

# The Economic Costs of the European Union’s Cookie Notification Policy

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Browser cookies are a basic component of the modern Internet browsing experience. These small text files are sent from a website and stored in a user’s web browser while the user is browsing that website. They are used for many purposes, from the targeted advertising that keeps most websites free to the public, to providing authentication and security for users operating personal profiles on their favorite websites. In 2009, the European Union sought to regulate cookies as part of its “e-Privacy” Directive, forcing all European websites not only to post their cookie policies, but also to seek each visitor’s consent for the use of those cookies.<sup>1</sup> This report finds that the total annual cost of this law is \$2.3 billion dollars. This figure includes both compliance costs for European website operators and lost productivity costs. Given these costs and the law’s few demonstrated benefits, European policymakers should abolish this largely symbolic “feel good” law for the sake of the European digital economy.

## BACKGROUND

In 2009, the European Union (EU) modified its Directive on Privacy and Electronic Communications, also known as the “e-Privacy” Directive, to regulate browser cookies. The basic objection EU policymakers made to the use of cookies by websites is that some Internet users are unaware of their use and do not know how to control them, thus they may infringe on the user’s online privacy.<sup>2</sup> The Directive dictated that all 28 EU member states should pass laws requiring users to give informed consent before Internet content providers could use cookies that collect, store, or process consumer data.

A cookie is generally classified based on its lifespan and the domain to which it belongs. Based on lifespan, a cookie is either a session cookie, which is erased after the user closes his

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or her browser, or a persistent cookie, which remains on the device for a pre-defined period of time.<sup>3</sup> Cookies can also be classified by the domain; first-party cookies are used by the website that is visited by the user, whereas third-party cookies are stored by a different domain from the visited website. All of these classifications of cookies are subject to the e-Privacy Directive, which requires prior informed consent with “clear and comprehensive information” on these cookies.<sup>4</sup> The directive does exempt certain varieties of cookies based on their use according to the EU advisory body on data protection. Exempted cookies include user-input cookies, authentication cookies, user-centric security cookies, and various other kinds that deal with basic inter-website dynamics.<sup>5</sup> Websites not in compliance with these laws can face substantial fines.<sup>6</sup>

To comply with the directive, most European website operators have added a banner or pop-up notification about the website’s use of cookies. In many cases, users must click an “agree” button to use the website. Some countries do not require website operators to obtain explicit consent. For example, the UK’s Information Commissioner’s Office (ICO) allows website operators to use implied consent, i.e. they do not have to gain explicit consent from visitors to use cookies if their cookie notification message is visible.<sup>7</sup> While implied consent does not fully comply with the “e-Privacy” Directive, eight European countries operate their cookie notification policies with some form of these rules today.<sup>8</sup>

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This directive has been slow to take hold, with only three countries—Denmark, Estonia, and the United Kingdom—able to meet the initial rollout deadline of May 26, 2012 or to come close to meeting that date.<sup>9</sup> Furthermore, the disparate nature of the directive has not led to universal standards for cookies; rather, different policies have emerged regarding what each member state considers “clear and comprehensive information” on cookie use.<sup>10</sup> Therefore, member states have interpreted the e-Privacy Directive’s cookies in various ways. Some, like the Netherlands, have issued only general guidelines and left it up to marketers to interpret these requirements.<sup>11</sup> Others, like the United Kingdom, have drafted it into the legal system by amending already established laws, in this case the Privacy and Electronic Communication Regulations (PECR) Act 2011.<sup>12</sup> Still others, like Germany, have neither implemented the directive into local law nor offered any regulatory guidance.<sup>13</sup> This patchwork of different rules forces websites to be in compliance with multiple sets of rules that have varying standards if they wish to do business within the European Union.

## **ESTIMATE OF COST AND METHODOLOGY**

There have been several estimates of the cost of implementing the European Union’s Cookie law. A “Worst Case Scenario” report by consumer data platform Qubit predicted the UK economy alone could lose as much as £10 billion (\$15.9 billion).<sup>14</sup> The QuBits report postulates that if Internet users are continually asked to give consent each time they visit a website, new visitors will be discouraged from using from their websites. It also predicted negative effects to behavioral advertising and retail optimization, both of which could hurt the online marketing sector in Europe substantially. It is important to note this report came out prior to implementation of the law in the UK, and since that time the implementation of the law throughout the UK has changed dramatically. Another report by PricewaterhouseCoopers LLP estimated that this law’s opt-in requirement could

produce time costs for users in the UK between £190-235 million (\$303-375 million per year).<sup>15</sup>

