Experiences through

Collaborative activity to overcome IPv4 address exhaustion

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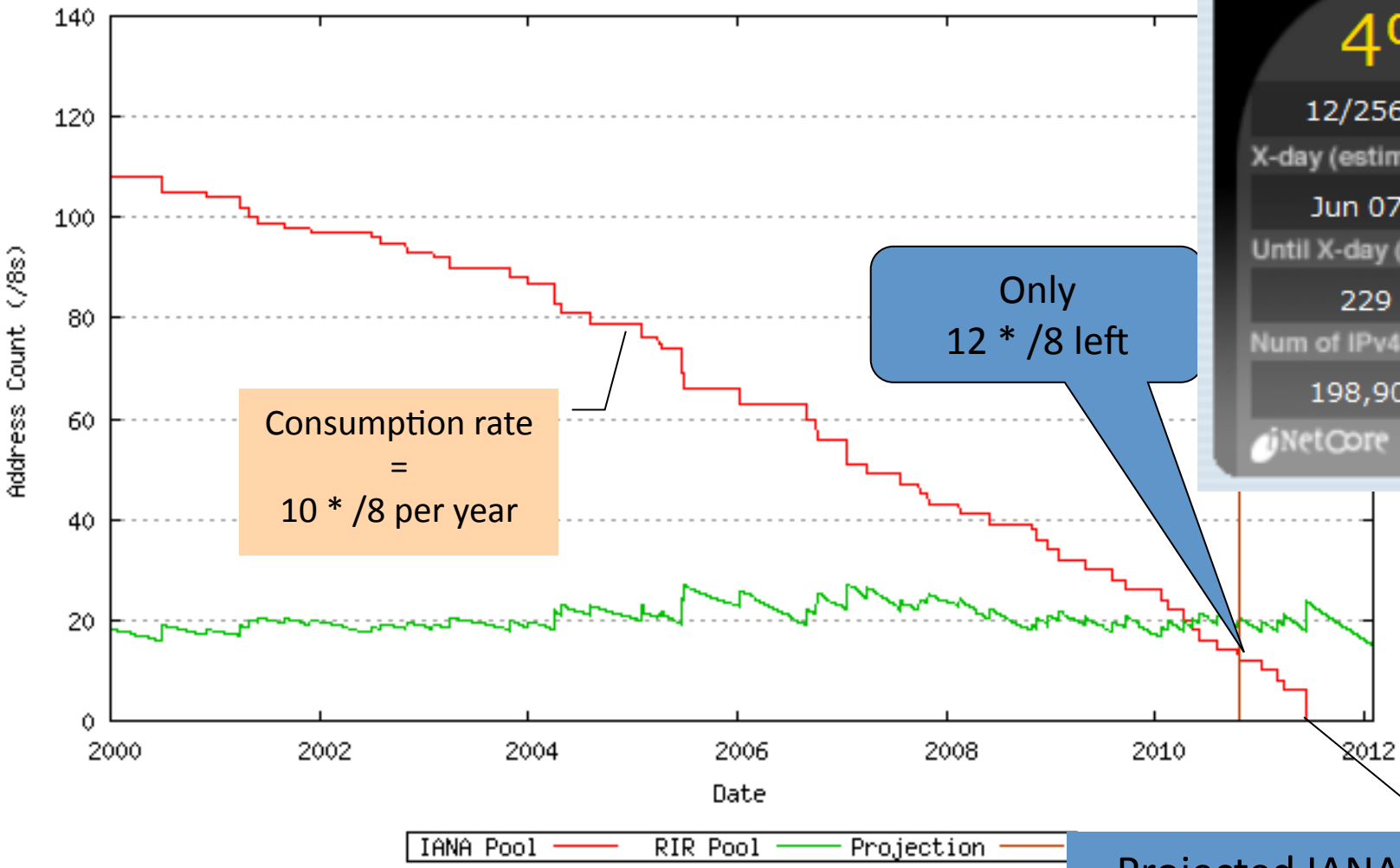
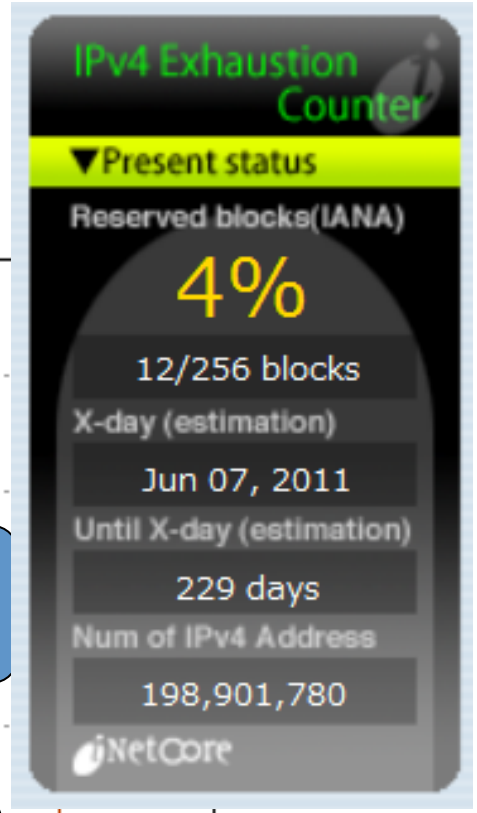
Director, WIDE Project

Director, Japan Data Center Council

IPv4 Address Pool will be exhausted

June 2011





Geoff Huston : IPv4 address space report
http://www.potaroo.net/tools/ipv4/

<< happened in last few months>>

1.MoU for IPv4 address depletion activities:

completed: ***Thailand, Singapore, India, Malaysia***

on-going: Indonesia

3.Indian IPv6 Roadmap Release Function by Ministry of Communications & Information Technology with ***a lot of mobile carriers/providers***

http://pib.nic.in/release/release.asp?relid=63382

"shall" start the IPv6 service by ISP before Dec.2011.

"shall" start the IPv6 e-Government before March 2012.

