

When regulators mean business

Regulation in the shadow of environmental Armageddon

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1 Introduction

This is a short sequel to an article which, arguably in too provocative a tone, accused the fraternity of environmental lawyers of allowing environmental law to remain ineffectual at a time when human civilization is facing environmental catastrophe.¹ That earlier article was picked up by a group of legal philosophers in Amsterdam, which invited me to explore the relevance and implications of branding the current ecological situation a 'catastrophe'. Although I will undertake that exploration from the skewed perspective of a regulatory theorist, some fundamental moral questions will arise that should be of a more general interest.

As I wish to avoid waxing dogmatic on the notion of 'catastrophe' (usefully explored by Richard Posner),² *Webster's Dictionary's* definition probably provides as good a starting point as any other:

'a momentous tragic usually sudden event marked by effects ranging from extreme misfortune to utter overthrow or ruin.'

Quite irrespective of our precise definition, for the sake of the arguments that will unfold what matters is that the threshold I employ for a catastrophe is a high one; it refers to events or states of affair that threaten, in the terminology of Hans Jonas, 'real human life on earth' ('echten menschlichen Lebens auf Erden').³ My emphasis will be on the type of environmental catastrophe with which regulators are most concerned, i.e. those brought about by human acts. Acts of (bio)terrorism will not receive much attention here, although most of the reflections that follow will be of relevance to such intentional acts, too.

A further useful distinction that structures this article is between the kind of human activities that, although they do threaten human life on the globe, we

- 1 Han Somsen, 'Schuttingtaal in het Milieurecht?' in *Liber Amicorum Peter Tak*, red. Y. Buruma (Nijmegen: Wolf Legal Publishing, 2009).
- 2 Richard A. Posner, *Catastrophe* (Oxford: Oxford University Press, 2004).
- 3 Hans Jonas, *Das Prinzip Verantwortung, Versuch einer Ethik für die Technologische Zivilisation* (Frankfurt am Main: Suhrkamp, 2003). After a chat at the School's coffee machine, my colleague Dick Broeren came up with his own definition, which perfectly captures the kind of apocalyptic events we are talking about in our thought experiment: 'a thoroughly destructive and irreversible climatic upheaval of cataclysmic proportions that is as dramatic in effect as it is insidious in onset, as unrelenting as it is out of control, undercutting the very sustainability of life and ultimately obliterating all life forms on the planet.'

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have come to accept as 'normal', discussed in section 3 (air travel, car use, the use of dangerous chemicals, etc.), and emerging potentially apocalyptic new technologies such as biotechnology, nanotechnology, synthetic biology and geo-engineering that are the subject of section 4. The distinction between these two classes is productive, because they give rise to partly different types of regulatory challenges.

The remainder of this article revolves around a simple thought experiment in which consensus is assumed about an impending ecological catastrophe facing humankind. It further assumes that, as a likely consequence, averting environmental catastrophe becomes the single most important goal on the regulatory agenda. On the basis of these two assumptions, I will briefly explore how technology-conscious regulators could, or arguably should, respond to such a situation. In the process, I will pose some relatively open-ended questions that are designed to set in motion further debate.

Such a debate is timely and pertinent for a number of reasons. First, humankind is not all that far removed from environmental catastrophe. Countless scientific reports concerning climate change, loss of biodiversity, depletion of fish stocks, and the like, actually employ language that already is rather too apocalyptic for comfort.⁴ Increasing scientific certainty about the state of our environment puts regulators in a strong moral position to act, so that they can focus on regulatory effectiveness and increasingly rarely have to adopt precautionary measures, which necessarily enjoy much less authority than retributive or preventive acts to avoid proven environmental threats. Simultaneously, as scientific certainty increasingly exposes the bankruptcy of the *status quo*, rational regulators will give the benefit of the doubt to new technologies promising great ecological gains.

Second, although I will focus my arguments on what I fear is a realistic prospect of impending catastrophe ('environmental Armageddon'), cynical regulators may construe 'fake-catastrophes' in pursuit of the extraordinary powers that are triggered in what political philosophers might call 'states of emergency' or 'states of exception'. Examples of such cynical constructions could vary, and might include threats of international terrorism, the advance of Islam, the decline of family values, etc.

