



# Greener Businesses Through Information Technology

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# Introduction

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## The Case for Greener Businesses

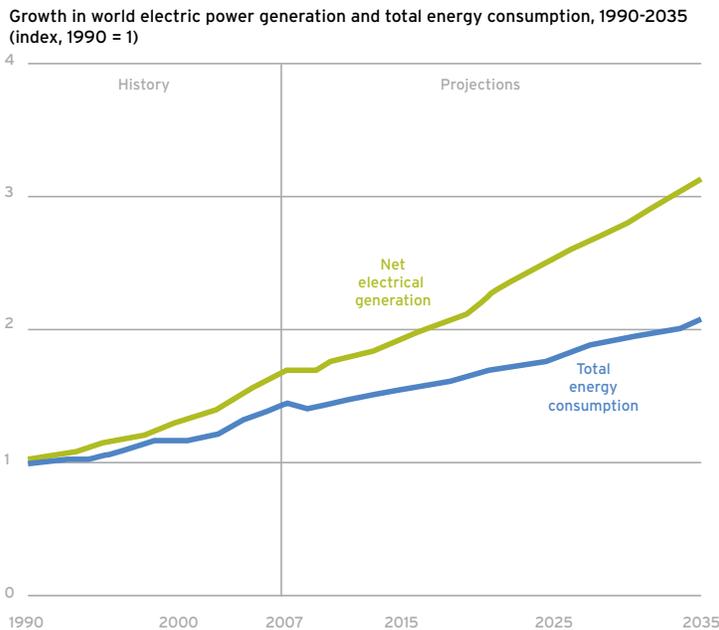
Carbon dioxide, methane, and nitrous oxide are known collectively as greenhouse gases, and are directly linked to climate change on the Earth. In sufficient quantities, these gases can trap heat that would normally dissipate into space, causing a rise in temperatures.

The chief concern for environmental scientists and analysts across the globe, however, is the rampant increase in the main contributor to climate change: carbon dioxide (CO<sub>2</sub>). Scientists have linked the rapid rise of CO<sub>2</sub> over the last half century to the depletion of the ozone layer and to global warming. Furthermore, scientists estimate that 80 percent or more of all greenhouse gases are caused by the burning of fossil fuel. While many people equate fossil fuel consumption primarily with automobile and other means of transportation, by far the greatest contributor of greenhouse gas emissions is gas, oil, and coal-fired electric generators.



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Meanwhile, the demand for electricity continues to grow, worldwide. Estimates are that global demand will increase 2.3 percent per year, on average, from 2010 through the year 2050<sup>1</sup>. While this increase seems modest, it will mean a further 300% increase in greenhouse gas emissions given the current technologies and power generation trends.



As a result of the dangerous increase in greenhouse gas emissions, governments, corporations, and developers are investing more and more resources into short-term cleaner energy solutions such as clean coal, safer nuclear power plants, and higher efficiency natural gas alternatives. Longer-term clean energy solutions include renewable power resources such as wind, solar, geothermal, and tidal generation, all of which are also undergoing large-scale research, development, and initial deployment. Regardless of whether power generation is provided by cleaner, short-term generators or by renewable power technologies, the cost of electricity will continue to rise with demand.

To keep prices low and supply plentiful, businesses and governments cannot sacrifice the environment for short-term economic gain, yet they also cannot hamper their economies by eliminating jobs that rely on abundant power. For these reasons, businesses are seeking ways to use energy more efficiently, thereby helping reduce overall power consumption and contain rising energy prices.

*Companies worldwide are asking:  
How do we cut energy costs, reduce  
our carbon footprint, yet continue to  
grow our business?*

# Energy Efficiency Creates Competitive Advantages

*The bottom line is threefold: Energy-efficient businesses save money and protect the environment, but are also strategically positioned to outperform their competition.*



Besides the obvious environmental advantages to reducing fossil fuel consumption, lower expenditures on any energy have an immediate effect on a company's bottom line. In fact, companies should view energy efficiency as a competitive business advantage as well as a cost-savings: the California Efficiency Partnership found that companies that employ energy-saving strategies in their companies outperform their competitors by 10 percent<sup>2</sup>. This higher productivity level goes beyond simple cost-cutting. Companies with proactive energy policies are more motivated and better strategically positioned than competitors.

According to a report by industry analysts, businesses must begin to look at cost management in a far broader sense, incorporating comprehensive energy management. From the intense electricity demands of data centers to manufacturing shop floors, businesses can gain strategic marketplace advantage with better energy management.

