# 11 *The power of norms; the norms of power: who governs international electrical and electronic technology?*

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## Introduction

"Who governs?" Robert Dahl (1961) asked in his classic pluralist study of New Haven politics. This volume takes his question to the international level, asking a series of related questions about the actors in "global governance." I apply Dahl's deceptively simple core question to the governance of terminology, measures, design, and performance characteristics of electrical and electronic phenomena and products. Electrical and electronic technology is governed internationally through the technical standards of the International Electrotechnical Commission (IEC). In this international nongovernmental organization, as elsewhere, governance involves the exercise of power and hence warrants political analysis.

There are many reasons – at least 5,425 of them, as of the end of 2008 – to concern oneself with IEC standards. Three brief examples will illustrate the point. When I take a picture with a digital camera, I can view the image on the camera's LCD screen or send the image to a printer, almost anywhere in the world. While resolution, clarity, and quality of display and printout might differ by manufacturer and

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model, the screen and the printer will both recognize and produce essentially the same colored image, *even though the LCD screen uses a mix of red, green, and blue light to produce each color whereas the printer uses cyan, magenta, yellow and black ink or dyes*. How is this possible? Second, when a patient needs x-ray images, s/he usually can trust that the x-ray machine will emit a sufficiently high dose of radiation to ensure that a usable x-ray image is taken without exposing him/her to exceptionally dangerous doses, *even though neither the patient nor the physician has measured the radiation emitted from the x-ray machine* (and in fact, neither may fully understand the technology). Why are we willing to have such trust? Third, as recently as ten to twenty years ago, many vacuum cleaners, hair dryers, and other motorized electrical appliances would interfere with the reception of nearby TVs or radios; some microwaves and cordless phone sets would interfere with each other, etc. Today, a manufacturer of these products can, usually truthfully, give a blanket assurance that such interference will not occur (or can be easily fixed by the consumer), *even though the product has probably not been tested for interference with the consumer's TVs, radios, phones, etc.* How is this possible?

The answer to all three questions is, at least in part, IEC standards. IEC 61966-series "color management" standards define colors so as to allow reliable communication of color data between a broad range of devices with very different ways of reproducing those colors (see IEC 2007a for more details).[1] These IEC standards ensure interoperability. IEC standard 60580, "Medical Electrical Equipment – Dose Area Product Meters" specifies where and how to measure the dosage emitted by radiological devices. Such measurement standards allow the manufacturers of these devices, if they implement IEC 60580, to provide technical data about their products, which can be meaningfully compared across competing products and against regulatory specifications of maximum permissible radiation levels based on the same standard.[2] Finally, IEC 61000-series standards for electromagnetic compatibility

[1] Parts of these standards originated in the strictly private "ICC" standards consortium, founded and operated for profit by Adobe, Agfa, Apple, Kodak, Fogra, Microsoft, Sun Microsystems, and Taligent, but 61966 is a series of IEC standards. For a discussion of different ways of setting technical standards, see Büthe and Mattli (2009).

[2] As this example illustrates, nongovernmental IEC technical standards are often used (explicitly or implicitly) by governments and regulatory agencies.

specify thresholds for electromagnetic disturbances that may be emitted by electronic and electrical products and the level of insulation/immunity a product must have from disturbances in its environment, so as to ensure noninterference even when they are operated in close proximity to each other – crucial for pacemakers, electronic components of brakes for cars and trucks, and laptop computers running essential applications.

These IEC norms get producers to design their products or operate their production processes differently than they otherwise would and they get consumers to blindly trust otherwise suspicion-evoking equipment. In other words, they have power (Dahl 1957). Yet, since all of the above sounds rather technical, some observers have concluded that international standardization is purely a science and engineering optimization problem. For Loya and Boli (1999), for instance, international technical standardization is evidence of the triumph of universalistic/global technical rationality over the use of political or economic power to "settle" conflicts of interest. There are, however, many reasons to doubt this harmonious image. Standards are prominent nontariff barriers to trade; where their harmonization opens markets, it benefits firms that are more competitive at the expense of less-competitive ones. Standards also affect the value of patents, which was the root cause of Thomas Edison's ruthless multi-year campaign to keep the United States from adopting alternating rather than direct current as the standard for household electricity (for example, McNichol 2006). And although IEC standards as such are merely prescriptive (that is, they are explicit norms in technical language), the increasing reliance of governments on these standards as the technical basis for regulatory measures means that IEC standards often are effectively mandatory rules for much of the global economy (ISO/IEC 2007, esp. 19ff.).[3]

In addition, whenever prior practice differs, standardization entails switching costs and thus distributional conflicts, as I have shown in previous work about ISO and IEC standardization, based on a survey among firms in five countries and five industries (Büthe and Mattli 2010a; Mattli and Büthe 2003; see also Krasner 1991). Despite these indications that standardization is often as intensely political as

[3] There is a close affinity here to the practice, analyzed by Danner and Voeten (this volume), of governments writing into later international treaties the definitions, rules, and procedures originally developed by expert judges.



it is technical, however, social science analyses of international standardization and standards-developing organizations are still few and far between. Most of the existing work focuses on the International Organization for Standardization (ISO) and specifically its 9000- and 14000-series process and management standards (Brunsson and Jacobsson 2000; Casper and Hancké 1999; Guler *et al.* 2002; Kollman and Prakash 2001; Prakash and Potoski 2006b and this volume). I focus here on the IEC, which has received hardly any attention in social science scholarship, even though it is one of the oldest institutions for transnational governance in the international political economy.

