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Materials Sustainability Standards and Intellectual Property

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I. INTRODUCTION

As public awareness of the impact of buildings on human health, climate change, energy usage and environmental degradation has grown, so has public interest in environmentally-sustainable building. The U.S. Green Building Council (USGBC), which develops and administers the well-known Leadership in Energy and Environmental Design (LEED) rating system, has certified more than 5,000 "green" buildings since its inception in 2000.[2] The state of California has adopted a statewide green construction code,[3] and several other states have adopted, or are considering, versions of the International Code Council's International Green Construction Code (IGCC).[4] And in terms of procurement, the U.S. General Services Administration (GSA), Department of Housing and Urban Development and other federal agencies have adopted aggressive policies to make their

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[2] U.S. Green Bldg. Council, The LEED Green Building Program at a Glance (available at http://www.usgbc.org/DisplayPage.aspx?CMSPageID=97&#presskit).

[3] Cal. Code of Regs., Tit. 24, § 11 (2010).

[4] Intl. Green Construction Code, http://www.iccsafe.org/cs/IGCC/Pages/default.aspx.

construction and building projects environmentally sustainable,[5] and numerous municipalities and counties have followed suit.[6]

Though less frequently discussed, one of the most significant factors affecting overall building sustainability is the sustainability of the materials used in construction. This recognition has led to the emergence of a broad range of advanced new building materials, many of which are claimed to address issues of sustainability either in their composition or the processes by which they are manufactured. The emergence of these new materials, as well as heightened public sensitivity to sustainability issues, have given rise to a burgeoning field of standards and certifications that purport to assess, measure and rate the sustainability of building materials ranging from structural elements such as masonry, drywall and flooring to interior design features such as carpeting, paint and furniture.

As part of an ongoing research program to study and evaluate such materials sustainability standards (MSS), we conducted an in-depth study of nine selected MSS with to the goal of identifying intellectual property issues associated with each. These nine MSS and a summary of our observations concerning the intellectual property issues implicated by each is contained in Part IV. As described in greater detail below, we found that the practices of manufacturers and standards development and certifying organizations in this field typically address copyright, trademark, and trade secret issues explicitly, but there is also a risk that patent issues will arise in the future.

II. THE MATERIALS SUSTAINABILITY STANDARDS (MSS) LANDSCAPE

Over the past decade the number and variety of MSS has grown rapidly, and today both consumers and commercial purchasers of building materials must contend with a daunting array of certifications, ecolabels and standards that pertain to the sustainability of

[5] U.S. General Svcs. Admin., *GSA Moves to LEED Gold for All New Federal Buildings and Major Renovations*, Oct. 28, 2010 (available at http://www.gsa.gov/portal/content/197325), U.S. Dept. Housing & Urban Devel., Enhancing Energy Efficiency and Green Building Design in Section 202 and Section 811 Programs 34-36 (2011).

[6] *See, e.g.,* Timothy Simcoe & Michael W. Toffel, *Public Procurement and the Private Supply of "Green" Buildings*, Harvard Business School Technology & Operations Mgt. Unit Working Paper No. 13-030 (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2142085) (describing and offering an explanation for the rapid adoption of LEED standards in different municipalities).

such materials.[7] In this Section, we briefly summarize the types of MSS and the processes and players involved in their development.

A. Types of Standards

With regard to MSS, it is critical to distinguish between standards, certifications, and ecolabels, though the three are closely related. As we use these terms, a *standard* sets forth the criteria by which a product is measured. A *certification* is a representation that a specific product meets a particular standard. The fact that a product has been certified as compliant with a standard is often signified by a visible *ecolabel* that is displayed on the product or its packaging.

MSS vary in the number of attributes that are considered, the number of product sectors to which the standard applies, the method by which the standard is scored, and whether single or multiple levels of certification are available. Some MSS focus narrowly on a single attribute of sustainability. For example, the GREENGUARD Indoor Air Quality certification, which has been awarded to more than 200,000 products, focuses exclusively on whether a product satisfies certain chemical emissions criteria. Because a single attribute may not be an accurate measure of the overall sustainability of a given building material, the nine MSS we examined were all multi-attribute standards.

A MSS may also focus on a particular product category or sector. For example, the NSF 140 standard addresses commercial carpet products, and the Nordic Swan Ecolabelling 031 standard applies to products within the furniture sector. Other MSS are broader and cover multiple industry sectors. We examined two such multi-sector standards, Cradle 2 Cradle (C2C) and SMaRT, both of which can apply to the manufacture of any type of building material.

MSS also vary based on the method by which a product is determined to conform to a given standard. Under the "prerequisite" method, a standard sets forth minimum criteria in each of several categories (e.g., water usage, recycled content, hazardous emissions, etc.). If a product meets each and every one of these criteria, it can be certified as compliant with the standard. The prerequisite method offers a degree of transparency,

[7] *See, generally*, TRACI ROSE RIDER, UNDERSTANDING GREEN BUILDING GUIDELINES (2009), and BUILDINGGREEN, GREEN BUILDING PRODUCT CERTIFICATIONS – GETTING WHAT YOU NEED (2011).

in that the criteria required to be met to comply with the standard are generally known, though the amount by which any given product has surpassed each of the minimum levels is generally not disclosed to the public. In contrast, the "credit" method allocates a certain number of points to a product for meeting various criteria set out in the standard. A product that scores a given number of points is deemed to comply with the standard. This method offers the manufacturer flexibility to choose the areas in which it wishes to focus its energies and does not require minimum levels of any given attribute. However, the credit method has been criticized because it generally eliminates the inherent transparency that exists in prerequisite-based standards and allows products to be certified when they may have poor performance in sustainability categories that might be important to certain users. Some standards, such as the NSF 336 standard for commercial textiles, blend these two methods by setting prerequisites that all products must meet, and then requiring manufacturers to earn a certain number of additional credits to achieve certification. This hybrid method permits the manufacturer some flexibility in choosing how to receive certification while ensuring that all products meet certain minimum standards.

