Ethics and technology 2.0: Responsible innovation and value sensitive design

Ibo van de Poel, Philosophy

14-3-2015

Overview

- Ethics and technology 2.0
- Responsible innovation
- Value sensitive design

Traditional approaches

- Ethics of technology
  - Focus on the external effects of technology on society

- Engineering ethics
  - Focus on the internal ethical issue in engineering

Ethics of technology

- Focuses on external effects of technology, not on the practice of developing technology or on engineering

- Not only safety and health but also effects on:
  - Sustainability
  - Relation with nature
  - Human autonomy and freedom
  - Authenticity
  - Human dignity
  - World view

Ethics of technology

- Often a negative or at least critical evaluation of technology
- Ethics as a brake
  - Anti-technological or
  - Ban on certain technologies
- Reactive rather than proactive

Engineering ethics

- Focus on practice of engineering and norms and values embedded in this practice
  - Often a focus on engineering codes of conduct

- Focus on ‘internal’ ethical issues
  - Integrity
  - Honesty
  - Trustworthiness
  - Conflicts of interest
  - Whistle blowing

- Little attention for broader social impacts of technology on society
  - Safety and health are addressed
  - Recently also sustainability
  - Less so for e.g. justice, privacy, democracy, etc.

- Little attention for design and for proactive role ethics
  - Focus usually on preventing harm rather than doing good

Ethics and technology 2.0

New features:

- From reactive to proactive
  - Not after a technology has been developed but already in the early phases (cf. video google Maps)
- Constructive approach
  - Ethics not as a break but to guide the development of technology
- Not only prevent harm but do good
  - Better technologies that contribute to a better society

Responsible Innovation

What is responsible innovation?

Product

- That reflects deeply held public values

Procedural

- A process for developing technology that meets certain procedural values

Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).

(Von Schomburg 2011)

Responsible Innovation is an activity or process which may give rise to previously unknown designs pertaining either to the physical world (e.g., designs of buildings and infrastructure), the conceptual world (e.g., conceptual frameworks, mathematics, logic, theory, software), the institutional world (social and legal institutions, procedures, and organization) or combinations of these, which - when implemented - *"expand the set of relevant feasible options regarding solving a set of moral problems."*

(van den Hoven 2013)

Product values

- Human safety
- Human well-being
- Health
- Sustainability
- Privacy
- Human autonomy
- Justice
- Democracy
- Responsibility
- Inclusiviness
- Etc.

(Van den Hoven et al. forthcoming *Handbook of Ethics, Values and Technological Design*)

Procedural values

- Anticipation
- Reflexivity
- Deliberation
- Responsiviness

(Owen et al 2013. A framework for responsible inovation)

Also mentioned:

- Accountability
- Transparency
- Learning
- Inclusiviness
- Opennness

Examples of responsible innovation in policy

Some example of responsible innovation

- EU: Responsible Research and Innovation (RRI)
- National Nanotechnology Initiative (USA): Responsible development of technology
- Netherlands Organization for Scientific Research (NWO): responsible innovation
- Chemical industry: Responsible Care

European Union

The European Commission (EC) … wants to promote the responsible use of science and technology both within the European Union (EU) and worldwide. This goal involves striking a balance between ethical and socio-cultural diversity, both at the EU level and globally, while respecting internationally recognized fundamental values — and promoting their further development.

Figure 1.2: Basic Values from the EU Charter and the EU Treaty

Nanotechnology USA

Responsible development of nanotechnology can be characterized as the balancing of efforts to maximize the technology’s positive contributions and minimize its negative consequences.
Thus, responsible development involves an examination both of applications and of potential implications. It implies a commitment to develop and use technology to help meet the most pressing human and societal needs, while making every reasonable effort to anticipate and mitigate adverse implications or unintended consequences.

NWO: Responsible innovation

The concept of innovation pertains both to the introduction of new products, processes and services and to organisational and societal renewal. This programme description defines innovation primarily as the use of application of the results of science and technology. Responsible innovation concerns research, development and design, and takes societal values, interests, needs, rights and welfare into consideration.