Third and finally, the regulatory techniques that will be discussed here are attractive for any public regulator that commands ever fewer resources to engage with ever more serious problems.

Before engaging in that debate, however, we very briefly need to consider the two single most important criteria on the basis of which regulators are held to account, as well as the way in which these inter-relate.

4 For the European environment, see the *2010 State of the Environment Report*, published on the internet at <www.eea.europa.eu/soer/synthesis/synthesis>.

2 The dual regulatory challenge of legitimacy and effectiveness

In general terms, regulators are faced with two distinct but interconnected challenges, one relating to the effectiveness of regulatory action, the other concerning its legitimacy. When we say, for example, that EU environmental regulation is effective, we imply that it preserves, protects and improves the quality of the environment, as these are the goals that the EU has set itself in that particular policy field.⁵

For the sake of our purposes, the challenge of legitimacy may be said simply to concern the question whether something represents ‘the right thing to do’, and pertains both to (a) the goal of environmental protection as such, as well as to (b) the ways in which that goal is pursued. Returning to our previous example of EU environmental law, legal scholars will answer the first limb of the legitimacy test with a reference to the Treaty on the Functioning of the European Union (TFEU), in particular to its preamble and Article 3(3).⁶ Moreover, Article 11 TFEU (known as the ‘principle of integration’) gives rise to a credible claim that environmental protection occupies a high position in the hierarchy of policy goals to be pursued by the EU.⁷

The TFEU affords detailed attention to the second limb of the legitimacy test, too. Some of these legitimacy requirements are tailored particularly to environmental regulation,⁸ but the vast majority of them take the form of institutional

5 This is relative to Art. 191 of the *Treaty on the Functioning of the European Union* (TFEU): 1. Union policy on the environment shall contribute to pursuit of the following objectives:

- preserving, protecting and improving the quality of the environment,
- protecting human health,
- prudent and rational utilisation of natural resources,
- promoting measures at international level to deal with regional or worldwide environmental problems, and in particular combating climate change.

6 Art. 3(3) TFEU provides: The Union shall establish an internal market. It shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance. (...)

7 Article 11 TFEU provides:

Environmental protection requirements must be integrated into the definition and implementation of the Union’s policies and activities, in particular with a view to promoting sustainable development.

8 In particular Art. 191 TFEU, which stipulates:

3. In preparing its policy on the environment, the Union shall take account of:

- available scientific and technical data,
- environmental conditions in the various regions of the Union,
- the potential benefits and costs of action or lack of action,
- the economic and social development of the Union as a whole and the balanced development of its regions.

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and procedural provisions that seek to bestow institutional and democratic legitimacy on the European regulatory process more generally.⁹

Colleagues in philosophy departments will mostly not be content to infer what amounts to 'the right thing to do' from a simple legal hierarchy, but will rightfully insist on a more fundamental philosophical position. There are of course numerous discourses that provide a moral basis for environmental regulation, which may be consequentialist, rights-based or deontological in character.¹⁰ Hans Jonas, in *Das Prinzip Verantwortung*, provides a relatively rare and early deontological response to the catastrophic developments to which modern technologies (*technologischen Zivilisation*) give rise.¹¹ Jonas explicitly acknowledges the shortcomings of prevailing (Kantian) ethics that focus exclusively on inter-human

- 9 See in particular Art. 192 TFEU, with ample cross-references to general provisions of EU law:
1. The European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee and the Committee of the Regions, shall decide what action is to be taken by the Union in order to achieve the objectives referred to in Article 191.
 2. By way of derogation from the decision-making procedure provided for in paragraph 1 and without prejudice to Article 114, the Council acting unanimously in accordance with a special legislative procedure and after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions, shall adopt:
 - (a) provisions primarily of a fiscal nature;
 - (b) measures affecting:
 - town and country planning,
 - quantitative management of water resources or affecting, directly or indirectly, the availability of those resources,
 - land use, with the exception of waste management;
 - (c) measures significantly affecting a Member State's choice between different energy sources and the general structure of its energy supply.

