Good Governance of Energy Technologies

On populism, NIMBYims and technocracy

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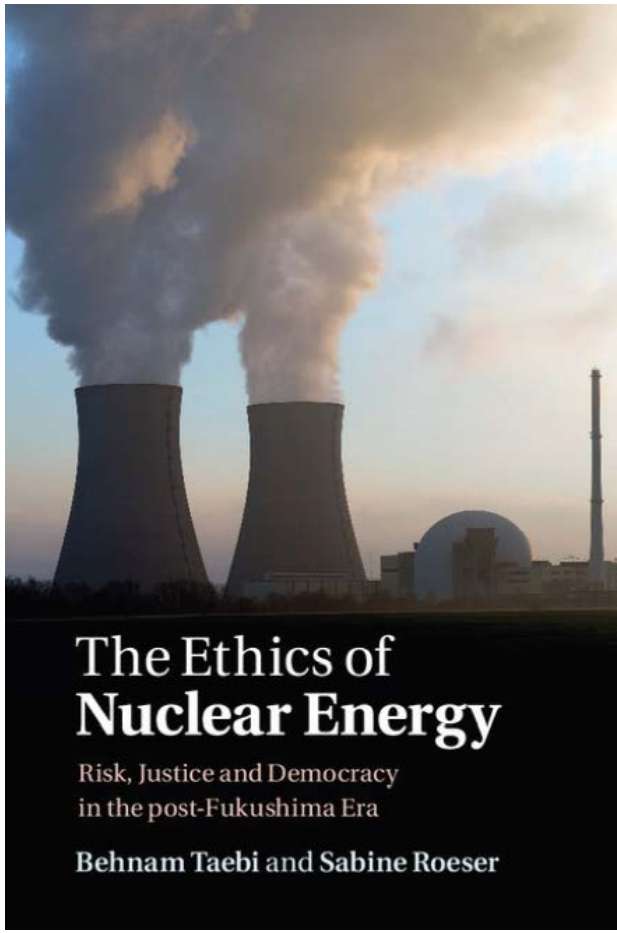
TU Delft

Journey of a Materials Science graduate

- 2005: MSc Material Science and Engineering
- Started in 2005 in ‘philosophy of technology’
  - PhD: understanding justice in nuclear fuel cycle (2007-2010)
  - Collaborations with engineering (RID at TU Delft & MIT)
- Helped reinvigorate ‘ethics of nuclear energy’
  - Away from the yes/no dichotomy
  - Understating the ‘desirability’ in terms of technological feasibility

- Ethics and radiation protection
- What escapes the calculus of risk assessments (‘normal accidents’)
- Gender & ethical voices
- Distributive & procedural justice
- Non-anthropocentric ethics
- Global nuclear energy & security
- Social experimentation
- Capability approach & nuclear energy in developing world
- Nuclear energy & energy landscape



Where controversy comes from

- Systems of energy production, distribution and consumption are subject to changes
- Changes give rise to controversy
  - Different people's interest and values that do not always coincide
- If not dealt with properly, controversies could lead to failure of a project

How to (not) deal with controversy

- NIMBY
- Populism
- Technocracy
- Social acceptance
- Inclusiveness
- Ethical uncertainties

NIMBY: an inadequate framework

- It rest on the wrong assumptions
  - People don't get it
  - We should only explain things better
- It neglect people's concerns
  - And, by that, could fuel controversy
- It underestimates people's capacity
  - To contribute and to think along
- It only gets us to dead ends
  - For technological developments and decision-making

NIMBY rests on technocracy

- Technocracy states that technological solutions are found by scientists and engineers
  - And they will be *presented* to the public
  - Alternatively, the public must be convinced
- It wrongly assumes that if the technical solution is sound the public will endorse them
  - It neglects many important societal & ethical issues
  - Emphasis on “manageable risks” (shale gas example)
- The “socio-technical divide” (Bergman et al. 2015) has proven to be unhelpful and ineffective

Populism is not the answer either

- In risk governance neither technocracy nor populism work; (Roeser 2018)
  - "Risk, technology and moral emotions"
- Populism: *all* public concerns must give rise to a change in the technology or the institutions governing that technology
- Populism leaves little room for reflection
  - And it neglects the issue of ethical diversity and uncertainty

