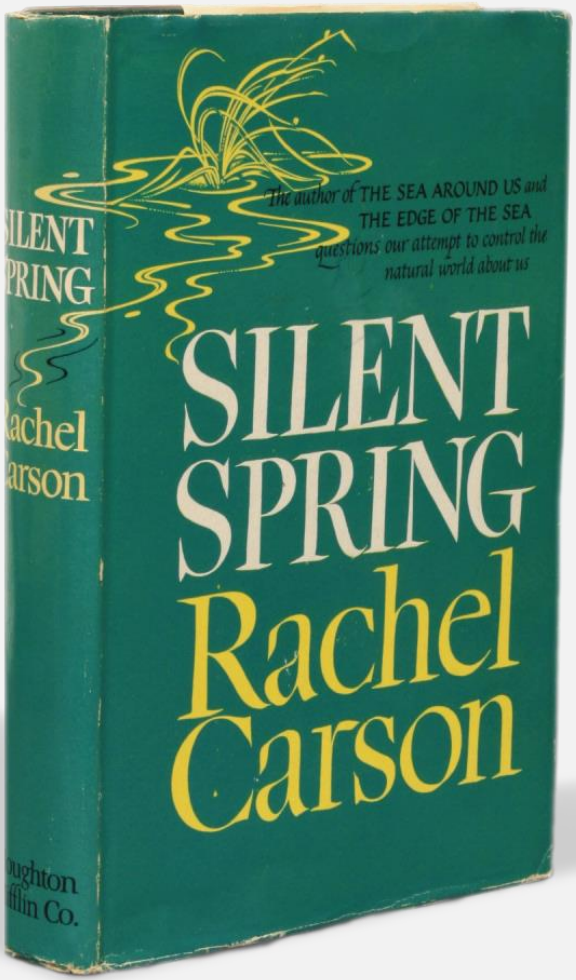
A Model for Technology Assessment

Technology Development & Impact Assessment (EPA 1132)

Wim Ravesteijn, TPM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THE EDGE OF THE SEA
questions our attempt to control the
natural world about us
SILENT
SPRING
Rachel
Carson

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Technology and Society: Systems and Regimes

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A step-by-step model for TA

Constructive Technology Assessment

FAT
LOSER
SKANK
STUPID
STUPID

Evolution
Choice
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Oxygen
Grow
Research
Excess
Government
Technology and Society
Funding
Universe
Artifacts
Organizations
Environment
Human
Media
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Enterprise
Military
Assumptions
Compact
Organise
Products
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Beneficent
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Specifically
Development
Science

Technology Assessment: What?

Technology Assessment is intended to provide a factual and normative input into the technology choice or decision-making process.

Technology Assessment is an attempt to establish an early warning system to detect, control, and direct technological changes and developments so as to maximize the public good while minimizing the public risk.