What is our goal ; toward the **"Eco-System"**

- Back-Ground (i.e., concerning and thread)
  - There are many systems/networks with IP
  - Still, there are many non-IP systems/networks
  - Networks and Systems are tend to be **Fragmented**...
- Objective and Goal
  - **Avoiding the fragmentation** of IP systems/networks
  - Encourage the **collaboration among sub-systems**
  - Explore the "Eco-System", that deliver **the cheapest system** deployment , while delivering **innovations**.


YouTube Turns on IPv6 Support, Net Traffic Spikes - PCWorld - Mozilla Firefox
YouTube Turns on IPv6 Support, Net Traffic Spikes
Carolyn Duffy Marsan, Network World
Feb 2, 2010 6:32 am
Geekなページ：[速報] YouTubeがIPv6に対応！ - Mozilla Firefox
[速報] YouTubeがIPv6に対応！
YouTubeが本日よりIPv6対応してます！
Google, YouTube, and
SONY for
“SONY UNITED”

What should we do.

0. Declaring we are going to “Next Phase”
1. Sharing the knowledge and experiences
2. {sharing} Testbed for education/training and system development experiences, for capacity building

   (*) IPv6 Forum will have a logo for educational material
3. Infrastructure development
   a. DNS, including DNS-SEC
   b. Interoperability, including smart objects
4. Traffic data collection, analysis and sharing
5. Explore new continents , e.g., Green by IPv6

Programs run by IPv6 Forum

- *"IPv6 Ready Logo Program"*
  - Identifying the readiness of equipments
    - Core, IPSec, DHCPv6, MIP/NEMO, SIP, MLD, SNMP/MIB
  - **Extending to embedded system, e.g., smart objects**
    - **IMS, 6Lowpan, {SmartGrid}**
- *"IPv6 Enable Program"*
  - Identifying the readiness of Services
- *"Education Certification Logo Program"*
  - **Educational material**
  - **Engineer and Trainer**

Programs run by IPv6 Forum

- *"IPv6 Ready Logo Program"*
  - Identifying the readiness of equipments

- *"[illegible]"*
- *"[illegible]ucation Certification Logo Program"*
  - **Educational material**
  - **Engineer and Trainer**

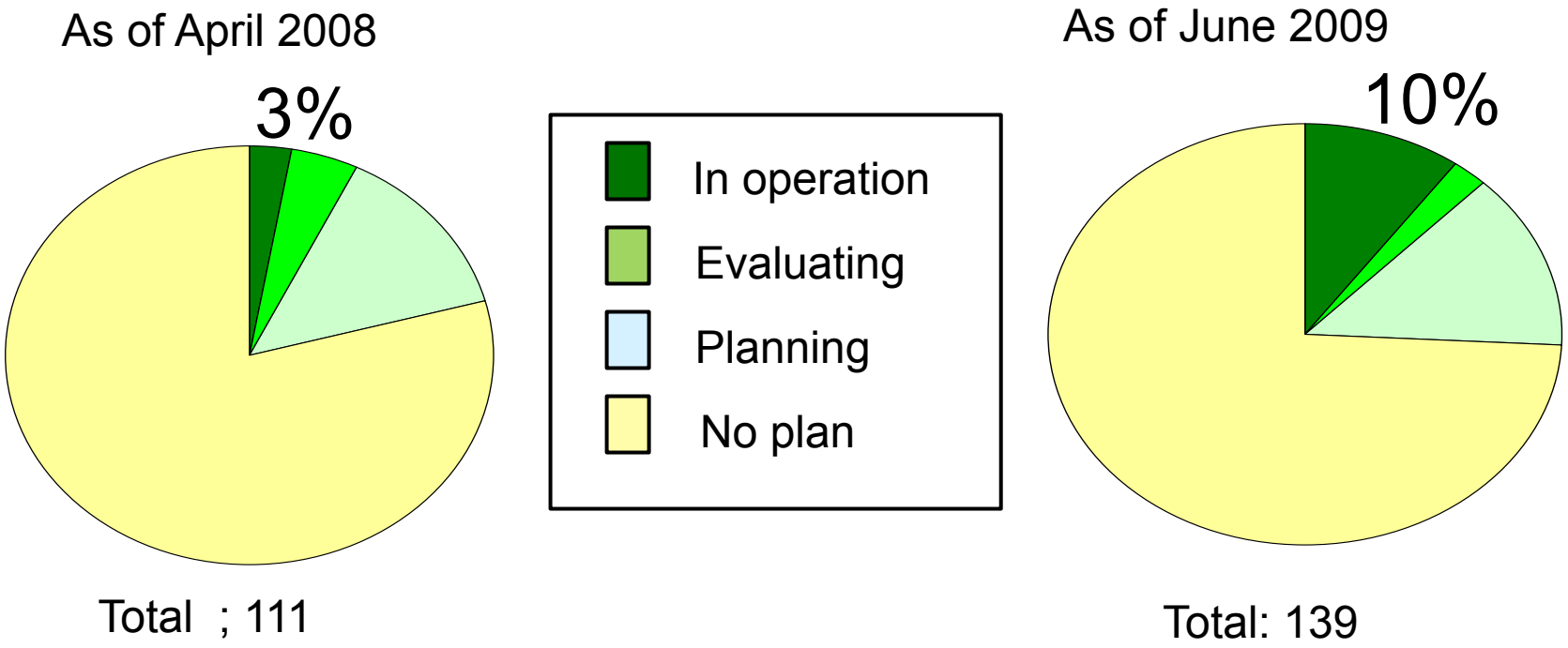
We may want to define common specification and criteria among APEC countries, while avoiding proprietary domestic definition.

