

When wind farms cause cancer – the public risk perception of technology and engineering megaprojects

In this talk and workshop, we will take a look at how it is possible that “experts” and “the public” sometimes (or often?) arrive at completely opposite conclusions regarding the riskiness of a particular technology or megaproject. More importantly, we will reflect on what our role as scientists and engineers should be in such situations.

The examples of contentious technology and megaproject-related risk perceptions are numerous. Does genetically modified food increase farming productivity, protect people (particularly in the third world) from hunger and vitamin deficiencies, or do they cause untold misery both economically as well as health-wise? Why are we not building nuclear power plants left, right and center to mitigate climate change? Why are some parents still convinced that vaccinating their children will lead to autism? And why is everyone in favor of more wind power, but joins a protest group as soon as one is planned next door?

These issues are interesting because they bridge a wide range of professional and academic fields. This talk and workshop does not aim at giving any final answers, but rather expose the participants to the complexity of the issue and many facets that they have. In particular, we will discuss:

- Megaprojects and risk: Why big engineering projects are hard to get right
- Engineering view of risk: Playing by the numbers
- Cognitive Biases: The evolutionary heritage of a 200'000 year old brain
- Social Movement and Social Movement Organization: Why humans take collective action, and how we are being manipulated into it
- Psychometric risk assessment: Numbers don't matter for how afraid we are of something
- Discussion and workshop: Industry, Politics, Media, NGOs –Who cares about an informed, fact-based dialogue? Should we be worried? What is our responsibility as the educated elite?

Megaprojects and risk: Why big engineering projects are hard to get right

There is significant evidence that big engineering projects tend to also be big in cost and schedule overruns. Why is it still difficult to develop an off-shore wind farm or construct a nuclear power station? What drives complexity of developing, constructing and operating large-scale socio-technical systems?

Engineering view of risk: Playing by the numbers

Engineers love numbers. When we develop risk assessment and mitigation strategies, we place great emphasize of using a method and model that gives us as much of an accurate representation of the technical system as possible. We will have a brief look at a reference risk management process (ISO 31000), as well as at a popular assessment method, Probabilistic Risk Assessment (PRA). We will discuss why engineers and project managers love these methods, but why they fail to satisfy the needs of non-technical audiences.

Cognitive Biases: The evolutionary heritage of a 200'000 year old brain

The “behavioral modern human” emerged 50’000 – 200’000 years ago. Evolution did not optimize us for cars, iPhones or global trade. We make up our mind in split-seconds, and then spend a lot of time finding rational explanation for our subconscious choices. When the new car we bought is red, we suddenly see a lot of red cars on the street. And most of us consider ourselves above average drivers. What are some of the “tricks” our emotional fast-thinking mind plays on our slow-thinking logical self? How does this impact our decision making?

Social Movement and Social Movement Organization: Why humans take collective action, and how we are being manipulated into it

People do not spontaneously explode into action. Collective behavior and social movements are a fascinating phenomenon, and received a great deal of academic attention in the last 60 years. Why can we be terribly upset about whale hunting, while losing no sleep over babies and children starving to death? Why do we suddenly erupt in disdain over a 50 year old partnership between a toy maker and an oil company? We will talk about perceived opportunities and threats, mobilizing processes, and issue framing as a sense-making model to understand why “the public” takes action and when. We will also talk about global Social Movement Organization and the associated “industry” to reflect on their motivation and priorities. We will also discuss why we think the European Union is generally an incredibly boring subject.

Psychometric risk assessment: Numbers do not matter for how afraid we are of something

Engineers have been pulling their hair out and accusing the public of right-out stupidity for as long as public opinion mattered in decision making processes: Why can’t people just be educated, inform themselves, think about an issue rationally and then support the one obviously correct answer? Or better: Why can’t they just trust the experts? Psychometric risk assessment investigates the “emotional”, or better, human, side of risk perception. Our perception and assessment of risk is not governed by numbers, but by factors such as how dreadful a risk is perceived to be, how much control we have over it, or whether it is a common occurrence or not. Choices that we “like”, i.e. perceive as highly beneficial, are also automatically seen as less risky, and vice versa.

Discussion: Industry, Politics, Media, NGOs –Who cares about an informed, fact-based dialogue? Should we be worried? What is our responsibility as academics?

We like to think that we live in an open, enlightened society. We are rational human beings, who organize themselves in a democratic way. Or are we a flock of dumb sheep herded in one direction and then another by powerful interests in politics, industry, media and NGOs? How can we, or the average person for that matter, make up their mind on highly complex and technical subjects such as climate change, nuclear power, wind farm development or genetically modified organisms? Society invests a lot of resources into their universities, so what is our responsibility as academics?