Session 5:
Building a Green Future

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ITU
and climate change

12% energy efficiency gain by letting consumers send in their utility meter readings by SMS / Smart Phone

Listening to music today consumes half the CO_2 to play that a decade a go using CDs (Stanford University)

Accenture Study: Cloud solutions can reduce energy use and carbon emissions by +30% Vs. on-premise. (smaller companies 90 % with a shared cloud service)

Connected Home

Energy Technology Consumerization drives the home of the future

Local Distributed Generation (Wind, Solar, etc...)

Cloud Energy Services
- Remote Control.
- Reporting, Analytics, Alerts
- Remote Diagnostics
- CRM/Billing
- Competitive Retail Offerings
- Appliance Diagnostics and offers
- Smart Energy Wizards

Utility Z

Meter (bi-directional power flows)

Home Energy Management System

Battery Storage

Managed Circuits:
- HVAC Systems
- Hot Water
- Pool Pump
- Comfort lighting
- Accessories
- Other loads

Hybrid/Electric Vehicle Interface

DOE 2007 Solar Competition Darmstadt winning entry

Eyeonearth.eu

Need for Innovation is Now!

AMD
The future is fusion

Growth of Internet Users:

- 1.8 internet users (400% increase since 2000)
- 340,000 books published in 2010
- 400,000 blogs on May 4th alone
- 20 hours of Youtube every minute
- 200bn emails sent a day

Data Traffic:

- 1 exabytes: 1bn gigabites of Data
- 2005 created 150 exabytes (2020 projected 35,000 exabytes to be created)
- 1 exabytes can hold all the information of the US Library of Congress X 100K

Where Data Lives? - Datacenters

- 10 billion Google searches in March 2010, each search .3 watt hours of energy, 3 billion watt hour per month, Power a 60 watt light bulb for 5,000 years
- Facebook 35000 servers, Amazon and Microsoft 50,000 servers, Google has 1million servers, 2 million AMD processors worldwide

$42 billion on Cloud computing by 2012

- **Hotmail**
  - 1.3 billion mailboxes
  - 155 PETABYTE (PB) storage, growing 2PB per month

- **Windows Live Messenger**
  - 300 million users
  - 76 countries, 48 languages
  - ~40 million people simultaneous connections
  - 9.9 billion messages a day via Windows Live Messenger

- 600 million unique users every month on Windows Live & MSN
- 1M Business Productivity Online Suite users in 36 countries & regions
- 5 petabytes of content served by Xbox Live during Christmas week
- 1 Petabyte+ of updates served every month by Windows Update to millions of servers and hundreds of millions of PCs worldwide

Microsoft's Datacenter Evolution (2005-2010)

