

How do nuclear scientists and engineers talk internally among themselves about the Fukushima energy crisis?

Haoran Yu, Ian Summers (Doctoral Student), Dr. Danielle Endres (Lead PI)

Undergraduate Research Symposium
University of Utah, Salt Lake City
April 5, 2016

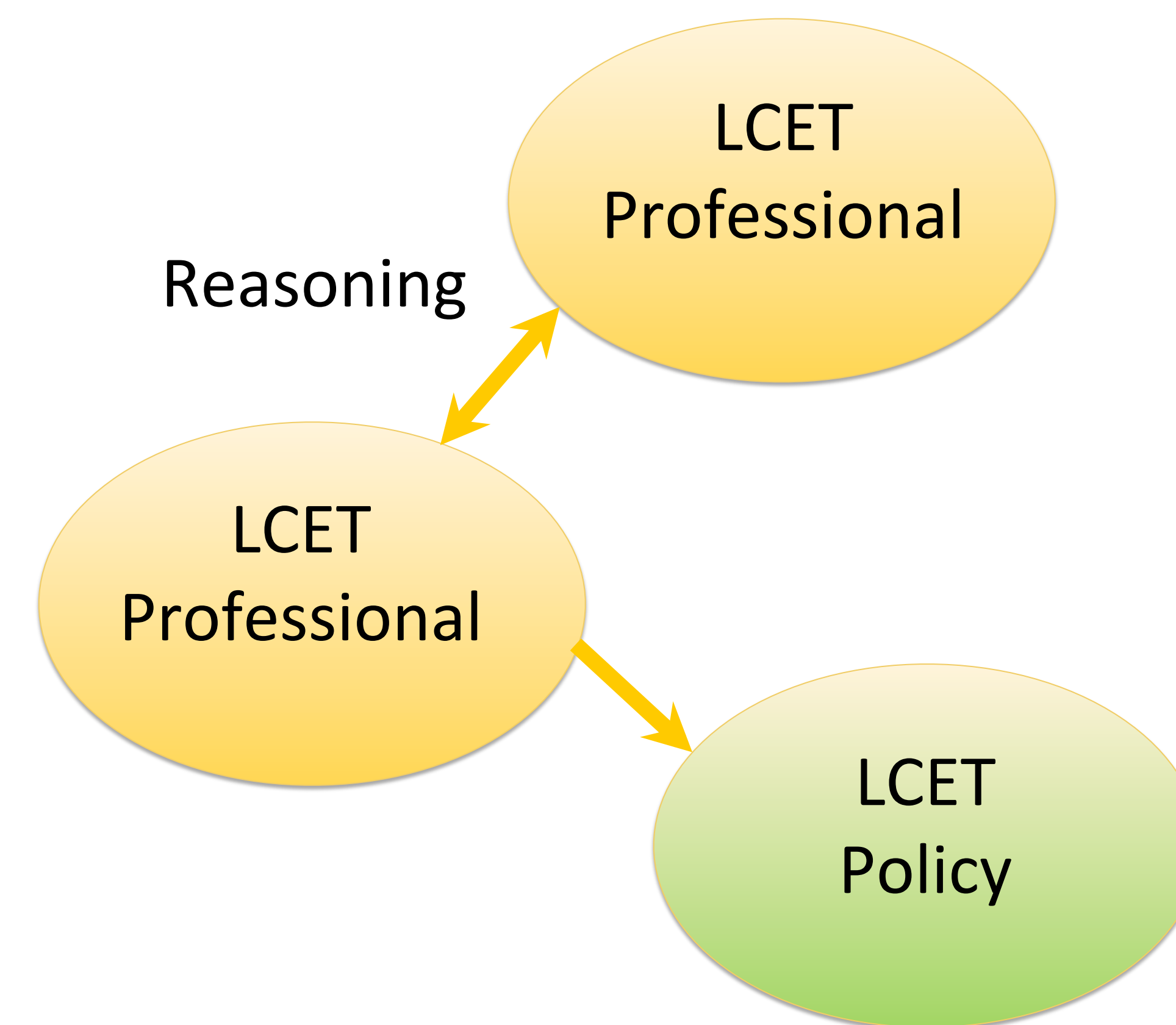
Introduction

- Controversies about the Fukushima accident highlight the connection between **science, society, and policy**
- Low-Carbon Energy Technologies (LCETs)** hold potential to address global energy and change energy policy
- Understanding the **forms of reasoning** used by scientists and engineers in talk among themselves can enable productive avenues for developing **low-carbon energy policy**



Forms of Reasoning

- Reasoning is the act of constructing a logical argument with a claim and support
- Technical reasoning includes forms of argument that produce legitimate scientific and engineering knowledge
- Prudential reasoning involves forms of argument that produce judgments based on value
- Previous research indicates that scientists and engineers use technical reasoning in communication among themselves and prudential reasoning in communication with the public
- Our hypothesis is that LCETs also use prudential reasoning among themselves**

