How E-Labels Can Support Trade and Innovation in ICT

BY NIGEL CORY | SEPTEMBER 2017

Displaying regulatory and other product information via electronic means—an "e-label"—is a sensible alternative to the jumbled collection of physical labels we now have on ICT goods. Given how products are shrinking, physical labels can inhibit innovation.

As information and communication technology (ICT) products get smaller, manufacturers face the challenge of fitting multiple small labels on their products to show a range of regulators and consumers that these products conform to regulations. This can lead to jumbled collections of barely legible labels that convey little or no information. Allowing the display of regulatory and other product information via electronic means—an "e-label"—is a sensible solution that ensures labels don't inhibit product innovation while helping to minimize cost and maximize consumer convenience. However, there is a risk that countries will implement divergent and complicated approaches to e-labeling that will undermine its benefits and present a barrier to global trade in ICT.

Allowing e-labeling is one small way that policymakers can support technological innovation, a crucial driver of economic productivity and improvements in quality of life. E-labeling allows regulators to be confident in their ability to access and enforce compliance, but in such a way that minimizes or eliminates the impact such requirements have on a firm's ability to innovate. For example, e-labeling can help avoid cases where ICT manufacturers have to change the design of a product simply to fulfil physical labeling requirements. Furthermore, if a country's e-labeling system is aligned with international best practices or standards, manufacturers can maintain compliance while providing innovative products at the lowest possible cost, thereby facilitating the trade in ICT products.

This report examines the use of physical and e-labels, shows that e-labeling offers benefits to the regulator, the consumer, and the manufacturer alike, highlights the risk of countries enacting onerous and divergent approaches to e-labeling, and analyzes challenges and issues

in allowing e-labeling. Finally, the report presents a range of recommendations and best practices for policies on e-labeling. These include:

- Countries should allow e-labeling. Policymakers should view the development of e-labeling policy as an iterative process they can start by allowing e-labeling to display information for products with an inbuilt screen, such as a smart phone, and then seek to expand the scope of products in subsequent revisions, such as to include products that don't have a screen, but can connect to one. It can eventually extend to allowing e-labels to be accessed through URL or QR (Quick Response) code, for ICT products that don't have a screen. In this way, policymakers can move forward with basic e-labeling rules, even if they aren't ready for advanced ones.
- Given that e-labeling has the potential to exert a significant impact on product design, manufacture, and distribution, policymakers should engage industry stakeholders at each stage of the policy process. To ensure policies for e-labeling aren't an unnecessary burden, private-sector experts should be involved in the design, drafting, implementation, and review process for e-labeling policies. Industry expertise can help ensure that the rules account for the technical details involved in presenting compliance information in an electronic format.
- Policymakers should aim for the "lightest touch" possible to ensure that requirements satisfy compliance requirements while minimizing or eliminating the impact on product cost and design.
- Policymakers should be flexible in how they initiate and pursue the changes needed to allow e-labeling.

MOVING FROM PHYSICAL TO ELECTRONIC LABELS

Traditionally, manufacturers have had to use physical labels on ICT products to convey the compliance information required to facilitate market access to a country, such as to address concerns over safety, electromagnetic interference, energy, materials, and/or recycling. Manufacturers tend to place product labels on a single panel so as to allow this information to be more easily located, fabricated, and controlled, as well as to minimize the negative visual impact to what may otherwise be a sleek and innovative product appearance (which is critical for market appeal). Manufacturers must either etch or print these labels on the device or on a label attached to the device or associated packaging. Complicating this process is that some countries dictate where labels must go. Given the number of such labels required for major ICT products, the requirement to use physical labels increases costs and potentially limits design options, while ineffectively conveying information to consumers about products.

A major problem with physical labels is that many ICT products are made for distribution in multiple markets, meaning that a product can have 20 or more regulatory labels (see photo 1). Moreover, requirements for product markings are growing as more countries require their own labels, as third-party certification organizations develop their own specific

markings, and as manufacturers decide to add new markings and statements as part of new private regulatory requirements (such as for environmental reasons). Companies are often forced to be creative in placing labels, such as on the battery inside the computer, which undermines their purpose in terms of conveying information to regulators and consumers.

Photo 1: An example of physical labels on a power adaptor for a Dell laptop.[1]

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Compliance markings serve two audiences—regulators and consumers. But even then, it's an open question as to how much attention consumers give to physical labels. E-labeling does not undermine each country's right to regulate ICT products for public health, safety, and other reasons. E-labeling is simply a way to convey information to consumers and regulators more effectively and efficiently than is possible with physical labels. Growing smart phone ownership means that many consumers have the ability to easily access information about their products electronically, whether this is on their device or via a link to a webpage on the Internet.

The starting point for many countries in allowing e-labeling has come with regard to smart phones, which makes intuitive sense given the device capabilities and the growing number of people around the world that use them—in 2016, 1.5 billion smartphones were sold globally.[2] This is part of a broader trend toward greater use of ICT as part of our daily lives and jobs, such as through the Internet of Things, wearables, autonomous vehicles, robotics, and other technological innovations. This means that regulatory compliance issues for ICT products will only become more important.

