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Consensus Conference
on zickzick Waste:

The Meaning of Participation

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Abstract

The Meaning of Participation:
UK CEED Consensus Conference on Radioactive Waste

Participation in political decisions is a controversial topic. In general it is often seen as positive and sometimes even necessary from the publics site.
Citizens participating governments or corporate managements aim to increase acceptance and legitimacy of their decisions.
Recognizing the different interests of involved parties, it should be looked carefully at these interests and differentiated between claimed goals of a participatory action and possible deviating underlying intentions.

Such discrepancies are looked at and if the virtual outcome of the examined *Consensus Conference on Radioactive Waste* is exceeding a mere consultation of the public. Key questions are: Who is why operating the consensus conference? Who is taking part? How are opinions and decisions (in both directions) being influenced by formal and informal hierarchies?

The way of opinion formation is critically analyzed and there are premised worked out that would be required for actual democratic participation.

Contents

1 Einleitung

blablabla There are different definitions of Technology Assessment. Basically it is about analyzing the effects introducing a new technology may have on a society. Therefor a variety of methods has been developed that could, according to the lecture, be classified as *analytical*, *heuristic problem solving* or *participatory* approaches.
A consensus conference is one participatory method.

In general participation is seen favourably in democratic terms. But looking closer and more differentiated at any case there are questions to be asked about the particular intentions of the involved parties: Who is why operating a public debate? Who is taking part? How are opinions and decisions (in both directions) being influenced by formal and informal hierarchies?

This essay wants to pursue these questions on the basis of some fundamental considerations in conjunction with one concrete consultation, the *UK CEED Consensus Conference on Radioactive Waste*.
After giving an overview about concepts of participation and the conference that has been held in the United Kingdom of Great Britain and Northern Ireland in 1999, we will finally come to a conclusion about the extent to which in this conference actual participation has taken place and what that means ...

2 teilhabe

2.1 unterteilhabe

The "Handbook of the Political System of the Federal Republic of Germany" defines:

Participation in politics means all actions that citizens voluntarily undertake, individually or in groups, with the objective of influencing decisions on different levels of the political system or coming to it themselves. [?]

About the sense and particular intentions for applying participatory processes there are numerous statements to be found which can not be prestigiously represented here. However, increasing acceptance of the assessed issue as well as democratic legitimacy appear as crucial points.

John Durant for example, Assistant Director and head of Science Communication of the Science Museum, London, calls it "interest to establish 'socially sustainable' policies". Citing Anthony Giddens, Director of the London School of Economics, Durant says that more and more people got disillusioned with democracy and science in parallel and further argues that participatory technology assessment, if carried out not only in order to inform the public (as happened with the UKs first consensus conference that was on genetically modified foods) but to seriously involve it in actual policy-making, was a way to overcome that problem.
Thereby he appears optimistically in pointing at an important differentiation that he describes as the *deficit* and the *democratic* model. Where the deficit model saw scientists as "knowledgeable experts", the public as "ignorant lay people" and the main task of participation in unidirectional information transfer, the democratic model considered the public as contributers to a "multiple [form] of expertise" and aimed to establish an equal relationship between scientists and non-scientists [?].

Another model describing different qualities of participation is given by Arnsteins "ladder of participation" which consists of eight rungs divided into three fields: the lowest two, called *Manipulation* and *Therapy*, belong to "Nonparticipation", followed by *Informing*, *Consultation* and *Placation* as "Tokenism" and *Partnership*, *Delegated Power* and *Citizen Control* as "Citizen Power" atop [?]. This too refers to mere information and consulting people as false labelling.

Both meet here with critical views on participation in political decision processes, that state, participation in politics was used to legitimate prevailing policies rather than *empowering* concerned people; although that term was often used, giving a wrong impression of what is behind it [?].
Participation was (already conceptually) not an egalitarian, you could also say but a hierarchical, act; one person or party is participating another. The power, more or less concentrated somewhere, was not planning on giving up itself [?].
Our democratic control mechanisms aim to avoid the misuse of power, not its appearance. Thus the participation of citizens in order to increase acceptance for decisions made by the powers, that may be described as an act of democratization, does not necessarily mean a distribution of power.
In fact it can be observed that an increase of participation in politics often arises in conjunction with crisis. At the same time *empowerment* and *participation* have been re-developed within managing strategies for companies...