Some standards offer multiple levels or "tiers" of certification (e.g., silver, gold, platinum). As one would expect, the requirements for achieving higher tiers are more demanding than those for achieving lower tiers. For example, the C2C standard offers four levels of certification based on increasingly stringent prerequisites. Other standards, such as the NSF 336 standard for commercial textiles, certify products at higher levels as they accumulate a greater number of credits.

B. Standards Development Processes and Players

While some MSS have been promulgated by governmental agencies in the U.S. and Europe, the majority have been developed by private sector actors.[8] The principal private sector participants in MSS development include manufacturers of building materials (either individually or acting through trade associations), designers and architects who

[8] In the U.S., governmental agencies typically develop or mandate standards that affect public health and safety or prevent environmental degradation. *See* Jorge L. Contreras, *Standards and Related Intellectual Property Issues for Climate Change Technology*, Washington University in St. Louis Legal Studies Research Paper No. 11-02-05, at 3-5 (2012) (http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1756283). While MSS impact both public health and the environment, they have not, by and large, been the subject of agency regulation in the U.S.

procure and specify projects using these materials, and consultants who advise both manufacturers and designers with respect to MSS and building sustainability more generally.

Actual standards development typically occurs in formalized standards development organizations (SDOs). Many SDOs in the MSS field are non-profit trade associations, such as the Business and Institutional Furniture Manufacturer's Association (BIFMA) and the Carpet and Rug Institute (CRI). Other SDOs are groups with general expertise in standards development, such as NSF International (NSF), Underwriters Laboratories (UL) and ASTM International, that have chosen to enter the rapidly-growing MSS sector. In some cases, a trade association with expertise in a particular industry has partnered with an established SDO to create a standard for that industry. For example, CRI partnered with NSF to develop the NSF 140 Sustainability Assessment for Carpet. In the somewhat unusual case of C2C, the standard was developed by a for-profit consultancy, McDonough Braungart Design Chemistry LLC (MBDC). Subsequently, MBDC transferred certification authority for the standard to a non-profit entity, Cradle to Cradle Products Innovation Institute (CCPII), allowing MBDC to continue to offer paid consulting services to product manufacturers while distancing itself from the certification of those products to the standard.

In addition, particularly outside the U.S., some MSS SDOs have significant governmental oversight are themselves governmental bodies. These include the European Union Ecolabelling Board (EUEB), which chooses independent organizations to lead specific standards development efforts, and Nordic Ecolabelling, a body formed by the Nordic Council of Ministers comprising official representatives from the five Nordic countries.

SDOs create standards through a variety of models offering greater and lesser degrees of openness and public participation. Typically, an SDO will convene a group of interested and knowledgeable individuals to develop a given standard. For instance, the NSF 140 standard was developed by the NSF Joint Committee on Sustainable Carpet, which included experts from state government, the federal Environmental Protection Agency, non-governmental organizations, manufacturers, and consumer advocacy groups. Sometimes, however, standards development is conducted in private, as was the case in the

first two versions of the C2C standard, which, as noted above, was developed by a private, for-profit company. Some standards that originated through a private development process are later released for public comment and are subject to further changes based on public input.

Once a standard is developed by the relevant SDO committee, it must be approved and issued by the SDO. This process may involve various ballots, both at the committee level and the level of the SDO's governing body, and may also allow for public commentary. If a proposed standard does not receive the requisite number of votes for approval, it may be sent back to the committee for revision. This process sometimes takes months or years to complete. For example, Underwriters Laboratories' Standard for Sustainability for Gypsum Boards and Panels (UL 0100) took nearly two years to advance from an interim standard to an approved standard.

Many SDOs, such as the Institute for Market Transformation to Sustainability (MTS), NSF, and UnUL, are accredited by ANSI as developers of "American National Standards" (ANS). ANSI accreditation signifies that an SDO meets ANSI's criteria for standards development, which include openness and other due process requirements.[9] ANSI accreditation is viewed as important for lending credibility to SDOs. Moreover, standards developed by ANSI-accredited SDOs may be submitted to ANSI for publication as ANS.[10] An ANS designation gives added credibility to the standard, and also ensures that the standard will made available through the ANSI web site. There is also a widely-held belief in the industry that being the first to "stake out" a particular area of standardization through the ANSI Project Initiation Notification System (PINS)[11] can give the first mover a significant

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[9] AM. NAT'L STANDARDS INST., ANSI ESSENTIAL REQUIREMENTS: DUE PROCESS REQUIREMENTS FOR AMERICAN NATIONAL STANDARDS (2012), *available at* http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/American%20National%20Standards/Procedures,%20Guides,%20and%20Forms/2012%20ANSI%20Essential%20Requirements%20and%20other%20Updated%20Procedures/2012_ANSI_Essential_Requirements.pdf. (hereinafter ANSI Essential Requirements 2012).