E-LABELING—AN OVERVIEW OF TYPES, BENEFITS, AND CHALLENGES

While e-labeling achieves the same outcome—the electronic display of compliance and other product information—it can come through different mechanisms and can differ by

device. These differences raise a range of issues that policymakers need to consider in enacting an e-labeling system.

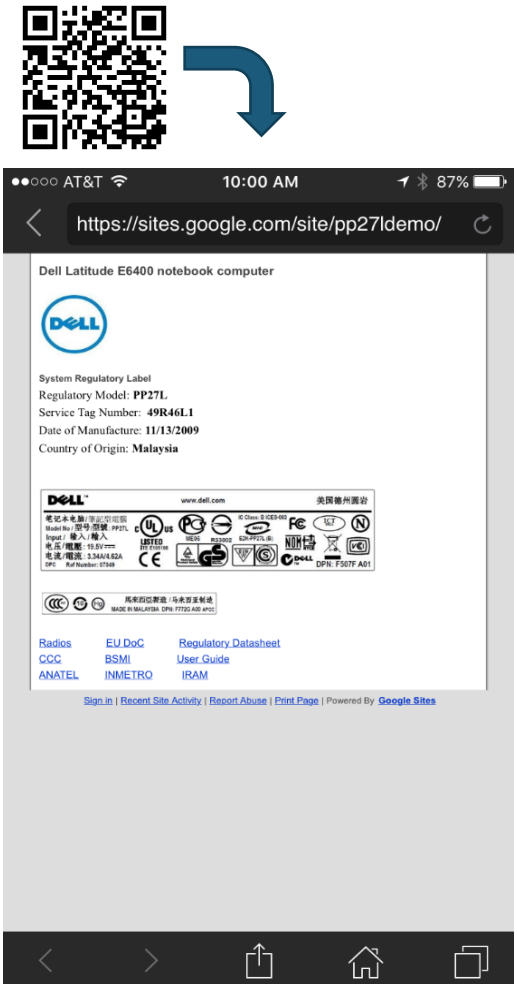
There are two main types of e-labels:

1. Regulatory labels and other information that can be displayed electronically on a device's in-built screen, such as on a smart phone (see photo 2). Alternatively, the screen can provide the user with a web link or other information on how to access the labels and other product information.

2. A machine-readable code (e.g. bar code or QR code) that allows a scanning device or smartphone to retrieve the labels, statements, and other relevant product information (see photo 3). For example, Dell has a central website that provides product compliance, setup videos, and other reference material via QR codes for many products without a screen.[3] Such a code can be printed on the product, viewed on the product screen, or affixed to the product's packaging.

Photo 2: How an e-label appears on an iPhone.[4]

Photo 3: A Quick Response (QR) code can be used to direct a user to a page hosting product information.[5]



There are different types of devices that could benefit from e-labels:

- ICT devices with an in-built (i.e., non-removable) screen, such as smart phones, tablets, printers, and GPS units.
- ICT devices with a tethered screen, such as a set-top box for a television or wireless headphones. Some ICT devices are transmitter modules that do not have an in-built screen, but due to wireless connectivity capabilities, are able to setup a secure connection to a product with a screen that can then display compliance and other information. This is the next category of ICT products for which regulators, such as those in Japan and the United States, are considering allowing the use of e-labeling.
- Modular ICT devices that are embedded in other products. With the Internet of Things, more devices will contain transmitters that connect day-to-day objects to other objects and/or the Internet. However, transmitters require regulatory certification. This raises the potential for regulators to consider whether these devices should be allowed to display compliance information via a tethered screen (such as with a smart fridge) or via a barcode, website, or QR symbol on the exterior of the product that encases the module.
- ICT devices without a screen and/or the ability to connect and transmit to a screen, such as AC adaptors for computers. E-labeling for these products could use a website address or machine-readable code or QR symbol so that a smart phone, tablet, or scanning device can access the product labels and other information.

The Benefits of E-labeling

This section summarizes some of these benefits of e-labeling.

Greater Information and Utility

Consumers and regulators are faced with the challenge of deciphering a multitude of labels crammed together onto a single panel of an ICT product, which is further complicated as ICT products get smaller. Users must identify which label relates to their country or concern (such as for recycling or other environmental issues). Moreover, if they want to find further details, they will need to look elsewhere (such as the product guide handbook). It is difficult to see how much useful information is being conveyed given the number of marks included on a typical ICT product made for multiple markets.

E-labels offer a more accessible and understandable mechanism for users to find the mark that is relevant to them, accompanying product statements and instructions, and any further details the manufacturer wishes to include, such as product warranties, contact details, recycling, and trade-in opportunities. Countries should mandate a minimum set of information manufacturers need to provide in the e-label, obviously including compliance labels, but otherwise leave it to manufacturers to decide whether they want to provide additional information as part of their customer and after-sales service strategies. In terms of further customization, companies could design a way to ensure that users only see the e-

labels that are relevant to their country, thus avoiding the confusing jumble of labels. Furthermore, e-labels can be more accessible, comprehensive, and readable for the simple fact that there are fewer size constraints when it comes to the electronic display of information, in contrast to the small font typically used in printed statements that accompany ICT products when sold.