The Council, acting unanimously on a proposal from the Commission and after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions, may make the ordinary legislative procedure applicable to the matters referred to in the first subparagraph.
 3. General action programmes setting out priority objectives to be attained shall be adopted by the European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee and the Committee of the Regions.
- The measures necessary for the implementation of these programmes shall be adopted under the terms of paragraph 1 or 2, as the case may be.
4. Without prejudice to certain measures adopted by the Union, the Member States shall finance and implement the environment policy.
 5. Without prejudice to the principle that the polluter should pay, if a measure based on the provisions of paragraph 1 involves costs deemed disproportionate for the public authorities of a Member State, such measure shall lay down appropriate provisions in the form of:
 - temporary derogations, and/or
 - financial support from the Cohesion Fund set up pursuant to Article 177.
- 10 See the *Stanford Encyclopedia of Philosophy* for a short overview of environmental ethics. The Encyclopedia is available on the internet at <http://plato.stanford.edu/entries/ethics-environmental/>. Within the European policy arena consequentialism is rife, as environmental protection is justified mostly in terms of job creation, competitiveness and economic growth.
- 11 Jonas, *Das Prinzip Verantwortung*.

interaction, and thereby do not easily offer a basis for duties towards other animals, plants, and future generations. He formulated his version of the categorical imperative as follows:

‘Handle so, daß die Wirkungen deiner Handlung verträglich sind mit der Permanenz echten menschlichen Lebens auf Erden.

This is not to say that Jonas’ philosophy intended to prioritize the aim of human survival (*‘Leitziel der Überlebenssicherung der Menschheit’*) over any competing rights. However, from the premise that *‘echten menschlichen Lebens auf Erden’* is what ultimately matters most (including a human life in which rights are respected), he distilled an *‘in dubio pro malo’* rule. This is to say: given the difficulty of predicting the long term impacts of numerous new technologies, we must base our judgments about such technologies on a worst case scenario.

It would be mistaken to infer from this rule a general aversion against new technologies. Jonas was sufficiently pragmatic to concentrate his arguments on technologies that harbour risks of *‘fatalen Schadensgröße’*, and was prepared to weigh the benefits against the risks of introducing new technologies. In the context of our thought experiment, in which impending ecological catastrophe is presumed, the *‘in dubio pro malo’* rule therefore may actually serve to give the green light to risky technologies that represent the last hope to address what otherwise would develop into an environmental Armageddon. I will develop this line of thought further below in paragraph 4, when the focus will be on the future role of precaution.

As it is, (constitutional) guarantees serve to protect institutional and democratic legitimacy, and constrain regulators who, but for those guarantees, could pursue regulatory effectiveness as their sole goal. For instance, smart meters give rise to increased energy or water use efficiency, but may not pass muster relative to Article 8 of the European Convention on Human Rights (right to privacy).¹² Similar concerns hamper the introduction of pay-as-you-drive technologies, and a whole range of other effective regulatory responses to legitimate policy goals such as health and national security.

The idea that effectiveness trumps legitimacy undoubtedly stands to gain currency when humankind is facing impending ecological catastrophe. It is perhaps also to be expected that deontological or utilitarian environmental ethics will emerge that help clear the legitimacy hurdles that currently limit the options of environmental regulators. Indeed, in our thought experiment, the importance of impending environmental catastrophe in good part resides in the fact that such constitutional values are set aside, or at the very least are substantially eroded to do justice to new ecological realities, in the same way as the 9/11 attacks have

12 Colette Cuijpers and Bert-Jaap Koops, ‘Het wetsvoorstel “slimme meters”: een privacytoets op basis van art. 8 EVRM,’ <www.consumentenbond.nl/morello-bestanden/209547/onderzoek_UvT_slimme_energi1.pdf>.

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paved the way for national security measures that would have been unimaginable prior to that event. Put differently, environmental regulatory priorities will be shifting towards effectiveness, directly at the expense of legitimacy.