[10] A standard that is approved by ANSI as an ANS is generally identified by the original SDO's name and reference number, together with an "ANSI" designation. Thus, NSF's "NSF 140" standard for carpet sustainability, which has been approved as an ANS, is formally designated as NSF/ANSI-140. However, for purposes of simplicity, we refer throughout the text of this paper to standards by their commonly-used SDO designations, without the ANSI designation. The full identifier for each standard is included in Table 1.

[11] *See* Am. Natl. Standards Inst., ANSI PINS Process: An Informative Summary (EsSC 7025) (http://publicaa.ansi.org/sites/apdl/Documents/Standards%20Activities/American%20National%20Standa

advantage over other SDOs. This belief is supported, in part, by ANSI's requirement that accredited SDOs must use good faith efforts to "resolve potential conflicts and to coordinate standardization activities intended to result in harmonized American National Standards."[12] Thus, if an SDO indicates its interest in standardizing a particular product attribute (e.g., sustainability of thermal insulation) and obtains the associated PIN from ANSI (a procedure that involves some cost to the SDO), other SDOs wishing to develop an ANS in the area will be required to "coordinate" their efforts with the first mover and may thus be dissuaded (both by the first SDO and by other ANSI participants) from attempting to duplicate its efforts.[13]

C. Product Certification

Once a standard has been developed and is issued by the relevant SDO, it becomes possible to certify that particular products conform to the standard. Certification requirements may be specified by the SDO responsible for the standard, or may be developed by the parties conducting certification testing.

Depending on the standard, different types of certification processes may be employed. *First-party certification*, or *self-certification*, occurs when a product manufacturer declares that its own products meet the requirements of a standard. There is an inherent conflict of interest in self-certification, but it also has the virtue of being relatively inexpensive and quick to achieve. *Second-party certification* occurs when an SDO certifies that a product meets the requirements of its own standard. While viewed as more reliable than first party certification, second party certification remains somewhat suspect due to the SDO's inherent interest in increasing the number of products certified to its standard. *Third-party certification* occurs when an outside certification organization certifies that a product meets the requirements of a standard. Because the certifier is independent of both the SDO and the manufacturer, third-party certification is generally seen as the most objective form of certification in this field, though even independent certification groups may be susceptible to market pressure to certify as many products as

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rds/ANSI%20Accredited%20Standards%20Developers/ANS%20Guidance%20Documents/PINS%20Informational%20Summary%20101309.pdf).

[12] ANSI PINS Process, *supra* note 11, at § 2.4.2.

[13] The authors thank Hannah Rae Roth for her insights and research in this area.

possible. Some SDOs, as in the case of the BIFMA E3 standard for sustainable furniture, only permit certification by organizations authorized by the SDO, giving the SDO a measure of control over the market for certification of its standards.

In order to signify that a product has met the requirements of a particular MSS, manufacturers are often permitted to place one or more logos or "ecolabels" on the product or its packaging and advertising. Ordinarily, a single ecolabel is associated with a given standard. The NSF 140 standard for carpet is an exception; each of the three authorized certification organizations (NSF, UL and Scientific Certification Systems) may grant manufacturers the right to use a different ecolabel to certify compliance with the standard. Moreover, while a product that has been certified by an approved method is usually entitled to use the associated ecolabel, the NSF 140 standard is once again an exception. Although NSF permits first-party (manufacturer) certification, self-certifiers are not permitted to use to the NSF ecolabel.[14]

D. Competition in the Market for MSS

As the above discussion suggests, there is vigorous competition in the "market" for MSS. This competition stems from several sources. First, as discussed above, public demand for buildings certified by LEED and other groups has led to an increased demand for building materials that can support claims of sustainability.[15] As a result, manufacturers of building materials require ostensibly objective designations to signal to the market that their products meet certain criteria of sustainability.[16] To the extent that manufacturers

[14] There are several possible reasons for this limitation. On one hand, it could be argued that manufacturer self-certification is less reliable than third party certification, and thus less deserving of application of the NSF certification mark. However, it is also true that NSF's own certification business would benefit by encouraging manufacturers to seek NSF certification, rather than certifying their own products.

[15] The LEED system awards points for the use of sustainable building materials. *See* Rider, *supra* note 7.

[16] Maxwell, Lyon and Hackett have postulated that corporate sponsorship of and adherence to privately-developed environmental standards may arise from a desire to preempt the government's development and imposition of more stringent standards. John W. Maxwell, Thomas P. Lyon & Steven C. Hackett, *Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism*, 43 J. L. & Econ. 583 (2000). This motivation may certainly exist in the area of MSS. However, in numerous discussions held by the authors and other members of our MSS research team with players in the MSS area, we found little direct evidence that this motivation strongly influences behavior in this area. One possible reason for this observation is that the government, other than through its market-based procurement policies (see notes 5-6, *supra*, and accompanying text), has not indicated a strong desire to impose regulations in the area of environmental sustainability to the same degree as, for example, the toxic chemical releases modeled by

can influence the content of MSS, they are likely to do so in ways that advantage their own products and manufacturing processes. Thus, manufacturers have strong incentives to participate actively in standards development and to support, or develop, standards that are likely to favor their own products and to disfavor products of their competitors.

Certifying agents are also involved in the competitive standardization process, as these organizations earn revenue by certifying that products comply with particular standards. Certifiers are thus likely to favor standards that require testing and measurement of a nature in which they already have expertise and a reputation. For example, consulting firms that grew up in the energy sector may favor the adoption of standards that place a high value on the measurement of energy usage characteristics rather than, for example, waste water discharge.

