he number of accelerated electrons in solar flares is normally estimated using purely collisional models and often presents a substantial challenge for electron acceleration models. Here, the relaxation of energetic electrons is considered taking into account the self-consistent description of Langmuir waves in the inhomogeneous plasma. Full numerical solutions of the set of kinetic equations for electrons and Langmuir waves are obtained for an inhomogeneous plasma. The results show that the presence of inhomogeneity significantly changes the overall evolution of the system. The inhomogeneity is effective in shifting the wave numbers of the Langmuir waves, and can thus re-distribute the energy accelerating the tail of electron distribution. It is shown that X-ray spectra calculated from such distributions and interpreted using purely collisional models will overestimate the actual number of energetic electrons.