



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

## **New Materials in Solar Cells: Can Social Science Contribute?**

Dr. Heidrun Åm

Post.doc

Center for Technology and Society, NTNU, Trondheim

# Overview Presentation

1. Introduction Public Engagement and Constructive Technology Assessment
2. Integrated Research
3. Project “Socially Robust Solar Cells”
4. Experiences Laboratory Study & Interdisciplinary Cooperation
5. Discussion



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

# 1. We *ought* to do Public Engagement

- ✓ ELSA research and public engagement became a legitimate and expected feature in policy-making of technology governance (Irwin 2006, Gottweis 1998).
- ✓ Belief in democratization of science and society relations.
- ✓ Ideas of dialogue, openness, and transparency



*Public engagement assumes that science and technology can be reframed, reshaped and redirected by numerous social factors that extend beyond the reach of technical expertise.*  
(Fisher 2011:608)



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

# 1. We *ought* to come in early

- Upstream/midstream engagement; anticipatory governance (i.e. Wilsdon & Willis 2004, Fisher 2007, Guston 2007, Barben et al. 2007, Pidgeon & Rogers-Hayden 2007)

*“[...] CTA shifts attention to the steering of the internal development of the technology. CTA is based on the idea that during the course of technological development, choices are constantly being made about the form, the function, and the use of that technology and, consequently, that technological development can be steered to a certain extent (Schot 1992:37).”*

- Search for new forms of interaction between science, public, and stakeholders (Chilmers 2008) to influence co-evolution of technology and selection environment → *how to do engage early?*



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

## 2. From *ought to*, to *how to*: Example Integrated Research

- Considers the societal issues while in the R&D phase (Conley 2011:716)/ integrates the results of ELSA-approaches into the science and engineering practice that the ELSA-researcher studies
- Integration-researchers participate and engage in the laboratory, while at the same time mapping the actor-network that contextualize the laboratory work.
- Goal: Broadening the scope of what researchers take into account through more reflexive decision-making (Fisher 2007:155)
- Decision-related methodology (STIR-protocol)



### 3. “Socially Robust Solar Cells” [SoRoSol]

10 participants from 4 disciplines (Material Sciences, Industrial Ecology, Philosophy, and STS)

1. The integration shall trigger a learning process and changed attitudes among participants.
2. *“Depending on input from HSE considerations and the social and ethical aspects to be studied as described in sections 2.2.2. and 2.2.3., respectively, we will then focus on either the more problematic ZnSe:Cr (or ZnTe:Cr) or the less harmful, but more complex CZTS.”*  
(Project description SoRoSol, page 3)



NTNU – Trondheim  
Norwegian University of  
Science and Technology

### 3. “Socially Robust Solar Cells” [SoRoSol]

- Monthly group meetings
- Ethnographic observation/intervention(?)
- Interviews with material researchers in the group
- Interviews with solar energy scientists in Norway
- Focus groups on renewable energy with “general publics”