Certifiers also compete with one another to certify the compliance of manufacturers' products with particular standards. Lerner and Tirole[17] have modeled the behavior of manufacturers and certifiers, assuming, among other things, that submitting products to certifiers known for conducting more rigorous and credible testing will reflect favorably on the certified products.[18] As a result, in a competitive product market, manufacturers will be attracted to more rigorous certifiers.[19] It may be too early to tell whether these predictions will be borne out with respect to MSS certification, as a robust, multi-party market for certification does not yet exist.[20]

Finally, SDOs earn revenue from membership dues and/or the sale of standards documents. They thus compete with one another to develop widely-adopted standards and to become the leaders in standardization within particular industry sectors. By the same token, SDOs that also perform certification testing earn significant revenue from this

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Maxwell, Lyon and Hackett. Nevertheless, our information regarding this question is merely anecdotal and a good candidate for further study.

[17] Josh Lerner & Jean Tirole, *A Model of Forum Shopping*, 96 AM. ECON. REV. 1091 (2006)

[18] *Id*. at 1091.

[19] *Id*. at 1107.

[20] As discussed in Section III.B, *infra*, there are currently three certifiers for the NSF 140 carpet sustainability standard, one of which is NSF itself (UL and SCS being the others). The recent entry of UL, a well-regarded and longstanding testing laboratory, into the market for MSS certification may indicate a belief on the part of UL that its reputation for reliable certification services outside of MSS may enhance its competitive stature in the MSS certification market.

service, and thus have an even greater incentive to have their standards adopted as broadly as possible, particularly if they prohibit third party certification to their standards.

This competition among manufacturers, certifiers and SDOs had been partially responsible for the rapid proliferation of MSS across the globe and has also led to a significant degree of market confusion regarding the different standards, certifications and ecolabels that exist in the sustainable materials sector. We have extensively addressed this market confusion in previous work,[21] and discuss it below in the context of MSS trademarks and ecolabels.

III. AN OVERVIEW OF INTELLECTUAL PROPERTY IN MATERIALS SUSTAINABILITY STANDARDS

Although intellectual property disputes have not (yet) figured prominently in the MSS field, intellectual property plays an important role in the development, publication and certification of MSS. In this Section, we outline some of the intellectual property issues and frameworks that characterize this field, particularly with respect to the nine MSS that we studied in detail.

A. Copyright

As written "works of authorship", technical standards are generally protected by copyright in the U.S. and elsewhere. Though standards are often the product of group collaboration, the copyright in the final, published version of a standard is typically claimed by the relevant SDO. Copyright notices were observed on several written MSS, including BIFMA E3-2010, Cradle To Cradle, GECA 50-2011 v2, and ULE ISR 100. Some SDOs have registered the copyright in their standards with the U.S. Copyright Office, which confers some limited legal advantages and is required in order to enforce such copyrights against infringers.

Among other things, a copyright owner has the exclusive rights to reproduce and publicly distribute copyrighted material; here, the written standard. This right enables SDOs to control the dissemination of standards. In some cases, SDOs have chosen to make

[21] Jorge Contreras, Hannah Roth & Meghan Lewis, *Higher Standards for Sustainable Building Materials,* 2 NATURE CLIMATE CHANGE 62 (2012) and Jorge Contreras, Hannah Roth & Meghan Lewis, *Toward a Rational Framework for Sustainable Building Materials*, STANDARDS ENGINEERING, Sept/Oct. 2011.

their standards publicly available without charge. These include most governmentally-developed standards (e.g., EULB and Nordic Swan) as well as some privately-developed standards (C2C, GECA 50 and UL-E). Other SDOs charge for access to their standards. Of the nine MSS we examined, four charged between $105 and $199 for access in either electronic or paper format: BIFMA E3-2010, MTS 2006 SMaRT, NSF 140, and NSF 336-2011. Standards that were offered electronically, such as NSF 140, can also restrict access through electronic protection measures, making it more difficult for a purchaser to duplicate or redistribute the written standard. Circumventing such measures can also be unlawful under the U.S. Digital Millennium Copyright Act, among other things, further enabling SDOs to control access to their standards. A number of standards displayed direct warnings against unauthorized reproduction or distribution, including BIFMA E3-2010 and ULE ISR 100, which is available without charge. Others include express "licensing" terms limiting user rights with respect to the use of their standards.

A recent copyright issue that is likely to be relevant to MSS, which are increasingly being utilized in state, local and national building codes, involves the "incorporation by reference" of technical standards into legislation. Use of a copyrighted standard may become mandatory by statute or regulation, yet access to that standard can still be controlled by the SDO that owns the copyright. This situation gives rise to a conflict between the SDO's proprietary rights in the standard and the public interest in knowing "the law."[22] A few recent cases have addressed this conflict, but the U.S. Courts of Appeal are currently split over the question whether copyrighted standards that are incorporated into law may be distributed without charge against the wishes of the SDO.[23] This state of uncertainty led the Administrative Conference of the U.S. (ACUS) to issue a December 2011 statement supporting free access to standards incorporated by reference in legislation.[24]

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[22] *See, generally,* Pamela Samuelson, *Questioning Copyrights in Standards*, 48 Boston Col. L. Rev. 193 (2007).