Having arrived at this point, we are ready to explore one particular regulatory modality which, with the advance of technological knowledge, will increasingly be resorted to by regulators that have elevated environmental protection as the single most important item on the regulatory agenda.

3 When regulators mean business: technologies as a regulatory instrument

Working in the growing shadow of impending environmental catastrophe, regulators will have to engage with the general public in an attempt to radically change behaviour. The most important sources of environmental decline have their roots in behaviour that regulatees have come to accept as normal; in such cases, regulatees are more than likely to resist regulatory intervention in their chosen way of life. Consequently, regulators will want to go about their business in such a way that non-compliance either invites automatic detection and punishment, or even is no option in the first place.

Regulators that are not hindered by procedural or institutional legitimacy requirements, or in any event are not hindered by them to the same extent, will increasingly turn under such circumstances towards *technologies* as a regulatory instrument ('techno-regulation' or 'code'), instead of or in conjunction with 'law', self-regulation, or 'market-mechanisms'.¹³ The defining feature and attraction of techno-regulation is the fact that it does not seek to engage with the moral or practical reason of regulatees, but simply *imposes* a norm that has been embedded in a technology (such as speed restrictions built into future wired cars, simple speed ramps, etc.).¹⁴ Lessig's understanding of code as law is by now a legal classic:

'In real space we recognize how laws regulate – through constitutions, statutes, and other legal codes. In cyberspace we must understand how code regulates – how software and hardware that make cyberspace what it is *regulate* cyberspace as it is. As William Mitchell (1995) puts it, this code is cyberspace's "law." *Code is law*.'¹⁵

In such instances, technology and environmental norm may come to coincide in such a way that (a) non-compliance is automatically detected or (b) is *prima facie* impossible. The first modality we may refer to as panopticon regulation, the second as preclusionary regulation.

13 On these four modalities of regulation see Lawrence Lessig, 'The New Chicago Law School,' *Journal of Legal Studies* 27 (2008) 2: 661–91.

14 Lawrence Lessig, *Code and Other Laws of Cyberspace* (New York: Basic Books, 1999).

15 *Ibid.*

In 'surveillance states' regulators employ panopticon surveillance technologies, i.e. technologies that are so sophisticated and effective that whenever an environmental offence is committed this will invariably be detected.¹⁶ Although panopticon surveillance generates widespread popular and academic unease, the problem with such an effective detection strategy is far from obvious, since in our thought experiment the survival of the human species is at stake. Indeed, in utilitarian moral communities, panopticon surveillance in fact appears an entirely appropriate response to impending ecological disaster, the more so given that previous regulation has utterly failed to make any meaningful impact on human behaviour.

Rights-based or deontological moral communities, however, may fear that panopticon surveillance gives rise to compliance for all the wrong reasons: mere fear of detection rather than respect for some kind of categorical imperative or utilitarian calculus. Yet, we may still respond that even in surveillance states, opportunities will remain for agents to do the right thing for the right reason. The private, in particular, represents a sphere of conduct that lies largely beyond the reach of State regulation. That unregulated zone, which continues to hold open opportunities to do the right things for the right reasons, would be compatible with different notions of moral community.

All in all, objections against panopticon regulatory strategies to avert ecological disaster appear rebuttable. Such rebuttals become more difficult when regulators adopt a preclusionary rather than a panopticon strategy. The essence of preclusionary techno-regulation again has been perfectly summarized by Lessig:

'Between [a]norm and the behaviour sought is a human being, mediating whether to conform or not. Lots of times, for lots of laws, the choice is not to conform. Regardless of what the law says, it is an individual who decides whether to conform.

Regulation in cyberspace is, or can be, different. If the regulator wants to induce a certain behaviour, she need not threaten or cajole, to inspire the change. She need only change the code – the software that defines the terms upon which the individual gains access to the system, or uses assets on the system. If she wants to limit trespass on a system, she need not rely simply on a law against trespass; she can implement a system of passwords (...)

