Energy supply with climate-positive sub-zero methanol as fuel

A historic opportunity for Europe to secure an independent energy supply, prosperity, and long-term social peace!

September 2025

This working paper describes the potential of a fundamental innovation that could secure Europe's and the world's energy supply while effectively reducing CO_2 concentrations in the Earth's atmosphere. The aim of the Taxpayers Association of Europe (TAE) is to initiate an open discussion and to highlight the potential of innovations for securing energy supplies and combating climate change on the basis of an existing concrete technical solution.

We are talking about climate-positive sub-zero methanol (*"green methanol"*). This is a new type of green, synthetic energy source, the production of which removes more carbon dioxide (CO_2) from the atmosphere than is needed for its production. The excess CO_2 is converted into solid carbon in a further process step – i.e., into a valuable raw material that can be used in industry and agriculture.

Viewed holistically, the production and consumption of sub-zero methanol reduces CO_2 emissions. The combustion process is CO_2-neutral. It is clean and releases only water and CO_2.

Sub-zero methanol can be produced cost-effectively in large quantities. And it addresses key objectives of the European Commission's REPowerEU plan – in particular, the diversification of energy sources, independence from fossil fuels from third countries, and the decarbonization of the transport sector. Sub-zero methanol is also compatible with the targets of the Green Deal and the "Fit for 55" package by actively reducing CO_2 emissions and making renewable energy efficiently usable. It can serve as a bridge technology here.

In short, green sub-zero methanol as a fuel provides a pragmatic and comparatively quickly feasible answer to the question of how the EU can quickly and efficiently become self-sufficient in energy supply.

To achieve this, two challenges must be overcome:

1. The EU must recognize **green methanol as a synthetic fuel**.
2. The EU must set up **research, development** and investment funds aimed at achieving "sub-zero emissions."

1. Europe needs its own independent energy source

The recent dynamic and rapid upheavals in geopolitics have made it clear to us that it is high time for Europe to become significantly more autonomous in its energy supply.

Thanks to a groundbreaking innovation developed in Europe, an independent energy supply for the EU is now within reach.

While the US intends to rely more heavily on fossil fuels in the coming years and sell them to Europe at high prices, China has long recognized the advantages of methanol and is pursuing its own methanol strategy. This country has already taken on a pioneering role in green methanol. The methanol vehicle fleet is growing steadily here.

In addition to applications in the chemical industry, methanol is generally being used more and more in the energy and transportation sectors. For example, the Maersk shipping company uses methanol as fuel for the latest generation of its container ships — as a sustainable and environmentally friendly replacement for heavy fuel oil.

If the EU takes the issue into its own hands, Europe will not become dependent on Chinese methanol.

To avoid this, the EU must recognize green methanol as a synthetic fuel in the short term, promote its development through research and development funds, and provide funding for the realization of global sub-zero plants.

2. What is sub-zero methanol?

Methanol is "refined" hydrogen. Methanol, also known as methyl alcohol (chemical formula CH_3OH), is alcohol in its simplest form – a colorless liquid with a characteristic, slightly sweet smell. Its combustion process is clean and releases only water and CO_2. When methanol is produced from green hydrogen and atmospheric CO_2, it is CO_2-neutral.

In the production of sub-zero methanol, more CO_2 is removed from the atmosphere than is needed to produce this synthetic energy source. Sub-zero methanol therefore reduces CO_2 and has a positive impact on the climate.

3. Advantages of sub-zero methanol over other energy sources

Neither wind and water energy nor solar energy are sufficient to secure Europe's energy supply. In addition, energy production from renewable sources is subject to strong fluctuations and there is currently insufficient storage capacity available.

These fluctuations are compensated for with the help of existing gas and nuclear power plants. Their capacities are sufficient for this task – but not to completely cover Europe's energy needs. The construction of new nuclear power plants requires lead times of ten to 15 years. Therefore, even with this energy source, Europe's energy supply cannot be improved in the short term. Added to this are the risks associated with nuclear energy.

Battery, ammonia, and pure hydrogen solutions also have limited potential. Furthermore, their use would require new infrastructure, which would necessitate further investments in the billions of euros. In addition, the European power grid would have to be continuously expanded. That, too, would cost a fortune.

Energy in Europe is far too expensive today. In contrast, green sub-zero methanol can be produced in a highly cost-efficient manner in the deserts of our planet, among other places.