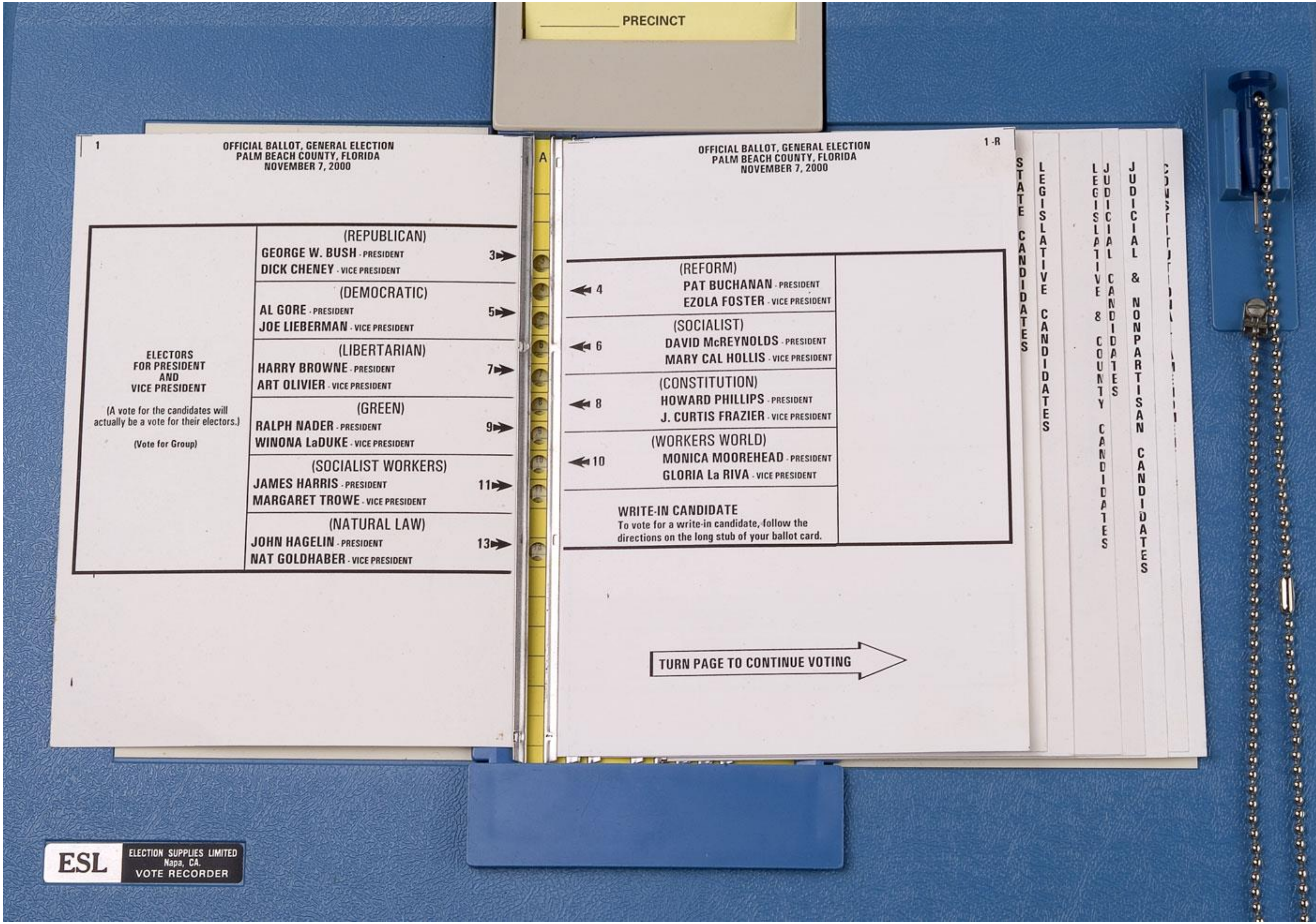
Responsible Care

Responsible Care® is the global chemical industry's unique initiative to improve health, environmental performance, enhance security, and to communicate with stakeholders about products and processes.

Responsible Care commits companies, national chemical industry associations and their partners to:

- Continuously improve the environmental, health, safety and security knowledge and performance of our technologies, processes and products over their life cycles so as to avoid harm to people and the environment.
- Use resources efficiently and minimise waste.
- Report openly on performance, achievements and shortcomings.
- Listen, engage and work with people to understand and address their concerns and expectations.
- Cooperate with governments and organisations in the development and implementation of effective regulations and standards, and to meet or go beyond them.
- Provide help and advice to foster the responsible management of chemicals by all those who manage and use them along the product chain.