### Estimated Cost for European Websites

This report will not focus on the laws' effects in a general sector or a particular country, but instead will look at its potential cost to websites and productivity throughout Europe should all web sites be subject to it. To estimate the total potential cost of compliance for European websites, we first estimated how many active websites could be subject to the e-Privacy directive. To do this, we gathered data regarding the total number of domains registered for each country code top level domains (ccTLDs) from the entities that manage each ccTLD as well as the Council of European National Top Level Domain Registries.<sup>16</sup> The following chart shows each country in the European Union with its corresponding ccTLD and number of registered domains. This estimate will undercount businesses operating in Europe with only a global top-level domain (gTLD), such as .com or .net, and no additional European ccTLD (e.g. bbc.com also operates bbc.co.uk so it would still be counted).

| Country        | Population | ccTLD | Number of Registered Domains |
|----------------|------------|-------|------------------------------|
| Austria        | 8,451,860  | .at   | 1,234,654                    |
| Belgium        | 11,161,642 | .be   | 1,478,373                    |
| Bulgaria       | 7,284,552  | .bg   | 37,855                       |
| Croatia        | 4,262,140  | .hr   | 85,766                       |
| Cyprus         | 865,878    | .cy   | 11,237                       |
| Czech Republic | 10,516,125 | .cz   | 1,158,375                    |
| Denmark        | 5,602,628  | .dk   | 1,266,915                    |
| Estonia        | 1,320,174  | .ee   | 78,037                       |
| Finland        | 5,426,674  | .fi   | 353,409                      |
| France         | 65,578,819 | .fr   | 2,819,217                    |
| Germany        | 80,523,746 | .de   | 15,781,017                   |
| Greece         | 11,062,508 | .gr   | 520,000                      |
| Hungary        | 9,908,798  | .hu   | 647,197                      |
| Ireland        | 4,591,087  | .ie   | 197,141                      |
| Italy          | 59,685,227 | .it   | 2,708,140                    |
| Latvia         | 2,023,825  | .lv   | 110,000                      |
| Lithuania      | 2,971,905  | .lt   | 166,978                      |

|                       |                    |     |                   |
|-----------------------|--------------------|-----|-------------------|
| <b>Luxembourg</b>     | 527,039            | .lu | 82,696            |
| <b>Malta</b>          | 421,364            | .mt | 15,000*           |
| <b>Netherlands</b>    | 16,779,575         | .nl | 5,503,073         |
| <b>Poland</b>         | 38,533,299         | .pl | 2,517,960         |
| <b>Portugal</b>       | 10,487,289         | .pt | 665,124           |
| <b>Romania</b>        | 20,020,074         | .ro | 635,226           |
| <b>Slovakia</b>       | 5,410,836          | .sk | 317,340           |
| <b>Slovenia</b>       | 2,058,821          | .si | 113,824           |
| <b>Spain</b>          | 46,727,890         | .es | 1,738,732         |
| <b>Sweden</b>         | 9,555,893          | .se | 1,312,994         |
| <b>United Kingdom</b> | 63,905,297         | .uk | 10,513,608        |
| <b>European Union</b> | 505,665,739        | .eu | 3,721,431         |
| <b>Total</b>          | <b>505,665,739</b> |     | <b>55,776,319</b> |

Figure 1: Populations and registered domain names for the European Union<sup>17</sup>

\*This is a rough estimate based on information on the proportions of ccTLDs in the top 1 million websites visited globally by traffic.<sup>18</sup>

Based on this data, the total number of domains registered in the European Union is 55,776,319. This number was reduced by 13 percent based on a 2012 Domain Name Industry brief, which estimates that only 87 percent of .com and .net domains that a user visits actually load as a website.<sup>19</sup> In addition, a single website could have many different pages all associated with the same domain. To account for this, the total was further reduced by 17.4 percent to account for the ratio of hostnames to active sites based on data from Netcraft's September 2014 Web Server Survey.<sup>20</sup> The 17.4 percent figure was derived from the ratio of active sites to hostnames.<sup>21</sup>

Using this calculation, the number of active, unique websites in the European Union was estimated to be 8,443,419 websites.

$$(55,776,319 \text{ ccTLD domains}) \times (0.87) \times (0.174) = 8,443,419 \text{ active websites}$$

We further discounted the number of active websites to account for websites that would likely not pay to become compliant, such as personal websites, holding pages, pay-per-click sites, and private (password-protected) sites. A report by EURid, the European registry in charge of .eu, found 37.8 percent of domains to be for businesses and 4.1 percent to be institutional websites.<sup>22</sup> These websites are likely to abide by the cookie notification policies. Therefore, we reduce the number of active and complying websites to 41.9 percent of all active websites.