How we should implicate

- As a Business Opportunity
  - Innovation, revolution and creation of businesses regarding the system and network industry.
- As a Risk Management
  - Preferential treatment for the existing operators will be hard
  - Even existing operators (i.e., ISP, ASP) will experience the difficulties
  - Expectation to “IPv4 address trading market” would be of risk.
  - System, network and service security issue

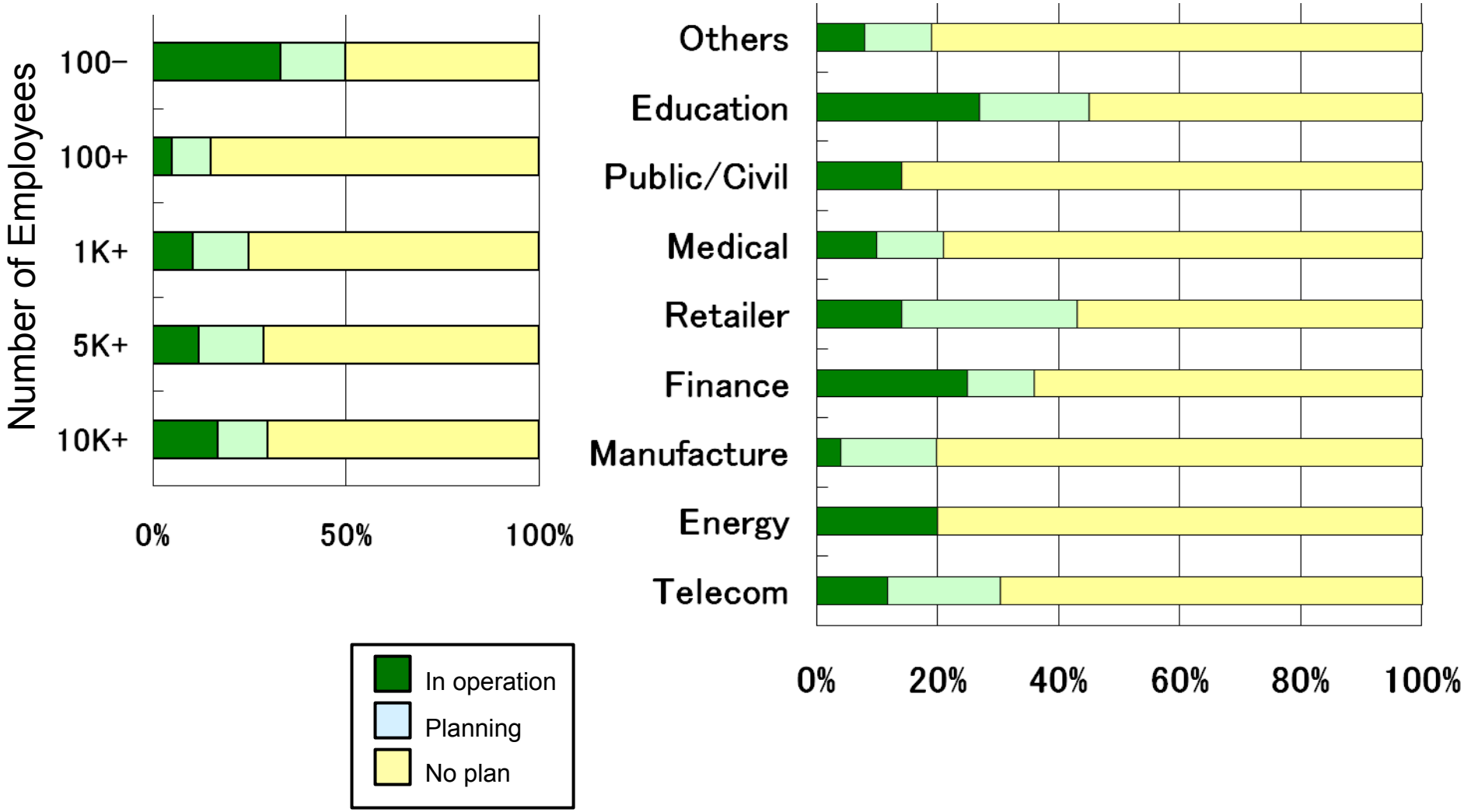
IPv6 Introduction into corporations in USA

Source : CISCO



IPv6 Introduction into corporations in USA (as of June 2009)

Source : CISCO



New continent ***for*** ICT industry, business opportunities ***by*** ICT

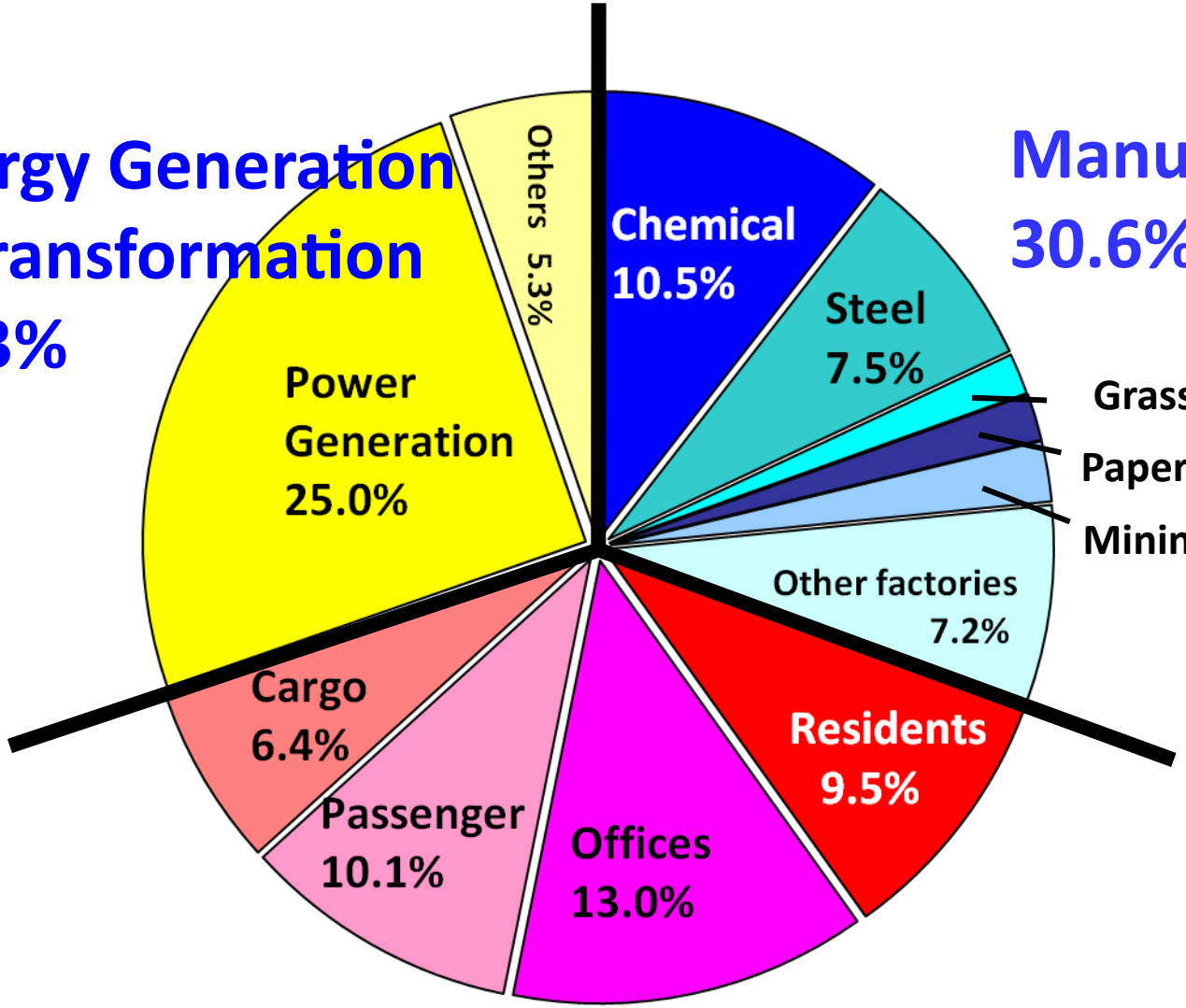
- Contribution of revenue by ICT industry in the **GDP is less than 10%.**
- More than **90% revenue** in GDP is come from **non-ICT industries**.
- Almost all the companies, including non-ICT industries, **depend on ICT technology** on their corporate operation.
- How to use the ICT defines the marketing power and operating power of companies.

