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# Austria's Futures: Past Perspectives and Present Expectations

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**Type:** National foresight exercises with emphasis on microelectronics and nanotechnology, in part historical  
**Organizer:** Robert Textor, University of Stanford; Ernst Eugen Veselsky, Österreichische Gesellschaft für Technologiepolitik (Austrian Association of Technology Policy)  
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### Purpose

The Brief covers a foresight exercise that is unique in so far as it revisits the projections and scenarios of a historical foresight undertaken in Austria in 1983 for the challenges and changes that Austria would have to meet up to the year 2005. Not only are these scenarios revisited but also compared to the reality of 2005. In a further step, a second foresight activity of this kind was started to build scenarios for Austria's future in 2025. The experts of 1983 saw the microelectronic revolution as the technological pacemaker of the future and 20 years later tried to assess the actual impact of this technological progress on various parts of Austrian life.

### The Expected Impact of Microelectronics

The beginning of the 1980s was marked technologically by the microelectronic revolution. Back then, many people expected this technology to have far reaching impact in our every day lives, in the organisation of work, on other technologies, on the economy and on international relations. As part of a US-Austrian exchange program called "Stanford in Austria" a group of futurists initiated a unique foresight process to assess

how these different sectors and how the 'Austrian Well-Being' would be affected by this technological change. In addition, activities were to be discussed on how to improve Austria's strengths and how to encounter the weaknesses.

The results were revisited in 2005 – in part by the same group of experts, in part by others – and compared to the reality. The foresight process was then completed, in 2005, completed by another look into the future and by drafting scenarios for the year 2025. The group of experts combined engineers, economists, social scientists, editors, managers and anthropologists.

### Ethnographic Futures Research

The method chosen for the first foresight exercise was a rather unusual one and one that we do not encounter frequently in other foresight exercises. The Ethnographic Futures Research (EFR) method was developed at Stanford University in 1976. As the title indicates, it combines research on the future with ethnographic research. It is based on interviews with people

from the ethnic culture to be researched, asking them to reflect form and structure of their own culture or socio-cultural system.

In the case of the first foresight of 1983, 32 high ranking personalities of Austria were asked to give their perception of Austria's future in terms of employment and work life, energy, social values, education, terrorism, medical research, interna-



tionalisation etc. These experts were asked to build three scenarios each: a positive, a negative and a most realistic one.

In 2005, 11 of the former interviewees could be motivated to reconsider the results from the historical exercise and to give account of possible future developments affecting Austria. EFR was applied once more. Another 10 honorary Austrian persons could be recruited to revisit the results from the first exercise and to take part in the new one as well. Most of the interviewees were professors from Austrian universities.

The interviews were conducted and recorded by students specially trained for this exercise. The synthesis and analysis was undertaken by Prof. Textor of Stanford and by Veselsky, the organizer of the 2<sup>nd</sup> exercise, respectively.

In a sense this foresight exercise is also the evaluation of the first foresight exercise. It rarely happens that scenarios are revisited after more than 20 years to assess what became true and what did not.

## Trends of the Scenarios for 2005 and their Realization

### Energy

Scenarios: The use of non-renewable resources was expected to profit from new microtechnologies with regard to energy saving options. Experts expected in their optimistic scenarios that questions of environmental protection would prevail. The pessimistic scenarios foresaw that the northern industrialized states would not agree to reduce energy consumption.

Reality: The development of wind energy and its feeding into the energy supply network was supported through tax benefits – publicly much criticised for its costs. Transfer of truck traffic to railway failed. Austria also failed to meet the international standards of CO<sub>2</sub> reduction. In order to meet the rising energy demand, Austria has to import nuclear energy from abroad. Cargo transit by trucks has exceeded limits and arouses the protest not only of environmentalists.

### Work Life

Scenarios: Expectations in terms of work, work organisation, working hours, productivity and salary were ambivalent. Interviewees saw work become less strenuous thanks to the microelectronic revolution. They expected, however, that growing international competition would exert pressure on education standards and wage level. Labour unions would lose power and (microelectronically based) machines would actually be used to keep workers under surveillance.

Reality: Technological progress through microelectronics has indeed made physical strenuous work easier. Demand for high skilled labour has increased. So has the gap between high and low skilled labour. It cannot be stated however, that employment in total has increased due to the advances of microelectronics. Even the boom triggered by the telecom branch was stalled by the deregulation movements and lay offs. The intensity of work, at least as it is perceived subjectively by the Austrian workers, has increased. Reduction of working hours could not be realized, instead early retirement increased (to prevent rise in unemployment).

