

MAN turbomachinery for liquid air energy storage (LAES)

Liquid air energy storage (LAES) is a cost-competitive, long-term, and large-scale solution without geographical restrictions. It makes fluctuating renewable sources capable of bearing base loads. MAN Energy Solutions provides turbomachinery including air compressors and air expanders which are the key components of LAES systems.

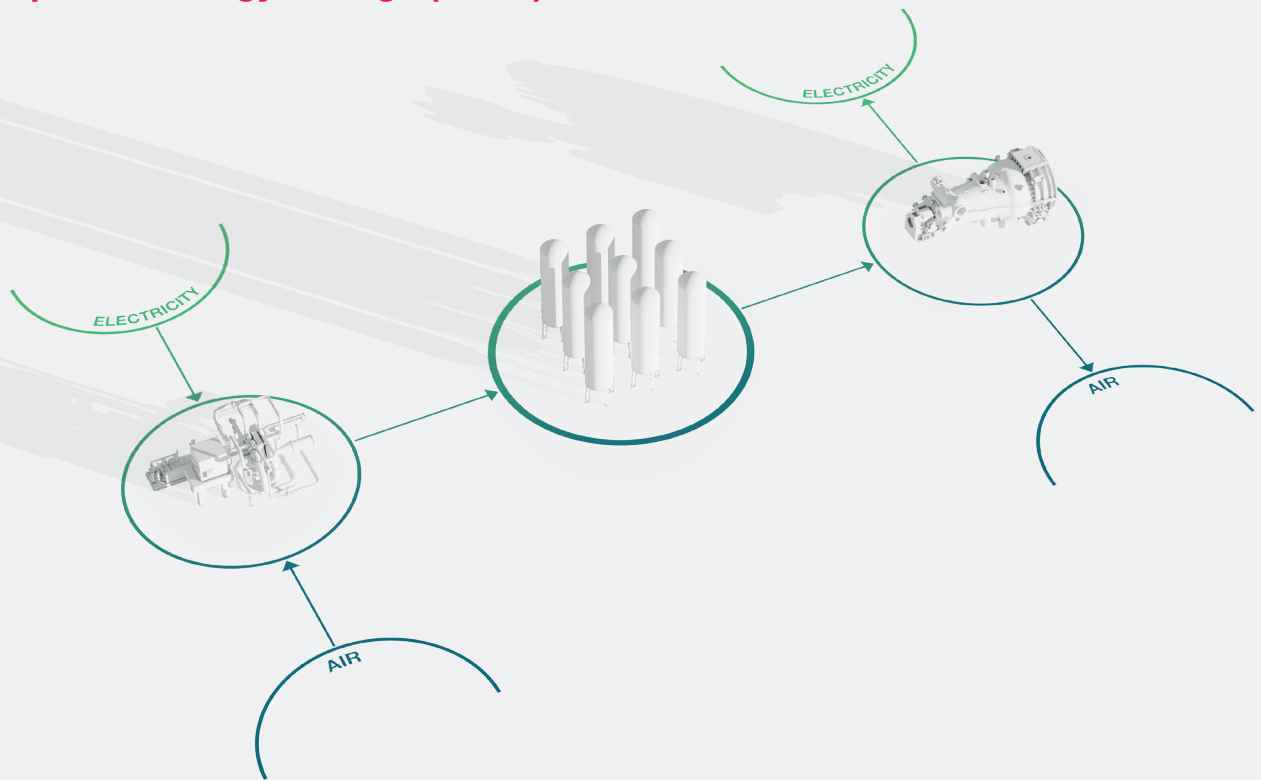
Benefits at a glance

- High system efficiency enabled by MAN turbomachinery
- MAN compressors and air expanders available for medium to very large system sizes for long-term storage
- Long life cycle and no degradation



MAN turbomachinery

for liquid air energy storage (LAES)



Technology

Off-peak or excess electrical energy is used to compress air via a MAN Energy Solutions compressor. The compressed air is then cooled down to be liquified. The liquid air is stored in insulated tanks. When power is required, liquid air is drawn from the tank, put under pressure by a cryogenic pump, evaporated and heated. This produces a high pressure gas, which is passed through a MAN air expander to drive an electricity generator.

MAN equipment for LAES

MAN ES has the most suitable key turbomachinery equipment for bulk energy storage solutions like LAES.

MAN compressors

MAN Energy Solutions is a leading manufacturer of air compressors with many years of experience in air

separation. Our compressor portfolio includes radial, integrally geared and combined axial/radial type main air compressors for large units. MAN compressors cover suction flow rates up to 1.5 million m³/h and max. discharge pressures up to 250 bar (3625 psi). With MAN compressors, over 45 tons of liquefied air can be produced per day.

MAN expanders

MAN Energy Solutions offers an efficient and reliable power recovery unit including air expander. Our expanders and steam turbines are suitable for power generation and mechanical applications up to 180 MW. The robust design of the expanders enables high inlet temperatures up to 760 °C (1400 °F) or high inlet pressure up to 140 bar (2031 psi). MAN tailors axial and radial gear expander solutions with single- and multistage designs to strike the perfect balance between costs and efficiency.

MAN Cryo

MAN Cryo has decades of extensive experience in cryogenic design and solutions. We design, engineer and provide a complete storage and vaporization system including cryogenic pumps for liquid air.

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