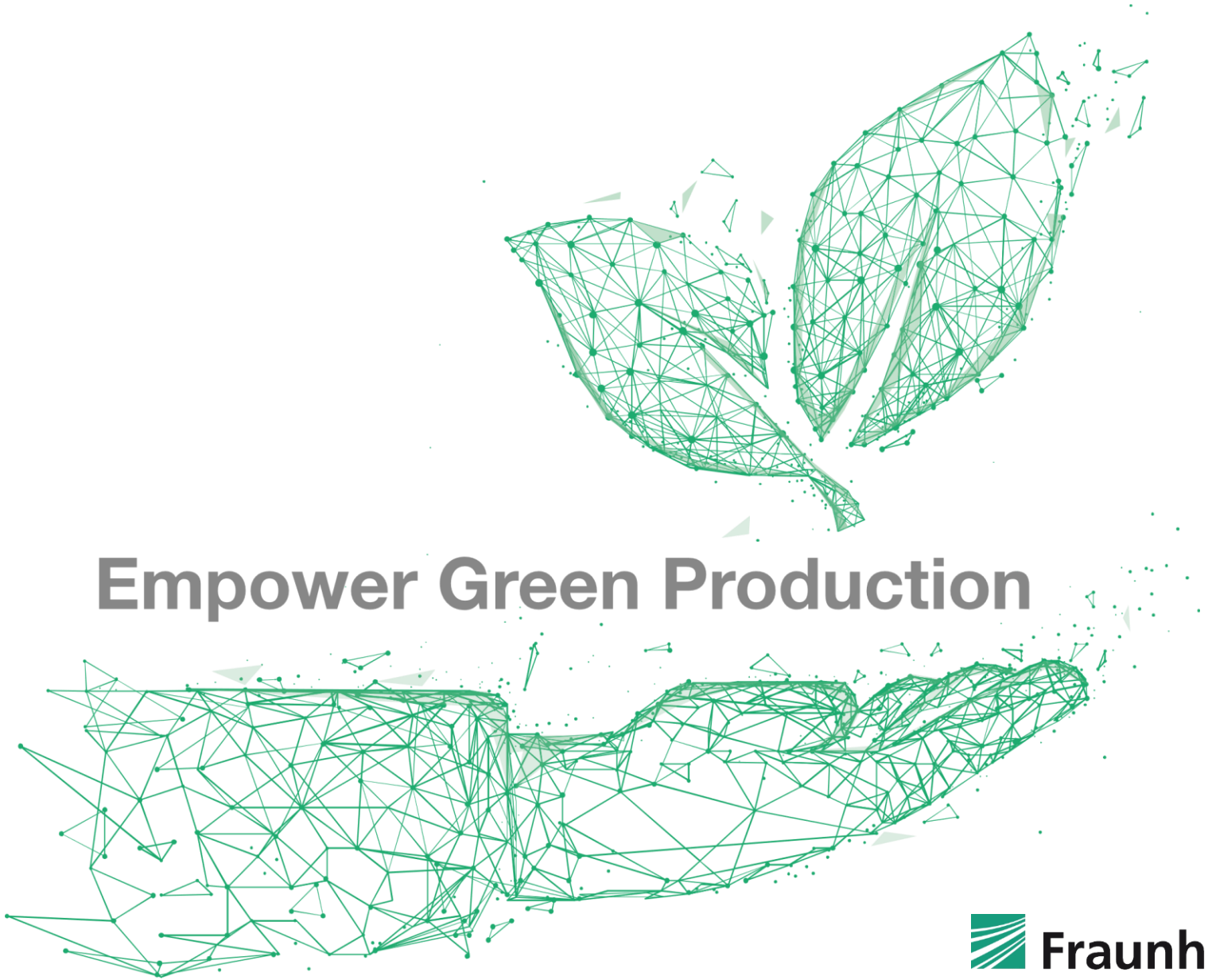

AWK'23

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Scalable Production of Energy Storage Systems