Development of Technology Assessment

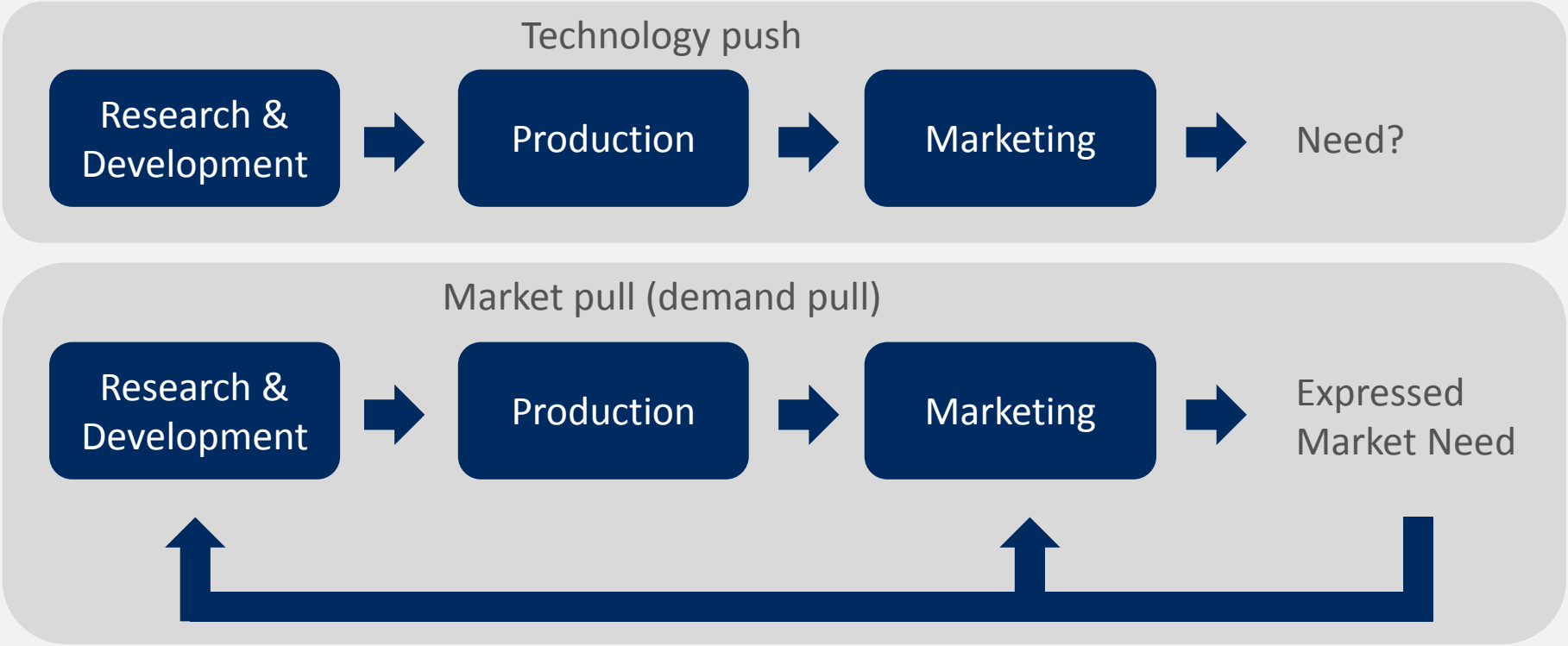
Early TA (1970s)

- Science is dominant
- TA-info is instrumental in a rational decision-making process
- High expectations
- Output TA = report
- Little attention for problem definition
- One TA organisation

Modern TA

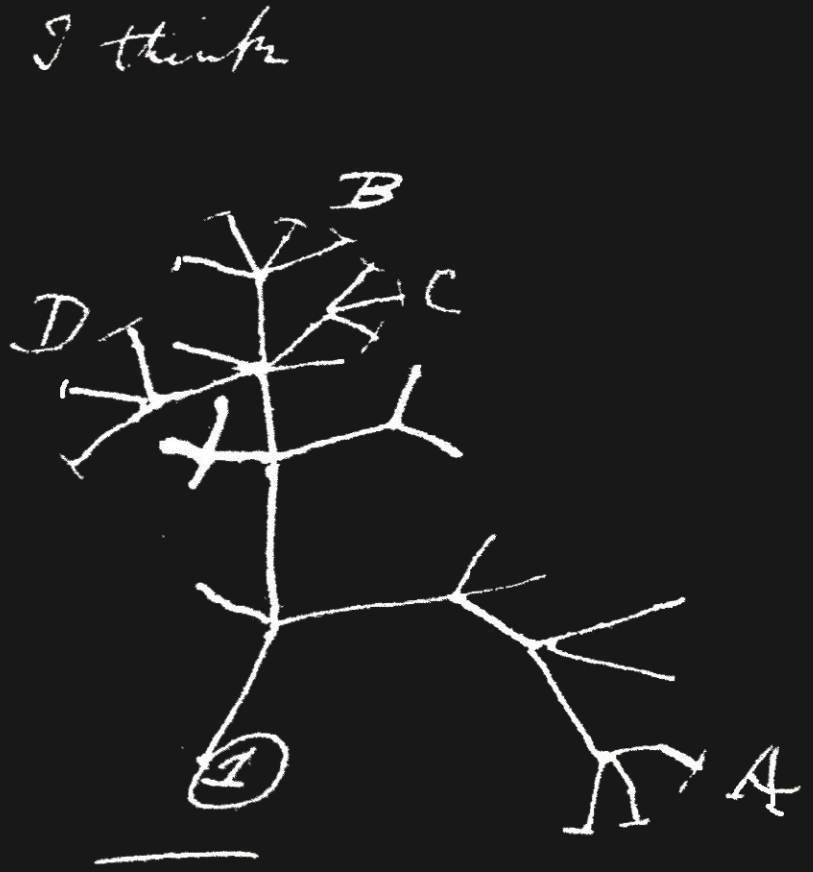
- Users are involved
- TA-info used by all actors in a conceptual way
- Modest expectations
- Output TA = report + debate
- Problem definition plays major role
- Several TA organisations