The development of such managing strategies by evaluating processes in relation to best practices is called *benchmarking*. Benchmarking applies in many different areas, for instance not only in companies but also at universities. So the "German Benchmarking Club of Technical Universities" is working on "best practices in quality management and development at Universities" [?]. In the following there shall only be considered management of companies and governments when talking about benchmarking.

One of the key issues in that field is the so called *change management* as can be seen in *benchmarking reports* of companies carrying out such analyzes, for example *ProSci*.

In "managing change" resistance against plans of a company or government is an unwanted and often expensive object to deal with that again demands specific strategies. ProSci offers [?]:

- *Information* if resistance is based on information deficiency, rumours & misjudgements.
- *Participation* if change agents lack important information or persons concerned have considerable capability of resistance at their disposal.
- *Assistance/help* if resistance is based on problems of adjustment.
- *Negotiation* in win-loss situations or with powerful parties of interest.
- *Manipulation* if other actions are useless or too extensive.
- *Enforcement* if time is short and the management possesses the necessary power.

Participation appears here as a tactic appropriate if change agents lack important information and thus depend on the knowledge of the persons they want to engage in a decision. Another case is no sufficient knowledge on neither side wherefore participation aims to apportion responsibility.
The second contemplated reason for participating someone, great capability of resitance, points at the argument that power, if threatened, was ostensively drawing back in order to preserve itself. Critics say thereby it was "converted to its own interests", instead of morality [?]. In case of political participation a democracy could use publics opinions to retreat from misguided development without conceding mistakes and instead bring up evidence for its effective (democratic) operation.

2.2 Prospects

Following Michel Foucault by looking at power as repressive ("power over") the public feels as *object* rather than a *subject*. The power appears to be linked to players where it is in fact structurally determined and because participation is not able to structurally diminish power relations but only situationally, a negative attitude towards participatory attempts is generated.
But if power is perceived as *productive* ("power to") in interaction with *knowledge* and the *subject*, participatory practices can be seen as regulating power by producing subjects, provided a matter of *active* participation. Then the increasing number of subjects re-structures the field of discourse and thereby can also re-distribute power [?].

"Active" participation, which means here to claim participation in political decisions, is not radical in terms of resistance against structural governance or repression. Nonetheless it is

neither only feigned nor illusionary, because it is feasible to force acknowledgments, possibly in fact for everyones account.

3 The UK CEED Consensus Conference on Radioactive Waste

3.1 Consensus Conference

The consensus conference has been developed on behalf of the Danish Parliament and the Danish Board of Technology and first used in the late 1980s. It is one method in public consultation that was specifically designed for scientific and technological issues.

The so called *lay panel*, a group of about ten to thirty people, is chosen somehow randomly. After a first information unit, normally used to get familiar with the topic and develop first, more general questions, there are chosen a number of experts, the so called *witnesses*. Questions are worked out by the panel and answered by the different experts in a conference chaired by one or two persons, if necessary repeatedly. Concluding the panel has to write a report on which the experts are asked to comment before its publication [?].

3.2 UK CEED

The UK CEED (UK Centre for Economic & Environmental Development) is a not-for-profit foundation that was established in 1984.

Involved are scientists as well as persons from industry and government, the current director (Chief Executive) since 1991 is Jonathan Selwyn, an Economist who worked for an Anglo-Japanese export company before joining UK CEED.

Self-Conception

By UK CEEDs own account it aims to demonstrate the benefits of so called good environmental practice to business and economy. Thereby they are contributing to a more sustainable way of housekeeping in both environmental and economic terms.

Their approach concludes scientific research and the promotion of and engagement to good practices by policy advisories and also providing practicable sustainable development solutions to government and business.

On their web page UK CEED presents a convincing environmental policy (even though there could be done more to deserve a *best practice* label): travels are kept to a minimum, if necessary public transport is being used. An awareness for energy saving is shown, the usage of recycling paper and waste separation services is obligatory and inks used are waterless, solvent-free and vegetable-based.

UK CEED has published a *Code of Ethical Practice*. Basis is the pretension of "highest standards of scientific and professional integrity" [?]. This code contains the claim to raise awareness of ethical considerations, elaborate guidelines for documentations, the demand of questioning ones own findings and honest attribution of others contributions. Furthermore possible conflicts of interest shall be regarded: that includes personal affiliation and "financial involvement with any organisation sponsoring or providing financial support for a project undertaken".