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To ascertain total cost, we then multiplied this number by the estimated cost of compliance for each individual website (€900). This rough estimate of the cost of compliance is based on feedback from European colleagues, and includes the costs associated with legal advice, updates to privacy policies, and technical updates to websites.<sup>23</sup>

$$(8,443,419 \text{ active websites}) \times (0.419) \times (\text{€}900) = \text{€}3,184,013,305 (\text{\$}4,055,987,188)$$

Based on this data, the total projected cost of compliance for the e-Privacy Directive's cookie policy is approximately €3.2 billion (\$4.1 billion).

To get an equivalent annual cost estimate to the European digital economy, we then divided the total cost to websites (\$4.1 billion) by the average useful lifetime of a website (3 years).<sup>24</sup>

$$\text{\$}4,055,987,188 / 3 = \text{\$}1,351,995,729/\text{year} (\text{\$}1.4 \text{ billion/year})$$

There may also be additional upkeep and maintenance costs for European websites to continue complying with the law. These compliance activities can be done internally or contracted out to specialized companies. For example, some services monitor all first and third-party cookies on a website and adapt the website's cookie policies to each user's preference over time, as well as customize the cookie notification to individual users.<sup>25</sup> On the lower end of these maintenance costs, companies may only pay a few hundred dollars annually, and on the upper end, tens of thousands. These additional annual costs may be substantial, but we do not estimate them here.<sup>26</sup>

### Estimated Cost to European Internet Users

We also estimated the productivity cost of the e-Privacy Directive's cookie policy. In other words we estimated the time it takes EU website users to read and click on cookie notifications. To calculate for productivity we first had to account for both the Internet users who are in the active labor force and those who are either retired or inactive. Based on population and Internet usage data, we estimate that there are 207.1 million Internet users in the European Union's active labor force.<sup>27</sup> There are an estimated 84.2 million retired or otherwise not employed Europeans Internet users.<sup>28</sup> We assume that the average adult Internet user visits 92 unique websites per month. The benchmark of 92 websites was chosen based on a 2013 Nielsen report that reviewed the browsing behavior of U.S. Internet users. Similar metrics could not be found for EU member states, but there is little reason to suspect it will differ substantially.<sup>29</sup> To account for possible variation between the United States and Europe, as well as users visiting the same domain each month (and therefore not needing to re-read and re-click the cookie notice), we discounted this number by 50 percent.

#### Active Labor Market

$$(207,100,000 \text{ users}) \times (92 \text{ domains/month}) \times (0.5) = 9,526,600,000 \text{ websites/month}$$

### Inactive Labor Market

$$(84,200,000 \text{ users}) \times (92 \text{ domains/month}) \times (0.5) = 3,873,200,000 \text{ websites/month}$$

We assume it takes European Internet users at least 2 seconds to notice, read and click on the cookie notification. This benchmark is conservative because some users may take longer to read the notification if it appears in a text pop up, while others may ignore the message altogether (as is the case with the implied consent regime in the UK).

### Active Labor Market

$$(9,526,600,000 \text{ websites/month} \times 2 \text{ seconds}) / (3,600 \text{ seconds/hour}) = 5,292,555.6 \text{ wasted hours/month}$$

### Inactive Labor Market

$$(3,873,200,000 \text{ websites/month} \times 2 \text{ seconds}) / (3,600 \text{ seconds/hour}) = 2,151,777 \text{ wasted hours/month}$$

We calculate the productivity lost based on the number of wasted hours and the median gross hourly earnings for an individual living in the European Union. Based on Eurostat, the European Commission's statistics database, the median gross hourly earnings is €12 per hour.<sup>30</sup> We conservatively estimate that working adults spends half their Internet time at work and half in leisure. To calculate the productivity cost for leisure, we used a discounted hourly wage. This type of discount has been used to measure economic costs of personal time, such as time spent in traffic. For example, personal travel time is usually estimated between 25 and 50 percent of prevailing wages, based on a variety of factors such as distance, traveler, and road conditions.<sup>31</sup> Using this metric as a guide, we selected a 50 percent discount for this hourly wage to account for leisure. We then applied this discount to both the portion of time wasted by workers (half as previously mentioned), and to all of the time wasted by non-workers.