These benefits of e-labeling make it easier for consumers to compare products and encourage positive innovation feedback loops, especially as manufacturers join voluntary labeling programs, such as for energy efficiency or environmental purposes. By accessing regulatory and other product information online, consumers can determine which products have which labels, and purchase according to their preferences.

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Easier Enforcement

A master list of labels and compliance information on the Internet or on the device, kept up to date by manufacturers, would offer real-time compliance information far beyond a simple mark on a tiny label. For the most part, the e-label has the same information as the physical label. Regulators can easily check if a manufacturer is abiding by e-labeling requirements (including changes) by simply checking the e-label on devices with an in-built screen, or if using a code or link for devices with no screen, by checking the designated website of the product. Given this is an essential function for an e-label, regulators should mandate that manufacturers maintain a working link between the device and the website used to display the markings and required information for a set amount of time, including after the product has been discontinued.

A Reduced Environmental Impact

E-labels allow manufacturers to reduce the material they use in labels and the replacement of labels. This includes the waste involved in recalling products and replacing labels (which often requires replacing the product's entire back plate) if requirements change after the product is manufactured and distributed. Furthermore, an e-label provides an easier way for manufacturers to provide details to consumers on how to environmentally dispose of the product. With better and more accessible information, compliance levels, such as with regard to recycling, may increase.

China's approach provides an example of the potential environmental benefits. Since 2016, China's Standard Certification Center has overseen a pilot program involving 35 companies, using 10 products, that use a "China Energy Label" QR code to inform consumers about environmental information, such as energy efficiency, cleaning, and disposal. These Chinese companies have integrated customer services into the e-label by providing mechanisms for consumers to find and schedule repairs and replacements.[6]

Reduced Impact on Product Innovation

Technological innovation means that ICT products are shrinking in size, such that physical labeling requirements may become a constraint on product design as manufacturers reach a point where they need to alter the optimal design of a product just to satisfy labeling requirements. This could act as a brake on product design and innovation, which, in many

product categories, would otherwise lead to products getting smaller still. Furthermore, by making product design easier, e-labeling can shorten the launch schedule for new products, as for major ICT manufacturers a change in something as simple as a physical label can take months to include as part of complex design and manufacturing processes.

A Live and Interactive Label

Physical labels are static and problematic in terms of updating—it takes time and money to recall products and remove and replace physical labels. In contrast, e-labels can act as interactive sites for product information that can be updated remotely to address any product user issues, manufacturer contact details, regulatory changes, and inaccuracies, such as typographical errors. In this way, e-labels lend themselves to easier and cheaper changes.

Cost Savings

As ICT products have become smaller and more aesthetically appealing, etching or applying physical labels requires more design time and expensive equipment. Manufacturers spend significant amounts of money on the creation, control, maintenance, and production of product markings, packaging, and instruction sheets that have traditionally been used to convey required certification or conditions-of-use information. These costs increase if manufacturers need to modify labels, re-work products, and perform in-country retrofits due to changing labeling requirements. E-labeling reduces or eliminates these costs without sacrificing a user's access to relevant regulatory information. Ultimately, e-labeling is a more cost-efficient labeling practice that minimizes the cost of ICT goods, which, in the bigger picture, spurs broader use of ICT products and the social and economic benefits that flow from them.

Easier to Affix to Smaller Products

E-labels, especially in the form of a website or QR code, are much easier to laser mark onto the external surface of small electronic components or affixed to the product's packaging with a non-permanent label.

Issues and Challenges to Enacting E-labeling

E-labeling involves certain policy reforms, IT equipment, connectivity, and processes that raise a range of potential issues depending upon the approach that a country takes. This section discusses these issues.

Regulatory Reluctance to Change

Regulators have an important job in ensuring that products sold in their market meet regulatory standards. Initially, the application of a physical label to ICT products when the production and distribution of these products became widespread appeared to be an obvious solution for ensuring that the products meet local regulatory requirements. However, the growth in ICT trade, the shrinking size of ICT products, and the option of using technology to define a new approach means it's time to move past physical labels.

One of the biggest challenges in moving from physical to e-labels is regulatory reluctance to change—regulators are wedded to their traditional approach as it symbolizes to them a very

tangible and clear way that the products meet their countries' requirements, and they are uncertain about how e-labeling would impact their ability to monitor the market for non-compliant products. E-labeling disrupts this status quo. The challenge for policymakers is working with possibly reluctant regulators to facilitate policy reforms, but there are a growing number of examples around the world for regulators to learn from. This is why it's useful to lay out a detailed and suitably long plan of action, including a transition period, that brings regulators and industry together on the design, testing (perhaps through a pilot program), implementation, and review of changes.

Possible Legal Changes

One challenge that policymakers and regulators will need to consider is whether they need legislative reforms to allow e-labeling, especially in cases where current law explicitly requires a physical label. Otherwise, regulators will need to ascertain what regulatory or administrative changes are needed to provide the framework and particular details for their e-labeling system. For example, Japan interpreted that displaying a conformity label electronically satisfied the law's requirement that such marks be "attached." Therefore, Japan only had to revise the relevant implementing regulation, not the law itself. This can be a useful tactic for countries to take when it comes to authorizing e-labeling.