Toward Metropolitan Design for smart and sustainable innovations

http://www.gutp.jp/

Source： Hiroshi Komiyama, Ph.D, MRI Ltd.,

Japanese Energy Consumption in 2005

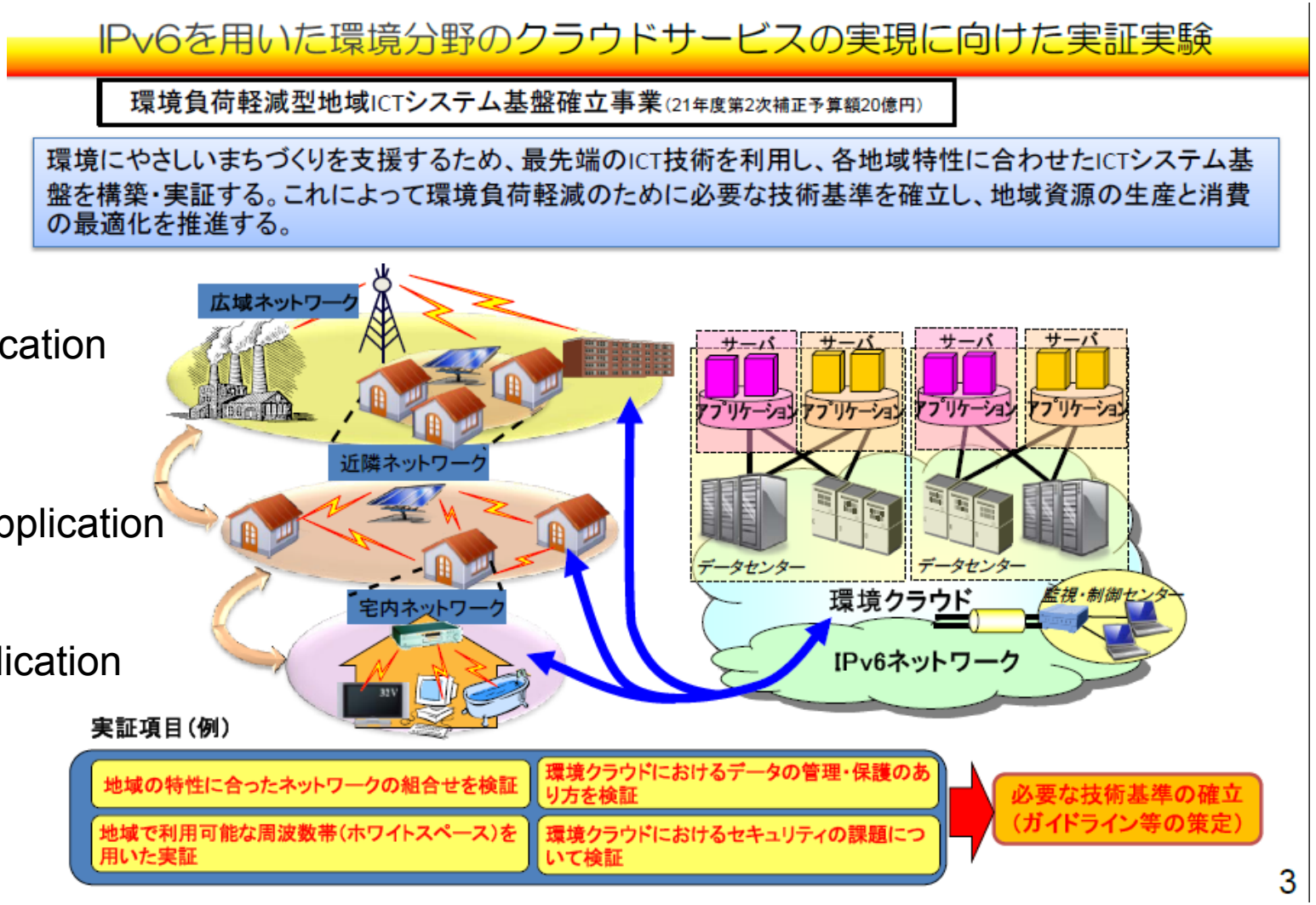


MIC Japan will promote cloud computing with IPv6 for smart city

WAN application

Campus application

Home application



Green Univ. of Tokyo Project

- Building No.2, Hongo Campus
  - Established in June 2008.
  - Targeted reduction;
    - **15%=$4M USD (in 2012), 50%=$30M USD (in 2030)**
  - 12 floor high, R&D and R&E activities
  - Established October 2005, Start of Operation in March of 2006
  - More than saving energy
  - Forming R&D consortium