Compared to the EU hydrogen strategy, methanol as "refined hydrogen" also offers a wide range of other advantages: for example, its liquid form makes it easy to store and transport (unlike pure hydrogen, for example, which can only be transported under high pressure and extremely cooled, requiring a high energy input). In addition, methanol has a much higher energy density than pure hydrogen or batteries: compared to conventional batteries, the energy density of methanol is eight times higher, and four times higher than hydrogen.

With only minor adaptations, liquid methanol can easily be used globally in the existing infrastructure, which has been built up over decades and in which considerable investments have been made. Instead of demolishing old pipelines, they can continue to be used. The potential savings would be enormous.

The EU imports fossil fuels (natural gas, oil, LNG) worth several hundred billion euros annually (for example, the cost from April to November 2024 was just under 260 billion euros). Sub-zero methanol production controlled by the EU could gradually replace these imports.

This could even lead to the creation of a European energy union in which EU countries jointly implement strategic projects such as methanol corridors, investment funds, or storage strategies. This could be supported by EU funding programs such as the EU Innovation Fund (ETS financing), Horizon Europe (research & development; development), or the Connecting Europe Facility (infrastructure projects).

4. Sub-zero methanol contributes to reducing CO_2 concentration in the Earth's atmosphere

During the sub-zero production process, CO_2 and water are extracted from the atmosphere at the production sites using a globally unique chemical-technical direct air capture (DAC) process or bio-based methods. This is then used to produce the liquid energy carrier sub-zero methanol.

This process removes more carbon dioxide from the atmosphere than is needed to produce the synthetic energy source. In a further process step, the excess CO_2 is split into solid carbon, for example. This is then processed into a raw material that can be used in industry (e.g., carbon fiber, raw material for batteries) or in agriculture (e.g., fertilizer). This makes sub-zero methanol CO_2-negative or climate-positive.

Methanol produced using sub-zero technology—sub-zero methanol—offers a forward-looking and globally unique solution that enables humanity to move away from fossil fuels and permanently remove CO_2 from the atmosphere—while also being highly profitable. With expertise from the heart of Europe.

The production facilities for sub-zero methanol should primarily be built in the Earth's sun belt. Outside the EU, for example, in Egypt, Namibia, Saudi Arabia, UAE, Australia, Chile, Brazil, the USA, or Mexico—in other words, in countries where solar energy is virtually unlimited and therefore available at unbeatably low costs. In Europe, Spain, Portugal, Greece, Cyprus, and the Balkan countries are considered promising candidates. Alternatives are locations where abundant hydropower or geothermal energy is available, as is the case in Austria, Scandinavia, and Iceland. Here, several of these production facilities can be scaled up to sub-zero giga plants.

The newly developed direct air capture process is the world's first and so far only process of its kind that extracts not only CO_2 but also water from the atmosphere. This is an important factor when operating such plants in desert regions.

5. Investing in a vision that can change Europe and the world

Financing could be made possible in the form of a European Sub-Zero Fund. With an estimated investment volume of €500 million, the EU could move forward as an anchor investor and play a leading role in the realization of Sub-Zero Plants—both on the European continent and globally.

A sub-zero fund currently being set up in combination with a European sub-zero standard production facility offers a unique opportunity for investors. Initial demo production plants are intended to confirm the efficiency and profitability of this technology before large-scale industrial plants provide the necessary production capacity. Once in operation, the equity investments will pay for themselves within a year.

6. Methanol strategy – a European flagship project

It is now important for the EU to speed up the implementation of this technology, as China has already recognized the potential of green methanol and has already taken initial measures as part of its own methanol strategy.

If the EU misses this historic opportunity to gain a unique selling point in the production and use of this sub-zero emission energy technology, China will seize this project for itself. The example of electric vehicles should serve as a warning: China was initially not taken seriously and was ridiculed, but is now set to become the global market leader in e-mobility in record time.

With this memorandum, the European Taxpayers' Association (TAE) wishes to make an active contribution to the energy transition. The core issue is how we can succeed in guaranteeing climate-positive energy production and a secure energy supply at low prices (sub-zero technology), thereby minimizing energy costs for businesses and private individuals.

In our view, the goal must be to seize the historic opportunity to export "sub-zero methanol" from Europe to the rest of the world and secure European technological leadership. This will enable controlled energy autonomy and long-term revenue for the EU.