Funding

Nevertheless the Centres Projects are often financially supported by private sector partners. Funding partners listed on the web page are British Airways, AOL, British Gas, Hewlett Packard, Sony, Vodafone and several governmental bodies, just to name a few.
Whereas that could bring up questions about the independence or objective of their research, UK CEED argues that the attraction of financial support stood for approval of their integrity.

Questions to be asked here are related to the ones concerning all sorts of so called public

private partnerships. Even though the UK CEED is not a regional or public corporation, it is dealing with concerns of public weal (one reason for participating citizens).
The idea that all parties could be winning in a constellation where private companies deal with public concerns is widely criticised, because of the obvious conflict of objective. Whereas a company, especially every limited company, has to focus on profit maximisation, *public welfare* means to allocate resources dependent on requirement rather than spending capacity.
Therefore any private capital investment would have to be thoroughly controlled which does practically and legally not apply in most cases.

3.3 Consensus Conference on Radioactive Waste

3.3.1 Radioactive Waste

The british definition of radioactive waste is *waste containing radioactive chemical elements that do not have a practical purpose*. That includes waste from the nuclear fuel cycle and nuclear weapon industry, other industrial and medical waste. Processing of fossil fuels (coal, oil and gas) also releases naturally occurring radioactive material (NORM). According to this definition plutonium for example is no radioactive waste, because its being processed for nuclear weapons.

Radioactive waste is classified into low level, intermediate level and high level waste. This refers to concentration, not to toxicity or half-life.

The main problem with nuclear waste is that it stays radiant over such a long period and therefore would have to be stored safely for several hundred thousand years which is, due to e.g. geological uncertainties, impossible to manage by now.

3.3.2 Nirex

Nirex, "the body responsible for the long-term management of radioactive waste" (UK CEED) has originally been set up by the UK nuclear industry as "Nuclear Industry Radioactive Waste Executive" in 1982.

Since then they have been examining deep geological disposal of low level & intermediate level radioactive waste and, due to a broad public opposition to their plans and the burying of nuclear waste in general, during the 1980s they have gained some objectionable notoriety.

In 1985 NIREX became the limited company "United Kingdom Nirex Ltd." Shortly after the IPO their proposals for nuclear waste repositories [...] were abandoned due to local opposition.

Seven years later Nirex announced plans to build a Rock Characterisation Facility (RCF) at Sellafield (nuclear site with repository, several reactors, reprocessing and vitrification plant). Nirex critics including *Friends of the Earth* and *Greenpeace* argued that the RCF was an integral part of Nirexs repository plans and in effect a "trojan horse" for an intended nuclear waste repository. It was also successfully argued that the RCF proposal was scientifically flawed; and that Nirexs scientific knowledge was insufficient to prove that disposal was safe for any site. Therefore the Secretary of State for the Environment rejected Nirexs case [?].

3.3.3 Realisation of the Conference

The UK CEED Consensus Conference first met in 1999 and reconvened in 2002. The initial idea for holding the conference came from within the UK CEED, the funding has been provided by public sources and NIREX.

The aim was to contribute informed citizens views to the political debate about radioactive waste management. Although it is stated that the selected panel is not representative for the public, the publics opinions and perceptions are playing a major role in the formulation of the conferences aims: through the discussion and conclusions of the participating lay persons there shall be gained insight into the publics appraisements.

Another point of interest was to inform the public and encourage further profound debates. It seems important that the conference did not aim to replace the normal democratic decision-making.
The conference was held in three weekends excluding the reconvention.

The Remit:

"The Consensus Conference is to focus on the effective and publicly acceptable longterm management of nuclear waste in the UK, both civil and military, concentrating particularly on intermediate and high level waste. This will be considered by the Citizens Panel in their capacity as members of the public, taking into account what they see as the relevant issues."

Citizens Panel

The citizens panel was made up of 15 people from the United Kingdom, randomly selected from the electoral register by the market research company *CFS International*. Four thousand citizens have been invited, about 120 responded in the first place, after obtaining information on the topic and time to be spent around 70 confirmed their interest. Out of these the sixteen panel members were finally selected, reputedly "at random" whilst assuring the balance in numbers between gender, educational background and regions. One of the scheduled persons did not show up.

