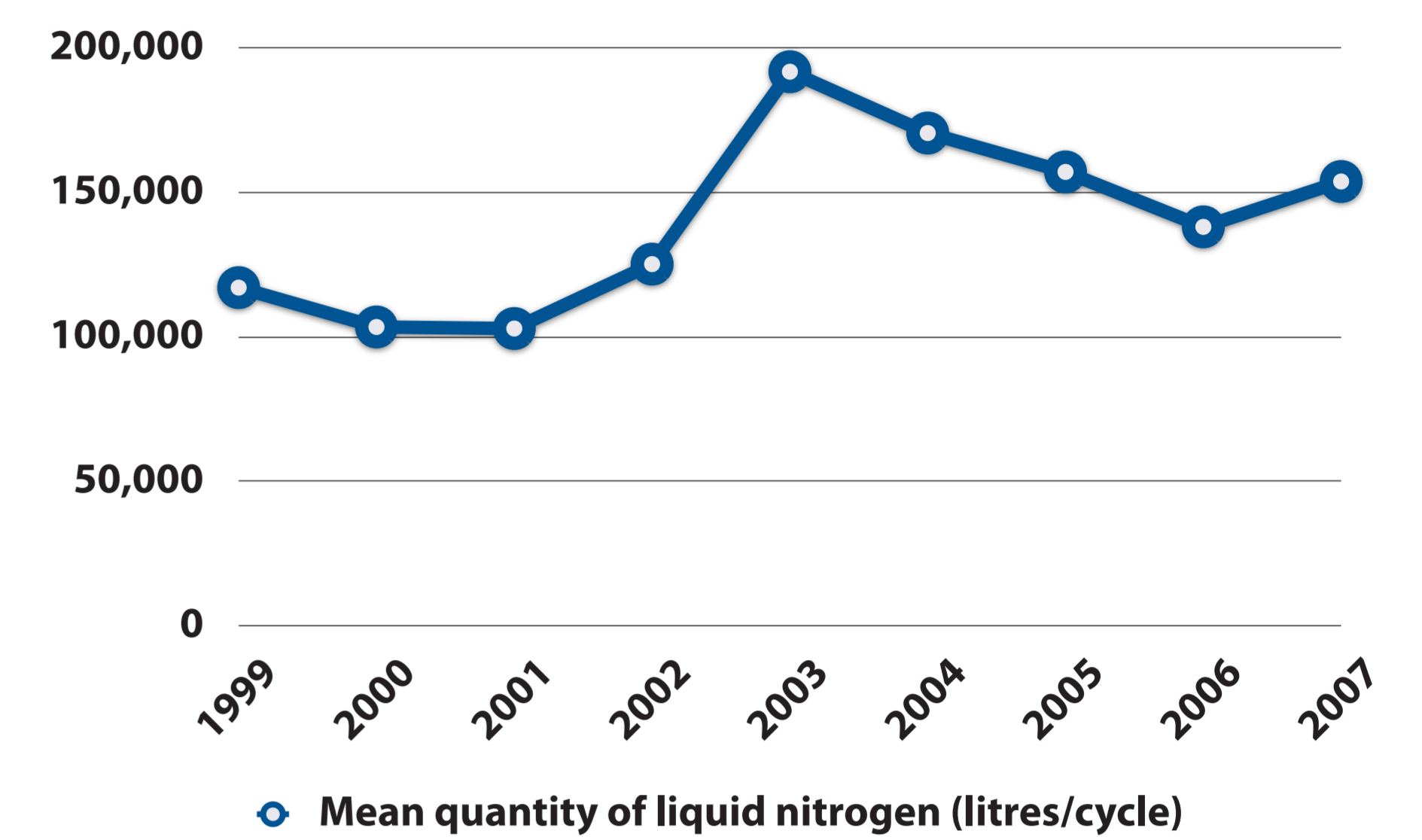
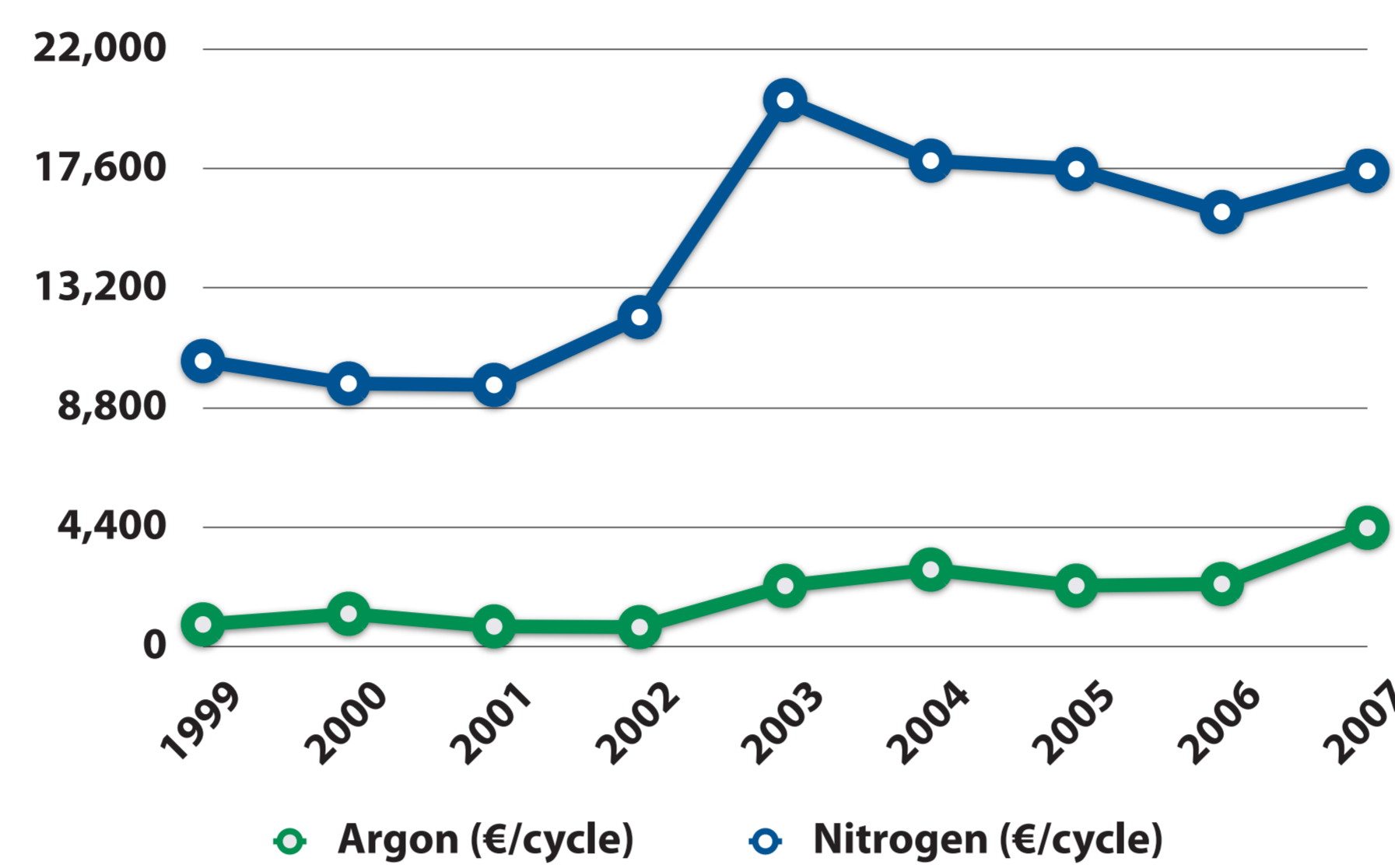
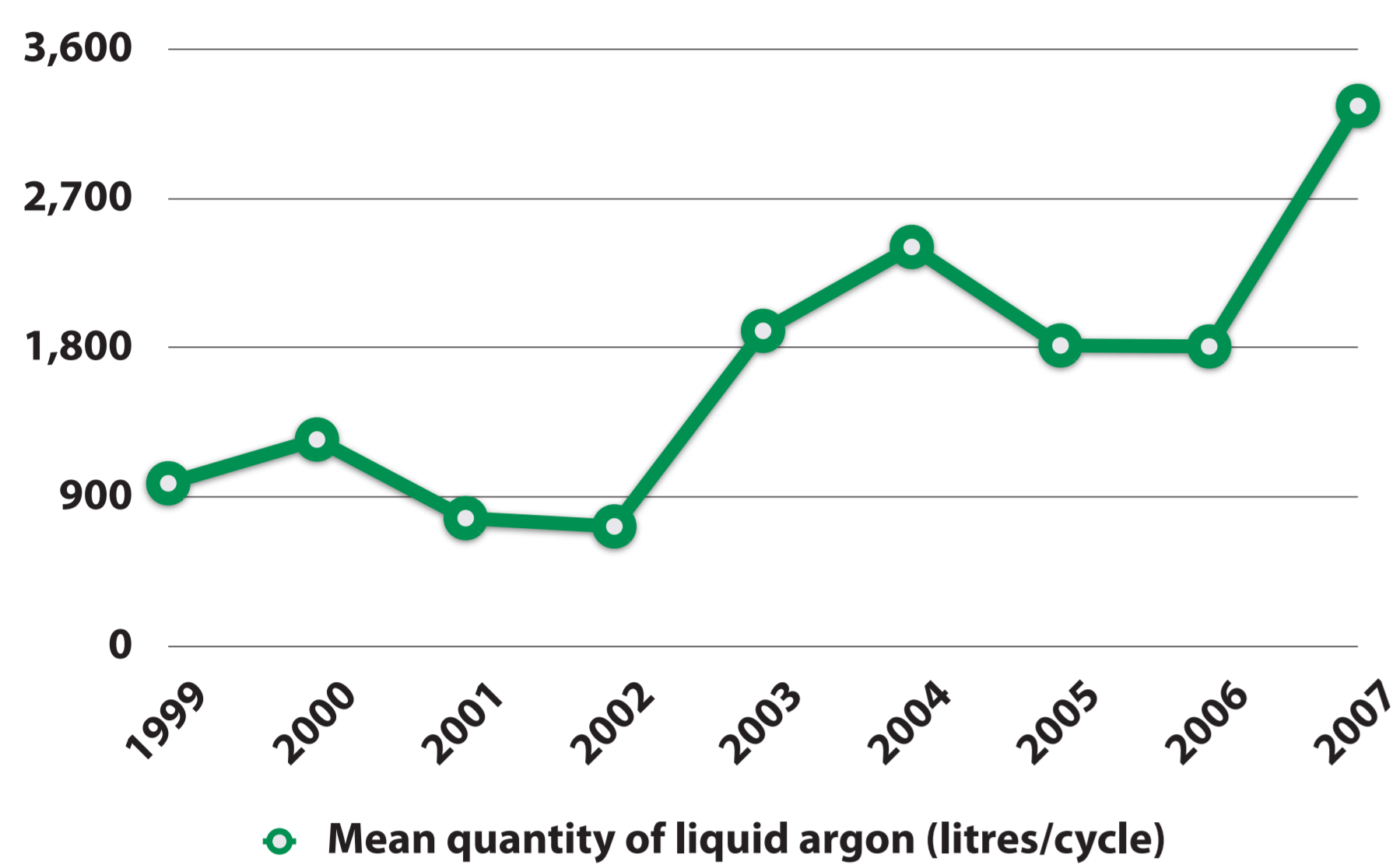


P. Mendes, N. Belkhier, E. Bourgeat-Lami, J.-P. Gonzales, Y. Memphis, E. Lelièvre-Berna, O. Losserand, X. Tonon, S. Turc

For many years, ILL sign contracts with CEA and CNRS for the delivery of liquid helium, liquid nitrogen and argon. The nitrogen and argon tanks are managed by an external company which check their level on a daily basis and fill them when necessary. There are one 2000 litres Argon tank, two 3000 litres and one 6000 litres nitrogen dewars located around the experimental halls. Argon is supplied directly on a few instruments with pipelines. Liquid nitrogen is delivered from four stations located in the reactor hall and at the extremities of the two guide-halls. The dewars are filled and transported to the instruments by technicians. Daily, in average, ILL use about 40 litres of liquid argon and 3000 litres of liquid nitrogen.