2005 — 2006 — 2007 — 2008 — 2009 — 2010

Generation 1
Datacenter Co-Location

Generation 2
Quincy and San Antonio

Generation 3
Chicago and **Dublin**

Generation 4
Modular Datacenter

Facility PAC

Deployment Scale Unit

Server

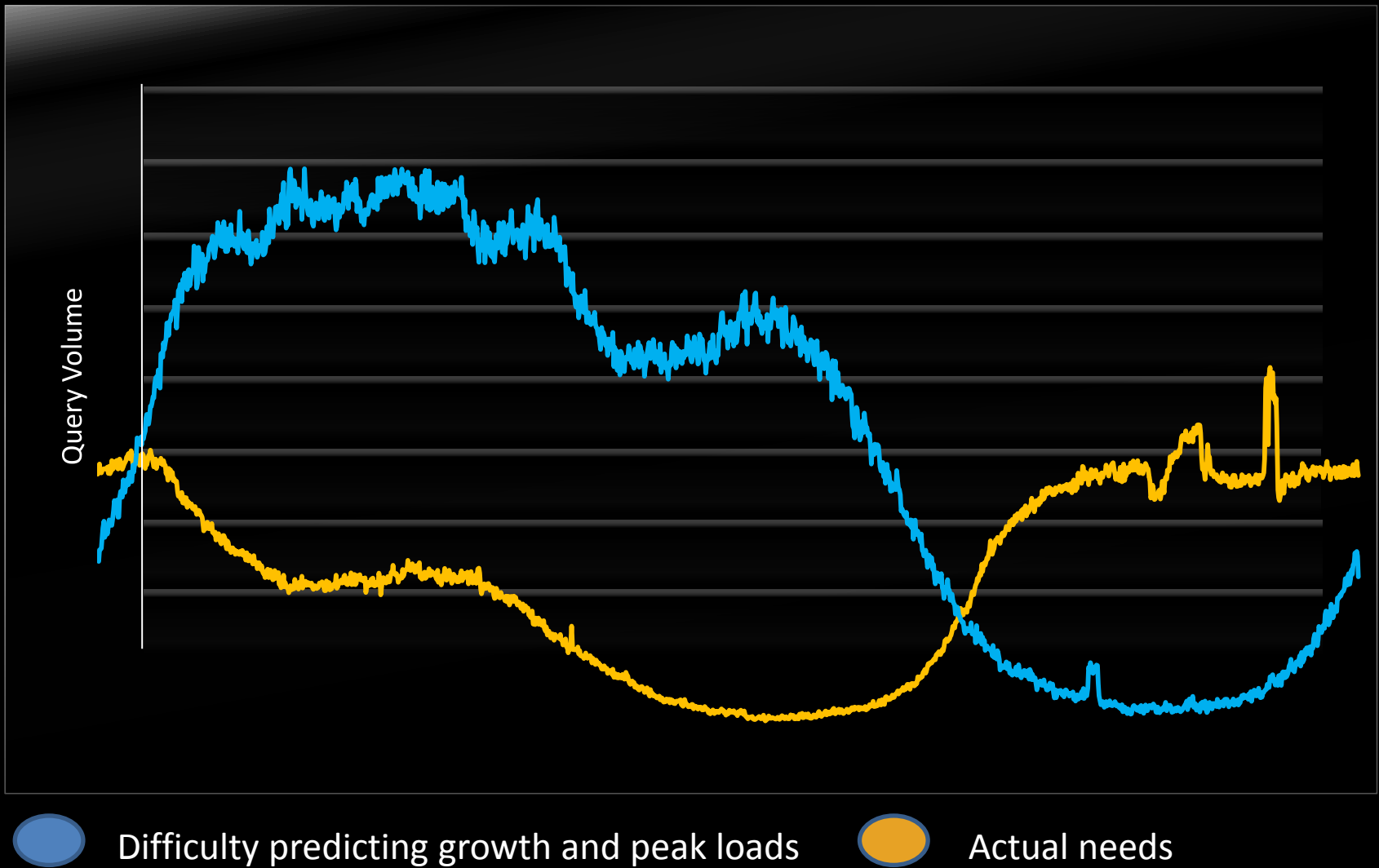*Capacity*

Rack

Density and Deployment

Containers
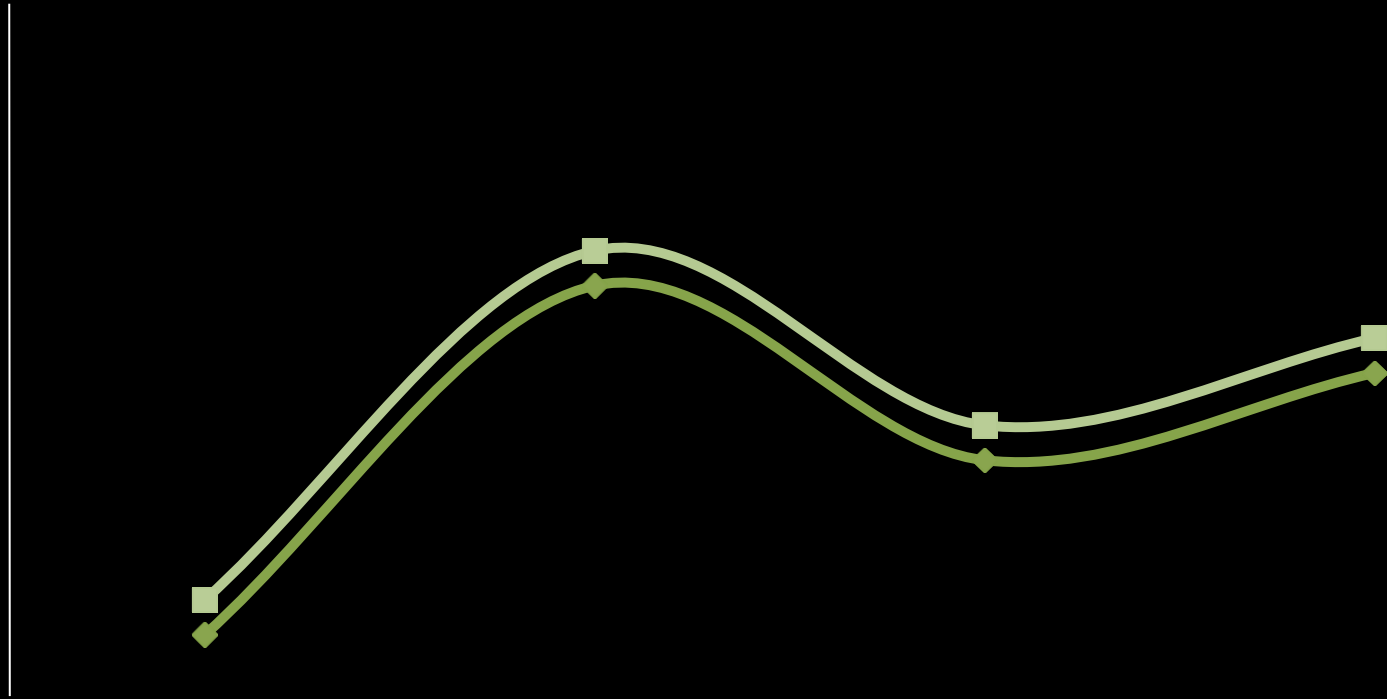
Scalability and …Sustainability
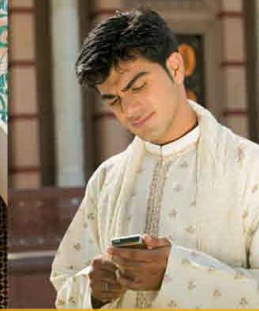
IT PAC Video