Provided Information

Prior to the first panel meeting all members received an information pack thats content was not published.
On the first weekend the most important issues were to be worked out. The second weekend ended with concrete questions and a selection of the experts the panel wished to consult. Unfortunately the provided list of available experts can not be found on the UK CEEDs web page nor is it published elsewhere.
Under the chosen persons that answered the panels questions were one man from NIREX, a woman from *Friends of the Earth*, a minister, a BNFL manager (operator of Sellafield q.v. section 3.3.2) and several other persons from companies and research institutions dealing with radioactivity.

Worked out Positions

The panel framed nine questions. Taken down in the *Panel Position* was , if achieved, the consensus or, if not, the opinion of the majority. Minority views were mentioned in the discussion.

Surface storage vs. deep disposal: Out of six experts two preferred above ground storage because of the necessity of monitoring and retrievability. Since it seems scientifically not legitimate to make statements about the (geological) future in over thousand years, another person who preferred deep disposal emphasized the importance of guaranteed accessibility. One expert called geological depth a "stable environment" therefore voted for deep disposal as did the spokesman of NIREX, one person abstained.
The panel agreed on deep disposal that shall however remain accessible as the best option. One member disagreed and found the waste needed to stay above the ground. The panel expressed its belief in a soon technological solution to make radioactive waste non-hazardous.

Monitoring radioactive waste producing companies: The question concerned current and future policies. The four consulted persons agreed that the monitoring in the UK was sufficient. The HM Chief Inspector of Nuclear Installations stated that 99 % of the UKs radioactive waste was stored in licensed sites.
The panel was convinced that the monitoring was satisfactory.

Research into nuclear waste treatment: Of the four experts making representations the member of BNFL declared that they were spending a huge amount of money on "assessment of new technologies". One person promoted the idea of transmutation (note: a technology turning radioactive waste into transient, less toxic substances), another claimed that the use of nuclear power was going to increase, that was not assessable and so international collaboration in research was necessary as a substitute for policy. A woman from *Freeland Research Consultant* expressed doubts about the sensibility of transmutation as a solution of the nuclear problem. It gave the impression of "final solutions" which do not (yet) exist. Transmutation was a chemical process bringing up new nuclear waste, in addition that approach was used to justify further nuclear fueling.
That last argument was none for the panel that considered it welcome to allow nuclear use

in the future, especially if risks could be decreased. Thus the panel put strong emphasis on the transmutation option as a great chance.

Privatisation: The man from BNFL stated that research on radioactive waste management was already carried out in public private partnerships and that safety was in the industrys interest, privatisation therefore not an issue. The second of the three experts speeking said he was "relaxed" on that topic and the third, a person from a swedish nuclear fuel and waste management company, affirmed that he could report only positives about full responsibility of the producers. The panel concluded that there was no problem with privatisation, "if carried out properly".

Information policy: The experts and laities alike agreed that there should be dealt more open with that concern. The public should get involved systematically. The panel brought out that they had been "deeply offended" by a statement of a member of the *House of Lords* who advanced the view that the public could not have a qualified opinion on that question which had to be left to the government.

Reprocessing of imported spent fuel: Three of the five responding people to the question what benefits were gained from the import of spent fuel for reprocessing argued pecuniary. Apparently the reprocessing cheapens the nuclear fuel processing. One person pointed at the international nuclear fuel market the UK had to compete with, a second said that it was economically not sensible not to run an existing reprocessing plant at its maximum capacity. The third and greatest financial argument was a 19 year order book worth over 12 Billion of the BNLF. One person suggested reprocessing reduced the total volume of radioactive waste, another affirmed the opposite and cited a NIREX inventory saying that "by far the largest radiation doses due to discharges arise from the reprocessing site at Sellafield".
The panel followed the financial argumentation but also recorded that they found it a good idea to stop reprocessing after the existing contracts have been completed. They did not feel in the position to decide on the question whether reprocessing de- or increased the amount of radioactive waste. A supplementary note was taken down on the transportation of nuclear waste. They saw it as an unacceptably high risk, amongst others because of possible accidents or sabotage. Transports needed to be thoroughly reviewed, at the same time they deplored the existing lack of transparency concerning modalities and dates of the transports

executions.

Continuation of nuclear power: Financial, environmental and social costs. Interrogated were a business consultant and a *British Energy* representative. Both held the opinion that nuclear power should be continuated. They argued that the publics perception of a high risk was due to misinformation and in fact the risks arising from burning fossil fuels (global warming and acid rain) were by far greater.
The panel expressed its preference of discontinuating nuclear power, but only if it could be replaced with pollution free or "significantly less polluting alternatives" and production should not be increased before an appropriate way to deal with the waste has been found.