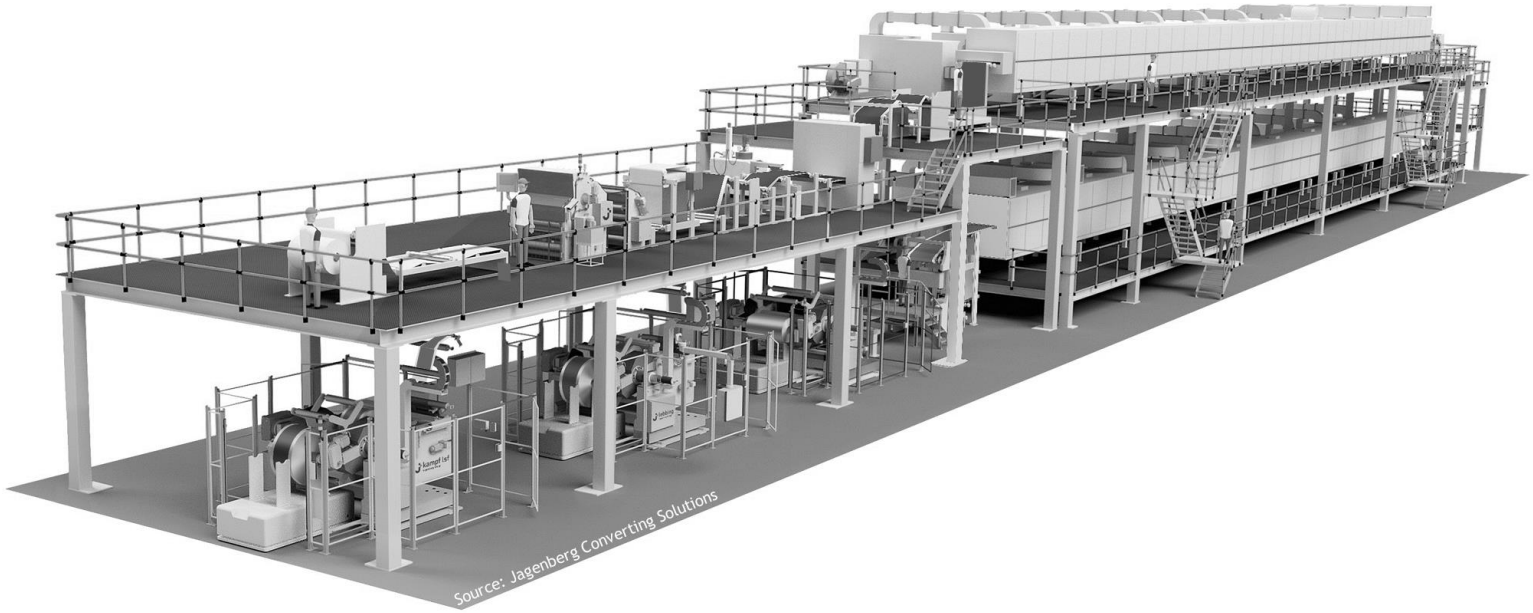
Impulse presentation – Session 2

Dr. Stephan Witt

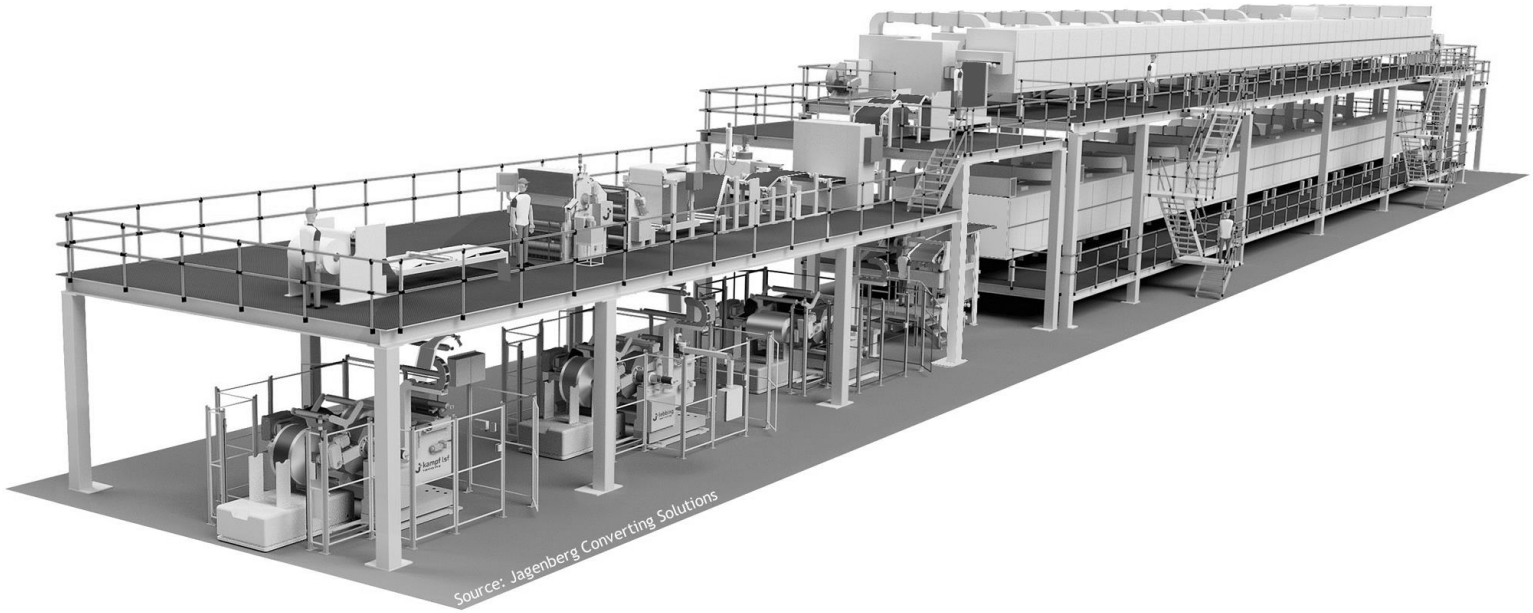
Fraunhofer IPT

WZL | RWTH AACHEN UNIVERSITY

Scalable Production of Energy Storage Systems