Bottom line savings in energy are the direct result of these comprehensive energy management plans, but companies that strategically streamline their facilities and businesses to be more energy efficient are also likely to find additional infrastructure savings. Moreover, all these savings are compounded every month and every year, making them exponentially more profitable than their competitors over time. In short, smart energy management leads to higher profits.

Companies that ignore their carbon footprint and energy expenditures are less productive and less profitable. One of the first steps companies can make to improve energy management and can potentially save billions of tons in carbon emissions worldwide is improved information technology services, according to analysts at Pike Research.

# Better IT, Less CO<sub>2</sub>

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**Competitive, responsible companies have begun saving energy costs and creating greater workforce efficiencies by adopting recent breakthroughs in smarter information technology (IT) services.**

Some of these IT innovations are a natural progression in business computing techniques, while others are a direct result of research and development to better utilize computing resources. Regardless, breakthroughs in energy-efficient computing are a welcome answer to sobering environmental statistics. For example, according to the U.S. Environmental Protection Agency, U.S. data centers alone consumed about 61 billion kilowatt hours of electricity in 2006 at a cost of \$4.5 billion. Worldwide consumption of electricity for computing purposes produces trillions of tons of carbon dioxide<sup>3</sup>. Partially in response to these high energy costs and horrendous greenhouse gas emissions, IT leaders have identified three major technology areas with the greatest promise in saving the environment through energy conservation.

These three eco-friendly technology groups are:

- Teleconferencing
- Data Centers
- Cloud Computing and Virtualization

Aside from the recent introduction of more energy-efficient computers, routers, printers, and monitors, these broader corporate computing strategies show the greatest promise in reducing energy costs and the environmental impact of computing systems now and in the future. As proof, the IT industry itself, despite its continued growth, has reduced its own greenhouse gas emissions over the last three years, largely because of widespread adoption of these three “green” technologies and their energy efficient data center construction. ***Companies outside the IT industry are just now fully leveraging these computing techniques and strategies to eliminate billions of tons of carbon emissions and save millions of dollars in energy costs.***

# Teleconferencing

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## In business there is no substitute for face-to-face meetings.

People need to put names to faces, and see whom they are conducting business with—it is a natural human instinct. But such meetings are expensive. Travel, lodging, lost job time, and reduced productivity are just a few of the costs. The biggest expense in terms of damage to the environment is travel.

Travel has a greater carbon footprint than many people imagine. Not only does travel literally burn energy during transportation, but lodging, meeting room accommodations, and meals on the road also add to the energy costs associated with face-to-face meetings. Live video sessions can drastically cut energy costs by eliminating travel entirely.

The main objection to teleconferencing, however, is the lack of clear, crisp video connections between participants. The need for concurrent presentations during video presentations has also been a complaint and drawback to teleconferencing in the past. Teleconferencing technology has matured significantly in the last five years, however, with higher quality systems offering a reliable and pleasing alternative to long-distance travel.



# Data Centers

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**Over the past 20 years, companies traditionally added more servers, more applications, and more desktops as their businesses expanded.**

The result has been a tremendous number of computers and applications as well as a much larger workforce to maintain and service this ever-increasing number of computers and resources. Companies have come to expect that business expansion means spending more on computing. Smart companies have found there is a better way – data centers. By consolidating all servers, applications, and management into one central location, companies get a better grip on their computing expenses, including their energy consumption. Most are finding they can do more with less once they have consolidated their resources.

This consolidation also means fewer people to maintain the center and less power consumed to run it. Under a data center model, ad hoc purchases of computers, peripherals, and applications stops. Smart resource allocation and utilization begins.

Forrester Research, a leading IT analyst group, estimates that the cost to power and cool a server for two years exceeds its purchase price. With data center consolidation, the carbon footprint of many companies can be cut by as much as 65 percent<sup>4</sup>.



# Cloud Computing

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**In the most efficient data centers, computing resources can remain highly underutilized.**

In the most efficient data centers, computing resources can remain highly underutilized. For example, even in the busiest data centers typical servers are only running at 30 percent capacity. Disk drive usage and router capabilities may also be far below 50 percent utilization. In essence, that means that every server, computer, router, or peripheral is consuming energy while sitting unused and idle. Cloud computing is specifically designed for higher and utilization of these resources.