[23] See, e.g., *Practice Management Information Corp. v. American Medical Ass'n*., 121 F.3d 516, 517 (9th Cir.1997), *opinion amended by* 133 F.3d 1140 (9th Cir.1998) (upholding AMA's copyright in a standard for Medicare and Medicaid reimbursement claims even though incorporated into law), and *Veeck v. Southern Building Code Congress Intl.*, 293 F.3d 791 (5th Cir. *en banc* 2002), *cert. denied* (SDO cannot prohibit the public distribution of copyrighted building codes that are incorporated into local law).

[24] Admin Conf. of the U.S., Administrative Conference Recommendation 2011-5: Incorporation by Reference (Adopted Dec. 8, 2011) (available at http://www.americanbar.org/content/dam/aba/administrative/administrative_law/2012_feb_4-5_council_agenda_with_materials.authcheckdam.pdf).

Following this statement, a group of administrative law experts submitted a formal Petition for Rulemaking to the Office of the Federal Register seeking to require that technical standards referenced in federal regulations be made freely available via the Internet.[25] This petition has generated significant debate, and responses to a subsequent Federal Register request for comments have both supported[26] and opposed[27] the proposed amendment.

B. Trademarks and Certification Marks

Each of the MSS that we examined was associated with at least one ecolabel. In the United States, ecolabels can generally be registered with the U.S. Patent and Trademark Office as certification marks. Unlike ordinary trademarks, which identify the source of a particular good or service, a certification mark signifies that the product it is attached to meets certain criteria established by the owner of the mark. The well-known "UL" designation from Underwriters Laboratories is one of the best-recognized certification marks in this field. However, certification marks are subject to strict rules: a certification mark must not be used for purposes other than certification and must be licensed for use with any product that meets the relevant criteria.[28] Additionally, the owner of a certification mark is not permitted to market goods or services that bear the certification mark.[29]

All but one of the U.S.-based MSS that we studied was registered as a certification mark in the U.S. The exception, the MTS 2006 SMaRT Sustainable Building Product Standard, did not appear to have a federally registered mark of any type, although protection may still be available in the U.S. under common law. In the case of C2C, the SDO, MBDC, transferred the CRADLE 2 CRADLE CERTIFIED mark to a non-profit entity, CCPII now responsible for certification to the C2C standard.

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[25] Letter from Peter L. Strauss to Office of the Federal Register dated February 10, 2012 (reproduced at https://www.federalregister.gov/articles/2012/02/27/2012-4399/incorporation-by-reference).
[26] *See, e.g.*, Letter from Michael Hertz to Hon. Cass Sunstein, Administrator, Office of Information and Regulatory Affairs dated June 1, 2012 (submitted on behalf of the ABA Section of Administrative Law).
[27] *See, e.g.,* Am. Natl. Standards. Inst., ANSI Response to Request for Comments on Incorporation by Reference (Apr. 10, 2012) (available at http://www.x12.org/docs/ANSI%20Response%20IBR_041012.pdf).
[28] 15 U.S.C. § 1064(5).
[29] *Id*.

Registration of ecolabels as certification marks can confer benefits on each player in the MSS field. The registrant, usually an SDO, establishes broad recognition of its standards through the display and use of its marks on products in the marketplace. Product manufacturers benefit from displaying the ecolabel because it enhances the appeal of their products, particularly if the ecolabel is well-known. Purchasers benefit from the ecolabel because they can then rely on it in making purchasing decisions without having to investigate the sustainability practices of manufacturers independently. This being said, in recent years the rapid proliferation of ecolabels has caused oversaturation and concomitant confusion in the market. Thus, in the case of commercial carpeting, at least three different eco-labels may signify compliance with the same NSF140 standard: NSF International, the SDO that developed the standard, as well as Scientific Certification Systems and UL-Environment (UL-E). However, each of these organizations certifies compliance using its own eco-label. Thus, carpet products that comply with NSF140 may bear one, two or three different ecolabels.[30] To address some of this market confusion, and increasing reports of unethical behavior in the marketing of environmental products, the U.S. Federal Trade Commission has recently adopted strict requirements designed to limit deceptive advertising using ecolabels, sometimes known as "greenwashing".[31]

The trademark landscape is somewhat different for the non-U.S. standards that we reviewed. Europe lacks the distinct certification mark protection available in the U.S. The EC Ecolabel, as a government-sponsored program, receives specific protection under European Union law.[32] The Nordic Ecolabel is a registered trademark in Sweden and Finland, and is pending registration in Norway.[33] And the Australian GECA ecolabel is

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[30] *See* Contreras, Lewis & Roth – *Higher Standards*, *supra* note 21, at 62-63, and Contreras, Lewis & Roth – *Rational Framework*, *supra* note 21, at 4-5 (classifying weaknesses in MSS standardization and certification in terms of, among other things, incompatibility, redundancy, loss of specificity and lack of transparency).

[31] Fed. Trade Commn., Part 260 – Guides for the Use of Environmental Marketing Claims (available at http://ftc.gov/bcp/grnrule/guides980427.htm) (applying to "environmental claims included in labeling, advertising, promotional materials and all other forms of marketing, whether asserted directly or by implication, through words, symbols, emblems, logos, depictions, product brand names, or through any other means, including marketing through digital or electronic means, such as the Internet or electronic mail").

[32] Regulation 66/2010, 2010 O.J. (L 27) 1 (EC).