7. Authors/supporters of the memorandum (ABC)

- Bavarian State Government
  Minister of State Eric Beißwenger, Member of the Bavarian Parliament
- Circle K.
  Director Sjur Haugen, Europe Office Oslo
- Diplomatic Council (UN Consultative Status)
  Andreas Dripke, Executive Chairman
  Hang Nguyen, Secretary General
  Jean Pütz, Science Journalist
- European Economic Senate (EWS)
  Dr Ingo Friedrich, President
- European Institute for Public Finance
  Dr. Richard Beyer, Scientific Director
- Glasshouse – Studies on a New Economy
  Johannes Maruschzik
- President of the Alexander von Humboldt Foundation
  Prof. Dr. Robert Schlögl
- Taxpayers' Association of Bavaria
  Rolf von Hohenhau, President
- Taxpayers Association of Europe
  Michael Jäger, President; Dr Horst Heitz, Secretary General; and
  Rudolf G. Maier, Press Officer

Taxpayers Association of Europe (TAE)

Munich Office

Michael Jäger
Nymphenburger Str. 118
D-80636 Munich
Tel.: +49 89 126 00 820

Email: info@taxpayers-eurtope.org
Webwww.taxpayers-europe.org

Brussels Office

Dr. Horst Heitz
Rue d'Arlon 46
B-1000 Brussels
Tel.: +32 2 588 1520

ANNEX

Practical example of the implementation of the methanol strategy

Sub-zero methanol concept from the OBRIST Group

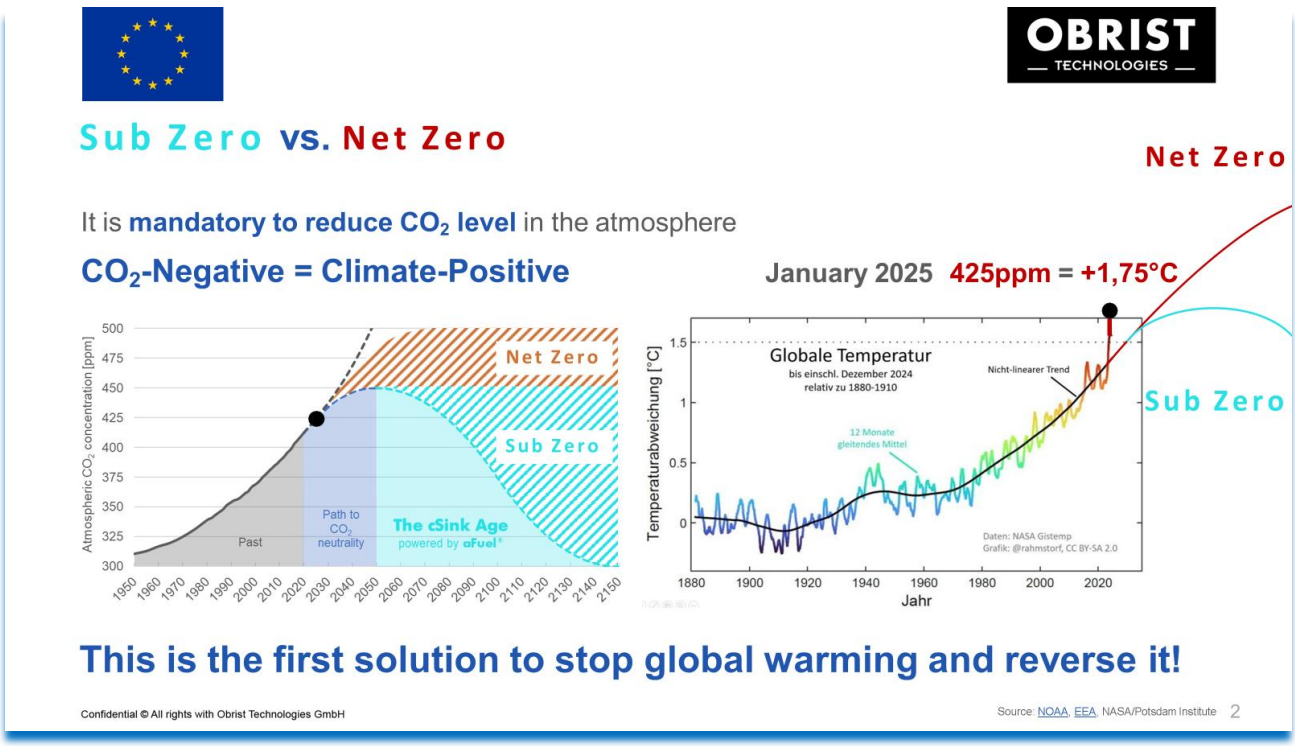
The following section will illustrate how the sub-zero vision can be implemented using the technical solution already available from the OBRIST Group. With its direct air capture process, the OBRIST Group, based in the Lake Constance region, is playing a pioneering role worldwide in green methanol and has developed a unique process that not only captures CO_2 but also extracts water from the atmosphere at the same time.

