

# Ethical standards of professional engineers; what should the contribution be from universities?

*Rob Lawlor*



# Outline

- Approaches to teaching ethics
  - Quantity
  - Algorithms
  - Case studies
  - Punchlines
- Challenges
  - Making room in the curriculum
  - Who is going to teach it?

# Teaching Engineering Ethics

# How Much Ethics?

- Teaching by omission
- Leeds:
  - Aiming for equivalent of 10 credit module

# Algorithms

## Ethics and Engineers

- A fundamentally different way of thinking.
- Empirical v non-empirical.
  - (More on this later)
- Challenge the students

## Wary of:

- Risk–benefit analysis (over reliance)
- Flow charts
- Box–ticking

But...

# Section 1 – Decision Making Flowchart

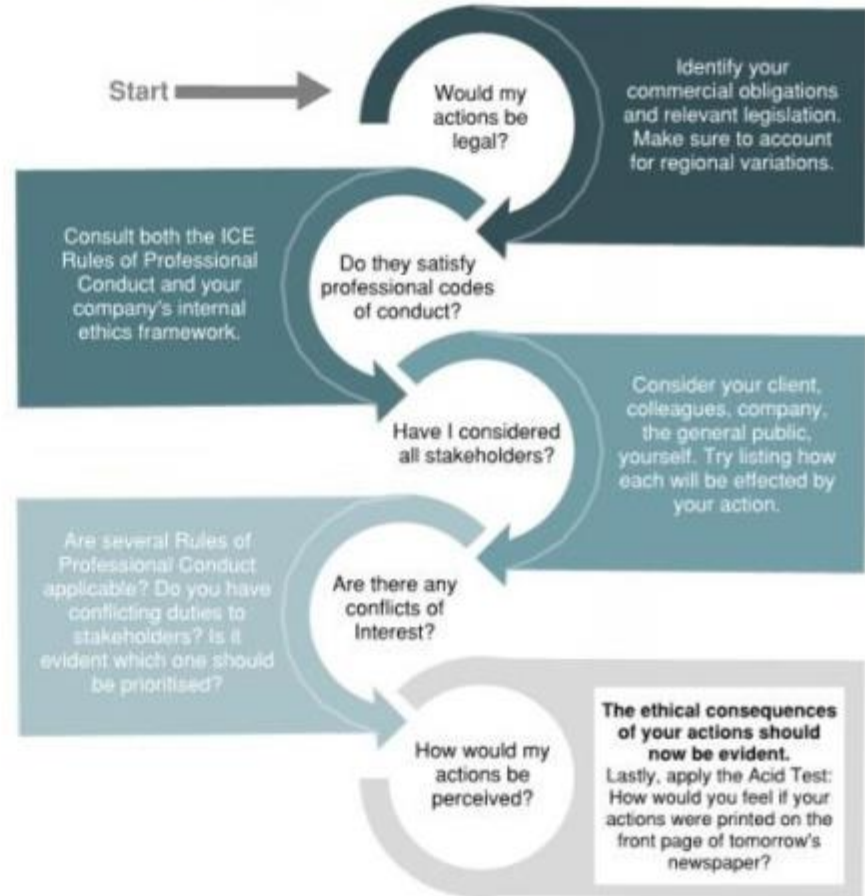
It is widely acknowledged that awareness of professional responsibility alone is insufficient when faced with an ethical dilemma.

This **Ethical Decision Making Flow Chart** provides a guidance framework for practicing engineers attempting to define and tackle ethical challenges.

Start by identifying your options in a particular scenario and then apply each option to the flow chart in turn. Note that there may be more than one ethically correct course of action.

Use the **Ethical Case Studies** on pages 14-19 to familiarise yourself with the process. It may be helpful to work through this with a colleague or in a group.

The **ICE Rules of Professional Conduct** have been summarised for quick reference on pages 5-11 of this Toolkit.



