Companies are increasingly encouraged to frame their sustainability activities and communication around ecological limits, as captured by concepts such as planetary boundaries, climate tipping points or regenerative capacity. Ecological limits may serve as scientific basis for defining environmental sustainability targets at the company level and, moreover, inspire companies to align their product portfolios with emerging societal needs related to sustainable transformations. Although corporate environmental reporting is widely researched, little attention has, hitherto, been given to company use of the ecological limits concepts in stakeholder communication. This study presents a comprehensive review of references made to ecological limits in corporate responsibility (CR) reports in 2000-2014. An exhaustive list of terms related to ecological limits was developed and used to search the CorporateRegister database, which contained approximately 40,000 CR reports from this time period. For every identified reference, we analyzed the context in which the ecological limit term was used in the CR report. We found a 10-fold increase in the number of references made to ecological limits in CR reports during the period 2000-2014. The number of CR reports published in this time period has also increased at a similar rate. Hence, the proportion of companies referring to ecological limits in their CR reports has over the years remained stable; roughly 5%. The most commonly invoked ecological limits were related to climate change and references to "2°C" were by far the most frequent. The vast majority of companies referring to ecological limits did so without specific references to ongoing or planned changes in their activities as a consequence of recognizing these limits. Only a small percentage, predominately high-tech companies (31 in total), explicitly used ecological limits to define targets for resource consumption, emissions reductions and/or as a stated reason for adjusting their product portfolio. In defining targets for resource consumption or emissions, only a few CR reports dealt explicitly with the issue of allocating resource and emission rights within ecological limits amongst companies and other actors. A longitudinal study of three companies showed that these did not directly report progress towards planned changes based on ecological limits and offered explanations as to why some companies abandoned planned changes altogether. Our findings provide novel insights into the current use of the ecological limits concept by companies and may be useful for actors trying to motivate companies to align their activities with the finite nature of Earth's natural systems.