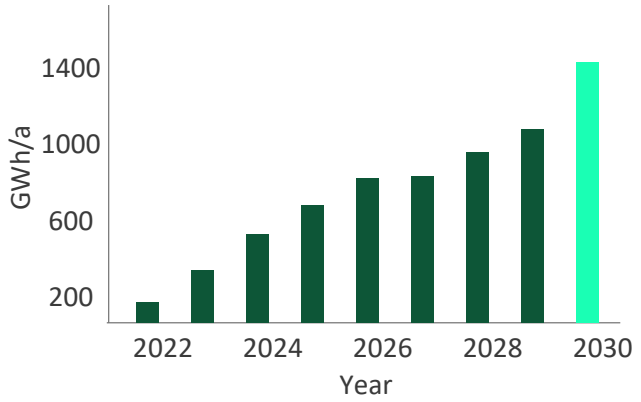


Scalable Production of Energy Storage Systems



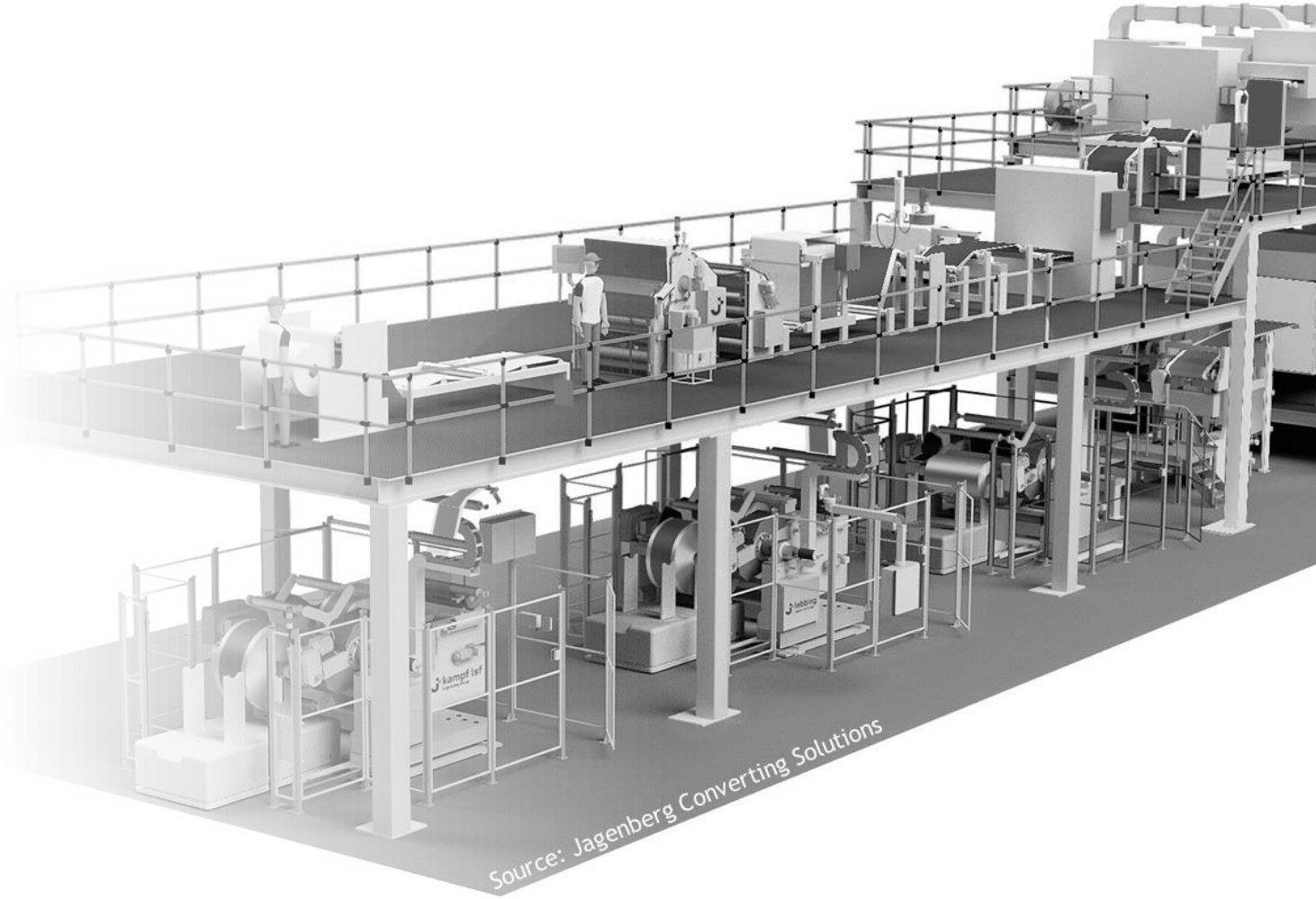
Battery production

- LiB **production** is **linear**
