



# Environmental Impact of Online Billing Compared with Paper Billing

## Life Cycle Assessment Summary Report

**Smarter, greener, together**

Prepared by Telstra Corporation Ltd, based on a report by URS  
Australia Pty Ltd

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## Introduction

Climate change is one of the biggest issues of our time. Telstra has been playing an active role in the climate change debate both nationally and internationally for some time. Telstra's approach includes:

- demonstrating how use of telecommunications technologies can help reduce greenhouse gas emissions
- proactive strategies for managing Telstra's own environmental impacts, including those impacts associated with greenhouse gas emissions and energy consumption and production
- a strong emphasis on the benefits of abatement through conservation of resources rather than over-reliance on offsets and accounting mechanisms.

Telstra recognises that many of its customers are concerned about global warming, and are looking for ways to reduce their carbon emissions. Telecommunications services and the online world present many opportunities for individuals and businesses to reduce their carbon footprint, and minimise their environmental impact.

It is widely assumed that the provision of customer bills online, Online Billing (OLB), produces fewer carbon emissions, and has a lower environmental impact than that associated with printing and posting bills on paper. There are obvious savings of paper by using an online bill; however, paper use is only part of the overall picture. Behind the scenes, other factors contribute to the environmental impact of both billing methods. For example, computer servers and home computers use electricity to generate and access online bills. Electricity, fuel and printing consumables are used to print paper bills and distribute them by postal services.

A recent study conducted by Telstra's Corporate Environment Group for its Online Billing Transformation Team, in conjunction with environmental consultants, URS Australia Pty Ltd. used a life-cycle approach to investigate the assumption that online billing had a lower environmental impact than paper billing. The study also sought to provide additional insights into the broader environmental impacts and benefits of online billing. The *Online Billing Life Cycle Analysis* report on that study was prepared by environmental consultants URS Australia Pty Ltd. This is a summary of that report.

## Methodology

The Life Cycle Assessment (LCA) methodology used in the study is a rigorous technique for assessing the environmental inputs and impacts associated with a product or process. The method is guided by an ISO Standard (14040 Series<sup>1</sup>) and requires a peer review by an internationally recognised expert<sup>2</sup>. The study considered inputs such as energy and material use, to compare the environmental impacts of online billing and paper billing associated with:

- bill preparation;
- bill distribution; and
- use of the bill by the customer.

The LCA process was also employed to identify the most significant contributing factors that influence the environmental impact of the two billing methods.

The study used Telstra's billing platform and customer base numbers as the basis for its calculations, and the findings cannot be extrapolated to other businesses of a different customer size or nature, except in general terms.

## Results

The study found that if one million of Telstra's individual consumer customers<sup>3</sup> elected to receive their bills online, rather than on paper<sup>4</sup>, there would be environmental benefits of:

- annual savings of 226,800 kg CO<sub>2</sub> (greenhouse gas emissions);
- annual savings of 39,000 reams of paper; and
- reduced environmental impacts for land use, human toxicity<sup>5</sup> and resource use.

The study also found the three critical factors that influenced the level of environmental impact were:

- the number of customers who elect to receive their bills online;
- the energy used by the internet servers that housed the online billing data; and

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<sup>1</sup> AS/NZS ISO 14040:1998, AS/NZS ISO 14041:1999, AS/NZS ISO 14042:2001, AS/NZS ISO 14043:2001 and AS/NZS ISO 14048:2003 <http://www.iso.org/iso/home.htm>

<sup>2</sup> For this report the experts were Sven Lundie & Greg Peters, Centre for Water and Waste Technology, School of Civil and Environmental Engineering, University of NSW.

<sup>3</sup> As opposed to business or government customers

<sup>4</sup> This assumes that online customers receive an online bill only, have turned off their paper bill and that 50% print their online bill at home. Each bill consists of 6.5 pages (or 3.25 sheets of paper printed double sided) and customers receive 12 bills per year.

<sup>5</sup> The effects of toxic substances on the human environment. In this model the toxic substances include compounds such as arsenic, chromium, IV and polycyclic aromatic hydrocarbons (PAH).

- the number of customers who receive their bill online, and print their bill out on local printers

The first two factors were interrelated. The more customers who elect to receive their bill online spreads the energy consumption of the data servers over a larger number, with a critical “break-even” threshold to deliver a net environmental benefit.

The study compares production of an online bill (assuming the online billing system is fully utilised), with an equivalent number of paper bills. The study then compares what happens if the online billing system is not fully utilised. In the Telstra example which was the basis of this study, it was found that there needs to be a minimum of 70 per cent of customers receiving an online only bill (with 50% of those customers printing at home) for there to be an environmental benefit.

The study also found customers who print out their bill after retrieving it online, negate some of the benefits of online billing. The study found that if more than 95 per cent of the customers who receive their bill online, print their bill out on local printers, there is no environmental benefit. This is due to the associated environmental impact of printing and recycling the customer’s locally printed bills – assuming they do recycle the paper.

### **Where do the savings come from?**

The study shows that the key greenhouse gas impact of the paper bill is due to the printing and sorting equipment as well as the paper manufacture and delivery. The key greenhouse gas impact of the online bill is due to the energy used for servers and use of the customers’ home computer and printer. By changing to an online bill there is a lesser greenhouse gas impact as illustrated in the base case<sup>6</sup>.

The paper savings relate to the paper avoided in printing the bill. However, an allowance is made for 50 per cent of online bill customers who may elect to print their bill at home. For business customers who have bills with more pages than that of the average consumer, the environmental benefit of using an online bill will be proportionally greater. As an example a Wholesale customer bill is equivalent to 30.8 consumer bills in terms of number of sheets of paper, and the impact is proportionally greater.

### **Conclusion**

There is an environmental benefit of using an online bill based on the scenario outlined in the study. The greatest benefit is obtained when the greatest number of customers are using an online only bill and are not printing out their bill at home.

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<sup>6</sup> Assumes that online customers receive an online bill only, have turned off their paper bill and that 50% print their online bill at home. Each bill consists of 6.5 pages (or 3.25 sheets of paper printed double sided) and customers receive 12 bills per year. Also assumes online billing server system is functioning at its designed capacity.

## Explanatory Notes and Data

This table shows the assumptions made that form the basis of this study.

### Online Billing - Explanatory Notes and Data

|   |           |
|---|-----------|
| Basis of calculations                     |           |
| Number of consumer customers <sup>3</sup> | 1,000,000 |
| Sheets of paper per bill <sup>7</sup>     | 3.25      |
| Bills per year per customer               | 12.0      |

Other assumptions:

- Online customers receive an online bill only, have turned off their paper bill
- 50% of online customers print their online bill at home
- Each bill consists of 6.5 pages (or 3.25 sheets of paper printed double sided)
- The online billing server system is functioning at its designed capacity.

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<sup>7</sup> There are two printed pages per sheet of paper i.e. double sided printed