Technology push vs. Market pull



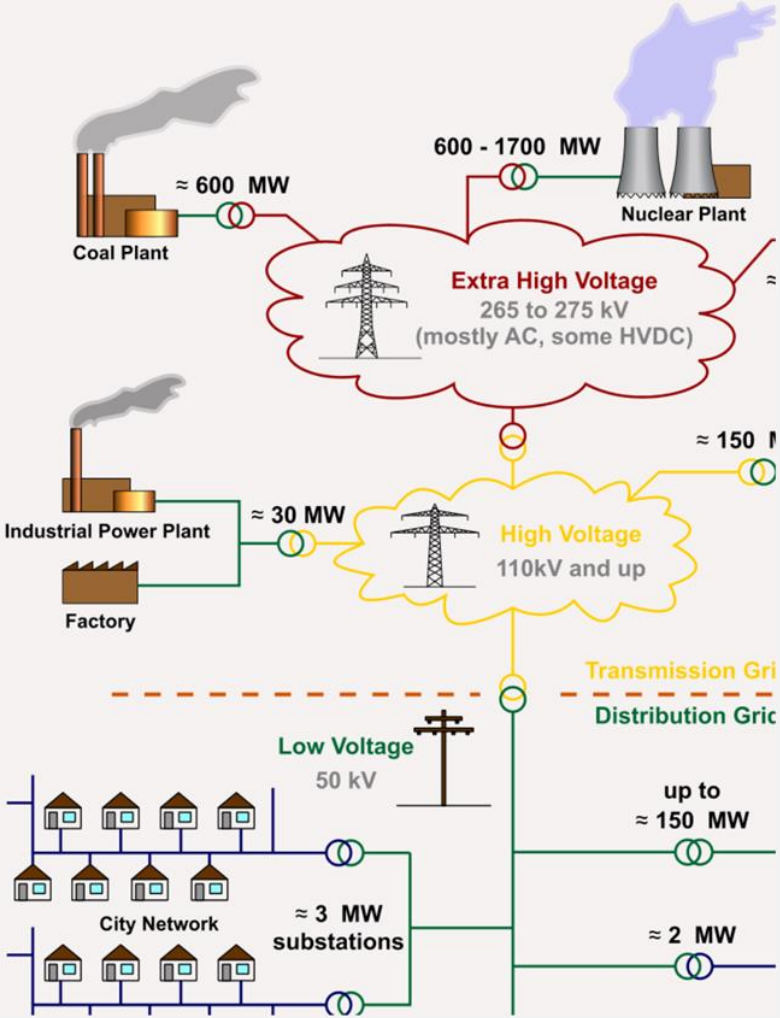
Evolution of Technology

Co-evolution & co-construction of technology & society



Socio-technical System

- Societal purpose
- E.g. electricity, transport and production systems
- Technologies and operators
- System in society


600 - 1700 MW
≈ 600 MW
Nuclear Plant
Coal Plant
Extra High Voltage
265 to 275 kV
(mostly AC, some HVDC)
≈ 150
Industrial Power Plant
≈ 30 MW
High Voltage
110kV and up
Factory
Transmission Gri
Distribution Gric
Low Voltage
50 kV
up to
≈ 150 MW
City Network
≈ 3 MW
substations
≈ 2 MW

Technological Regimes

- Rule-set for engineers
- E.g. Dry Feet vs Room for the Water
- Reflect societal rules

Ordering effects of technology

- First Order: planned, foreseen, desired, mostly positive
- Second Order: unplanned, (partly) unexpected, sometimes undesired
- Third Order: effects of effects