### Medical Progress

Scenarios: Medical standards were expected to improve as a consequence to microelectronic progress, so would life expectancy and possibilities of self-organisation at high age.

Reality: Except for the long working hours and increasing air pollution the conditions for health were overall judged to improve. New diagnostic technologies, electronic monitoring of health data, the use of sensors for advanced treatment technologies can be considered technological progress. Overall life expectancy in Austria has increased; gerontology has become a medical and political arena of its own. On the downside the experts mention the increasing complaints of stress, especially at the work place.

### Education

Scenarios: All experts were of the opinion that microelectronic products, data communication, networks etc. would prevail in schools, e.g. to monitor the things learned, to advance in self-education via computer. Some of them also expected that microelectronic products would compensate for some insufficiencies of the Austrian public schools system: superficial memorizing of facts instead of acquiring valuable knowledge. Further positive connotations were that all old and young people would learn how to work, communicate, earn money, organize leisure time with the help of the computer and that such devices would be 'demystified'.

Reality: Standards of skills are increasingly drifting apart and so are income differences, as the experts state. As the PISA-tests results repeatedly showed basic skills of elementary education were alarmingly low. On the level of higher education, however, electronic data processing and the features associated with it were widely used and contributed to an increase of knowledge and exchange.

### Social Order/Social Partnership

Scenarios: The use of microelectronic products would maintain the well-functioning system of balance of interests and the traditional Austrian social partnership. It would serve as a supporting pillar to adjust to the challenges brought about by the EU, globalisation and international competition. New possibilities of microelectronics would offer more access to information and to participation. Pessimists were afraid that international corporations would flood the market with new electronic consumption products in a way that would simply overwhelm the regular consumer so that there would neither be any possibility to digest these innovations nor to keep up with the traditional cultural activities. Cultural standards would be destroyed and a new divide would open up between those who were able to handle the new gadgets and keep up

with the innovation dynamics and those who would not. A rise in unemployment might go along with it.

Microelectronic progress would improve communication and relations between people as space and time could be transcended. Rise in unemployment, however, would make people aggressively fight for jobs and pose a burden to human relations. It was further expected that the three traditional sectors of the Austrian economy – industry, agriculture and services – would be complemented by a fourth one: data processing.

Reality: The experts draw a rather negative picture of what was left of social partnership in 2005. Rather than finding a balance between employees and employers, the major influence, they say, has shifted in favour of the corporations. A further argument they make is that microelectronics and easy access to information have minimized the information advantage that the social partners used to have from their in-house statistics and networks; thus making some of their traditional functions obsolete.

Although it is hard to see a direct or even indirect causality with technological change, some experts lament that the once consensus based Austrian society has been transforming to a more conflict oriented and increasingly competitive one. This change is associated with the increasing influence of US capitalism, the access to European Union and the overall globalisation. Further social problems were seen by the effects globalisation has on other regions of the world, especially the poor ones. This means that more people from abroad had an incentive to migrate to wealthier countries such as Austria, where problems of integration and multiculturalism arise.

Conflicts that used to be solved behind the closed doors of social partnership were increasingly debated in the media thereby politicised and polarised thus giving the social partners less and less opportunities to govern.

Effects on Austrian heritage and culture were identified by the experts as electronic media became more pervasive and gave other cultural media (national and regional) less room (although. This is probably just as debatable as many other expert statements and findings are. Not foreseen by the experts was the pervasiveness of mobile communication.

### **Terrorism & Crime**

Scenarios: Microelectronics were seen as both: opportunities to fight terrorism and crime as well as a new means for terrorists and criminals to threaten people and nations. Pessimistic views among the experts foresaw that civil rights would be curtailed in order to fight terrorism and crime.

Some chances were seen for Austria to increase its international position as a neutral country, e.g. using microelectronic devices and product as alternatives to military applications in order to support developing countries.

Reality: These expectations became true to a large degree, though the circumstances that contributed to most to them were not foreseen: the breakdown of the Soviet empire and the shift to a uni-polar world order contested by fundamentalist terrorism. In terms of support for developing countries Austria has realized quite the contrary: supplying long-range missiles for Iraq approved by the USA. Austria's significance as a mediator for international conflict regions has deteriorated.

