invested in improving our plants and equipment to reduce our carbon footprint. In future, the production of hot metal in Duisburg alone using the direct reduction plant will decrease our carbon footprint by over 40%. We are achieving further improvements at the Gelsenkirchen site by successively electrifying our gas-powered continuous annealing lines. In addition, there are groundbreaking pioneering projects such as at our sister company thyssenkrupp Hohenlimburg in Hagen, where the site has become the first ever

German industrial plant to be directly connected to a wind farm. This supplies production directly with electricity from renewable energy. And we also benefit from this. We cover around 15% of our electricity requirements with this wind farm.

What is thyssenkrupp Electrical Steel's long-term vision for a sustainable energy future?

Our idea is to use carbon-neutral production to manufacture grain-oriented electrical steel of the powercore® brand. First and foremost, these are top grades of the next generation – with excellent remagnetization and noise properties. On the one hand, this reduces direct CO₂ emissions and, on the other, contributes to efficient and low-loss electricity distribution.

Mr. Giovanakis, thank you very much for the interview.

"Top grades of the powercore® brand enable the efficient conversion and transportation of electrical energy."



Sees steel as a central material in the energy turnaround: Georgios Giovanakis, CEO of thyssenkrupp Electrical Steel

Podcast

To the new episode of our podcast "Gekocht, gewalzt, veredelt" (Smelted, rolled, refined): Electrical Steel – shaping the energy turnaround together



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More about thyssenkrupp Electrical Steel: <http://www.thyssenkrupp-steel.com/en/electricalsteel>

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