- **1300 GWh production capacity growth** by **2030**
- Opportunities for Europe:
  Sustainable and CO2-neutral production



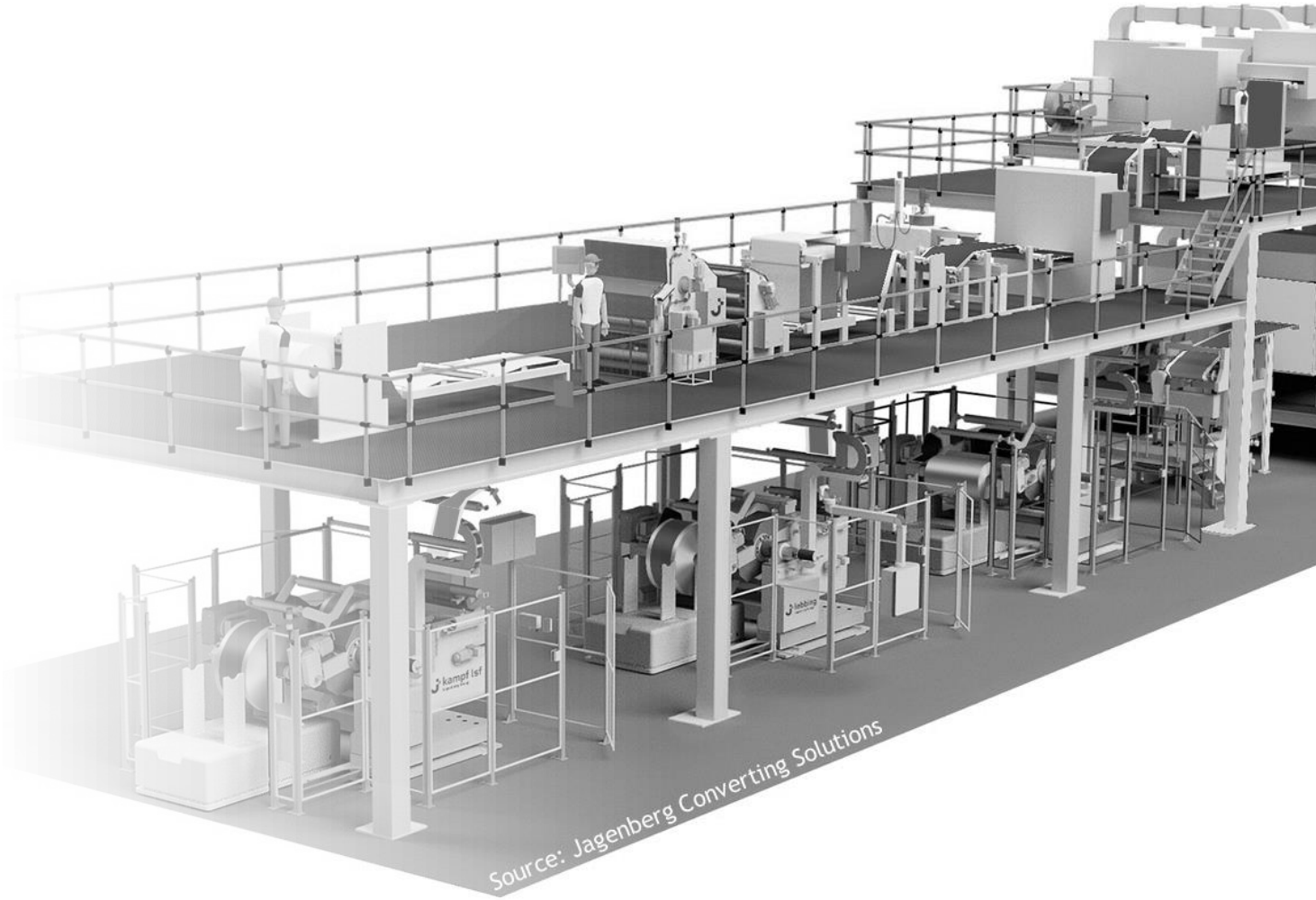
Forecast growth in battery production capacity in Europe