Devices with a Screen—Broken or Doesn't Power Up

A common concern is that e-labels would become unavailable if devices could not be turned on for whatever reason (e.g., broken or lost power). There are multiple options to mitigate this concern. For example, manufacturers could put peel-away screen labels with the appropriate labeling information on newly deployed devices, or certification information could continue to be included in owner's manuals and could also be prominently displayed on manufacturers' websites. The important point is not to prescribe particular technologies, but rather to focus on the policy goal—which is to ensure that the relevant information is available to consumers and regulators.

Different Regulatory Structures

Institutional arrangements for regulatory issues differ by country. For example, the agency responsibility for electromagnetic and radio transmitting devices may be separate from those involved in safety, environmental, and other regulatory compliance issues. This raises questions about coordination and how to get different regulatory agencies to allow e-labeling in their respective areas of responsibility.

Hosting and Control of Material

E-labeling can involve the hosting of regulatory labels and information on a website or database. However, this raises a question about where this information is hosted, who controls this location, and the process for updating. Again, regulators should work with manufacturers and relevant trade associations to design a clear, predictable, and reliable process for ICT manufacturers to host and manage this information.

Lack of Equipment and Technical Capabilities

E-labeling may require customs and other government officials to use a handheld device to connect to a network to display relevant labels when checking ICT products, which raises a concern about connectivity. However, there are technological solutions to this. For officials working at the point of entry, such as a port, this can involve the use of cell or Wi-Fi Internet services to provide connectivity. Another potential solution would be to use scanners that are able to read and store labels offline; the labels can then be checked later when the device connects to a network.

POTENTIAL BARRIERS TO TRADE AND INNOVATION—AVOIDING ONEROUS AND DIVERGENT APPROACHES TO E-LABELING

E-labelling remains a relatively new approach to conveying compliance and other information to regulators and consumers. While a number of countries currently allow e-labeling and only a few companies have begun using it, this list includes major ICT producers and markets for ICT products, including China, Japan, and the United States (for a full list of countries see Appendix A). Meanwhile, other major economies, such as India, are considering e-labeling. So it is likely that more countries will follow suit.

If countries make e-labeling systems overly complicated and prescriptive and substantially different, it will undermine the benefits of e-labeling and could become a future barrier to trade in ICT goods.

The potential problem is that as more countries allow e-labeling, they might make it overly complicated and prescriptive and substantially different from country to country. Divergent approaches to e-labeling would undermine its benefits in terms of simplicity and efficiency. Furthermore, if countries design approaches that are significantly different from one another (including a potential future international standard on e-labeling), e-labeling then becomes a potential technical barrier to trade in ICT goods. As we've seen with other technical issues, an outlier country could use its e-labeling approach as a barrier to keep foreign ICT products out as manufacturers have to decide whether to spend the time and money to alter the design of their product to meet the specific regulatory requirements for an individual country. This is why countries need to ensure that as they consider allowing e-labeling, they work toward achieving a degree of alignment with other countries, ideally through an international standard (see Annex A), to ensure e-labeling requirements don't hinder the global design, production, and trade in ICT products.

Regulatory standards and certification issues have always been an important part of the development of the Internet and the global production and sale of ICT products. One reason for the rapid diffusion of ICT products around the world is that standards for ICT products have supported interoperability as countries and manufacturers have worked toward developing and adopting open, transparent, and international standards that balance the interests of all stakeholders, thereby supporting a global ICT market. However, this approach has not been universal.

Recent history shows us that fragmentation is a real threat to global trade in ICT products. ITIF has shown how this can happen in its "The Middle Kingdom Galapagos Island Syndrome: The Cul-De-Sac of Chinese Technology Standards" report, which explained how China's use of indigenous technology standards discriminates against foreign firms in

order to support domestic ones.[7] One can easily see the problem if during the early days of the Internet countries had persisted with the development of separate, non-compatible email systems. Other real-world examples include in-country testing requirements at a government laboratory or government-approved third-party laboratory as well as unique, country-specific standards. Such differential technical standards and testing and conformity assessments can become technical barriers to trade.[8]

Country-to-country differences in technical regulation and standards and conformity assessment procedures further raise compliance costs for companies operating across multiple countries. Such costs are particularly daunting for small-and medium-size enterprises. While it is difficult to estimate the precise costs involved, the need to comply with such different approaches involves direct and indirect costs for producers and exporters. The Organization for Economic Cooperation and Development (OECD) finds that differing standards and technical regulations, combined with the cost of testing and compliance certification, could constitute between 2 and 10 percent of overall production costs.[9] Direct costs comprise the hiring of technical consultants to interpret foreign regulations, increased investment in production facilities, and the undertaking of additional certification procedures. Indirect costs comprise higher inventory and procurement expenses, and the loss of sales due to delays in product launches, which could be significant given the limited life cycle and rapid evolution of modern ICT products. In addition, different regulations and standards reduce the ability of companies to increase productivity through economies of scale.[10]

E-LABELING—BEST PRACTICES AND ISSUES TO ADDRESS

The following section outlines some best practices that countries should use in enacting an e-labeling system. Some are related to process, while others highlight key issues that will need to be addressed as part of an e-labeling system. Taken together, the following points outline how a country's policymakers and regulator(s) can run an iterative, inclusive, transparent, and efficient e-labeling system that can expand (such as by using QR codes) to include a broad range of products as regulators, manufacturers, and consumers adjust to e-labeling.