東京大学
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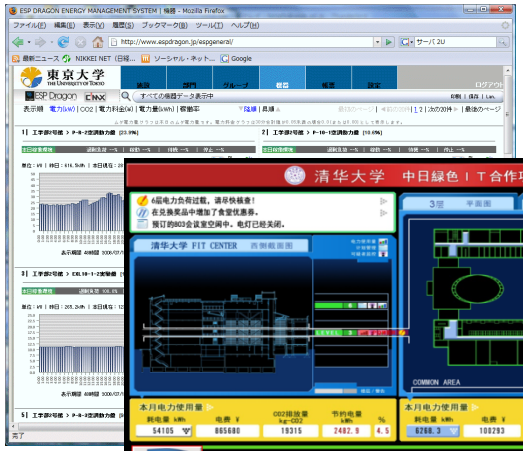
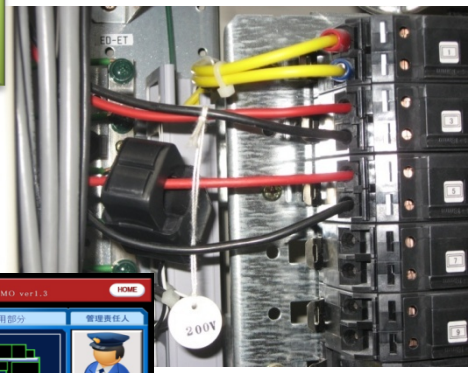
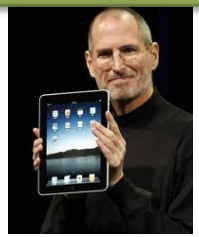
Smart Meter

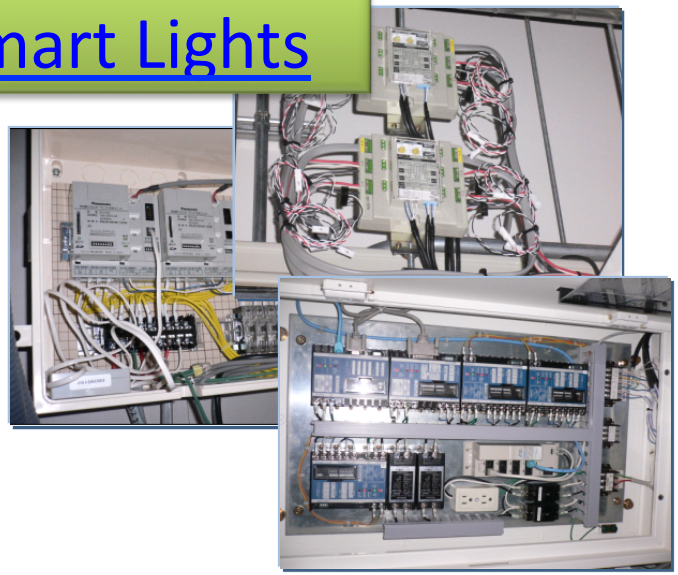




With iPad/iPhone



Smart Lights



Smart HVAC

Smart Kiosk

Strategic collaboration with China Team

Testbed and Standardization

中日緑色IT合同　清華大学　設置風景

Similar consortium has been established by Tsinghua (清華大学) University in Beijing (China), supported by MIC

大型ディスプレイ東芝REGZA　52‘

大型ディスプレイとタッチパネル

China-Japan Joint Green IT Project

湖南精密農業 Agriculture （「両型社会」建設）	清華大学FIT Green Campus/Building） （グリーンキャンパス）	中関村ソフトパーク Green Industrial Park （イノベーションハイテクパーク）
		
実施場所： 湖南省長沙市百果園農業ハウス	実施場所： 会議室、共用エリア、廊下、配電室	実施場所： IDCマシンルーム、共用エリア、廊下、駐車場
·センサー（温度、湿度、日照、CO2、土壌の監視測定） ·農作物成長リアルタイムビデオ監視制御システム ·灌漑自動化制御システム ·天窓、遮光ネット、ファン……自動制御システム ·農業知能制御プラットフォーム	·灯光照明、LED照明制御システム ·共用エリアビデオ監視制御システム ·センサー（人感、温度湿度、照度） ·空調改造 ·配電室改造 ·可視化集中制御監視測定（遠隔）	·灯光照明、LED照明制御システム ·共用エリアビデオ監視制御システム ·センサー（人感、温度湿度、防犯照明） ·IDCマシンルーム空調改造 ·電力システム改造（スマートメーター） ·可視化集中制御監視測定 ·駐車場管理