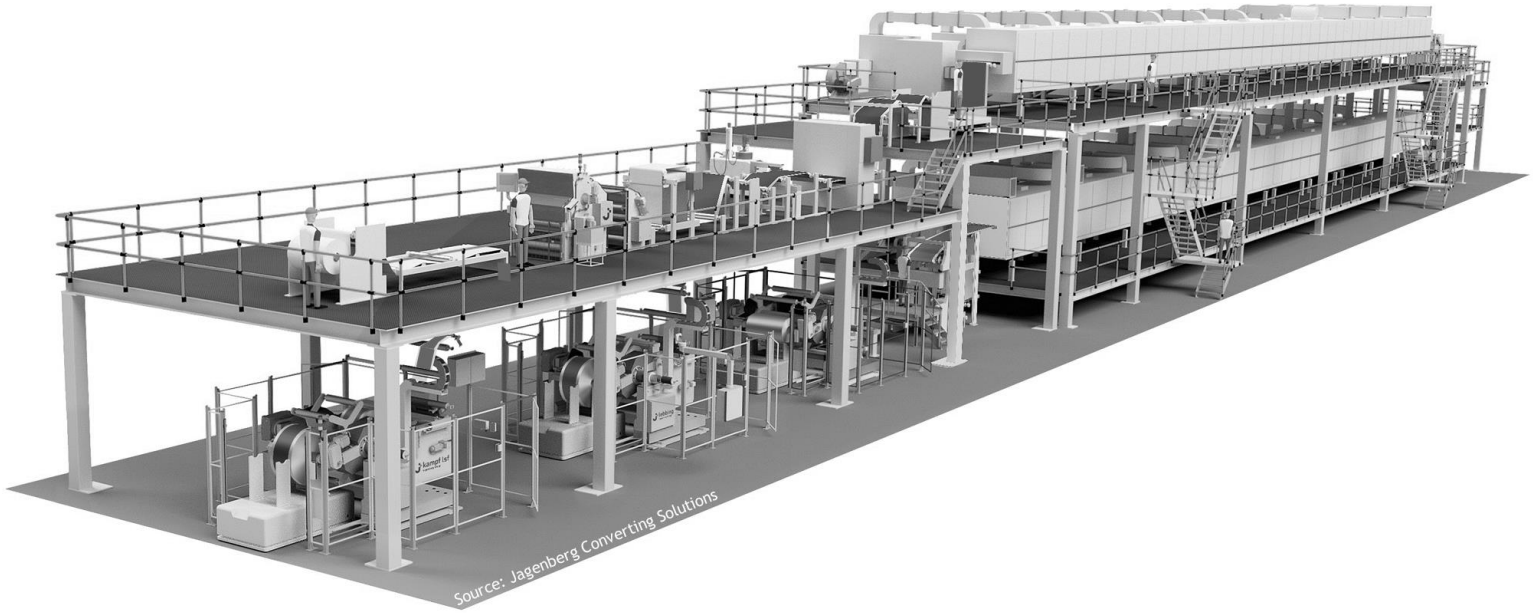
Source: Fraunhofer Institute for Systems and Innovation Research ISI, " Umfeldbericht zum europäischen Innovationssystem Batterie 2022"