Allow E-labeling, but Make It Voluntary, Not Mandatory

Countries should allow manufacturers to use e-labels as a substitute for physical labels to convey compliance and other regulatory information. However, countries enacting e-labeling should make it voluntary, and not mandatory, as manufacturers can have vastly different compliance requirements depending on their products and target markets.

Operate a Transparent and Participatory Rule-making Process

E-labeling holds the potential to be a win-win-win for manufacturers, regulators, and consumers, but in setting requirements in place, it's important that the process be transparent and participatory, involving all relevant stakeholders, and including a number of opportunities for feedback and engagement (such as a draft guideline, followed by feedback, and the release of a revised draft and further feedback). This is important, for a

seemingly small mandatory requirement may have significant cost and design implications for manufacturers. ICT manufacturers need time and details to assess the impact of regulatory changes and enough lead time to ensure that future products, which can take years to develop, meet new requirements.

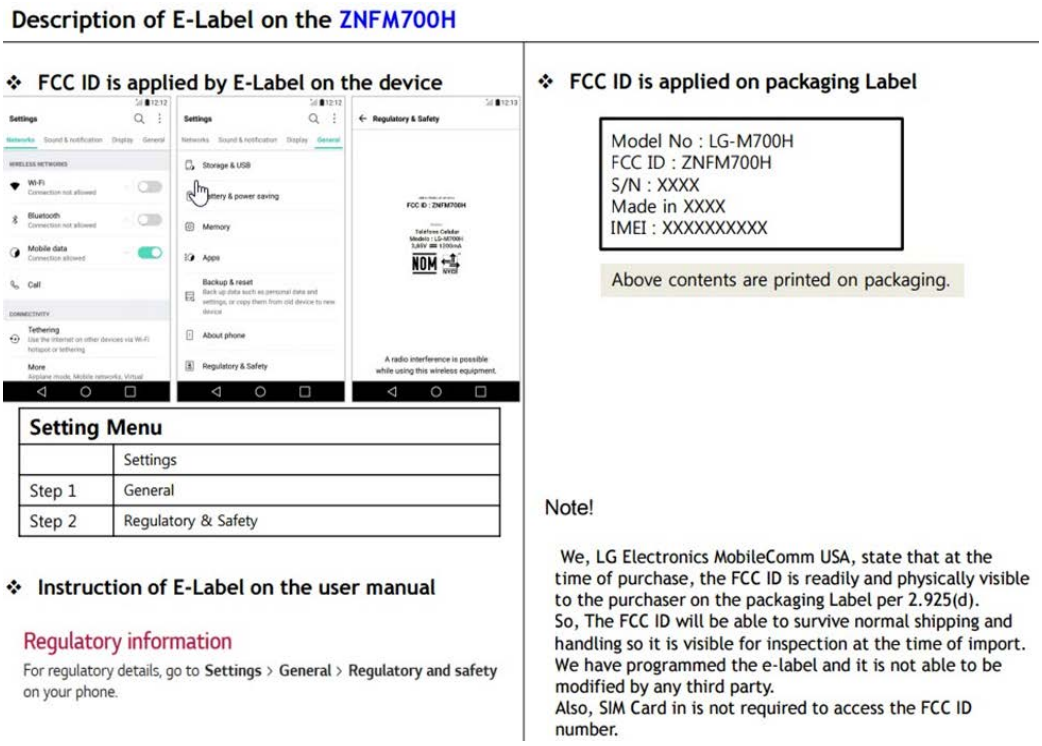
This also highlights the need for a process to involve government and private-sector officials with technical and engineering experience. For manufacturers, e-labeling involves technical regulations and standards, along with accompanying legal considerations, which affect design and production processes. The risk is that if a country's e-labeling process ignores industry concerns about the impact of some technical feature of the policy, it may ultimately undermine the benefits of e-labeling and negatively affect product design.

Focus on Streamlining and Simplicity: Set Minimum Requirements, But Be Flexible

E-labeling is about streamlining and simplifying the delivery of information about regulatory compliance, therefore it's important that countries enacting e-labeling require a core set of ideally harmonized or aligned principles and processes, while avoiding overly prescriptive settings to avoid undermining the fundamental goals and advantages of e-labeling. For example, Canada and the United States prescribe that a user has to be able to access the e-label on a device with a screen within three steps, but doesn't specify the pathway a company has to follow to achieve this (for example, see photo 4).

It's important that the process for developing an e-labeling system be transparent and participatory, as a seemingly small mandatory requirement may have significant cost and design implications for manufacturers.