Green university of Tokyo Project
グリーン東大工学部プロジェクト

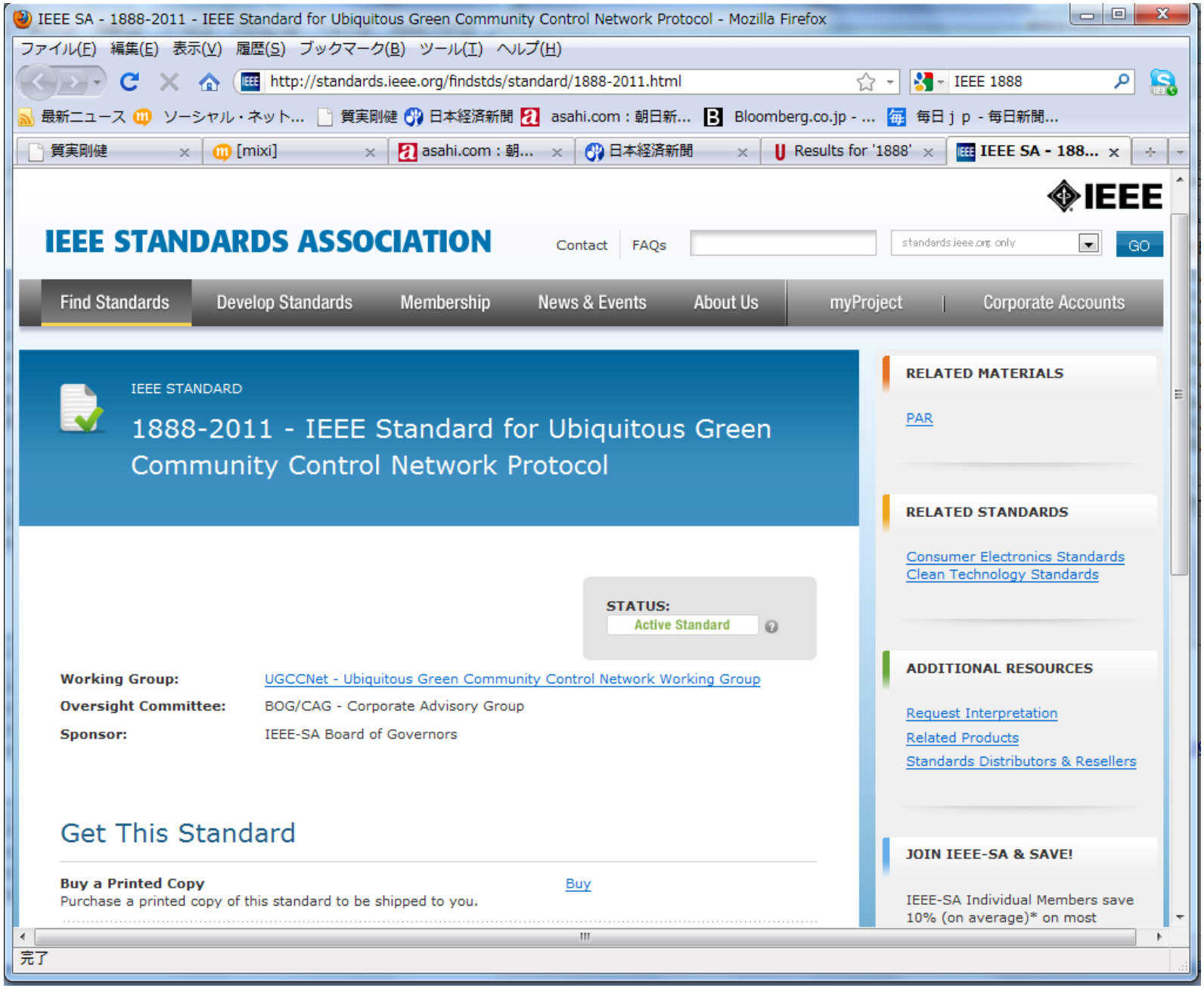
Toward Global Standardization; FIAP to IEEE1888 and ASHREA BACnet

IEEE

Approved Feb.2011

BACnet

On going



http://standards.ieee.org/findstds/standard/1888-2011.html

Activities toward global standard

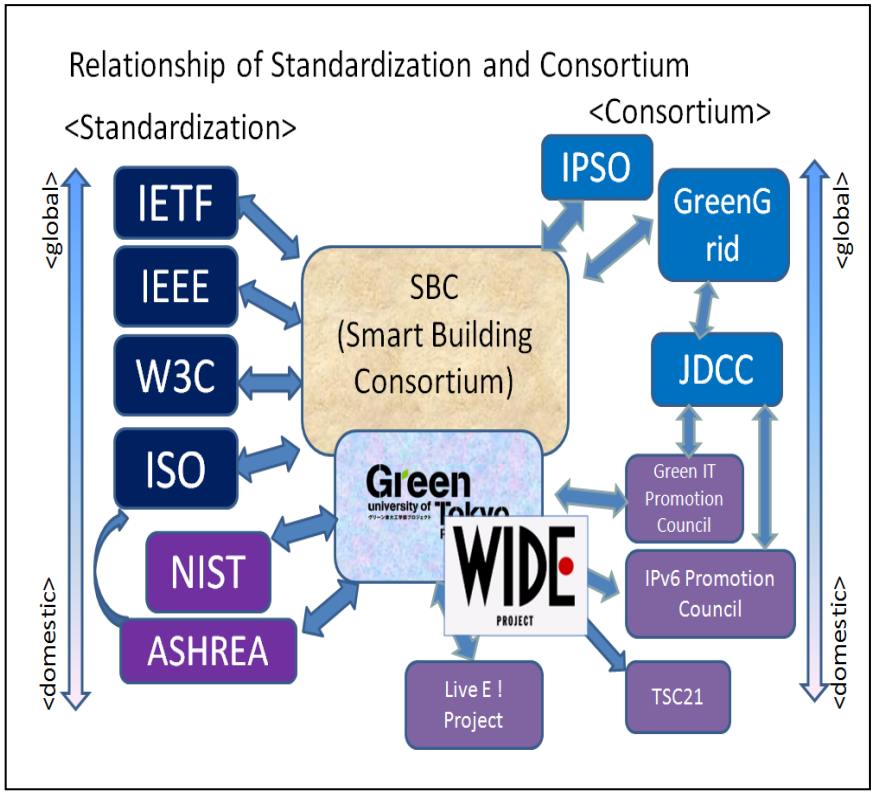
1. Not domestic, but global
2. Practical; implementable, interoperable, deployable
3. Sustainability, i.e., Eco-System

→ **Invitation of stakeholders (new faces for us)**

→ **Testbed operation**

→ **Interoperability of IoT/SO**

①China-Japan Green IT
②NIST B2G
③IEEE P1888
④IETF/W3C
⑤ASHREA BACnet (ISO/IEC)
⑥IPSO
⑦IPv6 Forum
⑧The Green Grid
⑨ETSI INT, IoT
⑩SBC(Smart Building Consortium)