Key theses

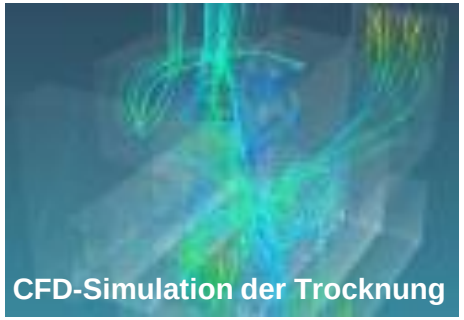
1. The technology and plant engineering used to date can be the **starting point** for European production if inefficient processes are **optimized**.
2. Existing production chains must be holistically **rethought** and **digitized** in order to maintain a technological lead.
3. The strengths of European manufacturers lie in **quality**, **efficiency** and **digitalization**.
4. The close **cooperation** of different player is the key to success.

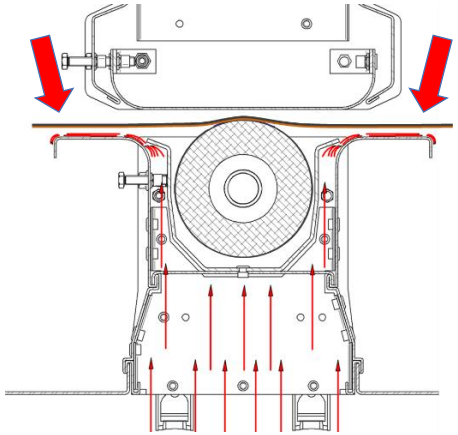


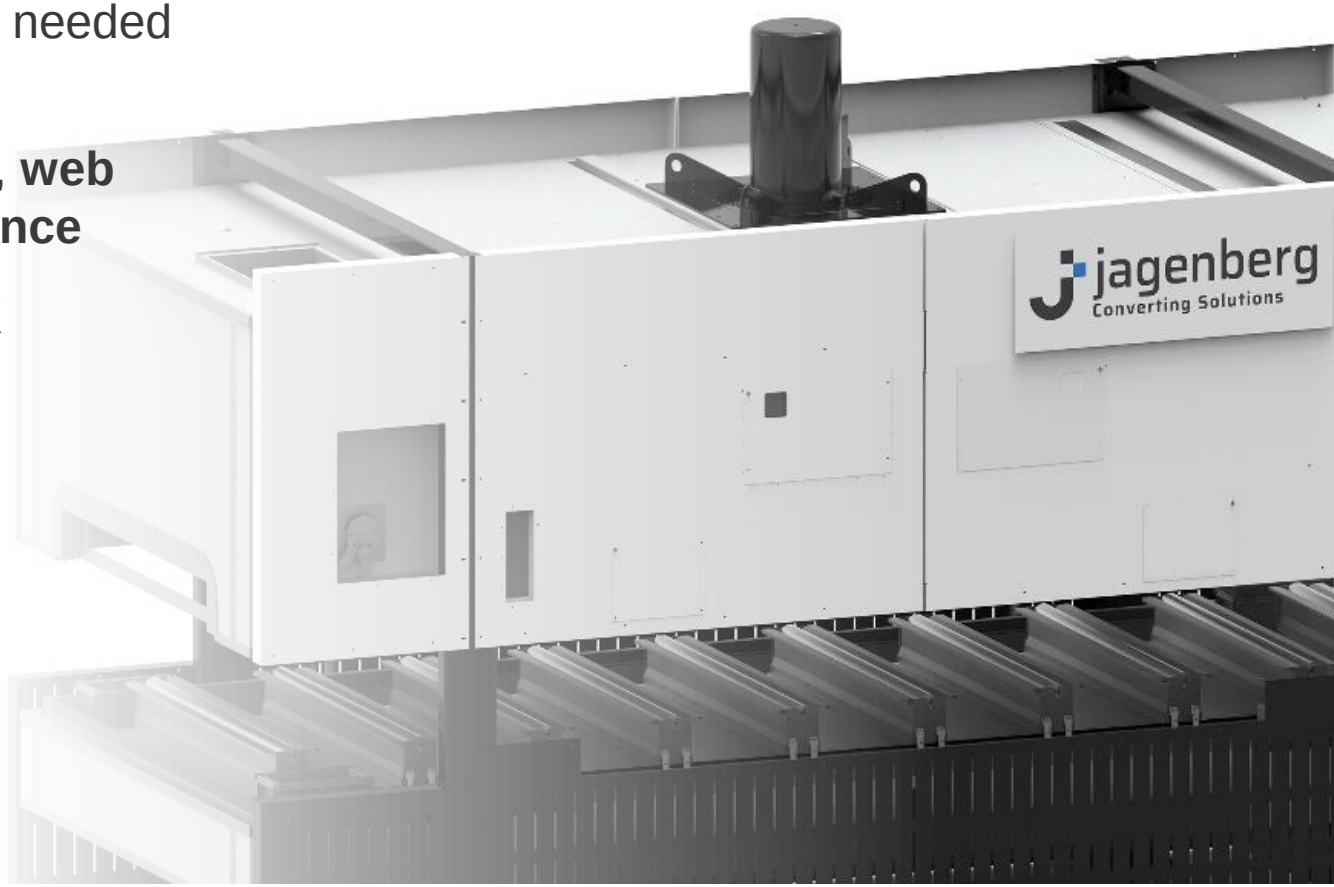


Example: Optimization of convection drying

- 25% of the energy required to produce a LiB cell is needed for drying
- Optimization potential exists with regard to **quality**, **web speed** as well as **energy efficiency** and **air guidance**
- **Savings potential: 30 % CAPEX** and **50 % OPEX**

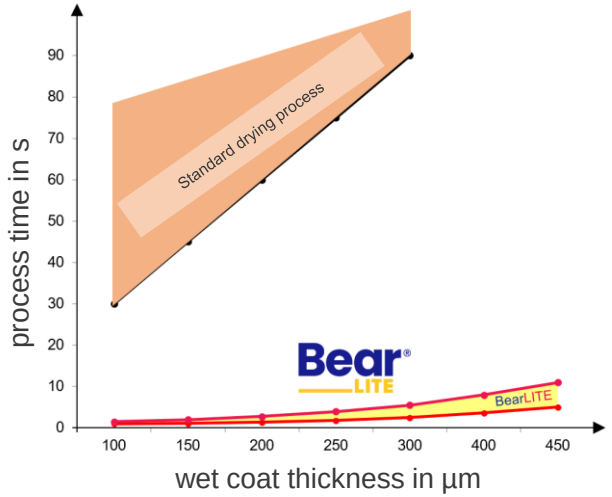






Example: Improvement of drying by near infrared radiation

- Change of the heat source to radiation
- **Reduction** of the **area** by **80%** and **energy** by **90%.**
- A validation in a large-scale technical environment is pending



Example: New assembly technologies

- Tape-laid process for pack sealing – developed with different players
- **Wet** processes have disadvantages in **cycle time** and **reversibility** (challenges in recycling as well as EoL)
- **Adhesive tapes** with precise production machines that allow faster **cycle times** and **reopening**

Disruption requires courage and can be implemented data-driven

- **Rethinking** energy storage production **along the value** chain
- **Data-supported adjustment of** production **minimizes risks**
- Improvements depart from the old and requires **data** and good **networks**
- **Recycling of** material and energy flows offers high potential that should be used

Industry representative
Dr. Stephan Witt, Jagenberg
Dr. Kai Baer, Adphos
Dr. Thomas Bastuck, Vulkan Technic

Fraunhofer IPT
Dr. Henning Janssen
Daniel Zontar, MSc.
Marlin Kersting, MSc.

Thank you very much for your attention!