More helpful approaches

- More effective and (socially defensible) approaches focus on
  - Social acceptance
  - Inclusive governance
- Yet, these cannot sufficiently account for broad societal and ethical issues either
  - Including ethical diversity and uncertainty’

Social acceptance and ethics

- Social (public) acceptance studies emerged as a response to technocratic approaches
  - To account for **societal and ethical** aspects of risk

- Yet, insufficient to capture all ethically relevant issues (the acceptance-acceptability gap)
  - Whose acceptance?
  - How to deal with the different preferences?
  - Especially problematic when dealing with intergenerational and transboundary risks

(Taebi 2017)

(Inclusive) governance

- *Inclusive risk governance* was proposed
  - To facilitate “efficient, fair and morally acceptable decisions about risk.”

    (Renn 2009)
  - And to **include** in the process government, industry, academia and civil society

- Yet, sole focus on inclusiveness cannot
  - Adjudicate between **ethical** priorities of stakeholders (e.g. value preferences)
  - Include all stakeholders: future generations and people in other countries

My approach: good governance

- Good governance of energy technologies must account for the societal and ethical issues, acknowledging **ethical uncertainties**

- To be sure, I am not dismissing social acceptance or inclusive governance
  - I am only drawing a bigger picture in which these helpful approaches would perfectly fit

Climate and energy technologies

- Climate and energy technologies are particularly complex and difficult to govern
  - Transnational and intergenerational risk and benefits
- Transnational: decision-making in one country could affect others
  - E.g. coal combustion, nuclear power plants
- Intergenerational: they affect interest of future people
  - In terms of resources we leave behind: finite resources
  - In terms of environmental impacts

Why does ethics matter?

- Many questions in the governance of energy technologies are essentially ethical
  - How safe is safe enough?
  - Who is getting the burdens and benefits?
  - Which/whose (public) values are relevant?
- Particularly difficult for international and intergenerational (climate & energy) risks
- It's one thing to say that ethics is relevant
  - It's a another thing to say *how* it matters

How does ethics matters

- Instance of normative/moral uncertainties
  - There is no unequivocal right or wrong answer to a moral question
  - There are different courses of action (partially) morally defensible
  - There is no course of action fully morally defensible
  - There are different (incompatible) opinions of different stakeholders

