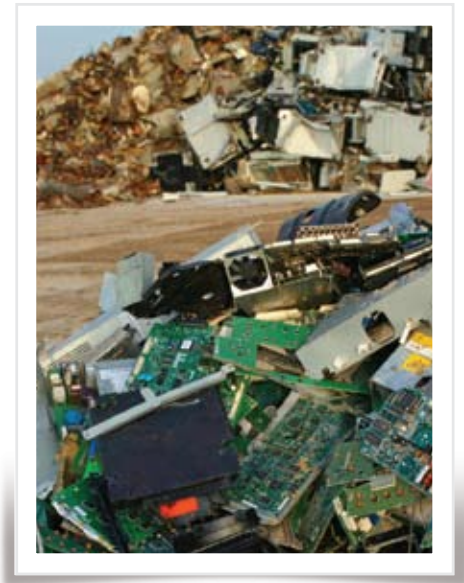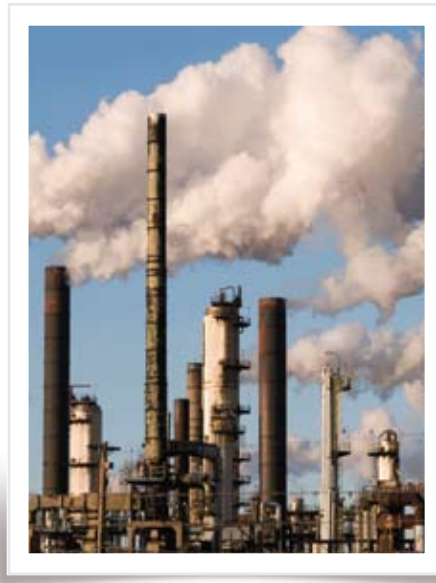# Lower the environmental impact of computing

*Traditional computing has a significant impact on the environment.*

Introduction

Today's PCs are far more powerful than the earliest room-filling computers. They also use less electricity. Arguably the first general-purpose computer, ENIAC drew roughly 150,000 watts of electricity. By comparison, today's PCs consume about 110 watts. That seems small. But there was only one ENIAC — and there are 850 million PCs in use today.

> *850 million PCs consume an immense amount of electricity. Most of it is provided by burning fossil fuels. This process emits pollutants, sulfur, and carbon dioxide into the atmosphere. These emissions cause respiratory disease, smog, acid rain, and global climate change.*

From the largest scale—the earth—to the smallest scale of a classroom or an office, the environmental impact of today's PC architecture is a huge and growing problem. Unfortunately, the impact is largely unaddressed and often unrecognized. In addition to massive power use, tens of millions of PCs are disposed of in landfills and garbage dumps around the world contaminating the soil with toxic e-waste substances like mercury and cadmium.

NComputing access devices consume 90% less energy than a PC.
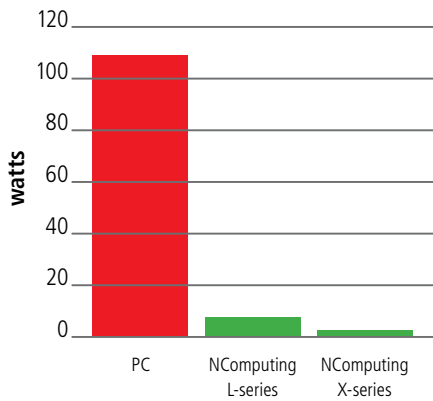
NComputing—an architecture that changes the green equation

NComputing systems are a major leap forward in green computing. More than 15,000 organizations in over 80 countries have used NComputing to slash their carbon footprint and electric consumption.

The NComputing solution is based on a simple fact: today's PCs are so powerful that the vast majority of applications only use a small fraction of the computer's capacity. NComputing's virtualization software and hardware tap this unused capacity so that it can be simultaneously shared by multiple users.

The NComputing virtualization software works on a standard Windows or Linux[1] PC. Each user's monitor, keyboard, and mouse connect to the shared PC through a small and durable NComputing access device. The device itself has no CPU, memory, or moving parts—so it is easy to deploy and maintain. It also consumes very little power.

Share 1 PC with up to 30 users with NComputing virtual desktops.

"**They were genuinely** excited to learn that CO_2 emissions were being reduced by as much as three and a half tons per year, and electricity use was cut by more than 5,000 kilowatt hours per year."

DAVE HLADY, IT SPECIALIST
ROCKY MOUNTAIN SCHOOL
DISTRICT #6

Referring to the energy savings that resulted from the installation of the NComputing solution at Lindsay Park Elementary.

Consumes 90% less energy per user

PCs typically consume between 110 to 200 watts of electricity. In contrast, NComputing access devices consume next to nothing. In fact, NComputing's L-series devices consume 5 watts per added user and the X-series consume just 1 watt per added user. If you replace seventy PCs with ten PCs attached to sixty NComputing X-series access devices, you would save over 10,000 kilowatt-hours (kWh), which translates to over 1 metric ton of CO_2 emissions per year.