Cloud computing extends the energy and resource efficiencies of data centers even further by sharing its resources with multiple companies or divisions at one time. The servers and storage are

then better utilized than when used by any one company. Furthermore, cloud computing can time-shift its resources, accommodating companies and workers from various time zones and handing off its resources from one shift of workers to the next. According to independent analysts at Pike Research, widespread adoption of cloud computing could reduce data center energy consumption by as much as 38% by 2020<sup>5</sup>.

Although cloud computing is especially effective in reducing energy consumption and resources, it also has additional security, maintenance, and other inherent cost-savings benefits.



# Tata Communications' Green Services

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**Tata Communications is a global leader in business communication and has embraced these latest green technologies in its global service offerings.**

Our Telepresence, Data Center, and Cloud Computing offerings dramatically reduce the typical business computing carbon footprint without sacrificing performance or cutting-edge features and benefits.

Tata Communications uses the latest and most energy-efficient networking and computing equipment possible in our facilities around the globe.



# Tata Communications' Telepresence

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**Based on Cisco Systems' TelePresence video conferencing hardware and software, Tata Communications offers the latest in teleconferencing services to its worldwide customers.**

Now companies can host face-to-face meetings without the cost and carbon footprint of travel, lodging, meals, or transportation. Even local workers can now reduce commuting by eliminating visits to the office. With high-speed connections over the Tata Communications' network, meeting participants experience lifelike high definition video, high-quality voice and audio, and the ability to share computer presentations, demonstrations, and electronic files.

Reduce your carbon footprint with Tata Communications TelePresence:

- Eliminate fuel-intensive jet, rail, or car travel
- Reduce energy consumption with fewer hotel stays
- Endure fewer commutes

You can compute your own carbon footprint savings at the Cisco Systems TelePresence Web site:  
[http://www.cisco.com/en/US/solutions/ns669/networking\\_solutions\\_products\\_genericcontent\\_green\\_solution.html](http://www.cisco.com/en/US/solutions/ns669/networking_solutions_products_genericcontent_green_solution.html)

# Tata Communications' Data Centers

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**By consolidating servers, applications, and networking functions in one of Tata Communications' award-winning global data centers, companies can drastically reduce their own energy consumption now—and in the future.**

Companies can boost their productivity, but also preserve the environment with these Data Center benefits:

- Less power consumption but more efficient computing
- Fewer devices to power and maintain
- Lower cooling costs for premises equipment
- More floor space and storage

*Reduce your carbon footprint as well as your equipment expenses.*

Because you have fewer servers and can eliminate server and storage closets, you also save on heating and cooling costs to maintain the proper working environment for that equipment. Fewer computers on your premises mean you can consolidate your office space as well, using that valuable floor space for employees or production instead of housing IT equipment and IT management personnel.

Tata Communications uses state-of-the-art systems to monitor and control power throughout its Data Centers. Cooling and lighting is designed to provide the most efficient use – yet reduce power. The latest techniques in green center design are incorporated in Tata Communications' newest facilities in the Far East and Europe, and many centers have already been upgraded for more efficient power use.

# Tata Communications' Cloud Computing

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**Companies that deploy cloud computing as an alternative to traditional premises-based computing reduce energy consumption through the elimination of under-used computing resources and by helping to fully utilize cloud-based resources among many users.**

By using a technique called virtualization, Tata Communications' cloud computing allows multiple companies to securely share servers, storage, computer memory, and other network services so that fewer total computing resources are wasted. For example, on satellite or cable television, multiple programs share the same delivery system rather than a cable or dish for each broadcaster. Similarly, cloud computing customers share Tata Communications' cloud facilities and its computing equipment to maximize utilization without sacrificing performance or wasting energy.

Customers see the following benefits in using cloud computing:

- Lower energy costs and smaller carbon footprint
- Full utilization of resources, less waste
- Use when needed, not always on

With Tata Communications you not only lower your own total carbon footprint, you host your applications in some of the most energy-efficient facilities in the world.

***It would be prohibitively expensive for your business to deploy the energy-saving equipment and best practices found in Tata Communications' Cloud Computing Centers.***

# Leading by Example

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**The services we offer our customers, Tata Communications uses internally. We've seen firsthand how teleconferencing, data center consolidation, and the latest in server, storage, and networking virtualization can save significant power and energy without sacrificing performance or reliability.**

Wherever possible we use Telepresence instead of time-consuming and carbon-emitting travel. We contain and reduce our reliance on ozone-depleting refrigerants. Our data centers use energy-saving design, floor and ceiling construction, ventilation, and lighting. We've reduced our reliance on fossil fuel generators.