[33] *See* Nordic Ecolabelling, *Regulations for the Nordic Ecolabelling of Products*, *available at* http://www.ecolabel.dk/NR/rdonlyres/8D264E5B-6F61-44CD-9AF3-0F92E9F36F27/0/RegulationsfortheNordicecolabellingofproducts.pdf.

registered in Australia as a trademark rather than a certification mark, even though registration as a certification mark is available in Australia.

As noted above, U.S. law requires that any party complying with the criteria established by the owner of a certification mark be permitted to display that certification mark.[34] Accordingly, none of the SDOs owning U.S.-registered certification marks charges specifically for the use of ecolabels (though separate charges for product testing and certification might apply). On the other hand, the European and Australian SDOs that we studied each charge a fee for ecolabel use.[35]

D. Trade Secrets

Although technical standards are often publicly-available and their compliance requirements are broadly understood within the industry, the standardization and certification process may still embody features that are viewed as proprietary and confidential by SDOs, manufacturers and certifiers. While the statutory and common law of trade secrets afford some baseline level of protection for such information, the use of written nondisclosure agreements by the participants in the certification process is also common and viewed as a necessary supplement to underlying legal protections.

The types of information that are typically subject to nondisclosure and confidentiality obligations in the MSS area include the following:

Standard Details. Most MSS are widely available. However, in some cases, an SDO may treat the contents of a standards document as confidential. In such cases, the standards may be available only for purchase and may stipulate that their contents should not be revealed publicly. Such requirements are often embodied in "license agreements"

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[34] 15 U.S.C. § 1064(5).

[35] Nordic Ecolabel charges an annual licensing fee of 0.3% of product revenue in Nordic countries. The minimum annual fee is € 1,500 and the maximum annual fee is € 100,000. Certain qualifying small businesses may have their fee reduced to € 750. *Fees Furniture and Fitments*, ECOLABELLING SWEDEN, http://www.svanen.se/en/Svanenmarka/Fees/Fees/Furniture-and-fitments-/ (accessed August 31, 2012). For the Australian GECA ecolabel, the annual licensing fee depends on total product revenue. Products earning less than 250,000 AUD can license the ecolabel for 500 AUD. Products earning between 250,000 and 10 million AUD can license the ecolabel for 02.% of the manfucaturer's "gate." Flat fees apply for products with higher revenue: 20,000 AUD for products earning up to 50 million AUD; 30,000 AUD for products earning up to 150 million AUD; and 40,000 AUD for products earning more. *Stage 3: Get Licensed*, GOOD ENVIRONMENTAL CHOICE AUSTRALIA, http://www.geca.org.au/get-certified/stage-3-get-licensed/ (last visited August 31, 2012).

accompanying the purchased standard or are contained on the SDO's web site. This lack of transparency can limit the market utility of standardization, as consumers of products claiming to comply with a proprietary standard have little information regarding the underlying requirements of the standard.[36]

Product Details. Manufacturers that submit their products for certification must often reveal confidential details regarding product manufacture, composition, ingredients, components, sourcing, labor practices, energy costs, facilities, transport and shipping, and the like. Certifiers would almost always be restricted from disclosing these details. Notwithstanding the foregoing, a growing trend (particularly in Europe) involves the disclosure of detailed environmental product declarations (EPDs). An EPD is a comprehensive informational document, generally between 12-20 pages in length, that is prepared by a manufacturer for a particular product. The information that must be included in an EPD, as well as applicable testing and measurement methodologies, are set out in product category rules (PCRs) tailored to each product category. Though EPDs are required by national regulation in some European countries (e.g. for all new consumer products in France)[37], and by voluntary certification programs elsewhere, EPDs are currently available for only a small fraction of building products sold in the U.S.

Product Scorecard. As part of the certification process, a "scorecard" is often created for the product under review. The level of detail and types of information contained in a certification scorecard varies by standard, but in general such documents contain information regarding the category-by-category compliance of a tested product with the standard.

Two of the nine standards we surveyed are expected to require some form of a public scorecard disclosure: the BIFMA E3-2010 Furniture Sustainability Standard and the MTS 2006 SMaRT Sustainable Building Product Standard. As of this writing, BIFMA E3-2010's public scorecard is under development, but is expected to show category-by-category scores. Certification to the SMaRT standard requires that manufacturers disclose specific metrics demonstrating compliance with the standard, as well as the percentage by

[36] *See* Contreras, Lewis & Roth – *Rational Framework*, *supra* note 21, at 5 (criticizing the lack of transparency in some segments of MSS standardization and proposing a more open, transparent process).
[37] BuildingGreen, *supra* note 7, at 53.

weight of recycled and biobased content used in manufacture.[38] Though disclosure is not as extensive, under the NSF 140 Sustainability Assessment for Carpet, NSF, when certifying products to the standard, releases the total number of points scored by certified products, though it does not break these into specific categories.

Certification Procedures. Testing for compliance with sustainability criteria is often a complex and involved process. It has long been a complaint of observers of the MSS field that consistent and transparent means for measuring and testing sustainability criteria are lacking. This problem is most acute with first-party certification, in which it is nearly impossible to verify a manufacturer's claims that its own products comply with a standard, and second-party certification, in which an SDO may be unwilling to share its proprietary certification methodologies with others. However, the problem also exists with independent third party certification, when different certifying groups use inconsistent methods for compliance testing and decline to make their methods and data publicly accessible.[39]

D. Patents

Despite the fact that significant patent-related standards disputes have been prevalent in industries such as electronics, telecommunications and related fields, to date patents have not been a large concern for MSS developers or manufacturers. Those MSS SDOs that are ANSI-accredited are required to implement the minimum ANSI-mandated patent policy[40] in their constitutional documents, and those that we studied generally do so without change (see Table 1). Non-accredited U.S. SDOs and non-U.S. SDOs generally have no patent-related policy that we were able to identify. We are aware of no current patent-related disputes in the MSS field, nor of any patent or licensing disclosure made to any SDO, whether or not ANSI-accredited, in connection with MSS standards development.