Value Sensitive Design


PRECINCT
1
OFFICIAL BALLOT, GENERAL ELECTION
PALM BEACH COUNTY, FLORIDA
NOVEMBER 7, 2000
ELECTORS FOR PRESIDENT AND VICE PRESIDENT
(A vote for the candidates will actually be a vote for their electors.)
(Vote for Group)
(REPUBLICAN)
GEORGE W. BUSH - PRESIDENT
DICK CHENEY - VICE PRESIDENT
3
(DEMOCRATIC)
AL GORE - PRESIDENT
JOE LIEBERMAN - VICE PRESIDENT
5
(LIBERTARIAN)
HARRY BROWNE - PRESIDENT
ART OLIVIER - VICE PRESIDENT
7
(GREEN)
RALPH NADER - PRESIDENT
WINONA LaDUKE - VICE PRESIDENT
9
(SOCIALIST WORKERS)
JAMES HARRIS - PRESIDENT
MARGARET TROWE - VICE PRESIDENT
11
(NATURAL LAW)
JOHN HAGELIN - PRESIDENT
NAT GOLDHABER - VICE PRESIDENT
13
1-R
OFFICIAL BALLOT, GENERAL ELECTION
PALM BEACH COUNTY, FLORIDA
NOVEMBER 7, 2000
4
(REFORM)
PAT BUCHANAN - PRESIDENT
EZOLA FOSTER - VICE PRESIDENT
6
(SOCIALIST)
DAVID McREYNOLDS - PRESIDENT
MARY CAL HOLLIS - VICE PRESIDENT
8
(CONSTITUTION)
HOWARD PHILLIPS - PRESIDENT
J. CURTIS FRAZIER - VICE PRESIDENT
10
(WORKERS WORLD)
MONICA MOOREHEAD - PRESIDENT
GLORIA La RIVA - VICE PRESIDENT
WRITE-IN CANDIDATE
To vote for a write-in candidate, follow the directions on the long stub of your ballot card.
TURN PAGE TO CONTINUE VOTING
STATE CANDIDATES
LEGISLATIVE CANDIDATES
LEGISLATIVE & COUNTY CANDIDATES
JUDICIAL CANDIDATES
JUDICIAL & NONPARTISAN CANDIDATES
ESL
ELECTION SUPPLIES LIMITED
Napa, CA.
VOTE RECORDER

Voting computers the Netherlands

- Judge forbids current models in 2007
- Voting secrecy not guaranteed
- No possibility for independent control on counting

Low overpasses Long Island

Low overpasses Long Island

- Designed by urban planner Robert Moses (1888-1981)
- Deliberate low as to avoid buses to go to the beaches
- Black people usually travelled by bus
- “Racist overpasses”

Value Sensitive Design

- Systematic attempt to include values of ethical importance in design
- Approach developed by Batya Friedman and colleagues
- Developed for information and communication technology (ICT), but broader applicable
- http://www.vsdesign.org/index.shtml

Three types of investigations (Friedman et al.):

- Empirical
  - Stakeholders and their values
- Conceptual
  - Conceptualizations of relevant values
  - Trade-offs
- Technical/engineering
  - Embodiments of values
  - Value issues raised by technology

Three activities(Flanagan et al.)

