This paper presents a case study of the application of TRIZ in an industrial development project. The study focuses on the TRIZ method “Trends of Engineering System Evolution” to develop innovative ideas for future household appliances. The paper starts with an introduction of TRIZ and the fundamentals of Trends of Engineering System Evolution. Building up on this theory the application of the method follows a five-step approach. First, four Main Parameters of Value are identified: Noise, Drying Result, Water Consumption, and Speed. In the second and third step, these parameters are evaluated and allocated on the Technology-S-Curve. Finally, in the fourth and fifth step TRIZ trends and sub-trends are used to develop ideas for household appliances based on their position on the S-Curve. Overall 44 ideas were developed. The result part presents three conceptual ideas. The paper closes with a conclusion of the project work and results. Main findings are: TRIZ trends are applicable in industrial project work, internal knowledge is needed for detailed application, and time-consuming application.