### Active Labor Market

$$[(0.5) \times (5,292,555.6 \text{ hours wasted}) \times (\text{€}12/\text{hour})] + [(0.5) \times (0.5 \text{ leisure}) \times (5,292,555.6 \text{ hours wasted}) \times (\text{€}12/\text{hour})] = \text{€}47,633,000 \text{ lost/month}$$

### Inactive Labor Market

$$(0.5 \text{ leisure}) \times (2,151,777 \text{ hours wasted}) \times (\text{€}12/\text{hour}) = \text{€}12,910,662/\text{month}$$

We then combined these values to solve for the amount of lost productivity for Europeans each month.

$$(\text{€}47,633,000 \text{ lost/month}) + (\text{€}12,910,662/\text{month}) = \text{€}60,543,662/\text{month}$$

Based on this data, the projected productivity cost of the EU cookie policy for Europeans each year is just over €726 million or \$917 million.

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*The European Union should act expeditiously to rollback this burdensome, vexatious directive for the good of its digital economy and the ease of web surfing of its citizens.*

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## Combined Total Annual Cost

Combined, the compliance costs and the productivity costs of the e-Privacy Directive's cookie policy total approximately \$2.3 billion dollars per year if most websites were to comply with the law. It is important to note that these figures are all approximations with a large margin of error. Many of these benchmarks were derived from numbers that are associated with data from the United States or ".com" websites rather than only European ccTLDs. We attempted to account for this potential weakness by employing conservative assumptions.

## COOKIE POLICY OFFERS FEW BENEFITS

Not only is the EU privacy directive's cookie policy costly, it also offers few to no benefits for EU citizens. In fact, by raising costs for website operators, it reduces the revenue available to develop quality online content and services for consumers. First, by requiring websites to notify users of all HTTP cookies, the policy may discourage many uncontroversial uses of cookies such as for personalization to improve users' online experiences. Businesses, for example, may decide not to include personalization features rather than pay the compliance costs. Second, even when cookies are used to deliver targeted advertising, this largely benefits consumers with better ads and website owners with higher revenue they can use to provide higher quality consumer experiences. Third, the policy has had little positive effect on users' online privacy. In part, this is because Internet users often do not read privacy notices because they are too boring, too long, or too hard to understand.<sup>32</sup> A 2011 study from across the European Union showed that 41 percent of users say that they do not read privacy notices on websites, and this number is likely conservative given survey bias.<sup>33</sup> Fourth, users have filed few complaints about how websites are using cookies. The UK's ICO received only 38 complaints regarding cookies between April and June of 2014, compared to 9,000 complaints for automated sales calls during the same period.<sup>34</sup> Answering this trifling number of complaints is not worth the law's financial burden given the fact that the ICO also has noted that the majority of cookie complaints are "vexatious, personal, and time wasting."<sup>35</sup>

Finally, the EU's cookie policy may impose indirect costs on businesses and consumers. Online advertising pays for the majority of the free and low-cost content available on the Internet.<sup>36</sup> Since targeted ads are more effectiveness than non-targeted ads, advertisers are willing to pay more for that advertising. If websites reduce the use of targeted online advertising in response to this policy, there will be less advertising money available to support free and low-cost European content and services.

## CONCLUSION

Several European Union and member state policymakers have begun looking at the cost-benefit analysis of this law a few years after its original implementation. On September 12, 2014, the new president of the European Commission, Jean-Claude Juncker, sent a letter to the new EU commissioner for digital economy and society (Günther Oettinger), requesting that he reform the e-Privacy Directive.<sup>37</sup> Additionally, the UK's ICO will also review its implementation of this directive in 2015. So far this law has offered few benefits to compensate for the quite significant direct and indirect costs outlined in this report. As

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the European Union and its member states begin to revisit the e-Privacy directive, they should recognize that continuing to implement this cookie law is costly both to economic productivity and individual European websites. As this report shows, the EU's cookie law imposes a cost to its citizens of \$2.3 billion dollars per year. Furthermore, if the ICO's experience is any sign of this law's public mandate, it is unwanted in Europe as well. The European Union should act expeditiously to roll back this burdensome, vexatious directive for the good of its digital economy and the ease of web surfing by its citizens.



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## ENDNOTES

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## ABOUT ITIF

The Information Technology and Innovation Foundation (ITIF) is a Washington, D.C.-based think tank at the cutting edge of designing innovation strategies and technology policies to create economic opportunities and improve quality of life in the United States and around the world. Founded in 2006, ITIF is a 501(c) 3 nonprofit, non-partisan organization that documents the beneficial role technology plays in our lives and provides pragmatic ideas for improving technology-driven productivity, boosting competitiveness, and meeting today's global challenges through innovation.

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