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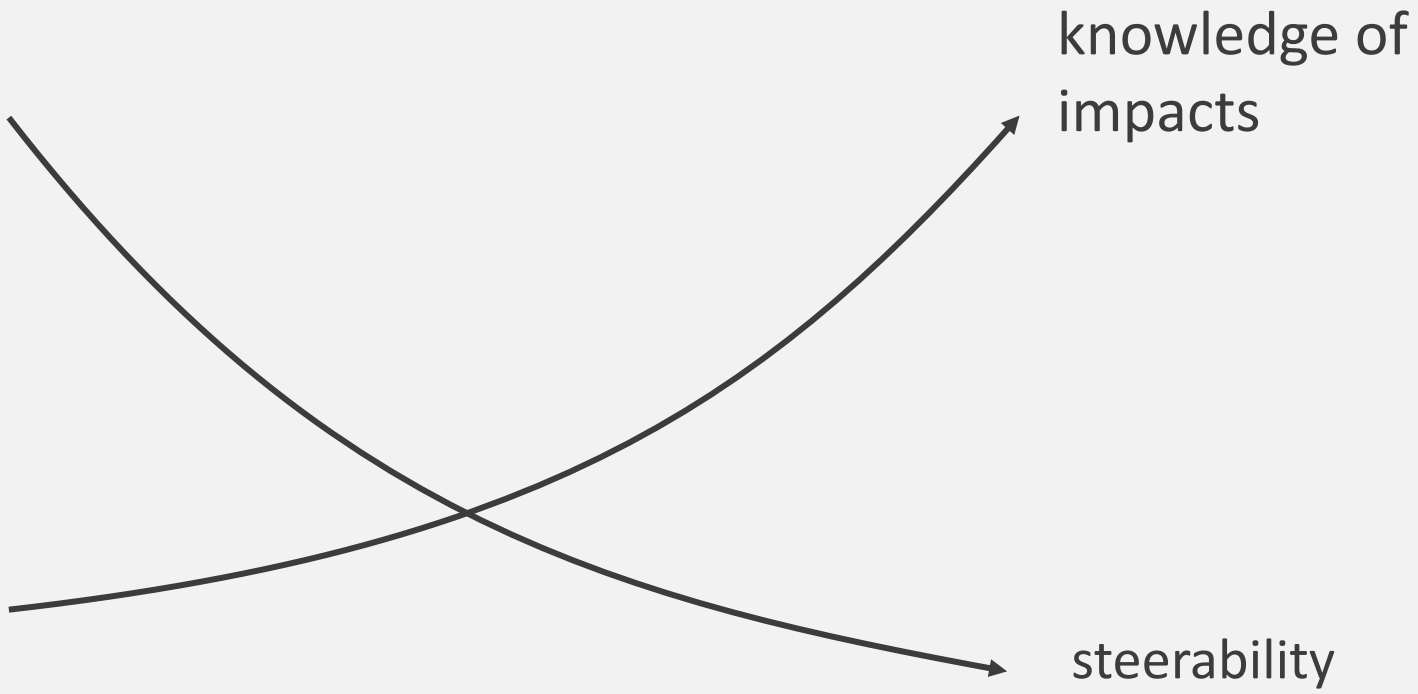
Definition of Technology Assessment

- systematic identification, analysis and evaluation
- potential secondary impacts
- social, economic and environmental systems and processes

Control Dilemma

….attempting to control a technology is difficult, and not rarely impossible, because during its early stages, when it can be controlled, not enough can be known about its harmful social consequences to warrant controlling its development; but by the time these consequences are apparent, control has become costly and slow (Collingridge 1980)

