



Fraunhofer IEG based on Fraunhofer ISI et al. (2022b) assuming a constant COP of 3.0. \* Corresponds to economically optimised operation with low full load hours. \*\* Heat generation from the large-scale heat pump matches immediate heat demand (no use of heat storage). The maximum heat generation of the large-scale heat pump is limited so that 6 000 full load hours occur over the year. Assuming that the hourly wholesale prices and CO<sub>2</sub> emission factors on the electricity market do not change as a result of the change in the operating mode of the large-scale heat pump. \*\*\* Electricity price and CO<sub>2</sub> emission factor for operation under high load apply only to the first marginal unit. With each additional unit that switches from flexible operation to high-load operation, the price of electricity (and the CO<sub>2</sub> emission factor) increases, because increasingly expensive (and CO<sub>2</sub>-intensive) electricity generation plants are needed to meet the additional demand.