

On the Future of Innovation. The needs of the customer decide whether a technological innovation becomes successful or not, and the user prefers those innovations that improve upon existing technologies in the fields of energy, communications, and mobility by dissolving the tensions between robustness, safety, and cost-effectiveness without any compromise. A lot of predictions of the future that were made in the 1950s and 1960s now seem quite childish: the colonisation of the oceans and outer space, factories at zero gravity, gigantic magnetic monorails, and enormous supersonic airplanes that bridge the continents. So why did the integrated circuit enable such a wide range of new opportunities and products, while light weight construction materials, nano structures, and a better understanding of the composition and function of DNA didn't really or only to a very limited degree? All the government subsidies for alternative but rather volatile energy sources such as wind power and photovoltaics or buzzwords like 'smart networks' and 'intelligent electricity meters' suffer from a profound error in reasoning made by futurologists. People won't feel tempted to create individualised everyday items such as toothbrushes, plates, or cutlery at home if they can buy the same mass-produced objects in a number of different styles at unrivalled prices. Electric mobility and 'smart energy networks' are in this parallel world of catastrophic climate change and the no-less frightening prospects of resource shortages just as quasi-existent as the intelligent fridge. The currently well-supplied and heavily-promoted sector of wind and sun energy is in no shape or form an ideal improvement and hence a potentially successful innovation. If, at first glance, it seems this optimism about the future was subsequently replaced by a more sceptical attitude, truth be told, ecological doubts and fears about the depletion of natural resources only fuel the creativity of futurologists. Back in 1967, they didn't just predict the PC and its impact on office life and leisure time, but also the video recorder, satellite television, home banking, industrial robots, traffic management systems, and the mobile phone. But technological trends aren't everything; sure, a few boffins were able to predict back in 1967 that the miniaturisation of circuits was bound to advance the performance of electronic data processing. You are more likely to suffer an accident while travelling by car than by train or plane--in the latter cases, one travels along clearly defined and monitored infrastructures with professional drivers or pilots; in a car, one doesn't. Kahn and Wiener did not just predict that by the year 2000 there would be farms on the bottom of the sea, we would be able to control the weather, and interplanetary (manned) space travel would take place, but also the ascendancy of alternative energy (sources) and electric vehicles. Viewed with today's experience, these flights of fancy that range from programmed dreams to artificial moons and massive cargo submarines ought to bring a smile to the face of the reader. Every technological innovation becomes attractive to the user because of a special utility function he or she can gain from it. The utility function is valued using three criteria: Robustness: the use must be reliable and always available. Following decades of (this) ecological influence on the funding for (the) economy and innovation, these conceptions are somewhat solidified. They consist of photos and drawings that are randomly attached to any combination of various kinds of possible advances in nano-, bio-, and information technology. It is safe to say that it was with the publication of Herman Kahn's and Anthony Wiener's *The Year 2000* in 1967 that such prognostics became socially acceptable. But materials sciences, bio and genetic technology, cognitive sciences, and even such mundane things such as the

efficiency of the internal combustion engine were coming a long way too. 3D printing also failed to catch on at home, despite the predictions made by Kahn and Wiener, because it only offers limited possibilities at significant costs. The nuclear-powered automobile is merely replaced by the battery-powered car, oh, and though the power is derived from wind energy, needless to say the curvaceous design remains. Kahn and Wiener predicted 100 technological innovations, and about half of them came to fruition. It is he or she that decides with his or her wallet the fate of any innovation, not by giving heed to dreamy eyed visions but by asking himself or herself the rational question: what is it good for? So far, it wasn't possible to create a surface robust enough to withstand repeated mechanical interaction. From the user's point of view, any technological system has its drawbacks and as the successful predictions in the past proved, it was those innovations that reduced those drawbacks the most that became successful. It was because they overcame the contradictions of the three utility functions that users demand of their products. Just because a car remains stationary for most of the day should not fool us into thinking that they weren't bought for that purpose (they are there when you need them.) Cars are bought to satisfy the unpredictable, unplanned desire to be mobile. The desired restructuring of the electricity supply requires a profound change to consumer behaviour. Government, economists, and product developers would be well advised to concentrate on those recommendations made by futurologists that consider the wishes of the user. By Peter Heller Nowadays, the typical presentation of a futurologist is a near-infinite roll call of possibilities. This leads to the creation of myths, which come to life in the imagination and thus attain a strange quasi-existence. Oh, by the way, according to Kahn and Wiener, the battery-powered car was meant to dominate the automobile market by the year 2000. What's its use?