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[38] THE INSTITUTE FOR MARKET TRANSFORMATION TO SUSTAINABILITY, SMART BUILDING PRODUCT STANDARD 7.1.2. (Dec. 15, 2006).

[39] *See* Contreras, Lewis & Roth – *Rational Framework*, *supra* note 21, at 4.

[40] ANSI Essential Requirements 2012, *supra* note 9, at § 3.1. The ANSI patent policy requires that ANSI-accredited SDOs obtain assurances from each holder of a patent essential to the implementation of an ANS that such patent holder will license such patent to all applicants on terms that are "reasonable" and "demonstrably free of any unfair discrimination". *Id* at § 3.1.1(b).

This absence is somewhat striking. In theory building materials such as concrete, steel, glass, fiberboard and treated wood are amenable to patent protection when they embody novel compositions of matter or methods of manufacture. Likewise, new manufacturing processes that reduce environmental discharges, improve efficiency, or otherwise enhance environmental sustainability are protectable by patents. However, we are not aware of significant patenting in this area. Notably, most surveys of patenting in the "clean tech" area do not even discuss sustainable building materials.[41]

The absence of patents from the MSS landscape suggests several things. First, given the relatively low thresholds of novelty and non-obviousness that characterize at least the U.S. patent system, one can assume that developments in materials technology would, theoretically, be patentable. Second, there have been numerous innovations over the past decade in the field of sustainable materials. If these innovations have not been broadly patented, or if their developers have not actively been commercializing those patents, then this may be an industry in which the putative innovation incentives offered by the patent system may not, in fact, be necessary to fuel innovation. To wit, the companies involved in the building sector (the quintessential "bricks and mortar" industry) may simply be unaccustomed to thinking in terms of patenting and generating revenue from patents. Or, as others have noted, industries that rely heavily on proprietary manufacturing processes may justifiably value trade secret protection more heavily than patents.[42] In either case, the industry may continue down this path. However, it is also possible that some fraction of companies in the building industry may realize that patenting their innovations can lead to greater profits. If this occurs, then standards developers, SDOs and manufacturers would be well-advised to consider carefully the relevant SDO policies pertaining to disclosure and licensing of patents before misunderstandings and disputes arise.[43]

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[41] *See, e.g.*, Foley & Lardner LLP, Cleantech Energy Patent Landscape Annual Report 2010: Investment and Licensing Opportunities May Arise in New Areas (2010), and ERIC L. LANE, CLEAN TECH INTELLECTUAL PROPERTY – ECO-MARKS, GREEN PATENTS AND GREEN INNOVATION (2011).

[42] *See* Jonas Anderson, *Secret Inventions*, 26 BERKELY TECH. L.J. 917 (2011).

[43] Patent disputes over standardized technology are certainly not limited to the ICT industry. *See, e.g., Avery Dennison Corp. v. 3M Company, et al.*, Complaint, No. CV 10-07931 MRP (RZ) (C.D. Cal. 2010) (alleging manipulation of the ASTM standardization process for retroreflexive sheeting) and *In re. Union Oil Co. of Cal.*, FTC Docket No. 9305 (Decision and Order, July 17, 2005) (alleging violation of SDO patent policies for standards relating to reduced emission gasoline). *See, generally*, Contreras - *Climate Change*, *supra* note 8, at 20-21.

IV. SURVEY OF MATERIALS SUSTAINABILITY STANDARD IP POLICIES

We reviewed publicly-available information about nine MSS, with a particular view toward understanding their handling of intellectual property rights. The results are summarized in *Table 1* below.

Table 1

Standard	**Standard-Development Organization (SDO)**	**Standard Type**	**Certification**	**Copyright & Availability of Written Standard**	**Trademarks & Certification Marks**	**Trade Secrets**	**Patent Policy**
BIFMA-ANSI E3-2010 Furniture Sustainability Standard (USA)	Joint Committee on BIFMA e3 Furniture Sustainability Formed by Business and Institutional Furniture Manufacturer's Association (BIFMA) and NSF BIFMA and NSF are ANSI accredited and non-profit	Prerequisites & credits Multi-level Multi-attribute Single-sector (furniture)	3rd party certification bodies must be authorized by BIFMA.	2011 version available for purchase online from BIFMA or ANSI for $105. Standard is licensed to the individual purchasing it.	BIFMA owns the "LEVEL" certification mark. It licenses the right to authorize the mark to certification bodies.	Scorecard revealing a product's distribution within certain categories is being developed.	Follows ANSI