Code is an efficient means of regulation. But its perfection makes it something different. *One obeys these laws as code not because one should; one obeys these laws as code because one can do nothing else. There is no choice about whether to yield to the demand for a password; one complies if one wants to enter*

16 The Panopticon is a prison building designed by the English philosopher and social theorist, Jeremy Bentham, in 1785 in such a way that a single observer could observe all prisoners, without the prisoners knowing for sure whether they are being watched. Bentham described the Panopticon as 'a new mode of obtaining power of mind over mind, in a quantity hitherto without example'. Bentham's *Panopticon Writings* are available on the internet at <<http://cartome.org/panopticon2.htm>>.

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the system. In the well implemented system, there is no civil disobedience. Law as code is a start to the perfect technology of justice.¹⁷

Instead of channelling behaviour, regulators in such cases effectively *direct* their regulatees, substituting any normative dimension of practical reason by a technological fix, in response to problems of which regulatees may remain entirely ignorant. Agents in such an environment are accordingly excluded from the discourse and debate of regulatory standard-setting, and such manifestations of techno-regulation therefore give rise to what has been branded an *Ersatz* moral community.¹⁸

Even if we are inclined to believe that for regulators to eliminate the possibility of doing wrong amounts to an unacceptable assault on the idea of moral community, we may still wish to distinguish between targeting potential *violators* (by ‘designing-out’ measures that preclude the possibility of deviance) or their *victims* (by ‘designing-in’ measures that protect agents against the harm otherwise caused by acts of deviance). To be sure, regulators might prefer technologies that remove the capacity or the will to deviate from the required norm (note my earlier example of wired cars). However, lacking this technological expertise, they might settle for immunising victims against violations (for example by genetically modifying seeds to avoid breaches of intellectual property).¹⁹ Whereas the end result in both cases is identical (in that no harm is done), there arguably remains a significant difference. Thus, when regulators design out non-compliance, agents may be entirely unaware that they are doing right rather than wrong, while agents, in the case of designing in, at least will be aware that they are consciously deviating. For moral communities, that difference matters a great deal.

Another relevant distinction may be made between techno-regulation that targets unintentional harmful behaviour (such as technologies that make it more difficult to miss signals to avoid train accidents), and regulation that targets intentional acts. As argued elsewhere:

‘Is it perverse and implausible to argue that technological interventions that are designed for safety should *not* be adopted because they will give, say, train drivers or pilots less opportunity intentionally to inflict injury on their passengers? Surely, it is. Unless train driving or aircraft flying is a unique opportunity for the cultivation of moral virtue, there seems little sense in putting the lives of passengers at risk simply so that pilots and train drivers have the

17 Lawrence Lessig, ‘The Zones of Cyberspace,’ *Stanford Law Review* 48 (1996): 1403, 1408 (emphasis added).

18 Roger Brownsword and Han Somsen, ‘Law, Innovation and Technology: Before We Fast Forward – A Forum For Debate,’ *Law Innovation & Technology* 1 (2009): 1–73, 64.

19 I am referring to so-called ‘terminator technologies’ here. This refers to genetic interventions at the cellular level to ensure that seeds become sterile after just one generation, thus preventing the age old farming practice of separating seeds after each harvest. Terminator technologies may be expected to be much more effective in protecting inventions that companies such as Monsanto can claim than any intellectual property system could ever hope to offer.

opportunity to do the right thing. If a community is short of such opportunities, there must be better places for their creation than on the railway tracks or in the skies.’²⁰

4 Massive promise at the price of massive risk: the future of apocalyptic technologies shrouded in scientific uncertainty

Potentially apocalyptic technologies such as biotechnology, nanotechnology and synthetic biology are currently being developed by scientists around the globe. Those new technologies are invariably promising enormous benefits, many of them environmental, but they always are accompanied by sizeable potential risks which, like the gains, remain highly uncertain. The dilemma for regulators, then, is to come to grips with:

‘the contribution technology can make to averting both natural and man-made catastrophes, including the man-made catastrophes that technology itself enables or exacerbates.’²¹

It is true that scientific uncertainty about both the risks and the benefits of new technological development confronts regulators with one of the most difficult challenges of modern times. However, as the contours of the environmental catastrophe towards which humankind is heading are becoming clear, and risks assessments therefore ever more systematically take into account the risks associated with upholding the *status quo*, this should result in a positive regulatory tilt in favour of potentially apocalyptic technologies.

