Cosmic rays are measured at LOFAR simultaneously with a dense array of antennas and with the LOFAR Radboud air shower Array (LORA) which consists of 20 scintillators. In this contribution we present cosmic-ray energy reconstruction using radio and particle techniques and discuss the event-by-event and absolute scale uncertainties. The energies reconstructed with each method are shown to be in good agreement. The radio-based reconstruction has smaller uncertainty on an event-to event basis, so LOFAR analyses will use that technique in the future. We also present the radiation energy of air showers measured at LOFAR. Radiation energy scales quadratically with the electromagnetic energy in an air shower, which can be related to the energy of the primary cosmic ray. Once the local magnetic field is accounted for, the radiation energy can be used to compare the energy measured at different locations using different techniques. We compare the LORA particle-based energy scale to that of the Pierre Auger Observatory and find that they agree to within (6 +/- 20)% for a radiation energy of 1 MeV. The uncertainty on the comparison is dominated by the antenna calibration of each experiment. We plan to reduce this uncertainty in the future using a portable radio array to cross-calibrate the energy scales of different experiments using radiation energy and the same antennas.