# Case Studies

## The ideal?

# Wary of:

## Too much detail

- Tempting to think we want:
  - Realism
  - Facts
  - Data
  - Statistics
- My concerns
  - Comfortable
  - Distractions

## Just chat

- Radio phone in



# Alternatives

## What I want

- Learning outcomes
- Mistakes to highlight
- Non-obvious
  
- In short:  
Punch lines

## Compare with design in engineering

- May not be single, clear, right answer, but...
  - Important points to highlight
  - Mistakes to avoid
  - New perspectives

(Needn't be case studies)

# Examples

- Professionalism
  - Change perspective
- Codes of ethics
  - Non-obvious reasons why codes of ethics are important
- Mining case study
  - Non-obvious/contentious example of bribery

# Electric Car

## Empirical Engineering

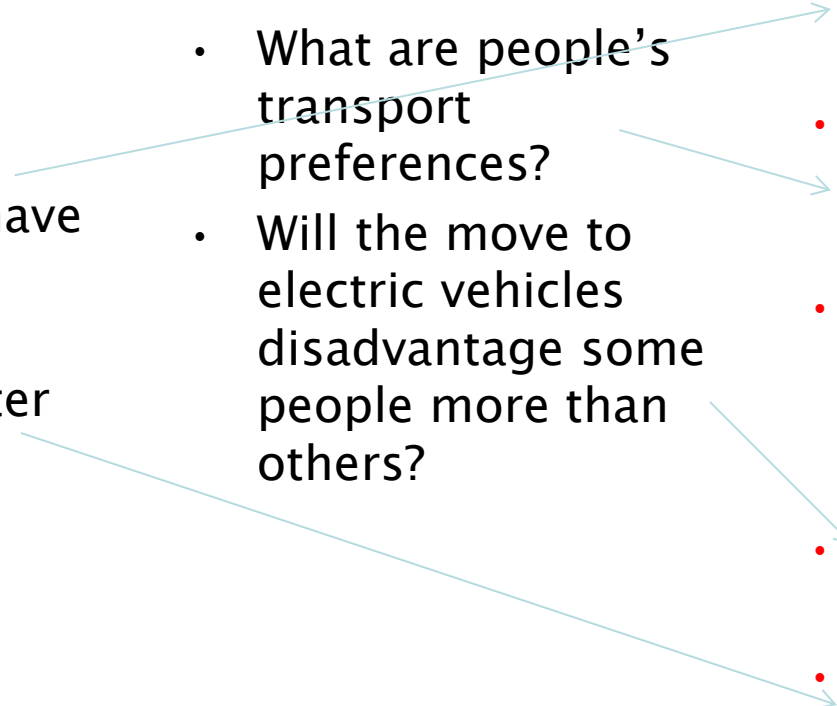
- Do electric cars have lower carbon emissions?
- What other impacts will electric cars have on the environment?
- Are there better alternatives?

## Empirical Non-engineering

- Will people buy electric cars?
- What are people's transport preferences?
- Will the move to electric vehicles disadvantage some people more than others?

## Non-empirical Non-engineering

- What should we care about, in the environment?
- To what extent do people's preferences matter?
- How do we distinguish between needs and desires?
- Would this be justified?
- What counts as better?



# Electric Car

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Deliberate mislabelling: the **punch line** is that an engineer needs to consider all three columns.

2<sup>nd</sup> punch line: the engineer isn't always the expert!

# Broaden perspectives: Engineering and Politics

- *Factor Five: Transforming the Global Economy through 80% Improvements in Resource Productivity*

Ernst von Weizsäcker, Karlson Hargroves, Michael H. Smith,  
Cheryl Desha, and Peter Stasinopoulos

- Technical solutions – but...

- “Many of the suggestions in this book are not politically feasible in a market that leaves almost no role for the state.”

# Challenges

# Not enough room in the curriculum

- Medicine:
  - Move away from knowledge based approach
  - Move towards skills and self-development



# Who Will Teach It?

- Staff from your university's philosophy department
  - But not used to teaching engineering students
- Dedicated staff
  - Becoming more common
- Existing engineering staff
  - May be beyond their area of competence

# Advantages Engineers Have

- Experience
- Knowledge of relevant cases and anecdotes
- Engineers can highlight ethical issues as and when they are relevant
- Know how to engage with engineering students

# Resources

- Textbooks
  - Martin and Schinzinger
- Journal papers
  - Michael Davis
- The Journal *Science and Engineering Ethics*

# New Resource

Also aiming to include teaching materials to go with it, probably including:

- Professionalism
- Codes of Ethics
- Mining case study (video)



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