



The Future of the Energy Sector

Heidrun Maier-De-Kruijff, Secretary General

CIRIEC-Austria

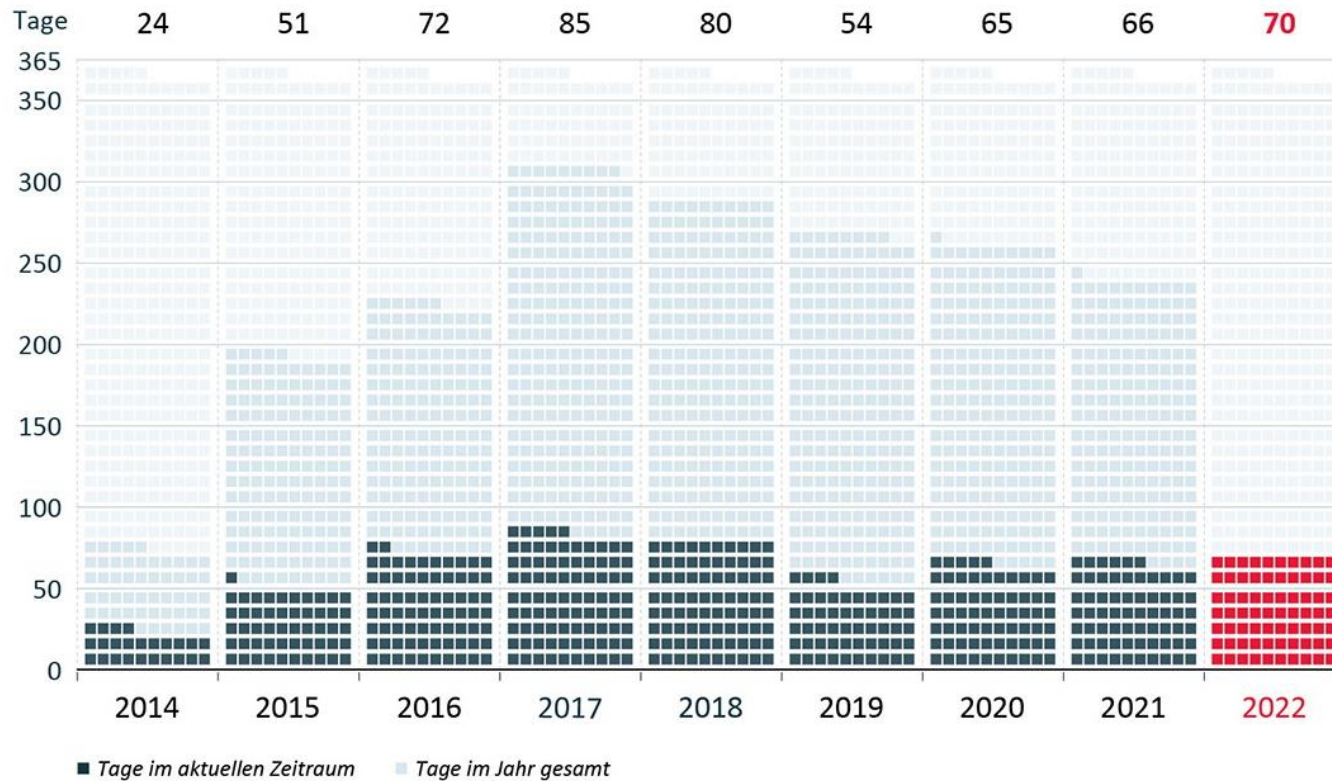
European Power Grids and the importance of Grid Stability

- European and Austrian **Grid Stability increasingly challenged** by dynamic developments in recent years
- In particular, the addition of **volatile, renewable generation** is challenging the Transmission Grid
- maintenance-related **line shutdowns** and low generation from hydropower make it necessary to **balance load flows** in the European Power Grid

Blackouts and frequency interferences

- **January 8, 2021, Croatia**
- **July 24, 2021, France**
- **Blackout defenses** have been **steadily increasing** in recent years
- high level of **supply security** cannot be taken for granted

Number of interventions by Austrian Power Grid to stabilize the German-Austrian power grid