Time to Market Lower TCO

Dynamic Provisioning

Query Volume

Difficulty predicting growth and peak loads   Actual needs

Dynamic Provisioning

Through Microsoft Unlimited Potential, we are working to enable sustained social and economic opportunity. We are committed to helping all people realize their full potential with the benefits of technology by:

- Transforming Education

- Fostering Local Innovation

- Enabling Jobs and Opportunities

Connections, Communities, & Partnerships

Transforming Education

Fostering Local Innovation

Enabling Jobs & Opportunities

Server Utilization

Utilization rate:

- A typical on-premise application 5 to 10 % average

- Cloud 40 - 70 % increasing the number of users served per machine

Figure 3: Relationship between Server Utilization and Power Consumption
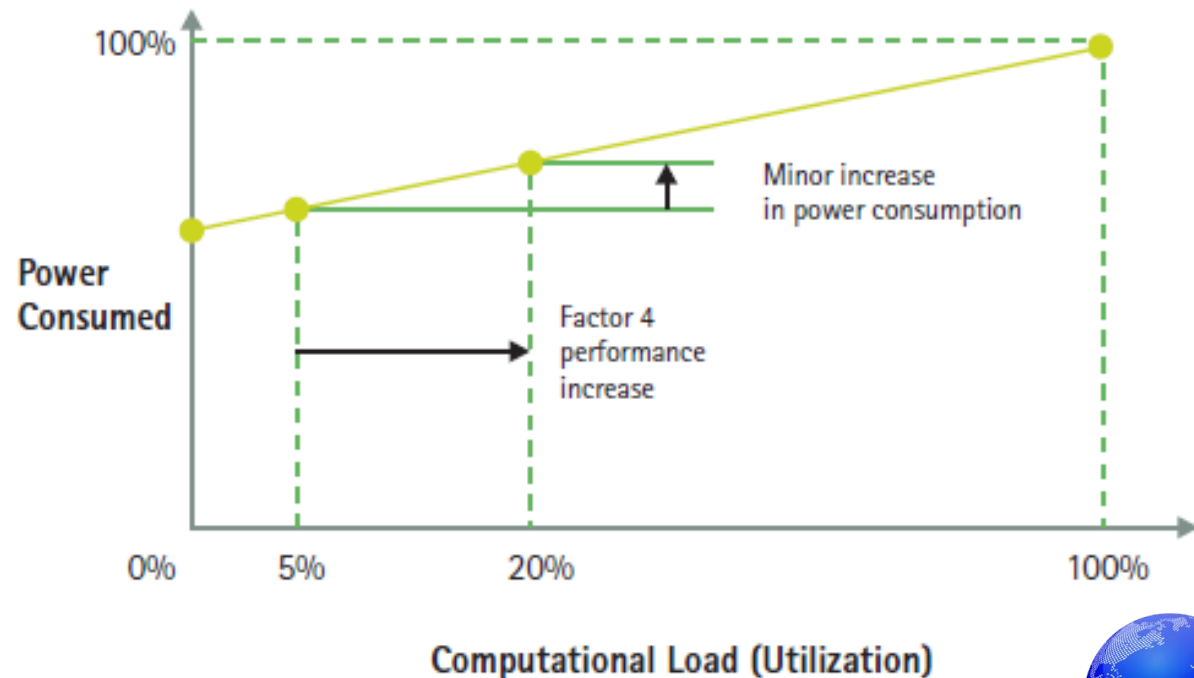
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Microsoft: Environmental Sustainability Vision

At Microsoft, we are committed to reducing our own footprint, and to creating the software and technology innovations that help people and organizations around the world improve the environment.

Demonstrate Responsible Environmental Leadership

Accelerate Research Breakthroughs

Enable Energy Efficiency

Microsoft Scope 3: 1/3 of CO2

- Microsoft Travel estimates that employees avoided flying more than 100million miles in the past fiscal year, saving 17,000 mtCO2. Microsoft has a commitment of reducing our own carbon footprint by 30% by 2012,

- Microsoft UK reduced air travel by 21% since 2007 verified by the Carbon Trust Standard in April 2010. We enabled this shift largely by using technology to replace and supplement travel and a flexible work policy which 90% of our staff take advantage of unified communications, web and videoconferencing