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

## 4. (Risks &) Nanomaterials: What are the issues?

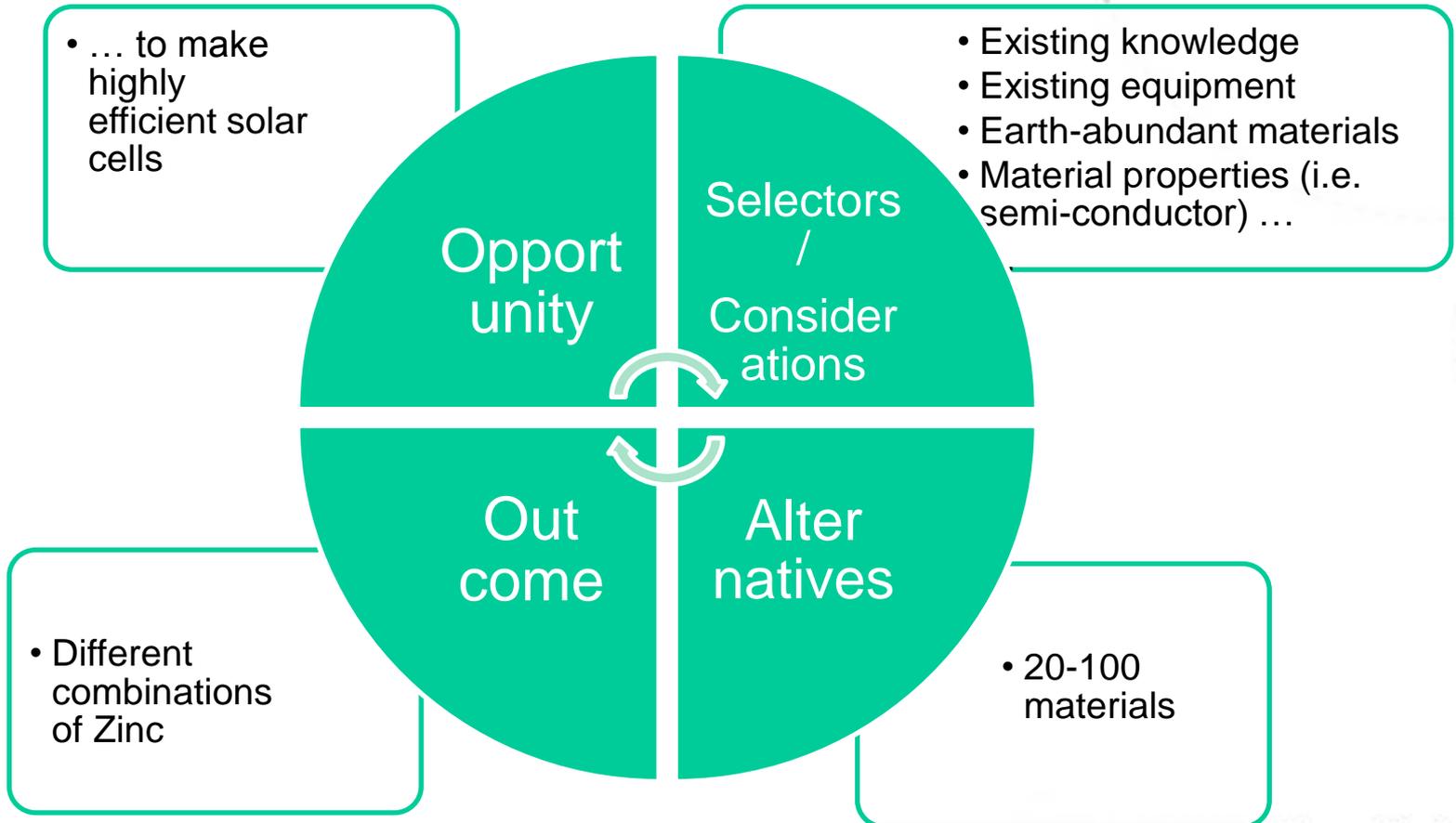
*“Mine was a responsible development excursion; therefore, I stayed with risk for hours, and I made the most out of it.”*

“NIMBYism”: Not in my laboratory



**NTNU – Trondheim**  
Norwegian University of  
Science and Technology

## 4. STIR-protocol: Material Choice



## 4. Bring in reflexivity?

Raise reflexivity on

- a) Work practices in the laboratory
- b) The (socio-ethical-political-economical) context of laboratory work

*Do we run into the danger of treating scientists as empty vessels that have to be filled with 'social understanding' not much different from the Public Understanding of Science's opposite misdemeanors?*



NTNU – Trondheim  
Norwegian University of  
Science and Technology

# Discussion

- *Are solar scientists an outstanding species because they are often strongly motivated by environmental concerns?*
- *Might research that involves intervention into life (i.e. cloning, the construction of hybrids, synthetic biology ...) be a more fruitful ground for the integration of social and ethical issues (than material science research)?*
- ***Have the ideas of integrated research maybe been surpassed by the practices of scientific Mode 2 work ?***



# Conclusion

- Existing critique on public engagement based on democratic issues (ST&HV 2008 33:2; Gregory & Thorpe 2010)
- Complement this critique: What can ELSA-researchers contribute on a **practical** level/concrete action?
- Critique of the 'ought to' or 'how to'?