This prediction pertains in particular to one class of technologies that has as its *sole and exclusive purpose* to avert environmental catastrophe, i.e. ‘geo-engineering’.²² In addition to mitigation and adaptation, geo-engineering may offer the possibility of alleviating the global warming aspect of climate change or even the possibility of addressing its cause by reducing the atmospheric concentration of greenhouse gases. In deciding whether and how to pursue these geo-engineering technologies, regulators will have to weigh potential benefits against potential risk. Such an exercise is complex at the best of times, but becomes well-nigh impossible if both potential benefits and potential risks remain uncertain as a result of scientific uncertainty or scientific ignorance.²³ It is precisely for those

20 Brownsword and Somsen, ‘Law, Innovation and Technology.’

21 Posner, *Catastrophe*, 15.

22 Geo-engineering includes a wide array of potential activities which vary significantly in their technical feasibility, cost, time scale of response, and potential environmental consequences. Proposals to remove CO₂ from the atmosphere constitute the first of the two main categories of geo-engineering. The second is to reduce global warming, perhaps the worst symptom of climate change, by increasing the reflectivity, or albedo, of the earth.

23 Scientific uncertainty denotes a situation in which possible outcomes are known, but the likelihood of those outcomes remains uncertain. In cases of scientific ignorance, both outcomes and likelihoods are uncertain.

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situations that the precautionary principle is meant to be of use. Numerous articulations of the precautionary principle are in simultaneous circulation, but Principle 15 of the Rio Declaration is generally deemed to offer an important and fairly representative example of its original meaning:

‘In order to protect the environment, the precautionary approach shall be widely used by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.’

In this formulation, the essence of the precautionary principle (in Principle 15 interestingly termed ‘precautionary *approach*’) resides in its *enabling* nature: it allows regulators to take preventive action to avoid threats of serious or irreversible damage in cases where they otherwise could not do so.

As observed above, it has often been implicit that precaution should apply to proposed change, but not to the *status quo*. However, the idea that maintaining the *status quo* is worthy of priority over conscious change, even if this involves uncertain risk, is wholly without foundation. All things being equal, if uncertainties about the risks of *not* consciously intervening in the earth’s climate disappear, the precautionary principle will eventually affect regulatory tilt in favour of geo-engineering, instead of working against it. Regulators will then rightfully argue that the fact that uncertainties remain about the potential risks of intervening in the climate is *not* a reason to delay action. There is plenty of historical evidence that this is indeed how policy makers act when faced with the possibility of catastrophe, including the Hiroshima bomb, which, even though it was thought to carry a small risk of a chain reaction that would be fatal to life on earth, was detonated to avert to near certainty of prolonged war and possibly even global totalitarian rule.

5 Conclusion

Social biologists such as E.O Wilson have emphasized that humans and other animals evolutionary are not coded to act in furtherance of the rights and interests of future generations.²⁴ Humans biologically simply are not predisposed to lose much sleep about trans-generational justice, far from it; in the shadow of environmental Armageddon, human beings will need to be disciplined to the extent even that they cannot *but* do the right thing.

This short article represents an attempt to paint the contours of a world in which this has become the prime concern of environmental regulators. It has suggested that, in such a world, technology will be the key regulatory device. Various technologies, but also preclusionary technologies drawn simultaneously from ICTs,

24 See in particular Edward O. Wilson’s *The Future of Life* (New York: Vintage, 2002).

neurosciences, artificial intelligence, biotechnology, nanotechnology and synthetic biology, become the regulatory instruments of the future.

It has become clear that such systematic recourse to environmental techno-regulation invites a range of fundamental legal and ethical questions. When such questions arise in the context of an impending catastrophe, as the example of the war on terrorism clearly suggests, fundamental principles that discipline environmental regulators and bestow legitimacy on their actions will prove 'fundamental' only up to a point.