Types of normative or moral uncertainties

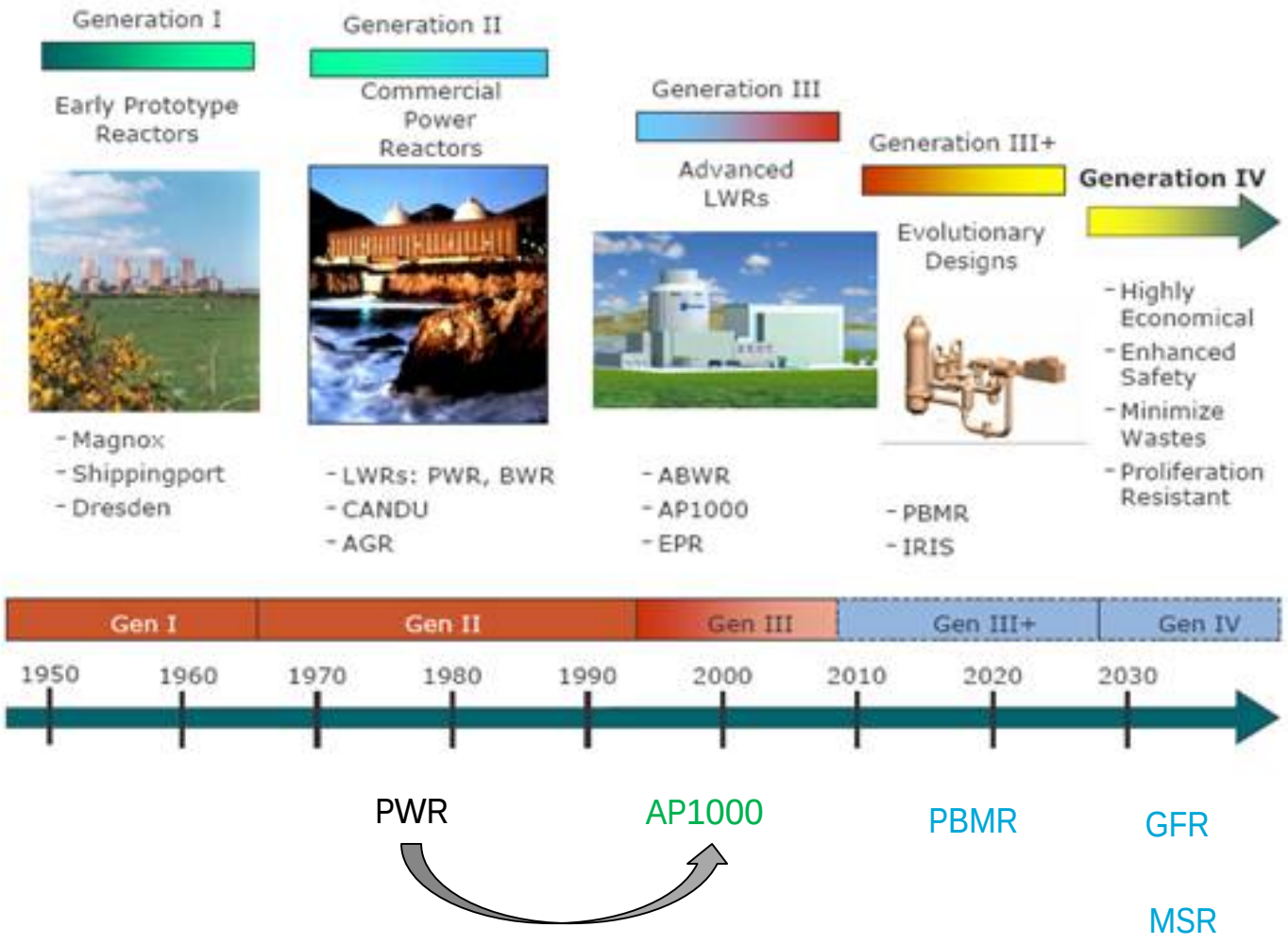
Evolutionary normative uncertainty	When one does not know which moral norm would apply to a technology, because both the technology and moral views could evolve.
Theoretical normative uncertainty	When different ethical theories would respond differently to an ethical question.
Conceptual normative uncertainty	When different ethically relevant concepts (e.g. values) could be prioritized or interpreted differently.
Epistemic normative uncertainty	When there is incomplete knowledge about fundamental phenomena, or different interpretations (with different moral implications) are possible of the same body of knowledge.

Nuclear waste disposal

- Evolutionary uncertainties
  - The Netherlands started nuclear energy production in 1960s; waste must be disposed of in 2120
  - Very long life-time of the waste and *leakage*
- Ethically laden questions & justice
  - What do we owe future generations?
  - Whom do we owe it to?
  - How to deal with conflicts between present and future?
  - What level of protection should we offer future generations?

Conceptual uncertainties about values

- Acknowledging the diversity of values
  - The design perspective: e.g. unclear reactor design
- Acknowledging the diversity of opinions about values
  - The public debate: e.g. the Dutch shale gas debate



Green: incremental improvements
Blue: radical design change

Traditionally, strong emphasis on safety

Generation	II	III	III+	III+	IV	IV
Reactor type - acronym	PWR & BWR	ABWR	AP1000	PBMR	GFR	MSR
Core damage frequency (per reactor-year)	10^{-4} to 10^{-5}	1,6 X 10^{-7}	4,2 X 10^{-7}	5 x 10^{-7}	N.A.	N.A.
Type of change in design	Default design	Small & incremental compared to BWR	Medium & incremental compared to PWR	Radical	Medium to radical	Very radical change in reactor technology

Overview of the reactors and their core melt-down probabilities

Adopted from (Taebi and Kloosterman 2015)

Future reactors must comply with a *host* of values….