Photo 4: How a New LG Cell Phone Will Display an E-label as Outlined in its Application to the U.S. Federal Communication Commission.[11]



Flexibility is also important as technology continues to change, as it is hard to know whether current products or mechanisms (such as the QR code) will be superseded in the future. Furthermore, just because e-labeling makes it easier to present more information to a user, it doesn't mean that the government should specify an expanded list of minimum requirements, instead leaving it up to manufacturers to use e-labeling as they see fit. For example, e-labeling minimum requirements could include the basic details already commonly found with current products, such as conformity labels and statements, product details, including manufacturer details and contact information, the product name, model, features, and production date.

Security, Accessibility, and Storage

Countries should set a few simple, but commonsense, responsibilities regarding the security, accessibility, and storage of e-labels. Manufacturers should be responsible for ensuring that there is a working link between the e-label and the service hosting the relevant compliance information (e.g., a website). Countries should ensure that accessing e-label information does not require any fees or special access codes, that the e-label information does not have any unnecessary copyright restrictions applied to it, and that it can be accessible by all major platforms (e.g., iOS and Android). The manufacturer should also have the relevant e-label information programmed in such a way that it cannot be easily modified or removed by a third-party. Furthermore, manufacturers should ensure that this compliance information remains available for the lifecycle of the product, including for a period of time after the product has been discontinued.

Where e-labeling involves the presentation of information via an interactive link, such as a website or database, this e-labeling information needs to be stored somewhere. Manufacturers are best placed to provide and control this information given their knowledge of the product, the fact they already provide much of this regulatory information and other materials to consumers as a normal part of their business, and the fact they can manage this as simply another part of their broader regulatory compliance activities. Manufacturers could be made to have individual responsibility for hosting e-labeling information or to have this process managed by an industry association or voluntary grouping of relevant manufacturers. Both these latter options have the benefit of allowing the relevant information to remain viable if the individual company goes out of business. The alternative—submitting this information to a government-run website or database—raises questions about performance as this function may fall victim to failures in government ICT systems that are less than best in class, or to changes in budgets or personnel or offices responsible for maintaining the system.

Specify Details on Accompanying Instructions

Companies should provide instructions for how users can access the e-label along with the product, whether in the product documentation (such as user manual or as a packaging insert), affixed to the product (such as a sticky label), or on the product packaging or packing material (such as the bag in which the product is packed). Another option is to

allow manufacturers to point users towards the use of a QR code or website to access the relevant information on the product's website.

Specify Which Products Can Use E-Labeling

Countries have a few options as to how far to extend e-labeling. Most countries with e-labeling have started by allowing it on devices with an inbuilt screen. Many of these countries (such as Canada, Japan, and the United States) have since started discussions about how to extend e-labels to other product categories. This is why policymakers should see e-labeling as an iterative process that can be built upon over time as regulators, manufacturers, and consumers become comfortable with it and as the stakeholders discuss the best way ahead in extending e-labeling to other products.

The intuitive first step is for countries to allow e-labeling for products with an inbuilt screen, but this should only be seen as a step toward expanding it to other product categories, such as those that don't have a screen but can connect to one.

E-Labels for Devices with a Screen

The first step is for countries to allow e-labeling for products with an inbuilt screen. Below are some issues that each country should address:

- Policy should specify how manufacturers are allowed to display the e-label, whether by showing the label in electronic form, a scannable code and/or a website which links to such information, and when the e-label should be displayed (such as during the power up sequence and/or in the product's menu function).
- Policy should ensure that manufacturers make access to compliance information available in a reasonable number of steps (whether this is three or four steps) and be relatively straightforward (i.e., not hidden).
- Policy should require manufacturers to make it clear where this information is contained in the user manual or other documentation that accompanies the product, as well as putting this information on a product's website.

E-Labels for Devices Without a Screen, But that Connect to a Device with a Screen

Devices without an inbuilt screen, but that can connect to a second device with a screen, are a natural next step to take in expanding the coverage of e-labeling. There exists a growing range of products that fall into this category--they do not have a screen but are controlled through software applications running on a smartphone, a web interface, or via a network connection, such as wireless DVD players, game conrollers, and keyboards. For example, the United States is considering allowing this form of e-labeling, but only for devices that have no functionality as a radiofrequency device unless connected to an electronic display.[12] To help faciliate this, regulators need to set up a regular engagement process with industry stakeholders, as outlined previously, to build their understanding of the technology and of how regulators can be assured that new forms of e-labeling don't undermine their compliance goals.

Consider the Use of QR Codes for E-labels

While not widespread yet, QR codes could potentially be used in a range of e-labeling systems, including products that are embedded in another product (and can't connect to a screen) or simply products without a screen or the ability to connect to one. QR codes offer

a relatively quick and easy way to connect a regulator or consumer to the site hosting compliance and other information. QR codes are used in an increasing range of settings given the proliferation of smart phone access, which through the use of free apps, allows users to scan the QR code to access the relevant information. For this reason, QR codes should be part of the discussion as countries look to allow e-labeling or expand existing systems.

