The first carbon-neutral computer lab in Canada uses NComputing virtual desktops

Lower the Environmental Impact of Computing

Drastically and Easily; in Two Critical Areas

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 less than 200 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 office, the environmental impact of today's PC architecture is a huge and growing problem. Unfortunately, the impact is largely unaddressed and often unrecognized. For example, most CIOs calculate the capital spent on hardware and software, but rarely consider the costs of powering systems and related air conditioning expenses. In 2006—according to the research firm IDC—while businesses spent nearly $55 billion on new servers, they also spent close to $29 billion to power and cool them.

An Architecture that Changes the Power Equation

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.

NComputing
Green Advantage

- *Most office workers use less than 5% of their PC's CPU capacity.*

The NComputing virtualization software works on a standard Windows or Linux 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.

Use 90% Less Energy Per User

- *NComputing access devices consume 95% less energy than PCs*
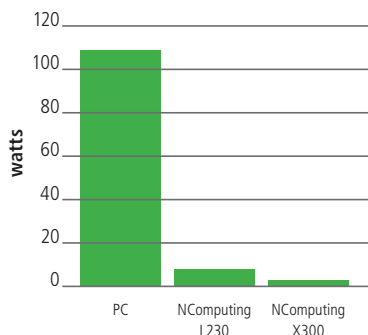
PCs typically consume between 110 to 200 watts of electricity. In contrast, NComputing access devices consume next to nothing. In fact, NComputing's L-series products consume 5 watts per added user and the X-series products consume just 1 watt per added user. If you replace 7 PCs with 1 PC attached to 6 NComputing X300 access devices you would save over 654 watts.

NComputing systems are a major leap forward in green computing. More than 15,000 organizations in over 70 countries have used NComputing to slash their computing costs by as much as 70% and electric consumption by 90%.

Air Conditioning

- *NComputing access devices generate 95% less heat than a PC.*

A single PC generates more heat than a 100 watt light bulb. A classroom, computer lab, or office with 30 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 5 PCs and 6 NComputing access devices generates 90% less heat and does not require additional air conditioning.

NComputing®

* *NComputing access devices generate 98% less e-waste than a PC.*

E-Waste

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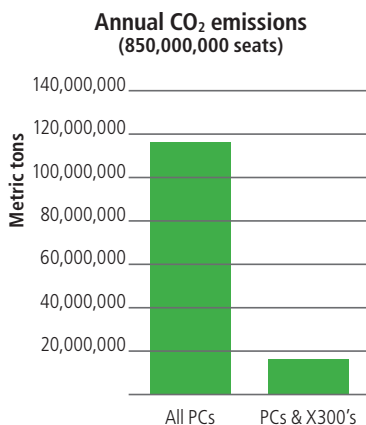
* In sheer weight, PCs generate much more waste than virtual desktops. A typical PC weighs about 21 pounds (9.5 kg); an NComputing access device weighs about 1/3 of a pound (0.15 kg), for a 98% reduction in electronic waste.

* 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 harmful substances such as lead, mercury, and cadmium.
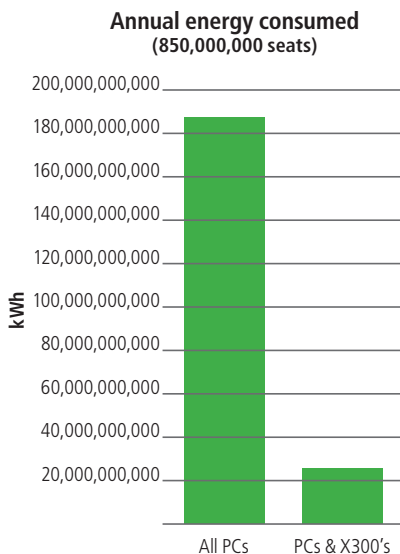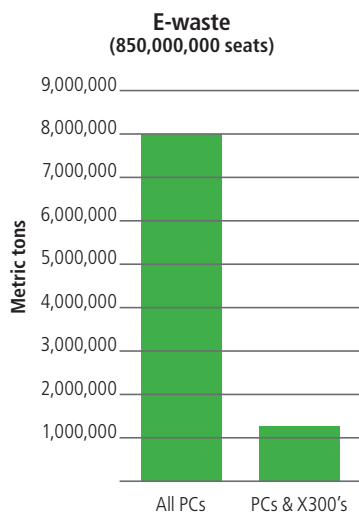
Global Impact

Over 850 million PCs are turned on every day. If NComputing systems were used instead (at a ratio of 6 access devices to each PC) there would be substantial immediate and long-term environmental benefits—as shown in the accompanying charts. The overall impact on the environment of adopting NComputing solutions would be enormous.

* The global consumption of energy by PCs would decline by nearly 160 billion kilowatt-hours (kWh) per year, or roughly 85%.

* A 160 billion kWh annual decline would save nearly 22 million metric tons of coal each year and would eliminate the need for eighty 1,000 megawatt (MW) coal power plants.

* A 160 billion kWh annual decline in energy consumption lowers the global emission of CO_2 by 100 million metric tons each year.

* Disposing of 728.6 million 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.

* Reducing CO_2 emissions by 100 million metric tons annually is equal to planting nearly 600 million trees or preserving over 820,000 acres of forest each year.

Annual energy consumed
(850,000,000 seats)

Annual CO_2 emissions
(850,000,000 seats)

NComputing ®

E-waste
(850,000,000 seats)

Metric tons	
9,000,000	
8,000,000	
7,000,000	
6,000,000	
5,000,000	
4,000,000	
3,000,000	
2,000,000	
1,000,000	

All PCs   PCs & X300's

If you are located in an area where electricity is unreliable and you therefore need uninterruptible power supplies (UPS) for your PCs, you will save even more with NComputing. With the NComputing X-series, power to the access devices is provided by the shared PC, so a separate UPS for each user is not necessary. This reduces the costs associated with UPS devices by as much as 85%.

And that is just for the PCs in use today. There are another billion more users who cannot afford PCs today, but who will join the market as virtual computing brings the prices down further and further. So to get a feel for the ultimate global impact of this breakthrough technology, 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 90,000 kWh and 59 metric tons of CO_2 emissions per year and 4 metric tons of e-waste.

Using NComputing devices is obviously globally responsible. But it is also locally responsible—to your budget. Because of the extreme reduction in electrical consumption, they 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 online calculator at www.ncomputing.com/green.

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 access devices saves money up front and over time. They consume less power, generate less heat, last longer, and produce 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 with dramatically less e-waste and electricity usage.