

## Short Position

### Open Direct Current Alliance (ODCA): Direct current for the energy-efficient factory

The energy transition is a necessary component of the sustainable transformation of society. The ecological focus is on a consumption of resources that does not exceed the earth's natural regenerative capacity. In terms of electrical energy, this can only be achieved by increasing efficiency and using CO<sub>2</sub>-free, renewable energy sources. Digitalized access to electricity supply and demand as well as integration of storage devices will be beneficial in balancing the volatile supply and demand schemes. More electronics and sensitive production processes require the highest level of power supply quality. The 130-year-old power grid can no longer cope with these new challenges. In addition, geopolitical developments are driving the quest for a resilient and decentralized energy supply. In order to achieve these goals, a change in the industrial power grid is necessary.

With the use of direct current technology, we support the social goal of a resource-conserving and CO<sub>2</sub>-neutral world. Our mission is to build the international DC ecosystem and to establish DC technology across applications.

## Our Positions

- **Direct current (DC)** has hardly been discussed publicly as an effective solution for **increasing energy efficiency**. To leverage the enormous potential, knowledge of the technology and its advantages need to be shared as widely as possible. There is a need for uncomplicated use and support in the form of government funding.
- The use of direct current in factories should not remain a national solution. For this reason, the ODCA<sup>1</sup> has positioned itself internationally from the beginning and is working on common international standards. Within the scope of the Green Deal, the European Commission should push for the introduction of direct current microgrids. DC technology also offers a solution for the much-discussed goal of **peak power reduction** since storage devices such as batteries are inherently DC and available for series applications. A European standardization and regulation would increase the speed of implementation as well.
- Many **local installation regulations currently hinder the implementation of DC technology** - these should be dismantled. In addition, the lack of legal recognition by the EU currently leads to difficulties regarding the insurability of early DC pilots. This should also be regulated concerning the liability of DC professionals.
- As in many areas of Central European industry, there is a **shortage of qualified professionals** (technical consultants, installers) in DC technology. Governments shall take this into account when discussing the immigration of qualified specialists.

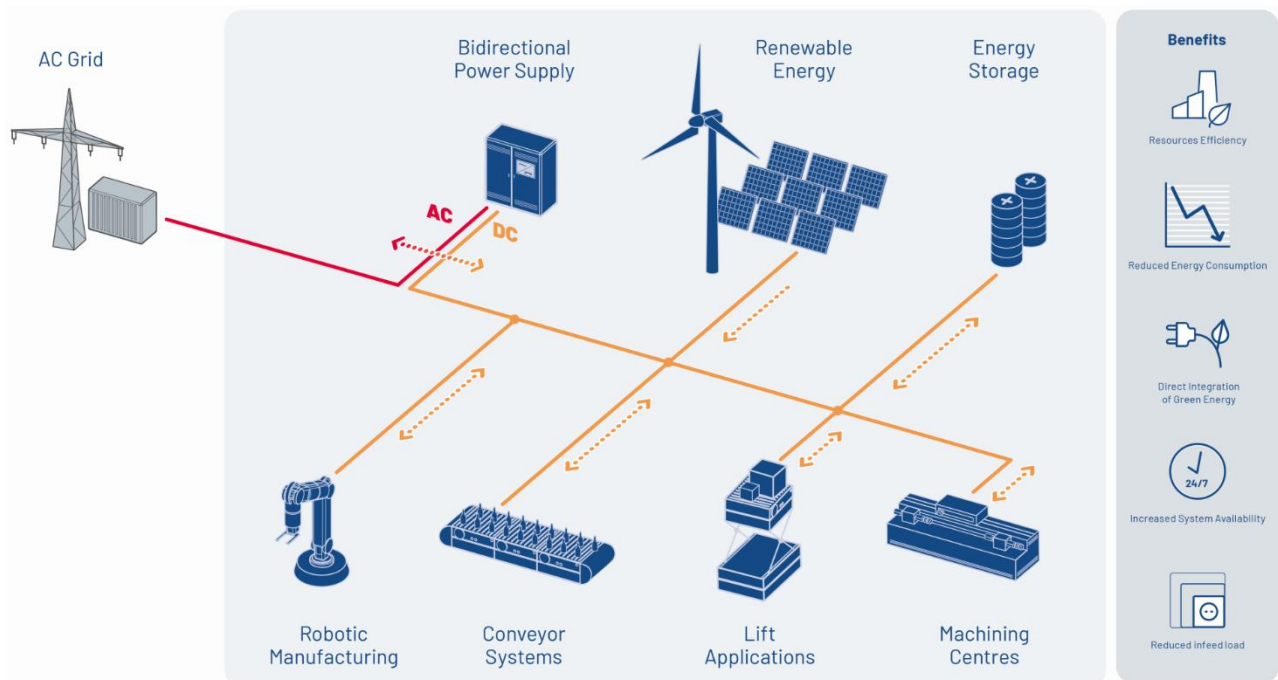
## Current state of affairs

- **Resilient grids:** The DC grid can support the resilience of the AC utility grid. For example, energy storage connected to the DC grid can ingest energy from or feed energy back into the utility grid depending on the current demand/supply situation. Additionally, they provide peak-power for short-time needs **reducing the**

<sup>1</sup> The Open Direct Current Alliance (ODCA) is a working group of the ZVEI with an international orientation.

**in-feed power** and easing the load on the supply grid. Decentralized grid management, simple integration of storage units and a single connection to the public AC grid ensure a reliable power supply.

- **Increased energy efficiency:** Industrial applications are driven by about 70% by frequency converters which convert electricity twice: from 50 Hz AC on the supply grid to direct current and then from that direct current to a variable frequency for efficient operation of motors and drives. Connecting all DC links of the inverters with each other makes the first AC-DC conversion redundant. This also allows for **direct use of the braking energy** from moving masses, leading to energy savings of six to ten percent, depending on the process dynamics.
- **Efficient integration of renewable energies:** Since solar power generation systems supply direct current, all that is needed is a DC/DC converter instead of the much more costly DC/AC inverter. This not only saves costs, but also improves dynamics and efficiency.
- **DC grids are safe:** The DC grid is just as safe for people as today's AC grid, as dedicated protective devices ensure the safety of people and equipment during operation and in the event of faults.



Quelle: ODCA

## Benefits of the direct current technology

1. Open system
2. Efficient integration of green energy
3. Resource Efficiency – 50 % copper reduction in cabling
4. Lower energy consumption – 6 to 10 % efficiency gains
5. Reduced feed-in-power – Up to 50 % reduction, depending on specifics of the production process
6. Increased system availability – Ride-through capacity for short-time power outage to ensure fast pick-up of production

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