# Air conditioning—the hidden environmental cost

A single PC generates more heat than a 100 watt light bulb. A classroom, computer lab, or office with PCs warms up very quickly. In fact, PC-filled work areas almost always have to be air conditioned. Air conditioners raise electricity costs and require large capital expenditures to buy, install, and maintain them. In comparison, a room equipped with PCs and NComputing access devices generates 90% less heat and does not require additional air conditioning.

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1   Please refer to the Microsoft operating system licensing requirements and technical details at www.ncomputing.com/mslicensing. Specific Linux support information is available in the NComputing Knowledge Base.

Annual energy consumed
(850 million seats)
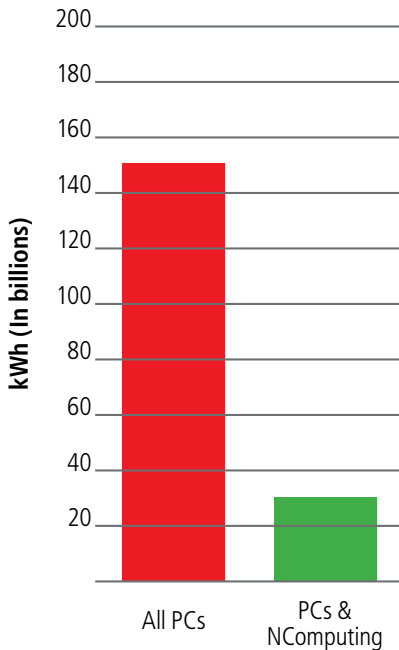
Annual CO$_2$ emissions
(850 million seats)
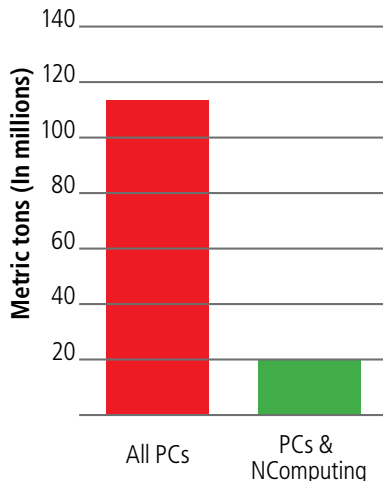
98% less e-waste in landfills

Electronic waste is a large and growing problem throughout the world. People rarely think of their PCs in the same way that they think of other toxic waste, but while electronic waste represents only 2% of trash in landfills, it represents 80% of the toxic waste. NComputing greatly reduces the magnitude of this problem.

- In sheer weight, PCs generate much more waste than virtual desktops. A typical PC weighs about 21 pounds (9.5 kg); an NComputing access device weighs about 1/3 of a pound (0.15 kg), for a 98% reduction in electronic waste.

- An NComputing access device also has a much longer useful life than a PC. When a shared PC is replaced with a newer one, the PC may go to a landfill, but the NComputing users can keep their access devices and enjoy the boost in performance from the new PC. So whereas PCs might be upgraded every three years or so, access devices could easily last five years or more. With less frequent turnover, less equipment ends up in landfills.

- NComputing access devices are also compliant with RoHS regulations. Which restrict the use of lead and other harmful metals.

Global impact

Over 850 million PCs are turned on every day. If NComputing systems were used instead (at a ratio of six access devices to each PC) there would be substantial immediate and long-term environmental benefits—as shown in the accompanying charts. The impact on the environment of adopting NComputing solutions would be enormous.

- Energy use would decline by over 120 billion kilowatt-hours (kWh) per year, or about 83%.

- The electricity usage decline would save nearly 15 million metric tons of coal each year and would eliminate the need for 120 megawatts of coal power capacity.

- CO$_2$ emissions would decrease by 96 million metric tons. This is equivalent to planting nearly 460 million trees.

- Disposing of NComputing devices (0.33 lb each), rather than disposing of an equal number of PCs (21 lbs each) would save over 6.7 million metric tons of e-waste.

And that is just for the PCs in use today. There are another billion users who will join the digital world in the coming decade. So to get a feel for the ultimate global impact of NComputing, just double all of the numbers above.

Calculate your energy & cost savings

You may not control millions or even thousands of seats. But even if you just control a few hundred, you can make an impact. For example, 500 seats would save over 70,000 kWh and reduce 9 metric tons of CO_2 emissions per year. At the end of the useful life, you will have to dispose of only one metric ton of e-waste instead of five metric tons.

Using NComputing is obviously globally responsible. But it is also locally responsible—to your budget. Because of the extreme reduction in electrical consumption, the devices can pay for themselves just by lowering your electricity bill in as little as a year. To find out how much you would save, use the calculator at ncomputing.com/greenadvantage.

Think globally, act locally

In these times of high energy costs and climate change, we all need to think strategically about how to minimize costs and conserve energy. A major cost of running an organization comes from supporting the PC infrastructure.

Virtual desktop computing based on NComputing saves money up front and over time. NComputing consumes less power, generates less heat, lasts longer, and produces less e-waste, all while delivering a rich PC experience. Ultimately, the NComputing green advantage helps organizations pursue their missions while they lessen their environmental impact.

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