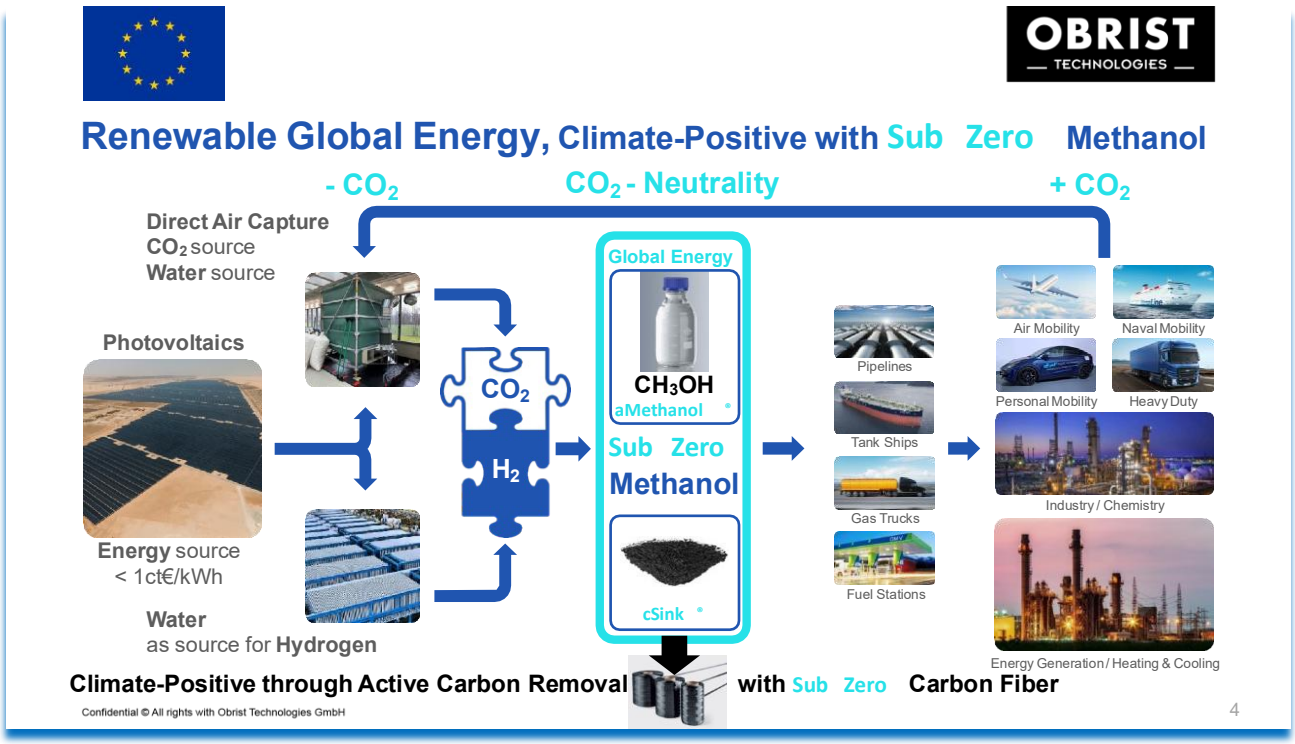
Last year (2024), a due diligence review was successfully conducted by the engineering and consulting firm ILF Consulting Engineers. Important: The review report confirms the feasibility of this sub-zero technology and the negative emissions associated with the production and use of green sub-zero methanol.