Supervision of the military: Experts on this matter were considered two men from the Ministry of Defence (MoD) and the Chairman of the *Naval Nuclear Regulatory Panel*. The first part of the panels question concerned the decommissioned submarines that appeared to be taken care of, but no decision could be made upon eventual resting places until final decisions on a repository have been made. After the explanations of the MoD the panel "felt confident that the military were both monitored and monitoring all aspects of safety adequately". The second part of the question about unlocated lost waste, that had been dumped at sea during the 1950s and 60s, could not be answered satisfactory and the panel insisted in efforts to be made to identify its locations. A third outcome from discussing this question was that the panel wanted more information for the public about the UKs nuclear weapons, but considered that out of their remit.

Terminology for classification: The experts summarized that the UKs classification was based on concentration alone and did not consider radiotoxicity, present activity, half-life, physical and chemical form of the waste or other parameters describing the harmfulness of a substance.
A man from BNFL expressed his disbelief that international standards would be adopted in the UK, the woman from Freelance Research Consultant called both national and international classification "obtuse" and suggested to class radioactive waste by the materials lifetime, a person from *Greenpeace* went into the same direction by calling present classification "deeply flawed" and arrogating plutonium to be classed as nuclear waste. The panel agreed with the experts on the need of a new, internationally approved method of classification that should

clearly indicate the potential harm of any substance.

Nirex: Because of Nirex disreputable past the panel put as well some attention at their role. It was recognised that Nirex had a bad image and was therefore not likely to gain the publics trust. In order to find a socially acceptable solution it was important to change that perception, either by disbandening the organisation and committing its responsibilities to a clear successor or by radically intensifying the contact to the public. In any case the responsible organisation should be regulated by an independent body by setting and enforcing rules. That body ought to consist of members from industry, science, environmental groups and the public.

3.3.4 Reconvention

In 2002 the panel was reconvened. After phrasing a *Consultation Paper* on the safe management of radioactive waste Defra asked UK CEED to reconvene the panel as now *informed members of the public*. The (reduced in numbers) panel affirmed their desire for more incorporation of the public.Their suggestions for a body structure of future waste management became more precise. They proposed a new governing body that was responsible for the Nuclear Installations Inspectorate and the actual managers of the waste, e.g. Nirex. Research should be carried out from both Nirex and governmental bodies. Nirex should become independent from waste producers as BNFL. Afar from that the panel commented rather uncritical about Nirex political attitude, but again claimed there should be worked on their image in order to maintain their "expertise as waste carers" [?].

3.4 Progress

In view of this essays topic, this section will be assorted under the aspects of *openness and transparency towards the public*, as it repeatedly appeared as essential concern of the panel, the *type of storage* (surface/shallow or geological), as one major question that was to be answered, and the *Energy Act 2004* together with the *2006 Energy Review* and its implications.

3.4.1 Openness & Transparency

Regarding this issue unfortunately there is not much positive outcome to be found. Some negative samples:

The government is carrying out concealed investigations about possible locations for repositories in fear of the so called *NIMBY* ("not in my backyard")effect and the associated feasible remonstrations.

Just on 5/21/08 plutonium to be used in MOX (= Mixed Oxide Fuel) has secretly been shipped between the Sellafield plant in Great Britain and the Melox plant in southern France [?].

Obviously the military has not published a list of the nuclear weapons used and positioned in the UK.

Looking at established public sources as newspapers or relevant webpages, there is no way of putting the information policy about nuclear concerns as transparency.

3.4.2 Storage

No decision has yet been made upon the long-term storage of radioactive waste in the UK. Nirex is still doing research on deep geological "burying" (a popular catchword for a form of deep disposal without sufficient retrievability in case of leakages or other unforeseen problems):

In January 2006 *The Guardian* titles "Nirex stand accused of sexing up their report on the wisdom of dumping [...] radioactive garbage in the ground." Although Nirex claimed to have learned "the lessons of the expensive collapse of research [...] in the 1990s", they were again presenting an overoptimistic view on deep burial of the dangerous waste: despite scientific concerns that the proposed containers for storage could leak within 500 years, Nirex declared its plans "viable" [?]. Other sources including a report on public relation strategies by Nirex itself are suggestive of inferior interests on a scientifically reasonable solution [?].