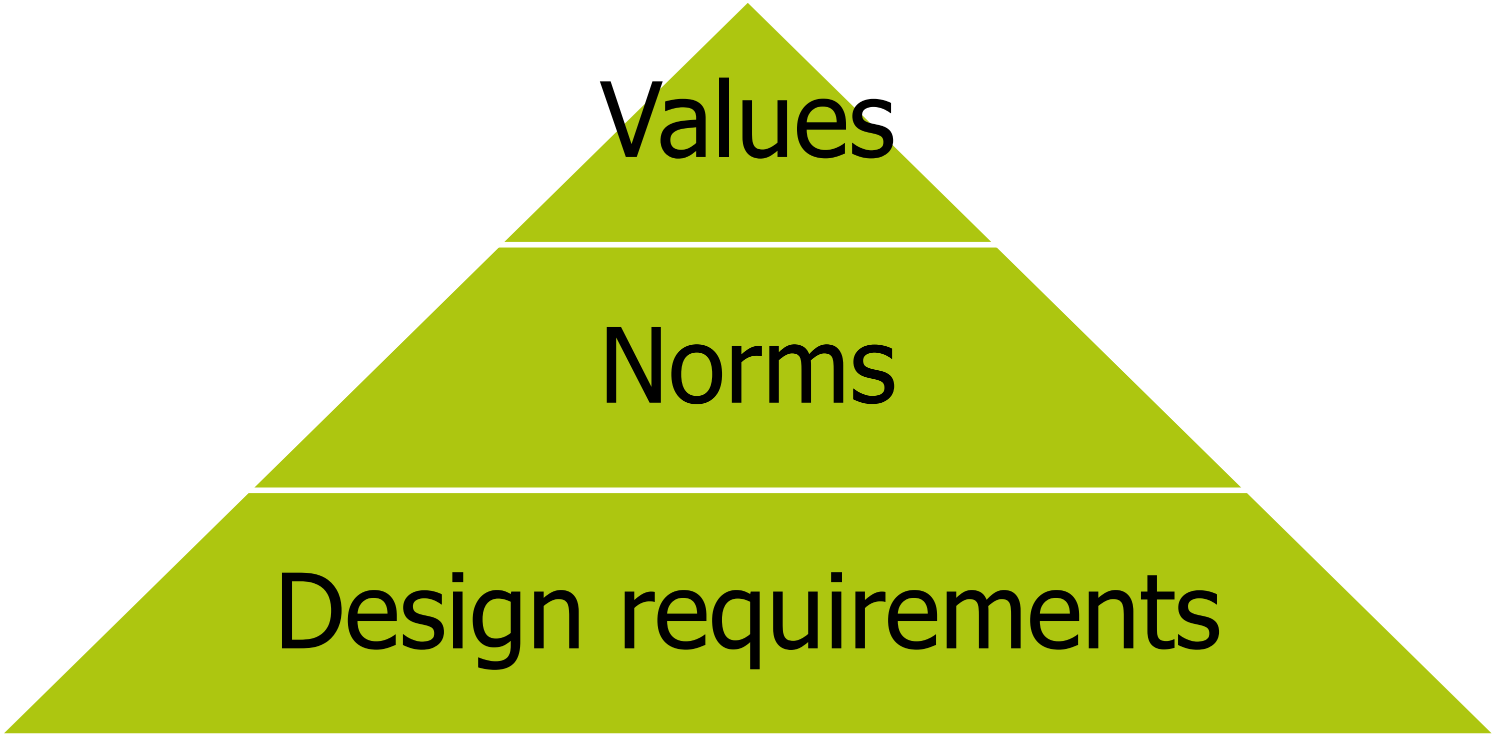
- *Discovery*. This activity will result in a list of values that are relevant for the design project.
- *Translation*. Translation is "the activity of embodying or expressing … values in system design" (Flanagan, Howe, and Nissenbaum 2008: 338).
- *Verification*. This is assessing, e.g. trough simulation, tests or user questionnaires, whether the design indeed has implemented the values that were aimed at.