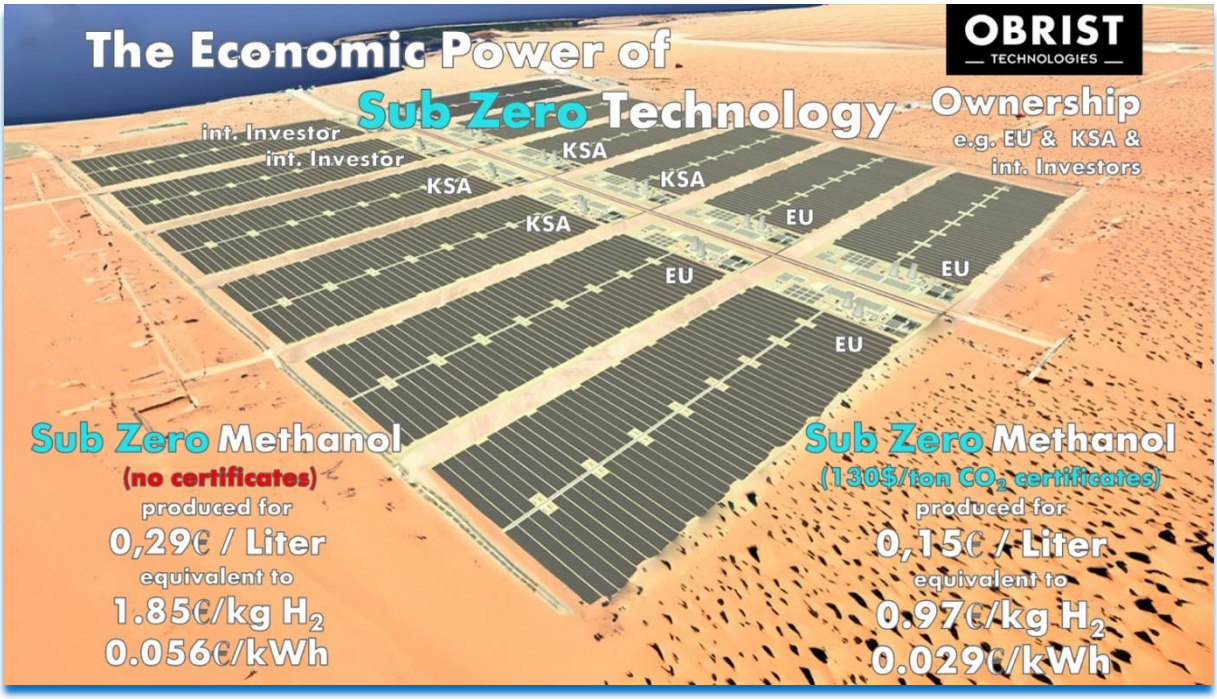
This green methanol is the first European bridge technology available for achieving the EU's climate targets, with the potential to contribute to climate-positive energy production and supply worldwide, while at the same time making Europe and the EU less dependent on third countries for energy. The key to the success of this technology lies in its marketability: by using solar energy, this green methanol has a clear cost advantage over other energy sources. In addition, existing infrastructure (including gas stations and pipelines) can be used.

It is therefore not surprising that the OBRIST Group has already gained a number of supporters for its Sub-Zero Vision. These include the Bavarian state government, the Taxpayers' Association, the Taxpayers Association of Europe, the European Economic Senate (EWS), the Association of Independent Gas Stations (bfT), the European Institute for Public Finance (EIPF), and the global gas station operator Circle K, to name but a few.

Excerpt "Sub Zero Methanol Concept OBRIST Group
www.obrist.at/technologies



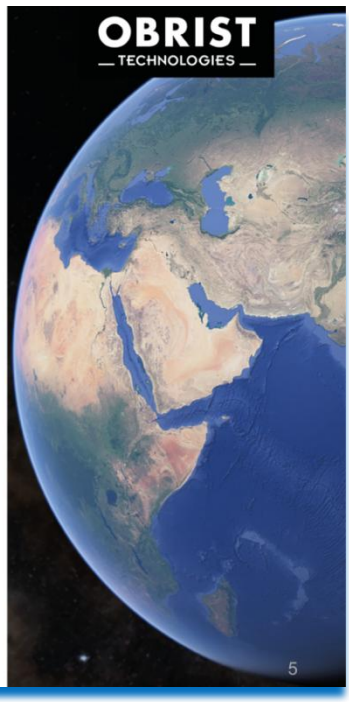

Renewable Global Energy, Climate-Positive with Sub Zero Methanol
- CO_2
CO_2 - Neutrality
+ CO_2
Direct Air Capture
CO_2 source
Water source
Photovoltaics
Energy source
< 1ct€/kWh
Water
as source for Hydrogen
CO_2
H_2
Global Energy
CH_3OH
aMethanol
Sub Zero
Methanol
cSink
Pipelines
Tank Ships
Gas Trucks
Fuel Stations
Air Mobility
Naval Mobility
Personal Mobility
Heavy Duty
Industry / Chemistry
Energy Generation / Heating & Cooling
Climate-Positive through Active Carbon Removal
with Sub Zero Carbon Fiber
Confidential © All rights with Obrist Technologies GmbH
4