ILL do not have its own helium liquefier. Liquid helium is shipped to ILL in 100 or 250 l dewars for immediate consumption. Then, the stock of helium is monitored all along its life at ILL. Each dewar is weighted before and after its use on an instrument. Helium is expensive and ILL staff and users are deemed to exploit the recovery line. Gasometers located on the instruments are used to monitor the efficiency of the recovery. The gas is collected in a 20m³ balloon which ensures a relative stability of the pressure in the recovery line. Once filled, the balloon is emptied by one or two compressors which fill racks of 200 bar bottles at a maximum rate of 300 m³/hour. When a rack of bottles is full, the gas is then sent back to a reservoir located at the CEA or CNRS before being liquefied again.



filling cryostat...



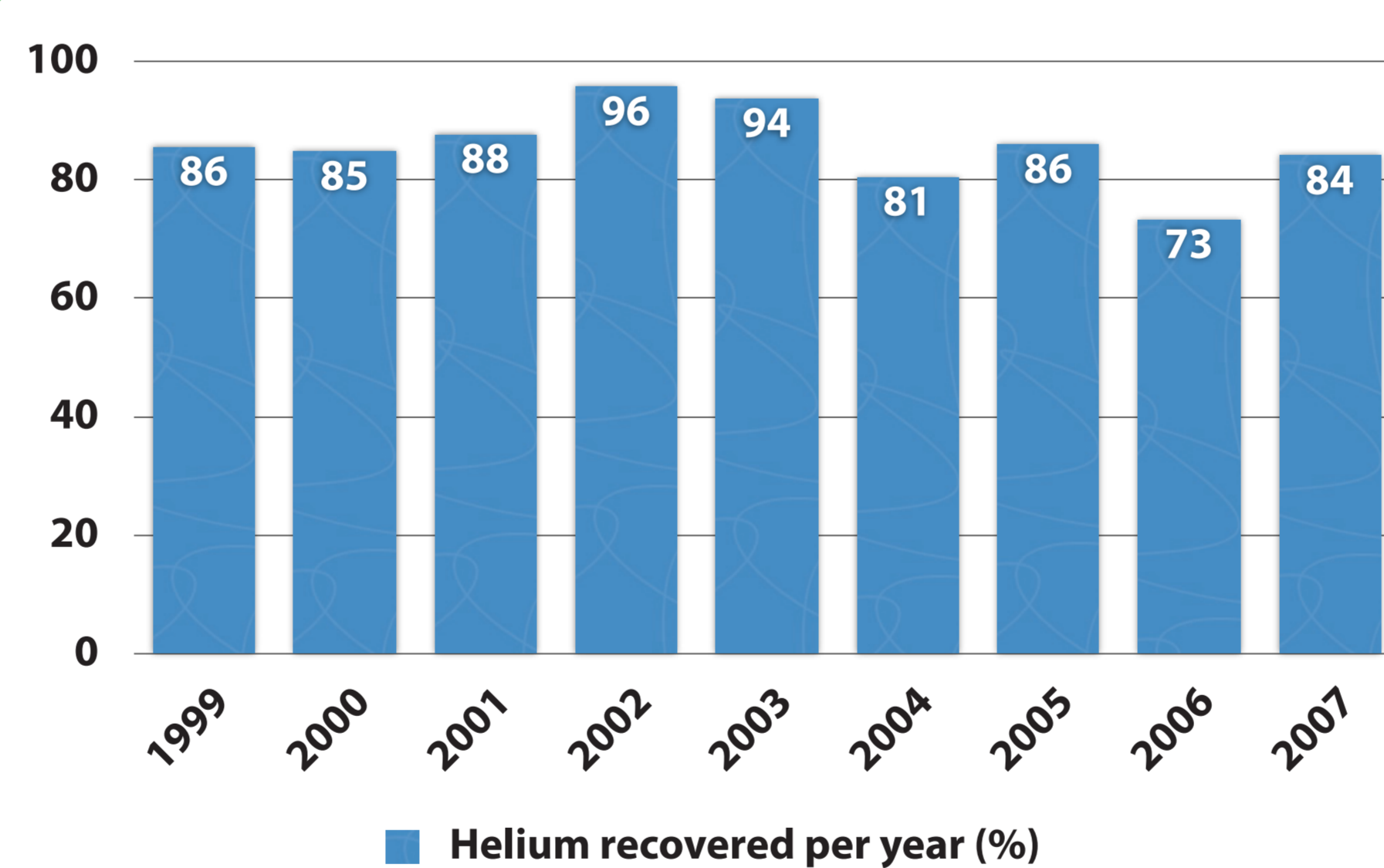
distributing liquid helium...