Standard	Standard-Development Organization (SDO)	Standard Type	Certification	Copyright & Availability of Written Standard	Trademarks & Certification Marks	Trade Secrets	Patent Policy
Cradle To Cradle (C2C) Certification Program V2.1 (USA)	McDonough Braungart Design Chemistry, LLC (MBDC) For-profit	Prerequisites Multi-level Multi-attribute Multi-sector	3rd party certification is performed by MBDC (the SDO), Environmental Protection & Encouragement Agency (Germany), and EcoIntelligent Grown (Spain). Certificate is issued by CCPII.	Available at no cost online.	"Cradle to Cradle" and "C2C" trademarks registered to MBDC. "Cradle to Cradle Certified" certification mark registered to MBDC and exclusively licensed to the Cradle to Cradle Products Innovation Institute (CCPII). CCPII is non-profit.	No public scorecard.	None found
European Commission Decision 2009/607/EC (European Union)	European Union Ecolabeling Board Government	Prerequisites No levels Multi-attribute Single-sector (hard surface coverings)	3rd party certification performed by "competent bodies" designated by EU member states.	Available at no cost in the Official Journal of the European Union.	European Union law specifically protects the EU Ecolabel. Annual fee required for use.	Voluntary public disclosure.	None found
Good Environmental Choice Australia (GECA) 50-2011 V2 (Australia)	Good Environmental Choice Australia Ltd Non-profit	Prerequisites No levels Multi-attribute Single-sector (carpet)	3rd party certification performed by independent auditors (Conformance Assessment Bodies).	Available at no cost online.	Ecolabel registered in Australia as trademark. Licensing fee required for use.	No public scorecard.	None found

Standard	Standard-Development Organization (SDO)	Standard Type	Certification	Copyright & Availability of Written Standard	Trademarks & Certification Marks	Trade Secrets	Patent Policy
Nordic Swan Ecolabelling 031 Furniture and Fitments, Version 4.0 (Denmark, Iceland, Norway, & Sweden)	Nordic Ecolabelling Government	Prerequisites No levels Multi-attribute Single-sector (furniture)	2nd party certification by Nordic Ecolabelling required.	Available at no cost online. May only be copied in its entirety.	Use of certification mark subject to application fee and annual licensing fee.	No public scorecard.	None found
NSF/ANSI 140 Sustainability Assessment for Carpet (USA)	The Carpet and Rug Institute (CRI) and NSF International (NSF) CRI is a non-profit trade association. NSF is non-profit and ANSI accredited.	Prerequisites and credits Multi-level Multi-attribute Single-sector (carpet)	2nd party certification by NSF and 3rd party certification by SCS and UL are available. 1st party certification is also available, but a self-certifier may not use the NSF certification mark.	Secure PDF or print edition available from NSF webstore for $105-160. Licensed for use of the individual purchasing the standard.	There are three ANSI-accredited certification bodies that each use their own registered certification mark: NSF, Scientific Certification Systems (SCS), and Underwriters Laboratories (UL).	Number of points scored is made available, but not the entire scorecard.	Follows ANSI
NSF/ANSI 336-2011 Sutainability Assessment for Commercial Fabric (USA)	NSF Non-profit ANSI accredited	Prerequisites and credits Multi-level Multi-attribute Single-sector (fabric)	1st, 2nd, and 3rd party certification to the standard are all available.	Secure PDF or print edition available from NSF or ANSI webstores for $105.	NSF certification mark may only be used when NSF is the certifier.	No public scorecard.	Follows ANSI

Standard	Standard-Development Organization (SDO)	Standard Type	Certification	Copyright & Availability of Written Standard	Trademarks & Certification Marks	Trade Secrets	Patent Policy
SMaRT Sustainable Building Product Standard - MTS 2006 (USA)	Institute for Market Transformation to Sustainability (MTS) Non-profit ANSI accredited	Credits Multi-Level Multi-attribute Multi-Sector	3rd party certification performed by two authorized certifiers: Ernst & Young and Redstone.	Available from ANSI webstore for $199.	No registrations owned by MTS.	Public scorecard. Manufacturers required to disclose certain product metrics.	None found
ULE ISR 100 for Gypsum Boards and Panels (USA)	Underwriters Laboratories, Inc., UL Environment subdivision (ULE) For-profit ANSI accredited	Prerequisites and credits Multi-level Multi-attribute Single-sector (wall board)	Self-certification, 2nd-party certification by ULE, or 3rd party certification by any certification body, but certification must be finalized and confirmed by ULE.	Currently available at no cost online, but will be licensed through ANSI webstore in the future.	UL owns certification mark, which is the only certification mark placed on a certified product.	No public scorecard.	Follows ANSI

V. CONCLUSIONS

Our review of the materials sustainability standards (MSS) landscape, and nine MSS in particular, reveal a number of characteristics that this field shares with other emerging technology standardization fields, but also a number of striking differences. Among the most notable observations are the following:

1. The development of MSS is dominated, at least in the U.S., by private sector entities, either industrial trade associations or, in one notable case, a for-profit consultancy. Government agencies such as the EPA have played a modest role in standards development in the U.S. and have been more prominent in Europe. There has been almost no involvement by academia in the field.

2. Most standards are available for free or a modest fee (less than $200). Nevertheless, market participants (SDOs, certifiers and manufacturers) have strong concerns about the protection of trade secrets inherent in the product certification process. The secrecy of much of this information hinders efforts to create uniform and transparent standards systems.

3. The use of ecolabels (certification marks) is widespread in the industry and the growth and unregulated nature of many ecolabel programs has been criticized.

4. Patents currently play a minimal role in the standardization and certification process. It is not clear whether patenting of sustainable building materials and processes is quietly being undertaken, or whether the industry generally relies on trade secrets as its dominant form of protection (further research in this area may be warranted). Nevertheless, the potential for patent issues in the MSS field exists, and participants could be better-prepared to address these issues before they arise.