SmartGrid e.g., http://www.ipso-alliance.org/

JDCC
日本データセンター協会
Japan Data Center Council

Design of “Smart” City

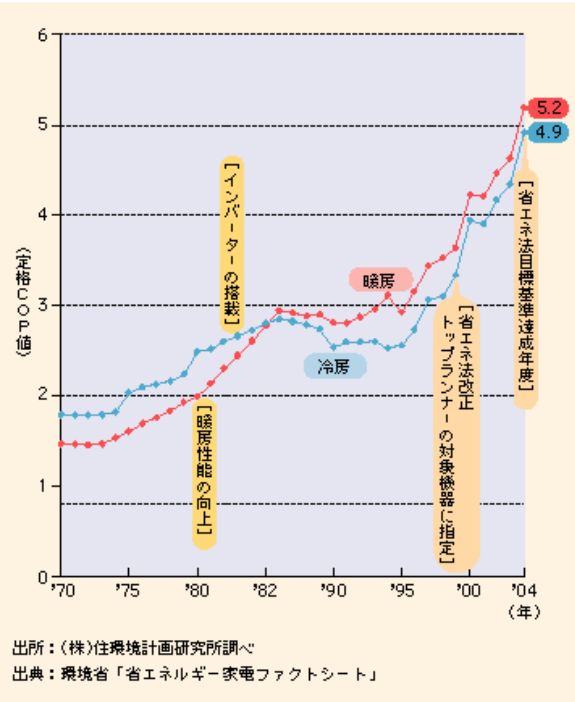
人(Human-being)		都市(City)	
脳＋頭骸骨(Brain)		Cloud Computing	
	頭骸骨(Skull), 血管(Blood vessels)		Data Center
	神経(Brain nerves)		Servers, switches
神経(Nerves)		Internet	
各器官(Organs)		Facilities (i.e., Things)	
	骨等(Bone)		Building(構造体)
	センシング器官(Sensor)		Sensor
	筋肉(Muscle)		Actuator

Strategic use of Internet Data Center for smart city -- talking with “TOKYO” --

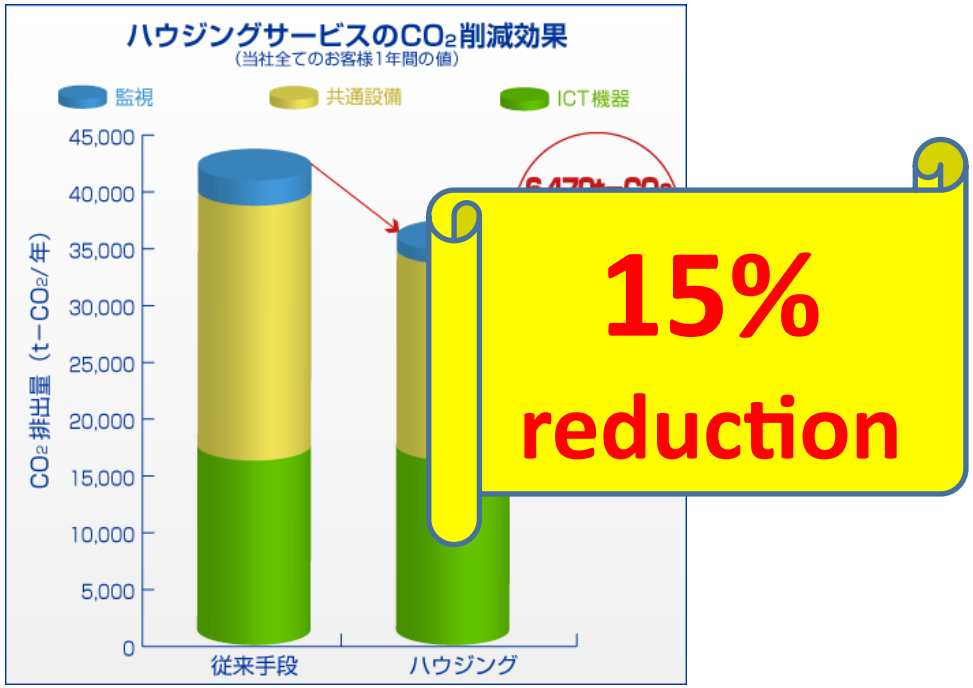
Contribution **by hosting** service

- Many offices install old and in-efficient HVAC systems. When we move the servers in these offices to iDC, we will be able to improve the HVAC bill. Current HVAC systems improves 30-40% energy efficiency, compared with existing systems.

図３－４－７　エアコンの冷暖房COP推移(販売ベース)