VSD tools and methods

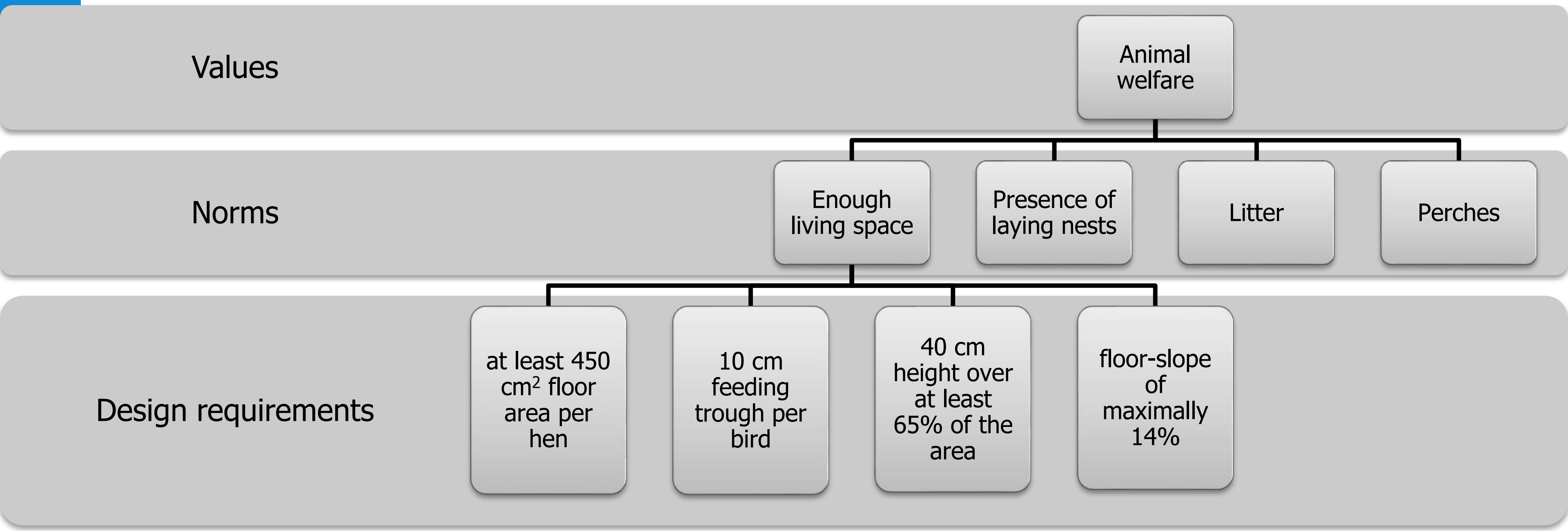
Some VSD tools and methods

- Direct and indirect stakeholders
  - Direct stakeholders: users
  - Indirect stakeholders: other affected parties
- Value scenarios
- Value dams and value flows
- Envisioning cards