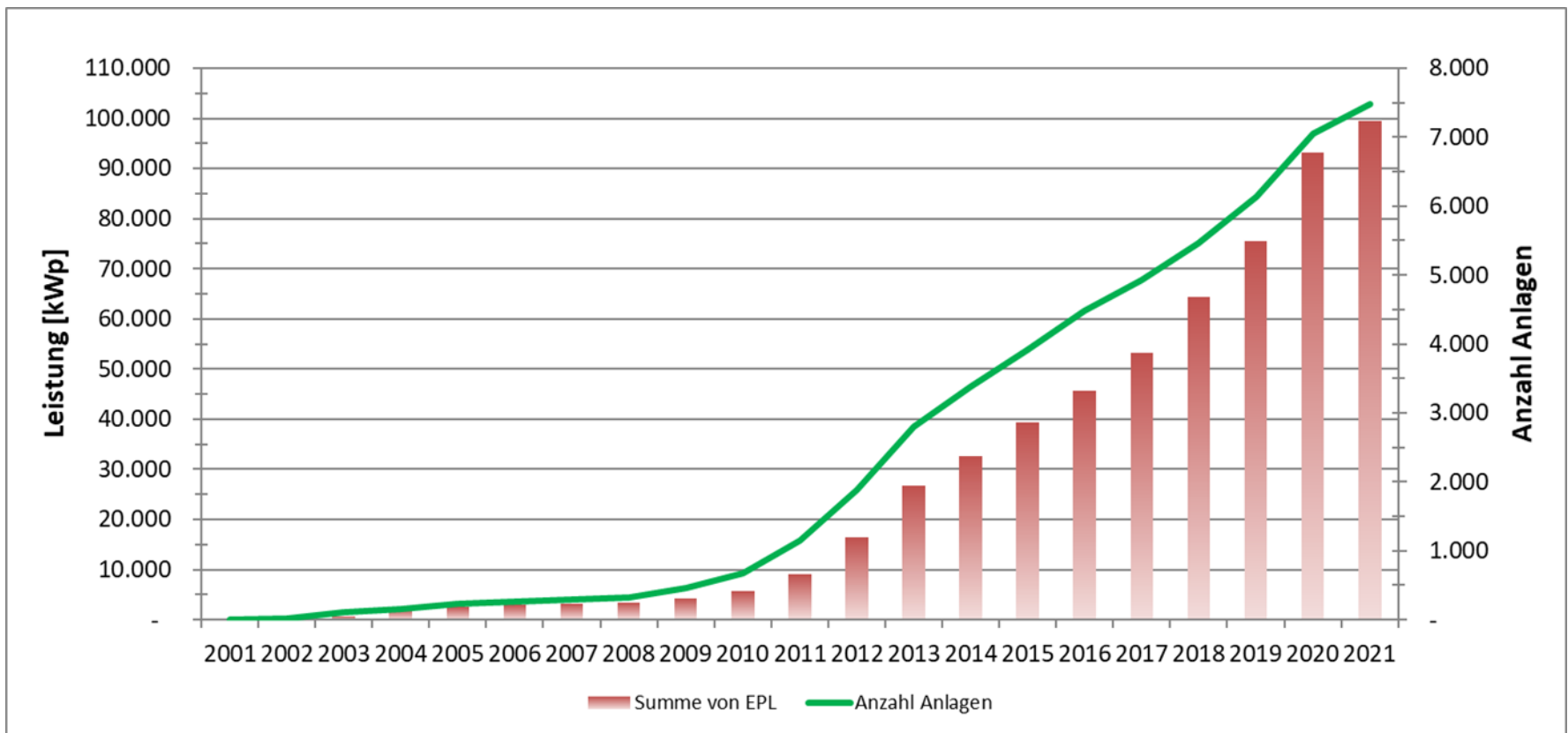


Auftraggeber: APG Austrian Power Grid

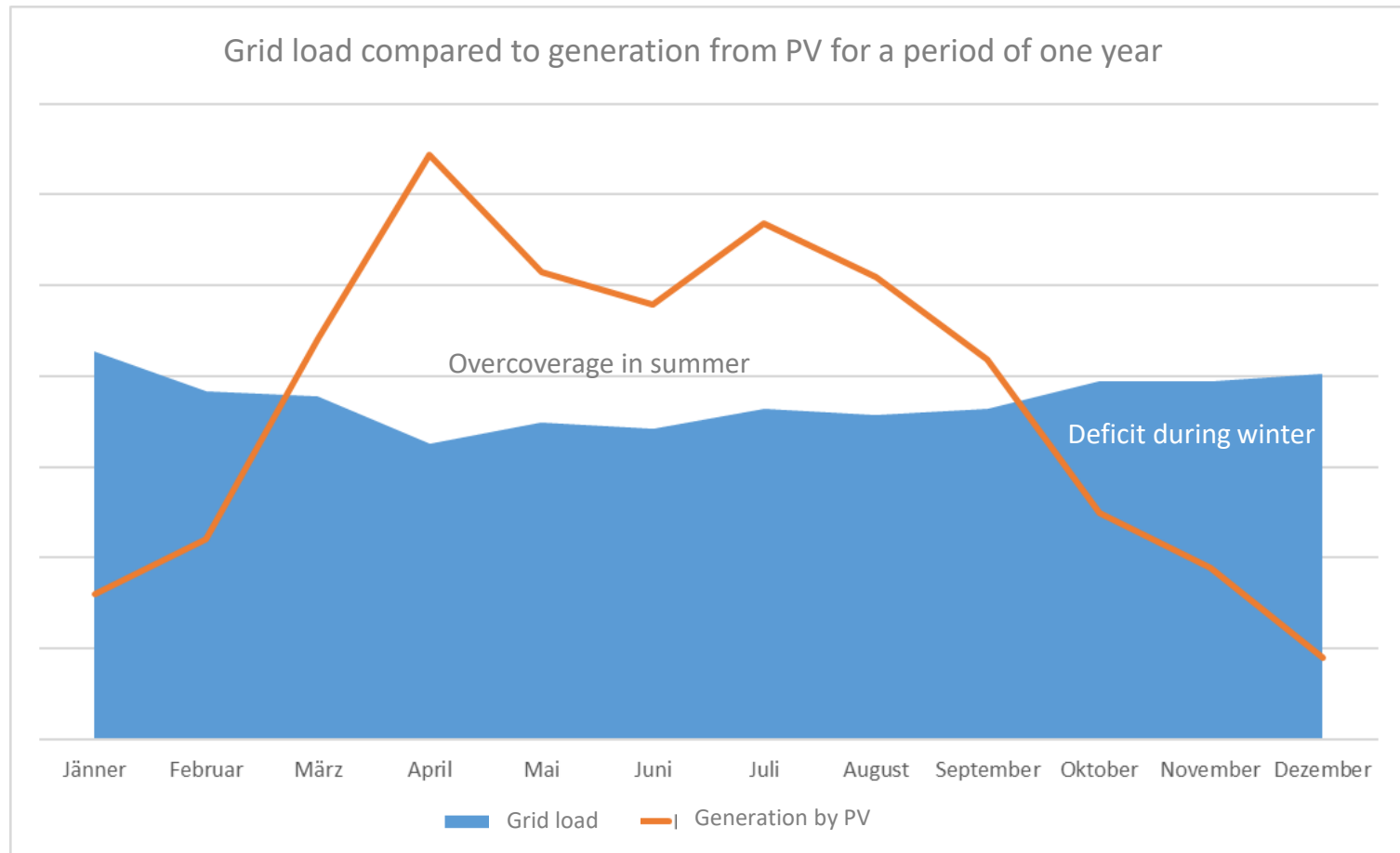
APA-GRAFIK ON DEMAND

Expansion of renewable energy without power grids?

Photovoltaics increases enormously



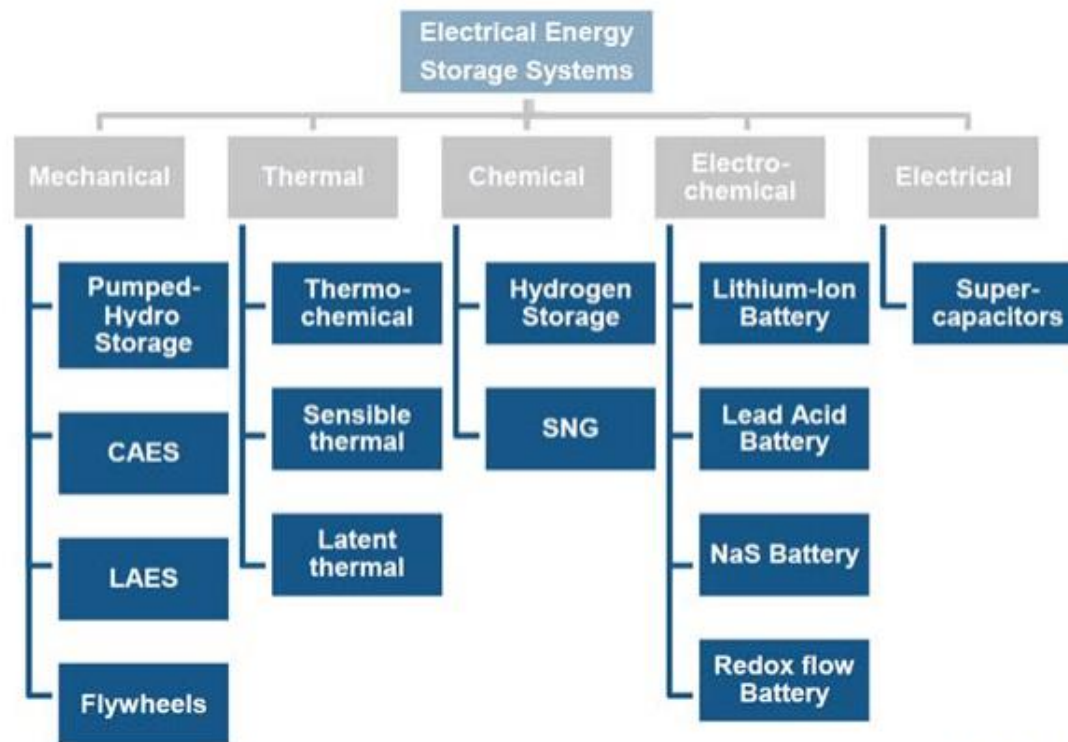
Seasonal storage necessary



Rules for Coordinated Grid Operation on the European Transmission System (SOGL)

- requirements and principles regarding **operational safety**
- provisions and responsibilities for **coordination** and **data exchange** between transmission and distribution system operators and significant network users (SNNs) in **operational planning** and near **real-time operations**
- requirement for the coordination of **unavailabilities**
- Requirements for the **schedule creation**
- **Standardized criteria** for balancing between generation and consumption (power-frequency control) and reserves

Energy Storage – the key to the Energy Transition



CAES = Compressed Air Energy Storage; LAES = Liquid Air Energy Storage; SNG = Synthetic Natural Gas.

Figure 2. Example of energy storage types (source: World Energy Council)