### **Austrian Culture and Internationalisation**

Scenarios: The future and continuity of Austria's culture under the auspices of the microelectronic revolution were seen as ambivalent. Optimists hoped that the Austrian cultural heritage would be preserved and could even gain from microelectronic innovations and that the Austrian self esteem would profit from it. Especially TV and broadcast stations would gain from technological progress and become independent of the dominant German media that is broadcasted to Austrians. Pessimists were afraid that the internationalisation would bring about a standardisation of culture and would destroy the Austrian "high culture". Standard German would dominate as a language and eliminate regional dialects and patois.

Reality: The variety of TV and broadcast stations has increased immensely, more, though by international than by Austrian providers. The banality and arbitrariness is lamented by the experts, not only with reference to the contents produced by the broadcast stations but also by the Internet.

### **Microelectronic Revolution**

The expectations associated with the microelectronic revolution were rather high not only in terms of impact on the economy but also in terms of technological progress on other sectors, changes in society, security, education, media etc. In retrospect one of the expert participants of this unusual foresight exercise uttered the opinion that the contribution of microelectronics to productivity increase was actually quite low. Only after users had learned how to adjust work organisation and workflow to the potential of microelectronics was it possible to achieve a strong productivity growth.

Major impacts on developments in Austria, however, are very much connected to specific political events rather than to the microelectronic revolution or any other technological development: the fall of the Iron Curtain, Austria's accession to the EU and overall globalisation.

As some experts stated, the momentum to use the microelectronic revolution and create a competitive advantage to become a front runner in some sub-segments was not seized in Austria as it was in Finland or Ireland. Rather, the paradoxical phenomenon was that some companies were able to generate high profits whereas the overall wage level did not rise nor did it lead to any reduction in working hours.

## What Austria Has to Expect from the Future: Scenarios for 2025

The views for 2025 very broadly highlight several issues of Austria's future very broadly and will be summarized in the following points without any further comments:

- world order will be dominated by a Pax Americana rather than UNO statutes imposed by progress in microtechnologies that will enhance police-state like surveillance rather than the implementation of the Human Rights Charta
- Austria's influence on EU politics will remain rather marginal
- questions concerning transit though Austria will be resolved at the expense of the environment and ecology
- the social network will become more porous with increased insecurity concerning work place and social benefits; social partnership will not regain its former strength
- mass unemployment and social fragmentation are seen as imminent dangers to Austria in the future; the competition for jobs will lead to lower wages and longer working hours
- The impact of the national government and the Parliament will be reduced in favour of local and regional administrative powers; federal structures will resist reform efforts political parties will become more alike and hollowed out

- on the fields of science and technology Austria is not very likely to contribute to radical innovations
- in microelectronics Austria's excellence will be that of a niche producer and end user (also including the fields of nanotechnologies, biogenetics and micro-optics)
- Austria is most likely to benefit from technological imports: e.g. speech recognition, miniaturisation of diagnostic and therapeutic products, genetic technologies in the agrarian and the health sector, alternative energy resources
- software development might still pose an opportunity for Austria's technological and economic development, following niche strategies
- access to the internet will prevail in society but also increase the divide between the digital literates and the illiterates
- entertainment via the internet will lead to an even more severe de-politicization of society; democratic participation will only be bogus
- the increase of the elderly population (above age 65) will pose problems to the social security system and new challenges to geriatrics; this might also lead to an impoverishment of some parts of the population
- for many elderly people new audio-visual technologies will be an essential means to communicate with the world outside their home

## Policy Implications

The expectations and recommendations the group of 22 experts gives to political and economic decision makers are rather implicit. The scenarios and perceptions of the future are constructed from a subjective point of view and the studies were not designed as to support political decision making but to give impulse to discussion about Austria's future. The implicit recommendations are thus rather general and do not bear any surprises. They plead for strengthening Austria as a competitive business location but not on the expenses of liberalizing the social market economy but building up industrial and S&T clusters. Other recommendations are pointed toward im-

proving the national education system and establishing a base for excellence and competence.

The rather mainstream results from both scenario processes, 2005 and 2025, most likely stem from the fact that even though the group of experts represented several disciplines, they were quite homogenous: representing a specific age cohort, belonging to the same social stratum and all being males. Certainly, each expert represented a specific area of (academic) knowledge; however each of them were laypersons in the other fields covered by the scenario exercises. This is one explanation why many statements were rather general, missing some insider knowledge of complex matters.

## Sources and References

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- <http://www.stanford.edu/~rbtextor/>

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