Values hierarchy



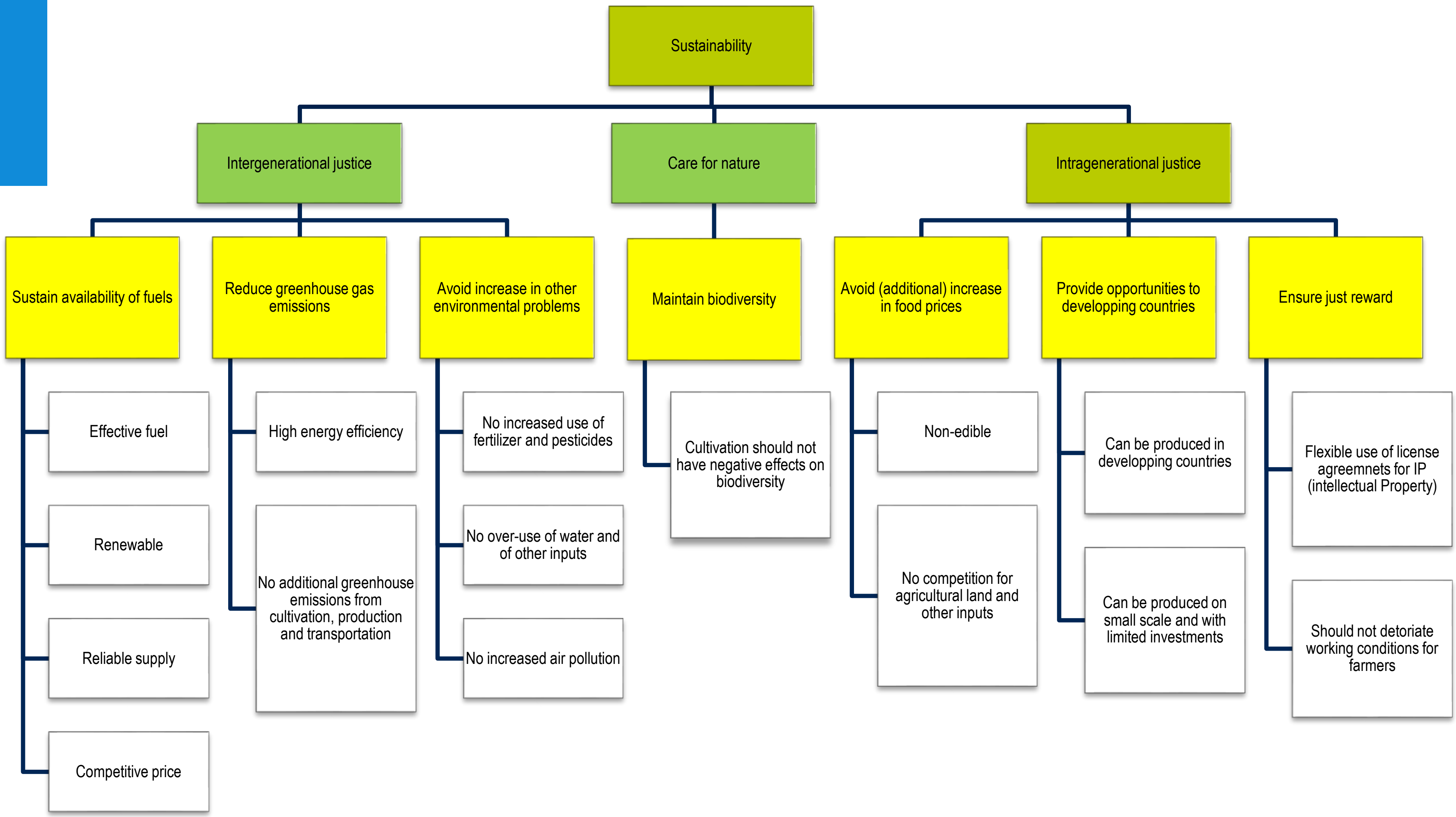
Example of values hierarchy

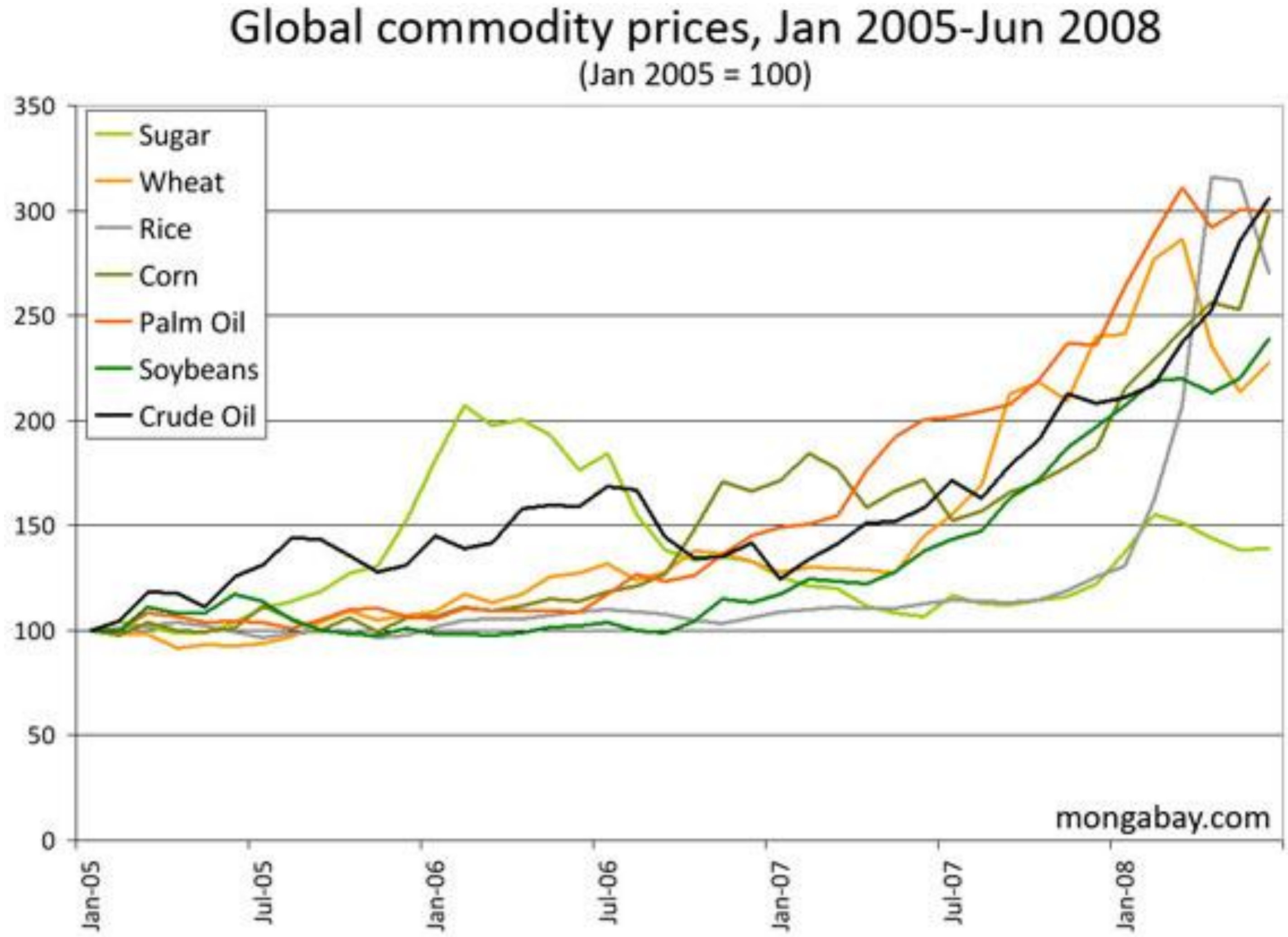


Constructing a values hierarchy

- Can be done top-down and bottom-up
- Usually combination and iterative process

- Top-down: specification
- Bottom-up: for the sake of


Sustainability
Intergenerational justice
Care for nature
Intragenerational justice
Sustain availability of fuels
Reduce greenhouse gas emissions
Avoid increase in other environmental problems
Maintain biodiversity
Avoid (additional) increase in food prices
Provide opportunities to developping countries
Ensure just reward
Effective fuel
Renewable
Reliable supply
Competitive price
High energy efficiency
No additional greenhouse emissions from cultivation, production and transportation
No increased use of fertilizer and pesticides
No over-use of water and of other inputs
No increased air pollution
Cultivation should not have negative effects on biodiversity
Non-edible
No competition for agricultural land and other inputs
Can be produced in developping countries
Can be produced on small scale and with limited investments
Flexible use of license agreemnets for IP (intellectual Property)
Should not detoriate working conditions for farmers


Global commodity prices, Jan 2005-Jun 2008
(Jan 2005 = 100)
Sugar
Wheat
Rice
Corn
Palm Oil
Soybeans
Crude Oil
350
300
250
200
150
100
50
0
Jan-05
Jul-05
Jan-06
Jul-06
Jan-07
Jul-07
Jan-08
mongabay.com

Value conflict

- There are at least two options for which at least two values are relevant as evaluation criteria.
- At least two different values evaluate at least two different options as best.
- The values do not trump each other.

CHART 7: FUEL SOURCES

Crop	Used to Produce	Greenhouse Gas Emissions* Kilograms of carbon dioxide created per mega joule of energy produced	Use of resources during growing, harvesting and refining of fuel				Percent of existing U.S. Crop land needed to produce enough fuel to meet half of U.S. Demand	Pros and Cons