Example of leaded fuel



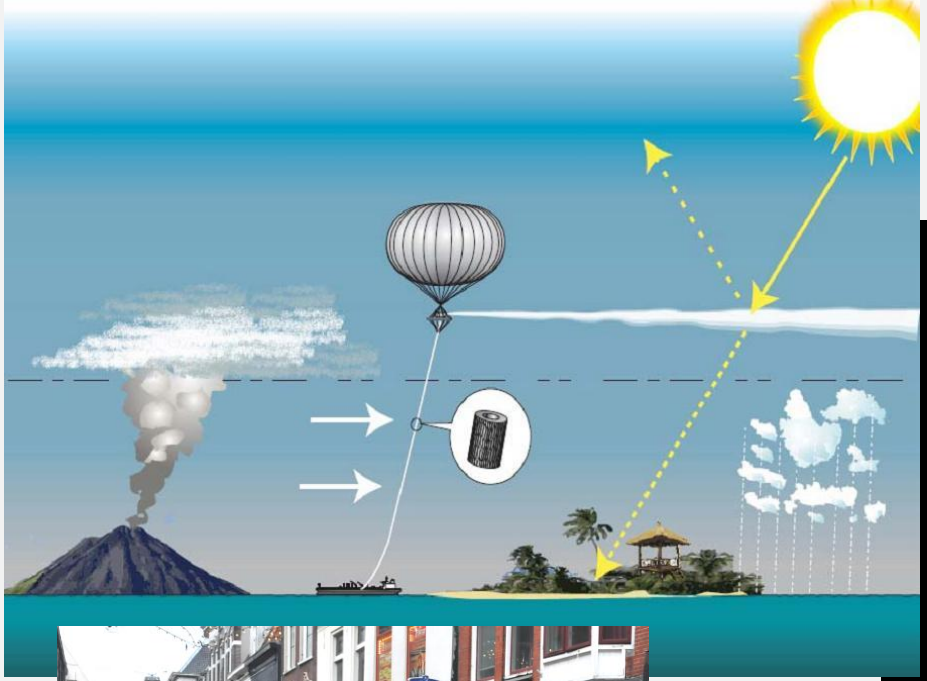
Model for Technology Assessment

1. Defining problem
2. Exploring / foresighting technological developments
3. Technology Impact Assessment
4. Normative judgment
5. Generating improvement options
6. Feedback

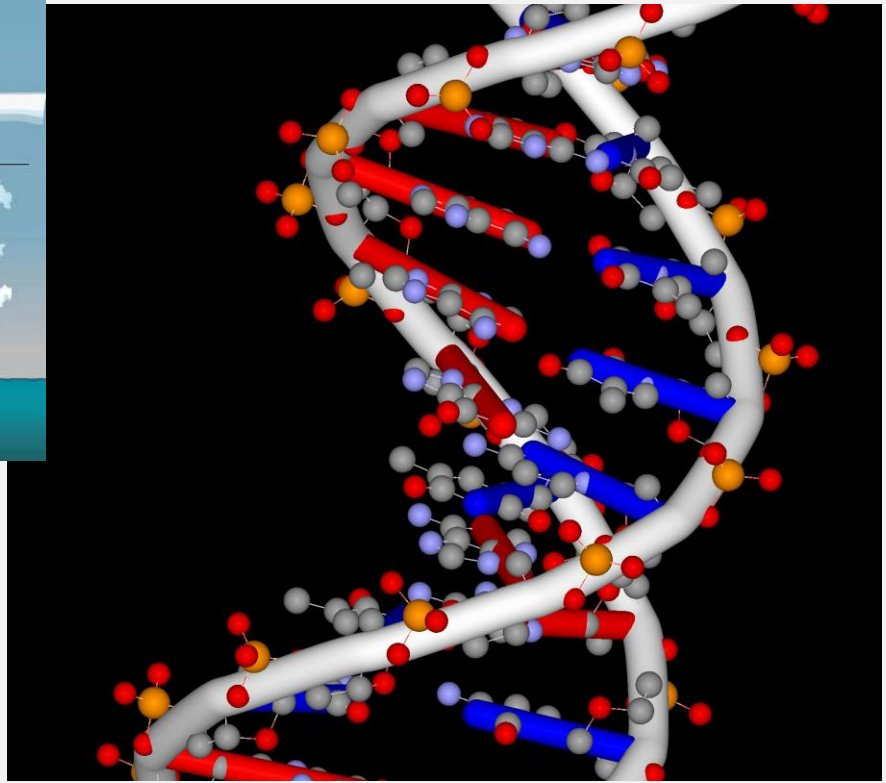
See: Smit & van Oost 1999

Constructive Technology Assessment

- Social needs
- Public debates
- Involving the public in R&D



Restaurant & Bar



Thank you for your attention!