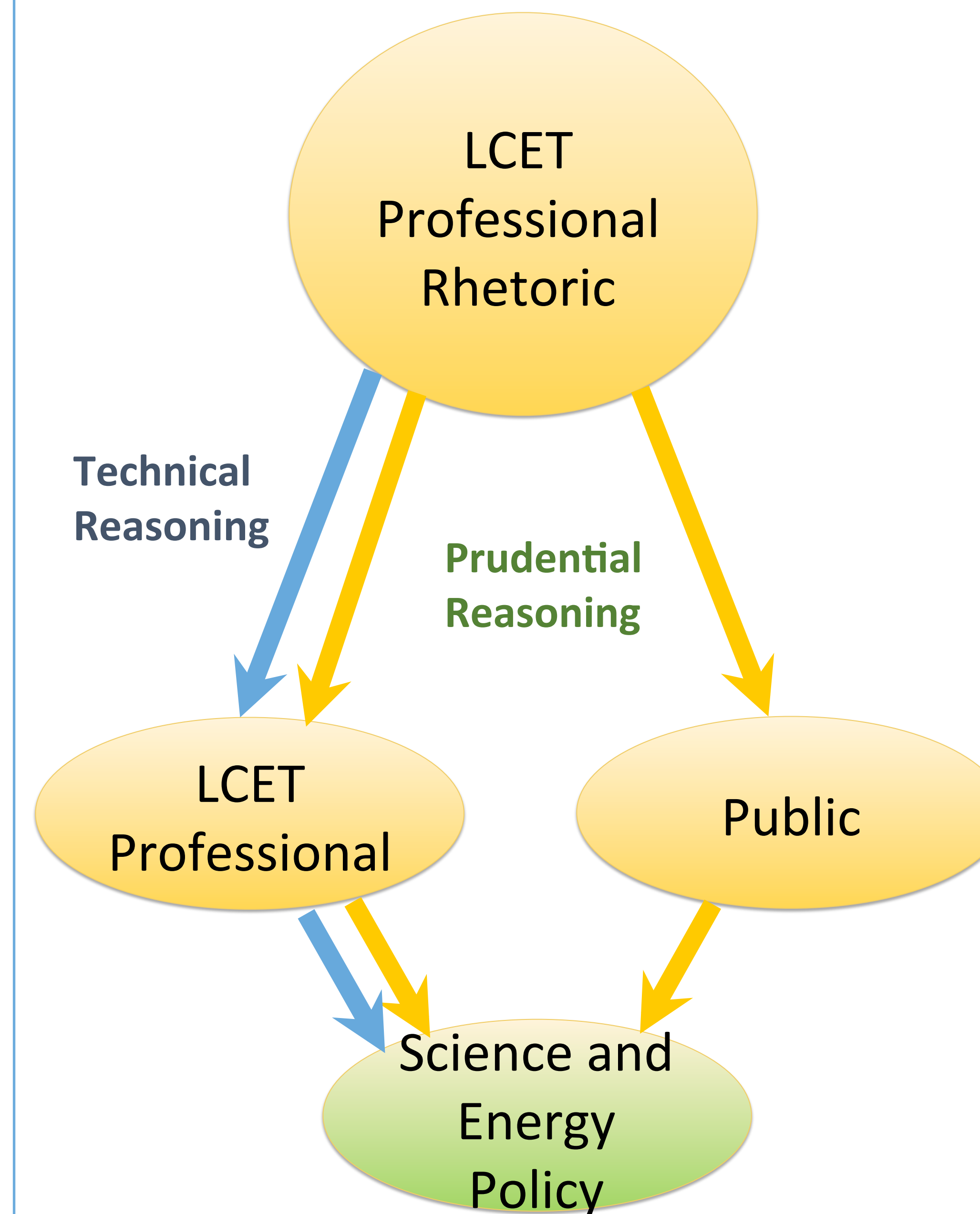


Who are LCET Professionals?

- They are **interdisciplinary** scientists and engineers across **multiple sectors** engaged in **basic and applied** research, development, and subsequent deployment of low-carbon energy technologies
- They all have **scientific training** and may be working in academic, corporate, or industry settings
- My project focuses on nuclear scientists and engineers

Research Questions

- RQ1:** What forms of reasoning do nuclear professionals use when communicating among themselves?
- RQ2:** If such forms of reasoning are present, how do they inform and constrain nuclear safety policies in the wake of the Fukushima disaster?
- RQ3:** What role does Fukushima play in future policy discussions surrounding nuclear safety?



Research Methods

- Rhetorical: used to analyze the internal expert-to-expert rhetoric of nuclear energy scientists and engineers to examine what sociopolitical aspects are important to scientists and engineers
- Qualitative: used to collect the data, which is based on participant observation and interviews with key scientists and engineers at an American nuclear science conference

Research Process

- 1 Ethnographic Interview
- 2 Long Interviews
- 8 Session Transcripts
- 275 lines

Findings

*positive = status quo unchanged by Fukushima
*negative = status quo challenged by Fukushima

Top 3:

- Nuclear Community Attitudes Towards Risk (Positive) - 31
- Safety Culture (Negative) - 31
- Natural Disasters (Negative) - 29

Least 3:

- Governments Reaction (Positive) - 3
- New Standard (Positive) - 1
- Environmental Fall Out (Positive) - 1

Examples

Nuclear Community Attitudes Towards Risk Positive

And so I think ethically there isn't at - there isn't really a problem.

Safety Culture Negative

And we don't really have those discussions when we're talking about the potential for nuclear, and taking it places, and whether it's safe or not, and what you need to think about.

Natural Disasters Negative

You've got to be honest, if you have a plant on a coastline, you have to start asking what is the credible tsunami height - thousand year flood - as opposed to a hundred year flood.

Acknowledgments

- NSF STS Division (SES 1329563)
- NSF SES 1550227
- University of Utah, College of Humanities, Seed Grant
- Collaborators: Tarla Rai Peterson (UT El Paso)