			Water	Fertilizer	Pesticide	Energy		
Corn	Ethanol	81-85	high	high	high	high	157%-262%	Technology ready and relatively cheap, reduces food supply
Sugar cane	Ethanol	4-12	high	high	med	med	46-57	Technology ready, limited as to where will grow
Switch grass	Ethanol	-24	med-low	low	low	low	60-108	Won't compete with food crops, technology not ready
Wood residue	Ethanol, biodiesel	N/A	med	low	low	low	150-250	Uses timber waste and other debris, technology not fully ready
Soybeans	Biodiesel	49	high	low-med	med	med-low	180-240	Technology ready, reduces food supply
Rapeseed, canola	Biodiesel	37	high	med	med	med-low	30	Technology ready, reduces food supply
Algae	Biodiesel	-183	med	low	low	high	1-2	Potential for huge production levels, technology not ready

Source: Martha Groom, University of WA, Elizabeth Gray, The Nature Conservancy, Patricia Townsend, University of WA

Innovation

- First generation biofuels: (existing) food crops
- Second generation: non-edible but competition for land and some negative ecological effects
- Third generation: based on bacteria and algae (but still very expensive)

Summary

Moral dilemma

- Agent A ought to do d
- Agent A ought to do e
- Doing d and e is (practically) impossible

- A ought to choose option x in the light of value V
- A ought to choose option y in the light of value W
- Choosing option x and option y is (practically) impossible

Innovation may sometimes solve moral dilemmas

- https://www.youtube.com/watch?v=hOlEt_Acq4o

Ethics and technology 2.0

New features:

- From reactive to proactive
  - Not after a technology has been developed but already in the early phases (cf. video google Maps)
- Constructive approach
  - Ethics not as a break but to guide the development of technology
- Not only prevent harm but do good
  - Better technologies that contribute to a better society

Critical questions

- Can we always anticipate value impacts of a technology?
- Constructive may become uncritical
- Is there enough agreement on the good?