



CO₂ Valorization

Electrochemical conversion of carbon dioxide
into chemicals and fuels

www.gigkarasek.com

CO₂ – from problem to opportunity

Conversion of carbon dioxide into valuable substances such as chemicals and fuels

The release of CO₂ emissions from the burning of fossil fuels contributes significantly to the greenhouse effect and exacerbates climate change on a global scale. As we move toward an economy that no longer uses fossil fuel sources, GIG Karasek has made it its mission to support global efforts to **capture and utilize CO₂ (carbon capture and utilization, or CCU)**.

Electrochemical conversion of CO₂

As an expert in industrial plants and plant engineering, we focus on **innovative processes for CO₂ utilization** and are a pioneer in the field of **electrochemical conversion technology**.

GIG Karasek offers a high-quality electrochemical recycling unit to **convert captured carbon dioxide into valuable products such as chemicals and fuels**. The centerpiece of the unit is the innovative **ECO2CELL** electrolysis cell.

How it works

The cell uses **CO₂, water, and electricity** in an electrocatalytic process to produce single and multiple carbon compounds, such as formic acid and ethylene. Applying

an electrical voltage causes the reduction of CO₂ at the cathode and the oxidation of water to oxygen at the anode. Depending on the applied voltage and other reaction conditions, a variety of products emerge. Therefore, the product selection can be controlled by the choice of catalyst, electrode materials, current density, and electrolyte composition.

Application areas

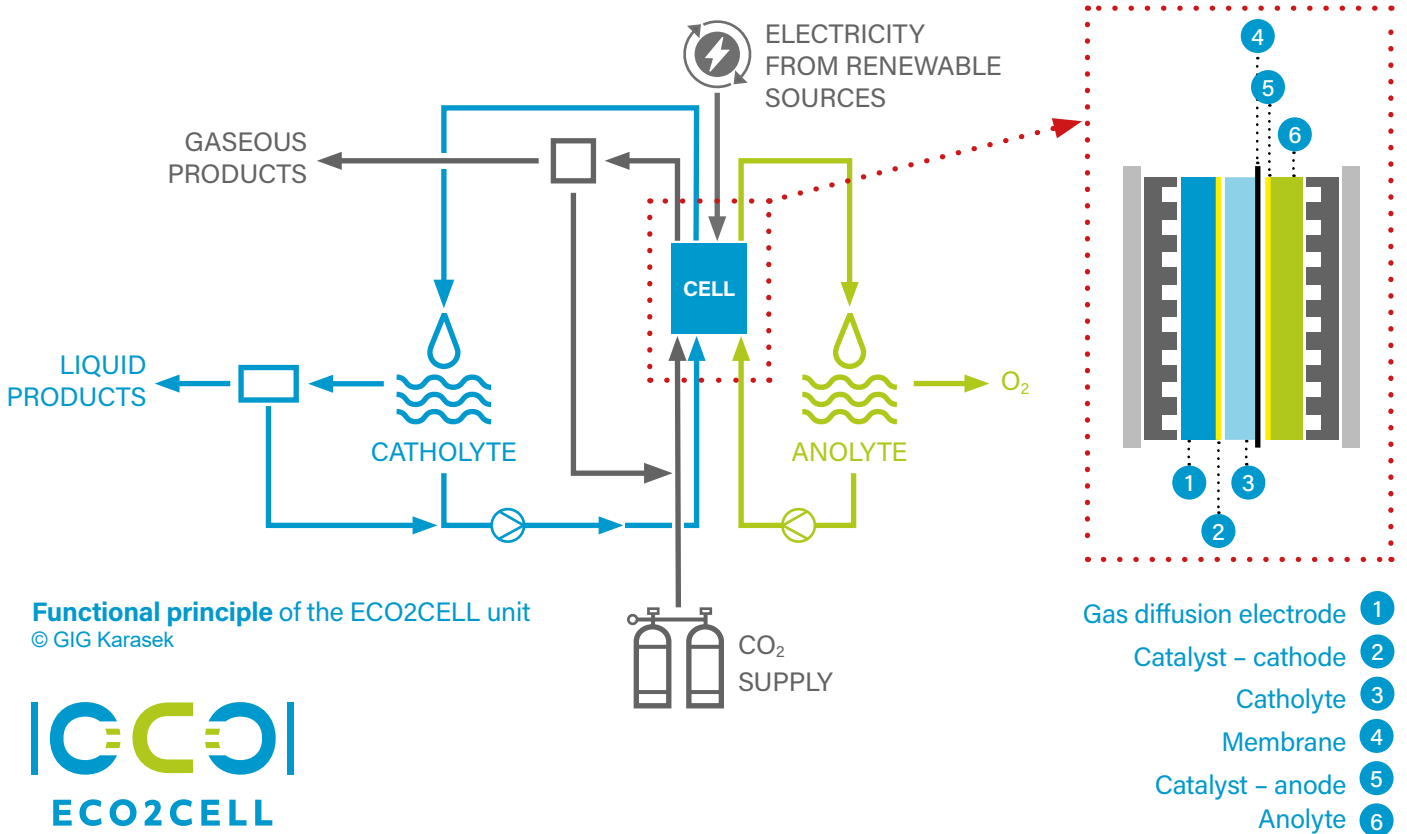
The technology is ideally suited for a wide range of applications, but especially for **carbon-intensive industries like the cement, biogas, steel, or petrochemical industries**.

END PRODUCTS

- ◆ Synthesis gas
- ◆ Ethylene
- ◆ Formic acid
- ◆ Methanol
- ◆ Other chemicals and fuels upon request

Patented ECO2CELL electrolysis cell © GIG Karasek





Why is GIG Karasek the right partner?

Thanks to our many years of know-how in plant engineering and process technology, we have the ultimate expertise to implement customer-specific solutions for CO₂ conversion. As a pioneer in this field, we have developed an innovative and efficient CO₂ conversion cell. The success of our process shows the way forward and has already been demonstrated in a pilot plant. All these preconditions make us the ideal partner to introduce CO₂ conversion into industrial applications and to provide turnkey systems to our customers.

We can help you with these services:

- ◆ Development of customer-specific CO₂ conversions solutions
- ◆ Design and construction of turnkey plants
- ◆ Process optimization and scale-up
- ◆ Consulting

Imagine a sustainable circular economy where CO₂ emissions are not only reduced, but converted into valuable products.

Carbon dioxide - from problem to opportunity. Let's tap into this enormous potential together!

ADVANTAGES

- ◆ **Product diversity:** The system can produce a large number of end products
- ◆ **Zero-emission technology** through the combination of water and electricity from renewable sources
- ◆ **Scalability:** Easy scaling thanks to the modular design
- ◆ **Mild process conditions** (ambient temperature and pressure)
- ◆ **Hydrogen does not need to be supplied to the process**

LEARN MORE



Visit our website or contact us at ent.gigkarasek@gigkarasek.at



Read the GIG Karasek Insights and download the white paper on CO₂ utilization!



We develop ♦ efficient ♦ competent ♦ cooperative ♦ proactive ♦ goal-oriented ♦ reliable customized process solutions and systems according to your requirements.

Regardless of the scope of services, our aim is to optimize your production facilities with tailor-made solutions in terms of product quality and processes. Where other companies reach their limits, we find ways to process your material flows by combining various process steps that have been developed over decades. A high level of expertise and personal all-round service make GIG Karasek your reliable partner for unique challenges.



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