The Economic Power of
Sub Zero Technology
Ownership
e.g. EU & KSA & int. Investors
int. Investor
int. Investor
KSA
KSA
KSA
KSA
EU
EU
EU
EU
Sub Zero Methanol
(no certificates)
produced for
0,29€ / Liter
equivalent to
1.85€/kg H_2
0.056€/kWh
Sub Zero Methanol
(130$/ton CO_2 certificates)
produced for
0,15€ / Liter
equivalent to
0.97€/kg H_2
0.029€/kWh

Profitability / Payback Period

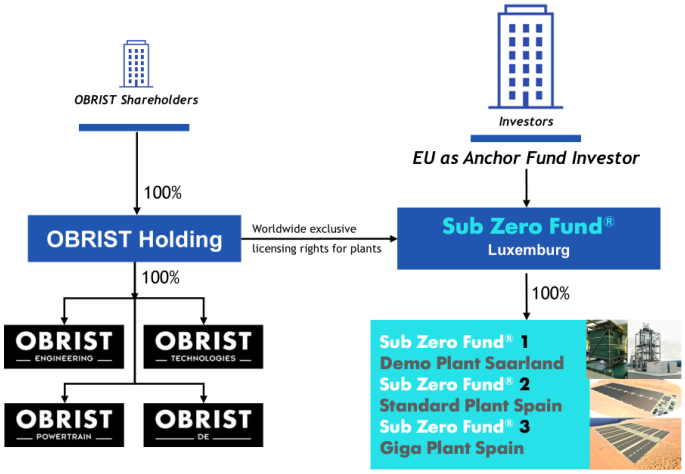
- **Potential Profit according to technoeconomic Due Diligence**
- Profit of Standard Plant **between 20 and 25%**
  → 360 to 450m€ per year
- Equity Ratio of 20%
  → Equity Contributions of Investors earned back after <1 year

- **Conclusion:**
  The fast realization of the Demo Plant as well as the Standard Plant enables us to realize the described profit potential and initiate further investments up to Giga Plants



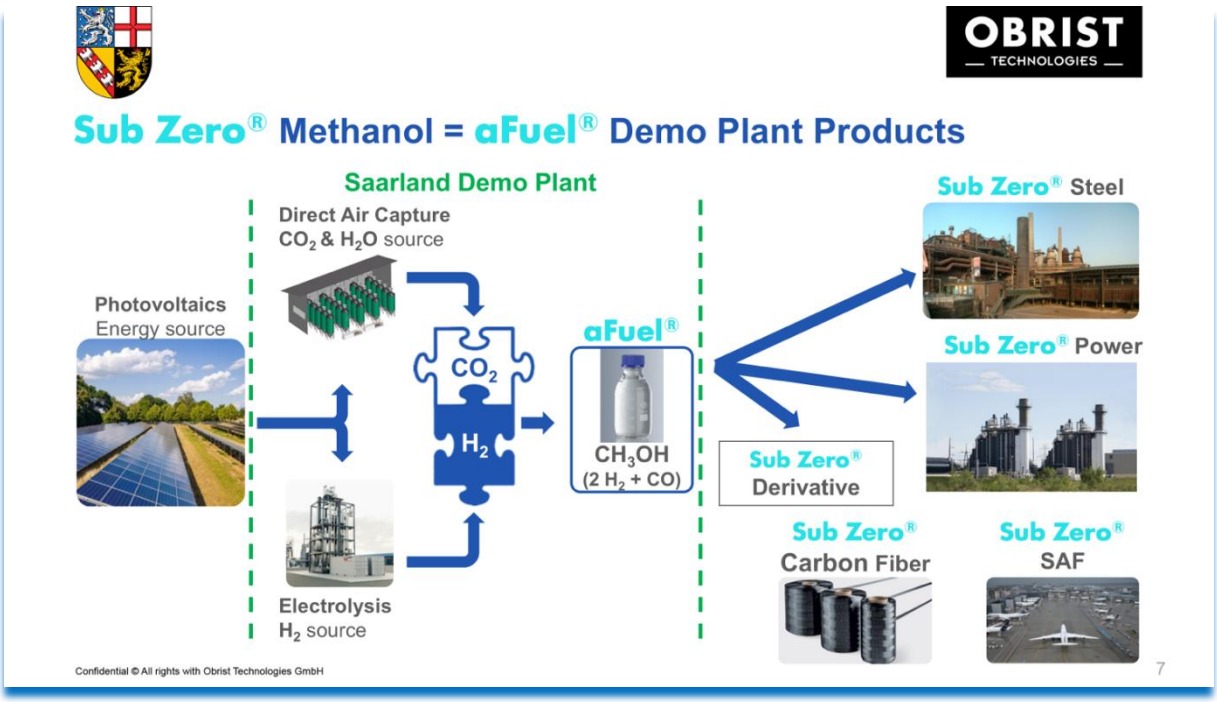
Confidential © All rights with Obrist Technologies GmbH

