



Image: European Space Agency

# Information and Communications Technology and Environmental Regulation: Critical Perspectives

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# Applications of ICT for Environmental Regulation

- Measurement and management
  - Remote sensing
  - Geographical Information Systems
  - Databases
- Information dissemination (internal and external)
- Behaviour change
- Public engagement and consultation
- Use by NGOs
- Energy and resource efficiency: smart grids, smart buildings, smart logistics



# Benefits of ICT for ER

- New modes of regulation –
  - ‘informational regulation’
  - regulation by disclosure
- Improved resource efficiency
- Increased effectiveness
- Faster, more targeted responses
- Better integration of science

# Disclosure as a Regulatory Tool

- ‘Reflexive’ regulation: public distribution of information as a driver for change
- History:
  - 1930s: financial regulation
  - 1960s/70s: environmental law, health and safety
  - Now: widely used



# Rationales for Disclosure

- Signal to stock markets
- Social impact ('naming and shaming')
- Benchmarking against peers
- Faster regulatory response
- Overcoming individual bounded rationality

# Difficulties with Disclosure

- Replicating the weaknesses of command-and-control
- Strategic reporting and gaming the system
- Accuracy of information
- Intractable individual habits
- Unpredictable results
- Difficulties in analysing cost/benefit
- Muddying the rule of law



# Improving Disclosure-Based Regimes

- Standardised methods and metrics
- Making behaviour change a norm
- Use as an element of *or* alternative to conventional regulation?

# Information in Environmental Regulation

- Often flawed and incomplete
- ICT expanding the scope and span of control?
  - Measurement often imprecise
  - Costs difficult to estimate
  - Methodologies rarely produce useful figures
- More information is not necessarily better



# Science in ER

- “Objective truth” or product of ideology?
- Operating in considerable uncertainty
  - “post-normal science”

# Models in the Policy-Making Process

- Fundamental to constructing policy context:
  - Catalyst for policy
  - Structure for regulatory decision-making
  - Mechanism for collaboration
- Often codified in software



# Difficulties with Models

- Scientific literacy of audience?
- Accuracy and currency of models?
- Data: Accurate? Verifiable? Consistent?
- Over-optimistic or over-simplistic use
- Models as proxy for real debate
- Risk of manipulation

# Interviews – Themes

- Change: new capabilities and processes, speed
- Human factors: Negative responses, skill requirements, errors, security problems
- Power: Public engagement, transparency, exclusion and the “digital divide”, open data, citizen science, loss of control
- Legal issues: Information governance, data protection, freedom of information, legislative constraints
- Data and information: important, not always accurate or digital, never too much



# E-government Perspectives – Limitations

- Focus on the citizens as consumer
- Interactions as quasi-commercial
- Sees government activity as single step decision-making
- Significant gap in research on “e-regulation”

# E-Regulation

- “The use of ICT by regulators and those who deal with them, such as regulated entities, NGOs and ordinary citizens, as an integral part of the process of measurement, assessment and feedback which is central to regulation.”
- Cannot simply re-use private sector experiences



# E-Regulation – Benefits

- Cheaper, more, quicker, better, new
- Improvements:
  - Better informed
  - More targeted
  - More iterative
  - More transparent and democratic

# Difficulties with E-Regulation

- ICT not neutral or deterministic
- Impact on existing imbalances of power?
- Disempowering external actors
- Brake on change:
  - Institutional
  - Organisational
  - Procedural



# Rule of Law

- Formal requirements:
  - Same laws apply to all, acts as a guide for choice
  - The State has legal authority for its actions
  - The State is held accountable for its actions
- Substantive elements: openness, stability, certainty, independence, access to justice, equality, fairness, lack of discretion, respect for human rights

# ICT and Legal Processes

- Legal processes neither simple nor linear
- Discretion exercised throughout
- Not easily modeled by logic or expert systems
- Risk of destructive feedback cycle
- ICT becomes embedded and entrenched infrastructure



# ICT and Power

- Power can be 'sovereign' or 'strategic'
- ICT as architecture of regulatory system
- Control passes from humans to software?
- ICT shifts power balances – perhaps more to the State?

# ICT and the Rule of Law

- Spread of ‘pervasive computing’, ‘ambient law’
  - Cameras at bring centres, fisheries monitoring, ...
- Large ICT systems are
  - closed to the public
  - constructed and maintained by experts
  - subject to bias, hidden values and guesswork
- Algorithmic regulation as the opposite of due process?



# “Get It Right First Time”

- Design principles:
  - Flexibility
  - Transparency
  - Awareness of rule of law
  - Respect for human rights
  - Open, re-usable data and source code
- For more, see <http://ict4er.org>