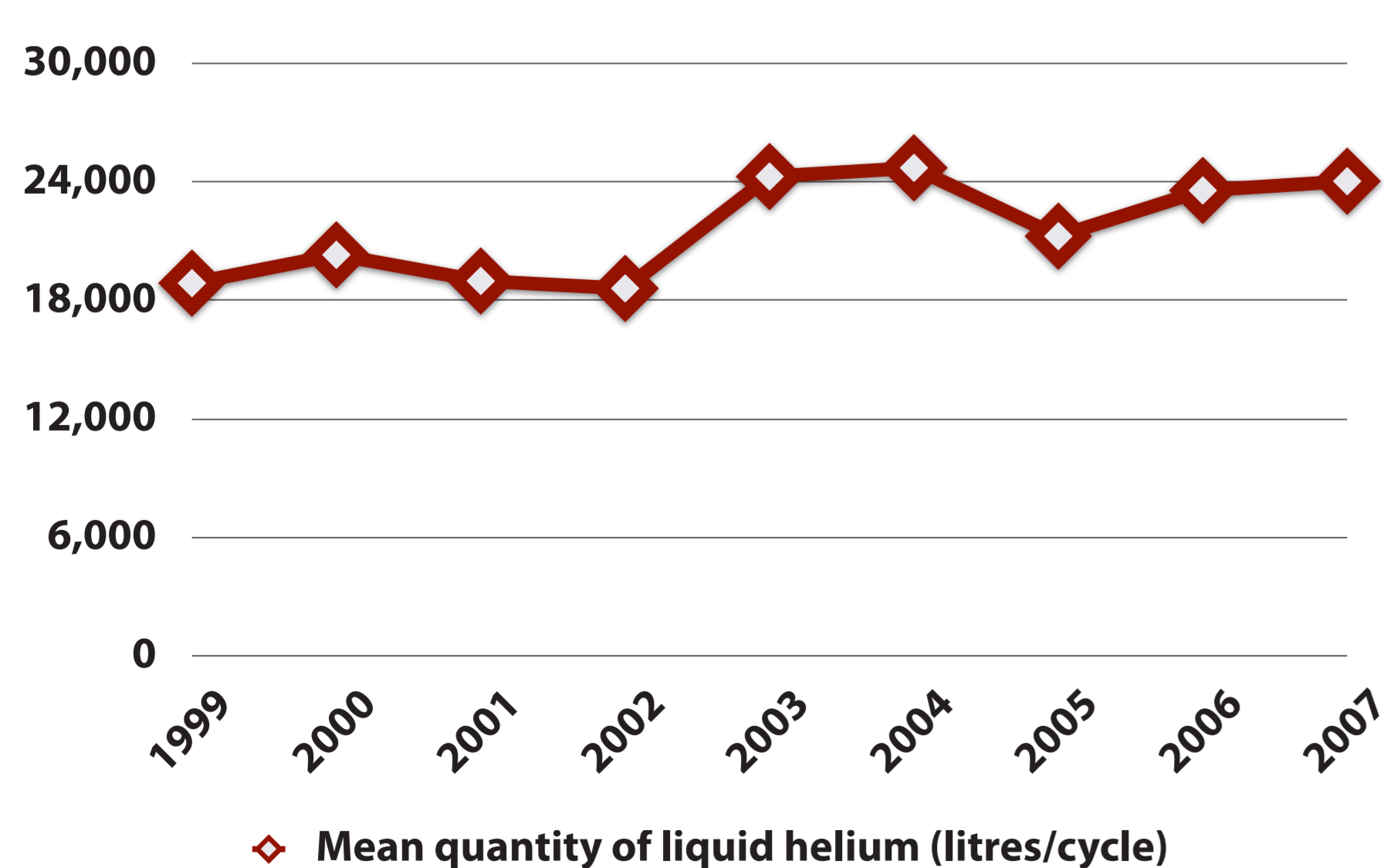
storing helium...