出所：(株)住環境計画研究所調べ
出典：環境省「省エネルギー家電ファクトシート」

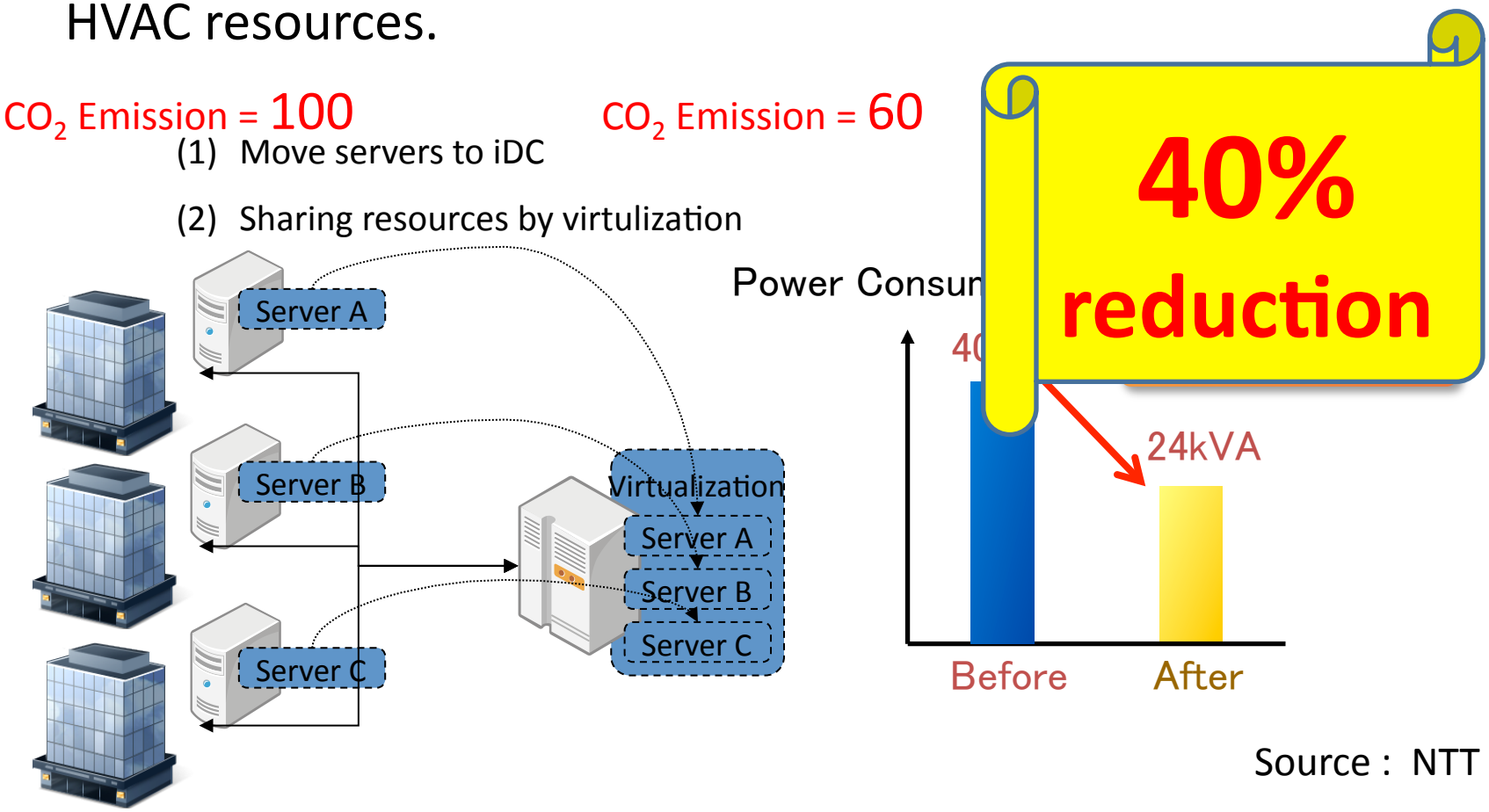


NTTビズリンクHP

http://www.nttbiz.com/eco_act/housing.html

Contribution of Virtualization, i.e., Cloud Computing

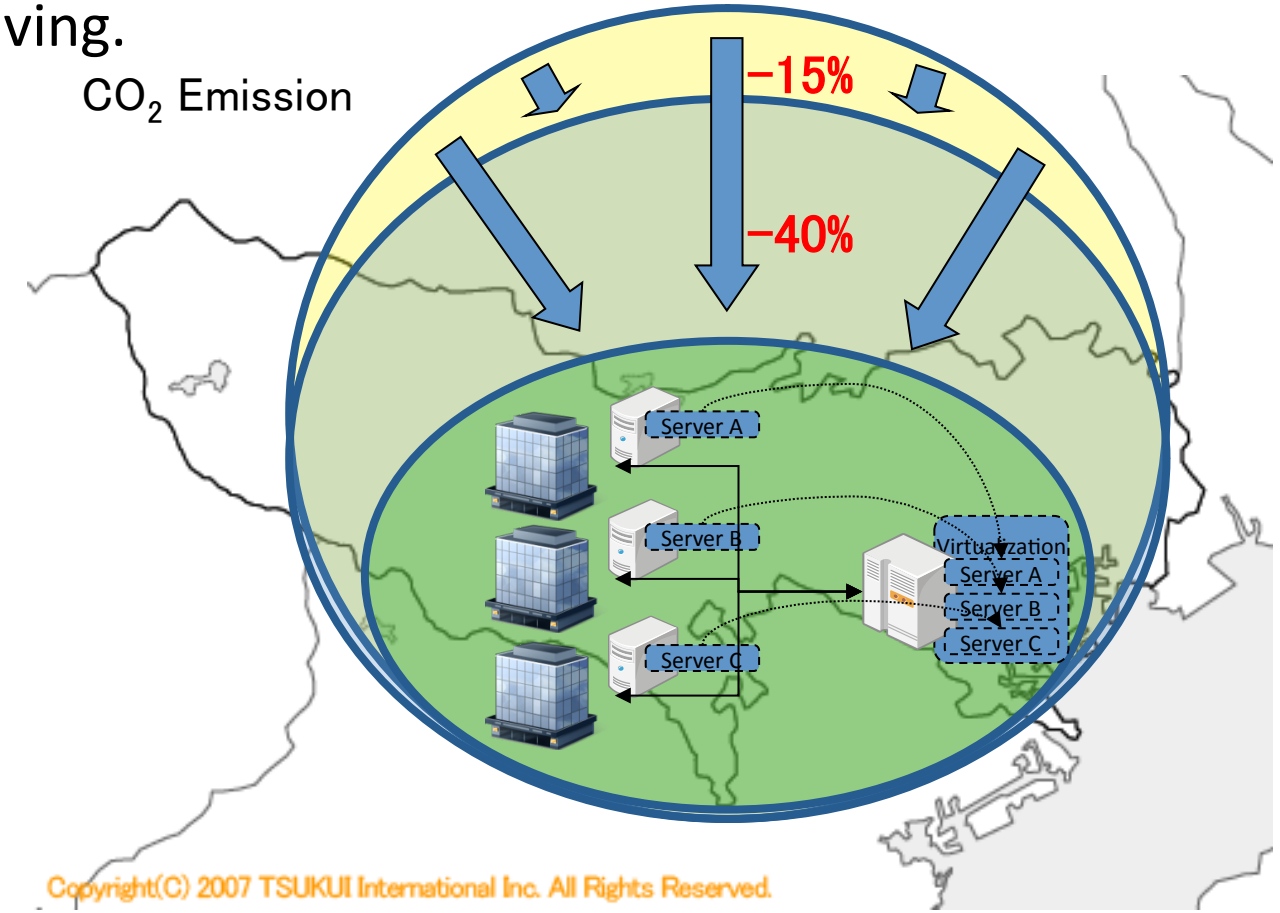
- Servers in the offices with old hardware platform can be accommodated in iDC with virtualization, i.e., cloud computing.
- Large energy saving by sharing the computing resources and HVAC resources.



Source : NTT

Strategic Energy Saving in Tokyo ?

1. Move and accommodate servers in the offices into iDC , hosting service, will lead to 15% energy saving
2. Vitalize the servers and integrate into a single physical machine, i.e., cloud computing, will lead to 40% energy saving.



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WIDE PROJECT

www.wide.ad.jp

Thank you

IPv6 Promotion Council

IPv6 Promotion Council of Japan:
http://www.v6pc.jp/en/index.html
e-mail: info@v6pc.jp

IPv4 EXHAUSTION

Task Force on IPv4 Address Exhaustion:
http://kokatsu.jp/