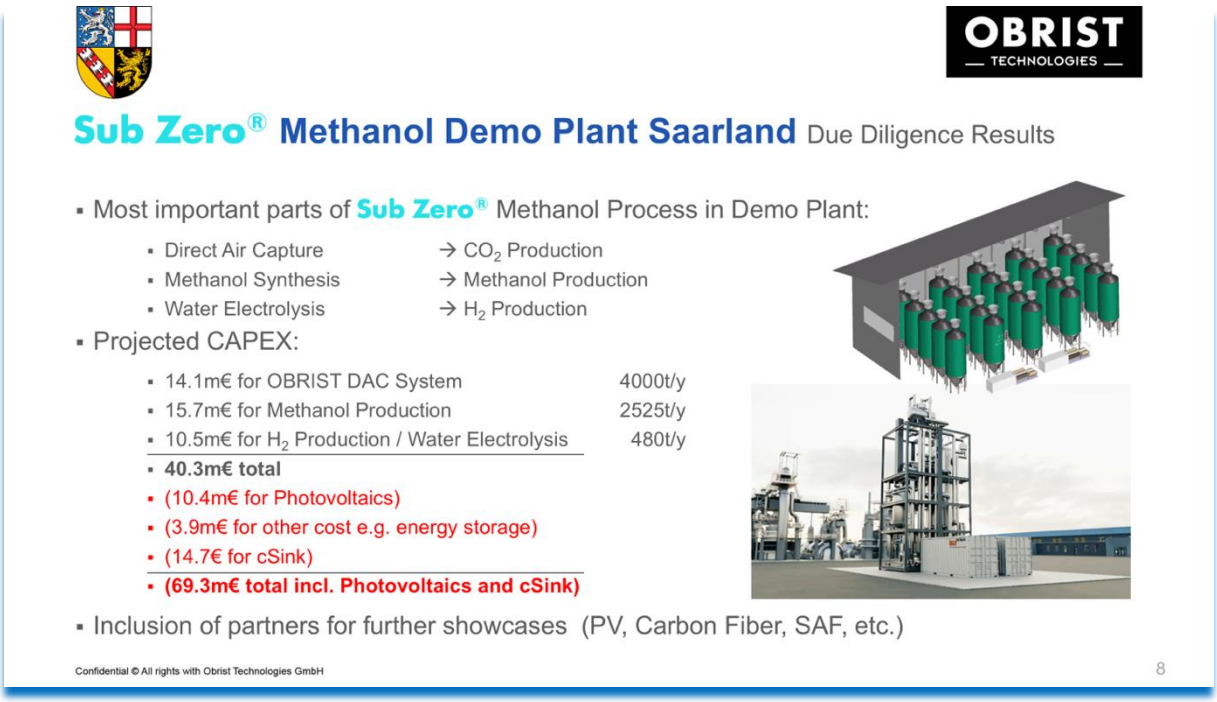
Sub Zero Fund® with EU as Anchor Fund Investor



- **+ Economy for the EU**
- **+ Ecological Revolution**
- **+ Energy Independence**
  150 plants needed to free Europe from fossil fuels dependency
- **+ Resilience**

Confidential © All rights with Obrist Technologies GmbH





Questions about the OBRIST concept

Frank Obrist, CEO
OBRIST DE GmbH
Felix-Wankel-Straße 10
D-88131 Lindau GERMANY
Tel: +49 8382 88936 11
Email:office@obrist.de www.obrist.at