- Safety
  - Health impacts of (unintentional) exposure to ionizing radiation
- Security
  - Protection from intentional harm (including proliferation)
- Sustainability
  - Environmental friendliness: anthropocentric or bio-centric?
  - Resource durability
- Economic viability
  - (Moral) importance in conjunction with other three values
  - It includes R&D investments

Comparison of promising reactors

- PBMR designed with safety as primary criterion
  - Scores good on security (no enrichment and Pu can't be separated)
- GFR was designed with sustainability as leading criterion
  - It scores less on safety and security because of Pu
- MSR uses Th and is designed with sustainability in mind
  - It scores relatively worse on safety (corrosive systems) and proliferation (^{233}U)

	PBMR	GFR	MSR
Safety	++	-	0
Security	+	- -	-
Sustainability (durability)	-	+	+ +
Economic viability	+	0	-

“Manageable” risk of shale gas

- In August 2013 a report was released in the Netherlands on ‘technological risks of shale gas’ (Witteveen+Bos)

- The minister of Economic Affairs:
  - There are risks involved with extraction of gas under high pressure; risks such as earthquake and the pollution of ground water. But the technical analysis shows that the risks are “manageable”

(Source NRC Handelsblad, 26 August 2013)

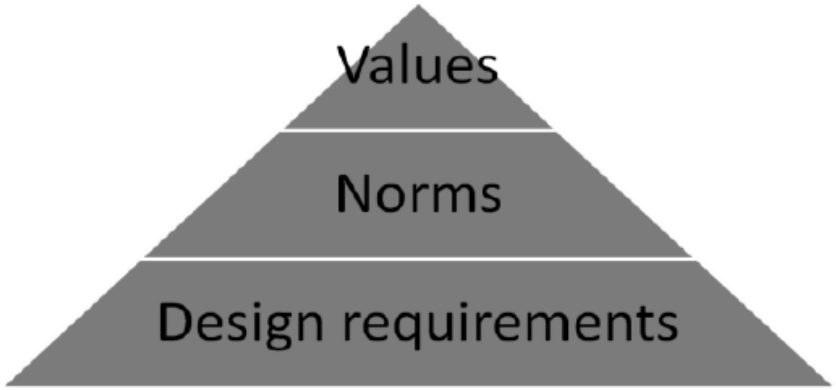
“Responsible innovation” of shale gas

- ‘Responsible’ shale gas innovation:
  - Appropriately reflect divergent stakeholders’ values
  - Both technologies and institutions incorporate values
  - Contestation arises when not all values are incorporated

- Two important research questions:
  - How can we accommodate the variety of (conflicting) stakeholder values? (e.g. design change)
  - How can technology and institutions be developed in such a way as to incorporate the variety of (conflicting) stakeholder values?

Value hierarchy (Van de Poel 2014)

- Values: considered important to be upheld
  - E.g. environmental friendliness
- Norms: Formulated to realise values
  - E.g. avoid pollution of surface water
- Design criteria: Very specific criteria for complying with norms
  - E.g. standards (ppm) for drinking water purification