However, using QR codes for e-labeling raises other issues. Consumer and regulator familiarity with QR codes may be limited, thereby making the regulator's task of designing and overseeing an e-labeling system that uses QR codes, and getting consumers to use it, a challenge. There will likely be questions about how regulators ensure QR-code reliability, security, and differentiation (from other QR codes). These issues are valid, but are not insurmountable, and again, they highlight the need for industry engagement and for the potential use of pilot projects to test new systems.

As an example, countries could address the following QR codes requirements:

- Where the QR code appears—viewed on the screen when the device is operating, or printed or affixed to the product or the product's packaging.
- A requirement that the manufacturer has to ensure QR code functionality such that it allows reasonably quick and easy access to the relevant regulatory information for that country.
- That apps to decode QR codes are available for free on major smart phones, such as Apple and Android.
- Much as they do with physical labels, countries need to ensure marks are produced clearly and in such a way that they can be read correctly and link to relevant websites or data in a timely manner.
- Where there may be more than one QR code on a product, the policymaker needs to outline how a manufacturer should differentiate these to allow users to identify which code is relevant to them.

CONCLUSION

E-labeling is a way to use technology to improve how regulators require manufacturers to show their ICT products comply with country-specific labeling requirements. Done right, e-labeling would also allow consumers to easily and conveniently learn more about their products, while allowing manufacturers to avoid having to modify product design and innovation to satisfy physical labeling requirements. However, there is a risk that countries will implement approaches that are either overly prescriptive and onerous, thereby undermining the benefits of e-labeling, or else divergent, such that they add to product cost and become a potential barrier to trade in ICT.

APPENDIX A: E-LABELING AROUND THE WORLD

International Standards-setting Process

Stakeholders have started the process of developing an international standard for e-labeling at the International Electrotechnical Committee (IEC, the world's leading organization for the preparation and publication of International Standards for all electrical, electronic, and related technologies).[13] Key principles of the IEC make it well-equipped to handle this task: to facilitate trade by eliminating duplication of conformity assessment tasks; supporting national and global adoption and acceptance of IEC standards; and encouraging peer assessment to ensure competence, consistency, and mutual confidence. The goal is to publish, within a few years, an IEC and International Organization for Standardization (ISO) standard for companies to adopt and for regulators to consider as a reference point. ISO is an independent, non-governmental international organization that uses technical experts to develop voluntary, consensus-based, and market-relevant international standards.

Australia

In 2015, Australia enacted the Telecommunications (Labelling Notice for Customer Equipment and Customer Cabling) Instrument 2015, which allowed e-labeling for devices with an inbuilt display as part of broader changes to the testing, labeling, and record-keeping obligations for suppliers of specified telecommunications equipment.[14] Australian industry groups supported the development of e-labeling.[15] The compliance label for telecommunications products in Australia is the Regulatory Compliance Mark, which can be displayed electronically on products with built-in screens. Australia does not prescribe how electronic labels should be displayed, but includes examples that they be displayed during the device's power up sequence, under the device's system information page, or under the device's help menu. Accompanying documentation must explain how the e-label can be viewed.[16]

Canada

In 2014, Industry Canada enacted rules that allow devices with an in-built display screen to present required label information electronically in lieu of a physical label or nameplate. Devices without an integrated display screen are allowed to present the e-labeling information through an audio message or a host-device display screen connected via a physical connection, Bluetooth, Wi-Fi, etc., if the connection to a device with a display is mandatory for use. Information that needs to be displayed includes the Industry Canada registration number for terminal equipment devices, certification number for radio equipment, and model identification number, along with any other required information for that device, unless it is permitted to be included in the user manual or other packaging inserts.

Canada's system requires manufacturers to provide clear instructions on how to access the e-label (in the user manual etc.) without special access codes or accessories (e.g. SIM cards) or having to go through more than three steps in a device's menu. Products utilizing e-labels are required to have a physical label on the product packaging at the time of importation, marketing, and sales. For devices imported in bulk (not packaged

individually), a removable adhesive label is acceptable to meet this requirement; for devices in protective bags, a label on the bag is acceptable. Any removable label must be able to survive normal shipping and handling and must only be removed by the customer after purchase. E-label information must be programmed and secured in such a manner that it cannot be modified or removed during the course of normal activities that a third-party (e.g., a typical user) might be authorized to perform (e.g., installation of applications, accessing the menus, etc.).[17]

China

In 2015, China's State Radio Regulatory Commission (SRRC) of the Ministry of Industry and Information Technology issued a notice that allowed compliance labeling to be displayed electronically for all radio transmission equipment with an integral screen. Manufacturers need to provide users with instructions on how to access the label. Users must be able to access the label without special permissions (such as access codes) or special accessories or supplemental plug-ins (such as a SIM card). Manufacturers utilizing e-labels are required to provide the relevant labels on individual packaging.[18]

European Union

The European Union (EU) has not adopted e-labeling yet. However, the European Union does allow e-labeling for medical devices, where the focus is on conveying the instructions for use electronically rather than via a paper leaflet.[19] This shows that e-labeling is possible in Europe. EU industry groups have pushed the EU to use bilateral/regional trade agreements to look at e-labeling.[20] In negotiations toward a Trans-Atlantic Trade and Investment Partnership (TTIP) agreement, the EU expressed a desire to cooperate with U.S. regulators on setting standards for e-labeling.[21] However, the European Union's preference has been to address these types of bilateral issues in separate EU-U.S. regulatory forums.

