



## Electronics Case study E-Recycler, Ltd.



E-Recycler Ltd. is a small electronics recycling company with a staff of 6, located in Newport, Wales

(<http://www.erecycler.co.uk/>). E-

Recycler is dedicated to manual dismantling of e-waste and refurbishment of used IT equipment. Tim Hourahine, the company owner, is passionate about saving resources for the Welsh economy, and the term circular economy is not a theoretic vision for him and his company but his daily business. Under these circumstances Tim was already convinced, that environmental facts and figures matter for him when he was approached by the "LCA to go" team.



Dominique Lyons, EDC, and Karsten Schischke, Fraunhofer IZM, met Tim at his place in Newport and familiarized him with the approach of "LCA to go". Being



asked, which product might be a typical one for refurbishment and resale he picked out a Dell Personal Computer. E-Recycler takes back such devices from business customers, cares for professional data erasure of the hard disks, cleans and checks the machine and installs a new operating system. For the carbon footprint assessment he chose the scenario, that a six years old PC is refurbished at his workshop and sold again for a hypothetical additional 3 years lifetime, thus quantifying the carbon emission savings of extended product lifetime versus buying a new machine after 6 years. Consequently a PC refurbished once replaces 1.5 new machines.

Within less than an hour the required data has been compiled to make a first assessment of the Dell PC. Materials are identified by optical inspection and weights of chassis and heatsinks have been estimated. It turned out later in the light of the assessment results, that the impact of these bulk materials is not the main contributor to the overall carbon footprint and an estimate is justified. Deep level dismantling for weighing parts more precisely is however only a question of time. CPU type, memory capacity and HDD size are easily accessible parameters, ATX board and graphics card are exactly those, which are already modelled as background datasets in the tool and thus can be entered without further adjustments. The rating of the power supply is given in W on the label, not as VA, which is the scaling parameter in the tool, but not exactly the same as wattage: In case of power supplies with power factor correction, both values are almost identical, but for those without power factor correction the VA rating might be significantly larger than the Watt rating. As an approximation however the output wattage can be taken for the assessment.

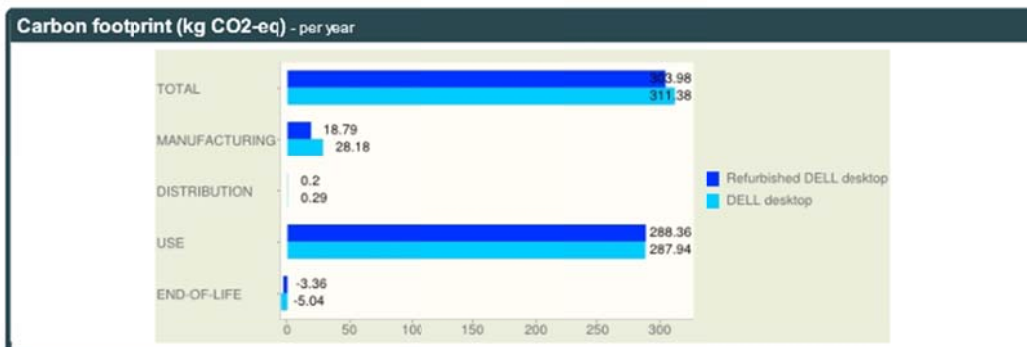


The calculated total carbon footprint of a desktop PC really surprised Tim: Although he has a sound technical understanding and although the environment matters to him, he was not at all aware, that the carbon footprint of computer products is so high, actually it could be as high as 1.8 tons CO<sub>2</sub>-eq. for a desktop PC over 6 years. The use phase is clearly dominating, but not really relevant for the refurbishment scenario as long as a system of similar computing power and energy efficiency is replaced by a refurbished unit. The manufacturing impact can be allocated to a longer lifetime, so is decreasing per year of use as depicted in the results graph below. Considering that 1 refurbished computer replaces 1.5 new ones, the carbon footprint saving of each refurbishment is roughly 80 kg of greenhouse gas emissions savings.



Organisation: E-Recycler  
Author: Tim  
Name of the product: Refurbished DELL desktop  
Version of the product:  
Description of the product:

### Comparison





Picking up a larger amount of IT products regionally with a van slightly adds to the carbon footprint of PC refurbishing, which is covered in the phase calculations, but does not really affect the overall results.

As E-Recycler also refurbishes some robust business laptops for a brand name customer Tim intended to go for another assessment of these products and their refurbishment right after the initial training on the "LCA to go" tool. The positive effect of refurbishing those laptops is expected to be even more significant, as they come back already after 2 to 3 years and as the life cycle impacts are much more dominated by the manufacturing phase, much less by the use phase. As a meeting with the representative of this brand name company was scheduled few days later, Tim recognized the opportunity to use such carbon savings arguments right away in talks with his business partners: "It's a magnificent tool, because we can answer the questions we get already right now." Tim does not only see a potential to communicate in this way with OEMs, but also with representatives of the Welsh administration to stress the importance of a circular economy.