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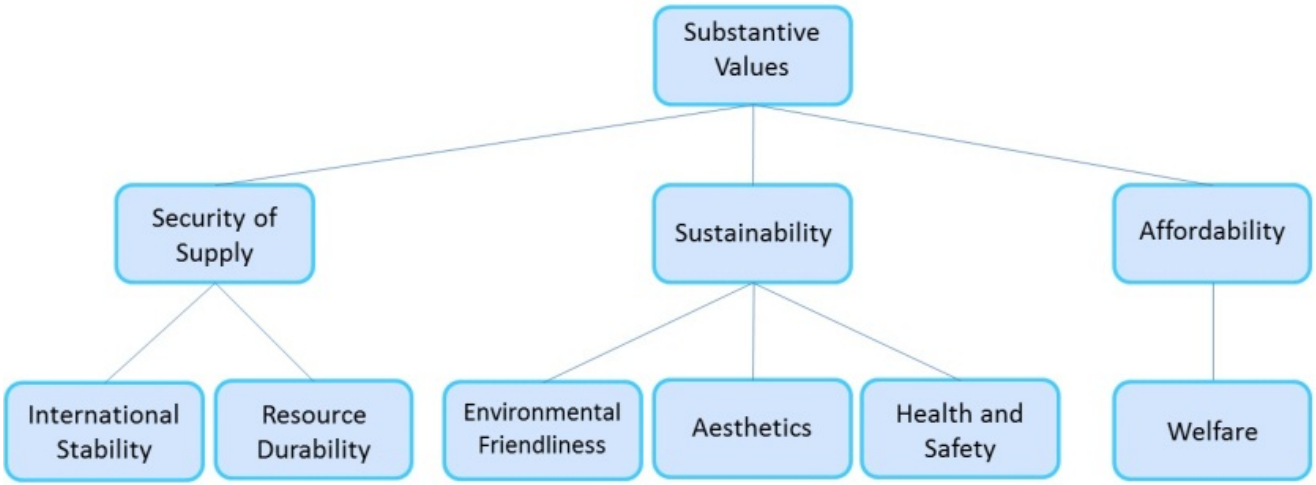
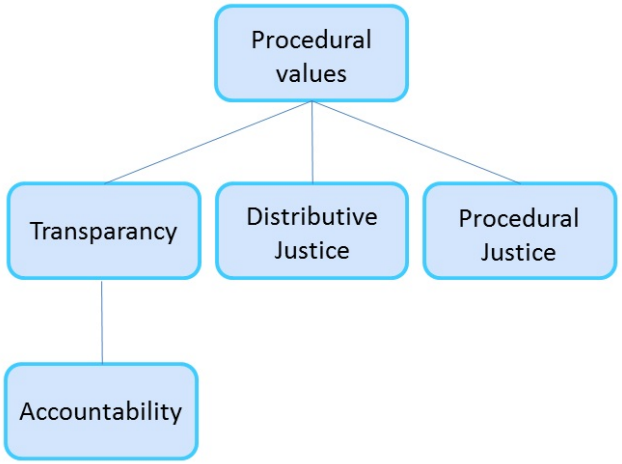
Values conflicts in shale gas debate



Source: (Dignum et al. 2016)



Are we there yet? New challenges!

- Acknowledging that we public values matter is one thing, pro-actively including them in technological developments is a whole different challenge

- Questions that need to be answered
  - Whose opinion (should) count?
  - Who gets to decides what is fair procedure and distribution?
  - How do we deal with different stakeholders' (diverging) opinions?

Do moral uncertainties make ethics redundant?

- Because there is often an uncertainty involved and because ‘ethics is a matter of opinion’?

- Many of these issues are the ones that we already deal with during the design, implementation and use of (energy) technologies

Relevance for future research

- New and important trend in funding schemes is to support *comprehensive thinking* about technological developments
- Responsible Research and Innovation
  - Within H2020 proposal but also in NWO-MVI
  - It requires alfa, beta, gamma collaborations
- More information: Dr. Paulien Snellen
  - Secretary of the NOW-MVI platform
  - www.nwo.nl/mvi
- Other examples: NWO Cross-over program and the ECCM Call

Thank you

Comments are appreciated!

now or later by email

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Cited literature

- Bergmans, Anne, Göran Sundqvist, Drago Kos, and Peter Simmons. 2015. “The Participatory Turn in Radioactive Waste Management: Deliberation and the Social–Technical Divide.” *Journal of Risk Research* 18 (3–4): 347–63.
- Dignum, M, A Correljé, E Cuppen, U Pesch, and B Taebi. 2016. “Contested Technologies and Design for Values: The Case of Shale Gas.” *Science and Engineering Ethics* 22 (4): 1171–91.
- Roeser, S. 2018. *Risk, Technology, and Moral Emotions*. Routledge.
- Taebi, B. 2017. “Bridging the Gap between Social Acceptance and Ethical Acceptability.” *Risk Analysis* 37 (10): 1817–27.
- Taebi, B, A Correljé, E Cuppen, M Dignum, and U Pesch. 2014. “Responsible Innovation and an Endorsement of Public Values: The Need for Interdisciplinary Research.” *Journal of Responsible Innovation* 1 (1): 118–24.
- Taebi, B, and J L Kloosterman. 2015. “Design for Values in Nuclear Technology.” In *Handbook of Ethics, Values, and Technological Design: Sources, Theory, Values and Application Domains*, edited by J Van den Hoven, P Vermaas, and I Van de Poel, 805–29. Dordrecht: Springer.
- Van den Hoven, J, P Vermaas, and I Van de Poel, eds. 2015. *Handbook of Ethics and Values in Technological Design: Sources, Theory, Values and Application Domains*. Dordrecht: Springer.