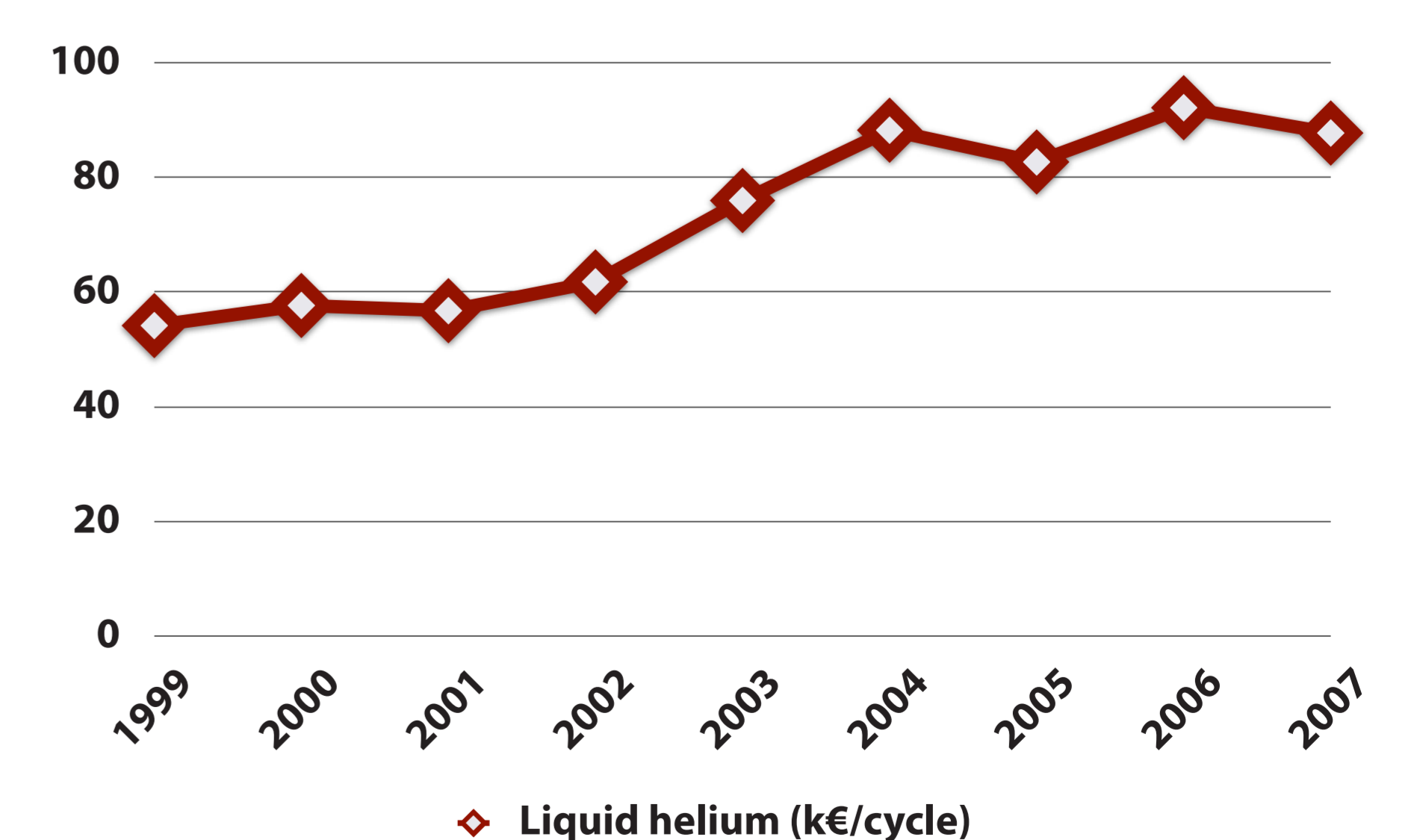
counting recovered helium...



compressing helium...



collecting...



ILL also collect the helium gas used at the ESRF but we only consider here the ILL usage. In average, ILL use about 24,000 litres of liquid helium per cycle, i.e. about 100,000 litres per year. This represents about 12.5 tons of helium (1/10 of the quantity liquefied in the 27km of superconducting coils of the LHC at CERN). Thanks to the efforts made by the staff and visiting scientists, about 85% of this gas is recovered every year, corresponding to savings that amount to about 325 k€. 