Our Chennai and Pune Data Centers are partially powered by wind turbines, while our new Singapore Data Center has received Leadership in Energy and Environmental Design (LEED) Gold certification, an independent, third-party verification that a building meets the highest green building and performance measures.

Tata Communications is also a member of the Green Grid, which is a global consortium of IT companies and professionals seeking to improve energy efficiency in data centers and businesses.

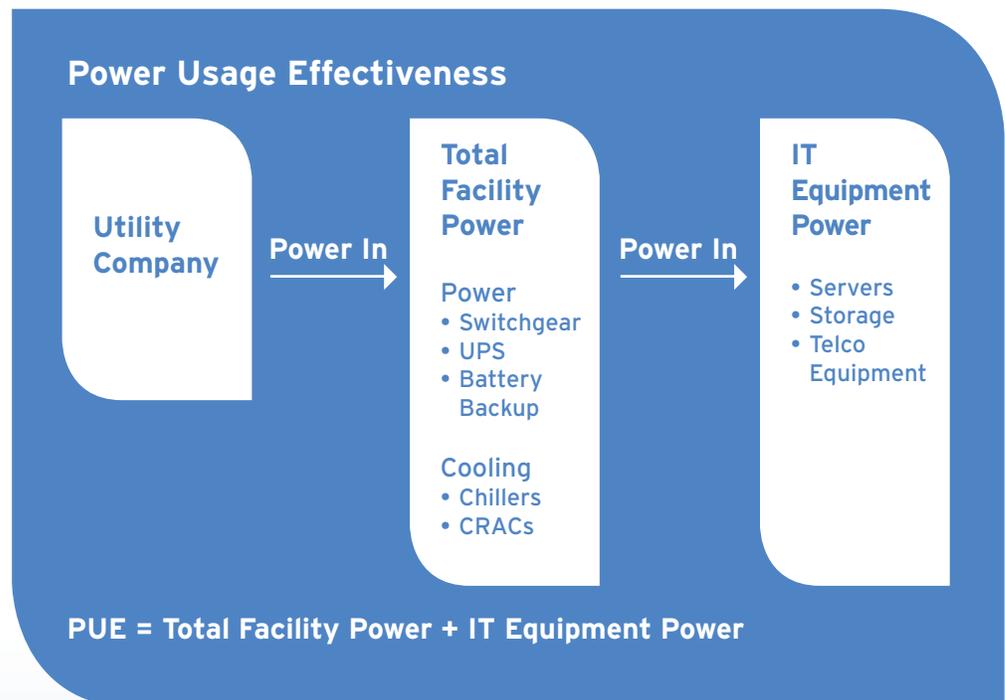
The Tata Communications' Climate Change Initiative is a company-wide program that promotes the following:

- Educating all employees on the importance of Green Technology and energy savings
- Developing a core team of "Climate Champions"
- Measuring and collecting the existing corporate carbon footprint
- Setting goals and creating corporate-wide metrics for reducing Tata Communications total carbon footprint

**As a part of this long-term carbon footprint reduction plan, Tata Communications developed a two-step plan which first created its baseline carbon footprint for the 2008-2009 time period.**

This baseline capture included not only data center and testing laboratories but also all office buildings, training facilities, and temporary offices. This data capture of power usage effectiveness measured fuel consumption, electric power usage, and HFC gas from cooling units.

The second phase, now underway, is analyzing this usage and identifying effective strategies for reducing our carbon footprint through technology, building, and/or policy changes. Our primary target for carbon emission reductions, however, continues to be new and existing data centers, which account for the majority of Tata Communications' energy consumption.



# Conclusion

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Tata Communications will continue its two-tiered approach to combating greenhouse gases in the years to come. As new technologies, management strategies, or alternate energy sources become viable means for reducing greenhouse gases, Tata Communications will embrace them not only as a part of its internal mission to improve its own carbon footprint, but also as a part of our service offerings to our customers across the globe.

**Together we can make a tangible difference in improving the environment.**

# References

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## Greener Businesses Through Information Technology



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## About Tata Communications

Tata Communications, a member of the \$72.5 billion Tata Group, is a leading global provider of a new world of communications. The emerging markets communications leader leverages advanced solutions capabilities and domain expertise across its global and pan-India network to deliver managed solutions to multinational and Indian enterprises, service providers, and Indian consumers.

Tata Communications' range of services include transmission, IP, converged voice, mobility, managed network connectivity, hosting and storage, managed security, managed collaboration, and business transformation for global enterprises and service providers, as well as Internet, retail broadband, and content services for Indian consumers.