The European Commission's Radio Equipment Directive (RED) does not yet allow electronic labeling as a replacement for physical marking on the product, but e-labels may be allowed by the European Commission in later reviews of the RED. It is permitted to use electronic labelling in addition to the requirements for physical labelling.[22]

Ghana

In 2015, Ghana's National Communications Authority issued guidelines for the approval of electronic communication equipment. These stated that e-labels would be accepted in place of physical marking, however, it is the responsibility of the manufacturer to ensure that e-labels cannot be altered.[23]

India

India's Ministry of Electronics and Information Technology is currently gathering input from stakeholders on a potential e-labeling system.

Japan

In 2010, Japan enacted administrative reforms to allow e-labels for devices with an inbuilt screen. Documentation that accompanies the device must show the user how to display the e-label.[24]

Malaysia

On June 1, 2015, the Malaysian Communications and Multimedia Commission (MCMC) enacted rules allowing e-labels for communications products with an inbuilt screen. The Malaysian approach is voluntary, not mandatory. Details of how to access the marks must be included in the accompanying documentation.[25]

New Zealand

In 2013, New Zealand enacted Radiocommunications (Compliance) Notice 2013 No. 2, which allowed the display of compliance labels electronically for products with an integral screen. The product documentation accompanying the product must explain how the label is displayed and it must be applied in such a way that it is difficult to delete, modify, or prevent the display of the label.[26]

Singapore

Since 2012, Singapore has allowed e-labels as compliance labels for devices with an integral screen. The product documentation accompanying the product must explain how the label is displayed.

South Africa

In 2016, South Africa released Gazette No. 36786, which allowed e-labeling as an alternative for products with an integral screen. The product documentation accompanying the product must explain how the label is displayed. The e-label must be displayed during the device's power up sequence, in the equipment's system information page, or under the device's help menu.[27]

South Korea

In 2015, Korea's Radio Waves Act allowed e-labeling for products with an inbuilt screen. In 2016, Korea's Electrical Appliances Consumer Products Safety Control Act allowed e-labeling for cell phones, smart phones, and tablet computers. E-labels in Korea should include the basic symbol of the national integrated certification mark, identification code, the name of the company that has undergone conformity assessment, name of equipment, model name, manufacturing date, manufacturer and country of manufacture. The manufacturer needs to indicate to the user that the product uses e-labeling. The user should be able to access the information without any special access password or authorization procedure or separate device (such as a SIM card) and should be able to access the information through the menu of the device within three steps. The specific instructions on how users can access the information should be provided separately, such as in the user manual.

United States

In 2014, the U.S. Congress passed the Enhance Labeling, Accessing, and Branding of Electronic Licenses Act (E-Label act), which directed the Federal Communications Commission (FCC) to allow manufactures of electronic devices with a screen to display information required by the agency digitally—on the device's screen—rather than on a label affixed to the device.[28] The FCC is involved as it is responsible for the certification and labeling of radiofrequency devices, in order to verify compliance with the Commission's interference rules. FCC Commissioner O'Rielly outlined how the E-Label Act provides a number of benefits, including conveying more information to consumers than is conveyed through regular labels, while not undermining the FCC's certification process.[29] Most recently, in July 2017, the FCC released new orders that codify and expand the guidance it had previously issued on allowing e-labeling.[30]

FCC rules hold that all devices with an integral (non-removable) screen can now display an e-label digitally on that screen, and up to three steps deep into the device menu. The user manual must include information on accessing that FCC info, or it can be on the product's website. Users must be able to access the information without any special access codes or permissions, must not require any special accessories or plug-ins (e.g., a SIM card), and users must be provided with specific instructions on how to access the information, and in all cases, the information must be accessible in no more than three steps in the device's menu.[31]

In 2001, the FCC allowed manufacturers of software-defined radios (SDRs) to voluntarily use e-labeling. If the modular transmitter uses an electronic display, the FCC certification must be readily available and be visible on the device or on the device in which it is stored. The user manual must also include instructions on how to access the electronic display and a copy of these instructions must be included in the application for equipment authorization.

Relatedly, the U.S. Food and Drug Administration (FDA) is pioneering the concept of Internet-based product information for medical devices and their unique device identification (UDI) number. In 2008, Congress passed legislation calling for a unique device identifier system. The FDA now requires manufacturers, and in some cases distributors, to label each medical device or its packaging with a unique number that can be read by humans and machines (typically by a barcode). By inputting that code or scanning the barcode, providers should be able to get data about the product from the FDA's Global UDI Database, such as its serial number, lot number, and its manufacture and expiration dates. This builds on far-sighted rules introduced in 2002, through the Medical Device User Fee and Modernization Act (MDUFA), which allowed e-labels to provide all labeling information for prescription devices used in health facilities, but allowed that health care facilities could still require labeling in paper form.[32]

ENDNOTES

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