3.4.3 Energy Act 2004 & 2006 Energy Review

The Energy Act 2004 set up a new Authority for nuclear Decommissioning (NDA) that came into existence in late 2004, and took on its main functions on 1 April 2005.

The NDA owns Nirex since 2006, in 2005 the ownership of the company had been transferred from nuclear industry to the governmental bodies Defra (Department for the Environment, Food and Rural Affairs) & DTI (Department of Trade and Industry).

According to the Energy Act no new nuclear power plants have been built in the following years. However two decommissioned plants have been re-commissioned.
Moreover the *2006 Energy Review* brought the building of new plants back in. In order to achieve their 2050 goal to cut emissions of carbon dioxide by 60%, the government should encourage private investors to finance the replacing of old plants by new ones.
2007 *Greenpeace* won a High Court ruling that threw out that Review and called it "unlawful", mainly for financial reasons. Nevertheless after publishing a consultation document the government gave its go-ahead for the building of the nuclear power plants in January 2008.

About the reprocessing order situation there can not be given reliable information since the Energy Act does not restrict further reprocessing and BNFL does not respond to corresponding requests nor does Defra.

The UK Classification of nuclear waste did not change.

4 Conclusion

The development after the conference shows not much direct influence on the decisions made. Looking at the panel positions and the political outcome one may wonder if the conference had any effect at all.
UK CEED puts it to their own (the Consensus Conferences) account that the NDA has been formed and Nirexownership been transferred from private to public bodies.
If that is justifiable is hard to say. If the panels opinion played a role (as it had to deal with its bad public image, the future of Nirex had been discussed before) it is officially not well approved - in related documents is nowhere found a link to those peoples work.

The chapter about the transparency the topic is handled with nowadays speaks for itself. If there was a real interest of the government to participate the public, access to relevant information would be one of the preconditions.
Obviously that would also increase the degree of vulnerability of all processes dealing with nuclear substances and display it to its fundamental opposition as well as to possible acts of war and therefore bear a very high risk. That leads to the question if *Radioactive Waste* is a topic suitable for public control at all or if participation can indeed only be applied in terms of rising acceptance of whatever political or economic decision here.

What makes that even more doubtful is the way the panel gained its opinions. At few stages it is recognisable that the lay people undertook serious independent thinking.
As no other than the witnesses informations were available they were to rely on the given information and counted on their expertise. A good example for the impression of total dependency on (natural) sciences is the expressed "strong belief" in transmutation or another technical solution that will "dispose nuclear waste" soon.
Such an attitude becomes more and more natural (and coactive) in societies based as strongly on expertise and elites as ours. With no question the panel expressed drastically deviant

positions, they generally met "in the middle" of the ones presented.

That is especially problematic as you may as well question the quality of the "experts" choice. As already mentioned the list to chose from was not published. It is to remark that environmental groups, that are throughout sharp critics of the usage of nuclear power in general, have been represented. The outnumbered presence of industrial lobbyists, particularly Nirex and BNFL with their strongly defined interests in the discussions outcome, attracts skeptical attention, but since the panel did not see any problem with the privatisation of such businesses either, I have to make the assumption that the issue of independence from economical interests may not be valuated very strongly throughout the British society. What is corroborating this guess is the slightly naive appearing "integrity" approach of the UK CEED.

Afar from that one may trust the declared intention of improving environmental practices of the UK CEED. If the applied manners are appropriate or promising has to stay doubtful.

Another more general problem with evaluating scientific doctrines that applies here, is shown by the history: the panel preliminary stated they were "not fundamentally opposed to nuclear power" and not "a PR exercise on behalf of the nuclear industry or the anti-nuclear groups". That means extremes were cut out from the beginning which does not appear very knowledgeable when looking at former establishing processes of new technologies or scientific "knowledge" where (often sharply dismissed) opinions contradictory to the current doctrine, profed right a few years later.

Recapitulatory it has to be said that in order to gain "real" participation - in the sense of all cited understandings - a radical change of society would be necessary.
People would have to empower themselves which is increasingly difficult especially when it comes to applying science. The dependence on expertise would have to be replaced by a system of information accessible for everyone likewise. A broader and low threshold education would be needed as well as more flat hierarchies - formal and informal.