In the century since it was founded in 1906, the IEC has grown from nine to seventy-one member bodies (fifty-four electrotechnical bodies with active full membership, seventeen with associate membership; one per country) and affiliates in eighty-two countries (see the section on "Expanding depth, scope, and membership" and Table 11.2 for an overview of the evolution of IEC membership; see also IEC 2008b). The IEC has vastly expanded the scope of its activities from the international "standardization of the nomenclature and ratings of electrical apparatus and machinery" (1904 declaration calling for the establishment of the IEC) to setting international standards for measurement, compatibility, performance, design, engineering development, and safety of industrial and consumer products in "all electrotechnologies including electronics, magnetics and electromagnetics, electroacoustics, multimedia, telecommunication, and energy production and distribution, as well as associated general disciplines" (IEC Mission Statement, 2006). As a result, there are now 5,425 IEC standards, most of them developed anew or updated/revised within the past decade (IEC 2009).[4] Over the course of a century, the IEC has thus developed from informal meetings among representatives of often nascent domestic groups of electrotechnical experts into a firmly established international organization that plays an important and well-institutionalized part in governing the international political economy. For international standard-setting, the IEC is today in most electrotechnologies "the only game in town" – similar to the European Union (EU) for much of European-level regulatory governance (McNamara, this volume). How did this happen? Who defined the vastly expanded

[4] Figures are current as of December 31, 2008.

range of issues over which the IEC came to claim governance authority? What is the IEC and who really "governs" electrical, electronic, and related technologies through IEC standards?

To answer the first two questions, I trace the process of institutional change that has allowed the IEC to attain its contemporary prominence and broad scope of authority.[5] I find that the IEC has broadened its authority by supplementing its initial expertise-based authority with institutional and delegated authority, as well as by proving competent in those areas of electrotechnical standardization in which it was already involved (what Avant, Finnemore, and Sell, this volume, call "capacity-based" authority). Synergies among these authority sources, in turn, allowed the IEC to broaden the scope of issues for which it developed international standards. This evolution of IEC governance was driven or at least made possible by the structural changes emphasized by Avant, Finnemore, and Sell: globalization, technological change, even the end of the Cold War, and deregulation (or, more precisely, what I call "the privatization of regulation"). However, these structural factors must be embedded in an analysis of actors, with real agency and economic as well as political interests, to explain the institutional evolution of the IEC from 1906 to 2008.

In the final section, I analyze who actually exercises power within the IEC[6] (and beyond) in each stage of the governance sequence: agenda setting, rulemaking, implementation, monitoring, enforcement, and adjudication.[7] I argue and show that the cast of actors is diverse and varies greatly depending on the specific governance activity considered. Even at face value, Dahl's question of "who governs?" thus does not

[5] The IEC's own archive of historical documents is unfortunately very limited, consisting mostly of the minutes of meetings, though these minutes were often quite detailed until the 1970s. This scarcity of historical evidence is a common problem for research about "governors" that operate without a public mandate for record-keeping.

[6] As I discuss below, the IEC has organizational interests that make it useful at times to treat the institution as an actor in its own right (see also Büthe 2007; Hawkins *et al.* 2006). Yet, scholars of institutionalized nonstate actors in world politics should not replicate at the level of inter/transnational organizations the analytical sleight of hand for which many of us criticize state-centric theories of IR, namely the reification of structures as agents, such that the individuals and groups disappear who exercise power via the institutional structure.

[7] I treat implementation and enforcement as well as monitoring and adjudication as separate activities, respectively (and do not examine adjudication here; see Bradley and Kelley 2008; Hawkins *et al.* 2006; Abbott and Snidal 2009).



have a simple, context-independent answer. Moreover, I demonstrate that formal and informal institutions at the international and domestic levels largely shape who governs and what means they can use to do so. This finding has important implications for the study of global governance more broadly: even in transnational nongovernmental governance, where states as such play only a limited role, cross-national differences in *domestic* public and private institutions matter. Analyses of the ways in which institutions and "institutional complementarity" constrain and empower the diverse actors at the various stages of governance (Büthe and Mattli 2010a) therefore hold great promise for improving our understanding of global governance.