



# Green NGN & Green PBX

*Mai 2010, Dr. Martin Budweg*

## Agenda

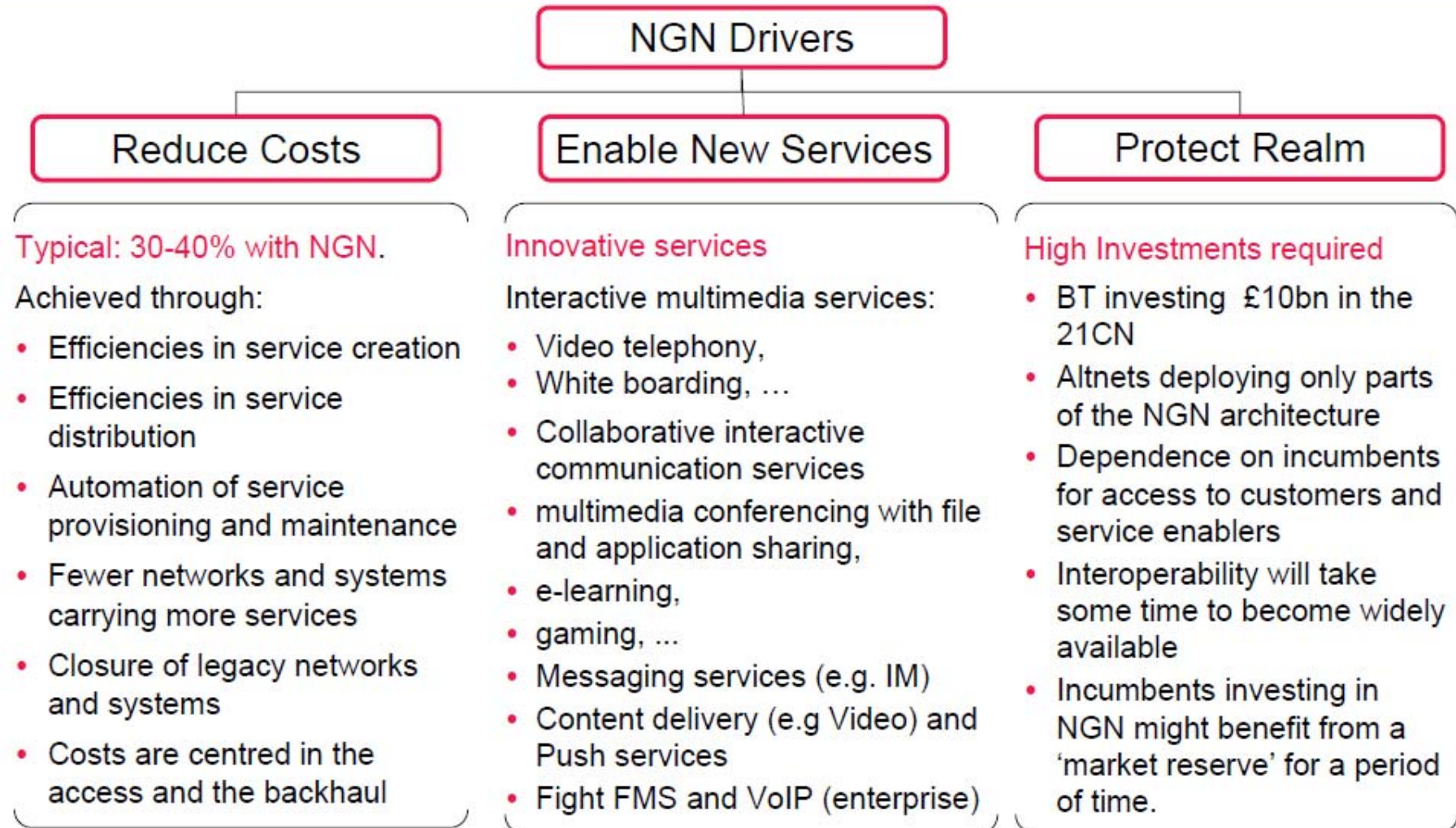
- Carrier Infrastructure
  - Why NGN
  - Where to save energy
  - Example of existing solution
  - Next Steps
  
- Corporate Infrastructure
  - Situation on Market
  - GreenPBX

## Arguments to move to IP based Systems

- VoIP and SIP Trunking are definitely greener than the alternative, existing TDM technology.
- IP networks use less energy, require less cooling and are less massive than the central offices and tandem switches they are replacing.
- The cost and material required to build a data center for SIP Trunking services is less than half that of a TDM switching center.
- The improvement is so significant that IP communications can easily claim the position of being a green communications service. Transitioning to VoIP/SIP Trunking is clearly a key step toward being a good steward of the earth.
- Telephone VoIP Adapters, which enable businesses to adjust their existing phone lines and infrastructures to be VoIP compatible: no expensive, time-consuming and environmentally unsafe need to rip out old wiring from walls and dump old handsets in landfills.

## Typical NGN & GreenPBX Argumentation

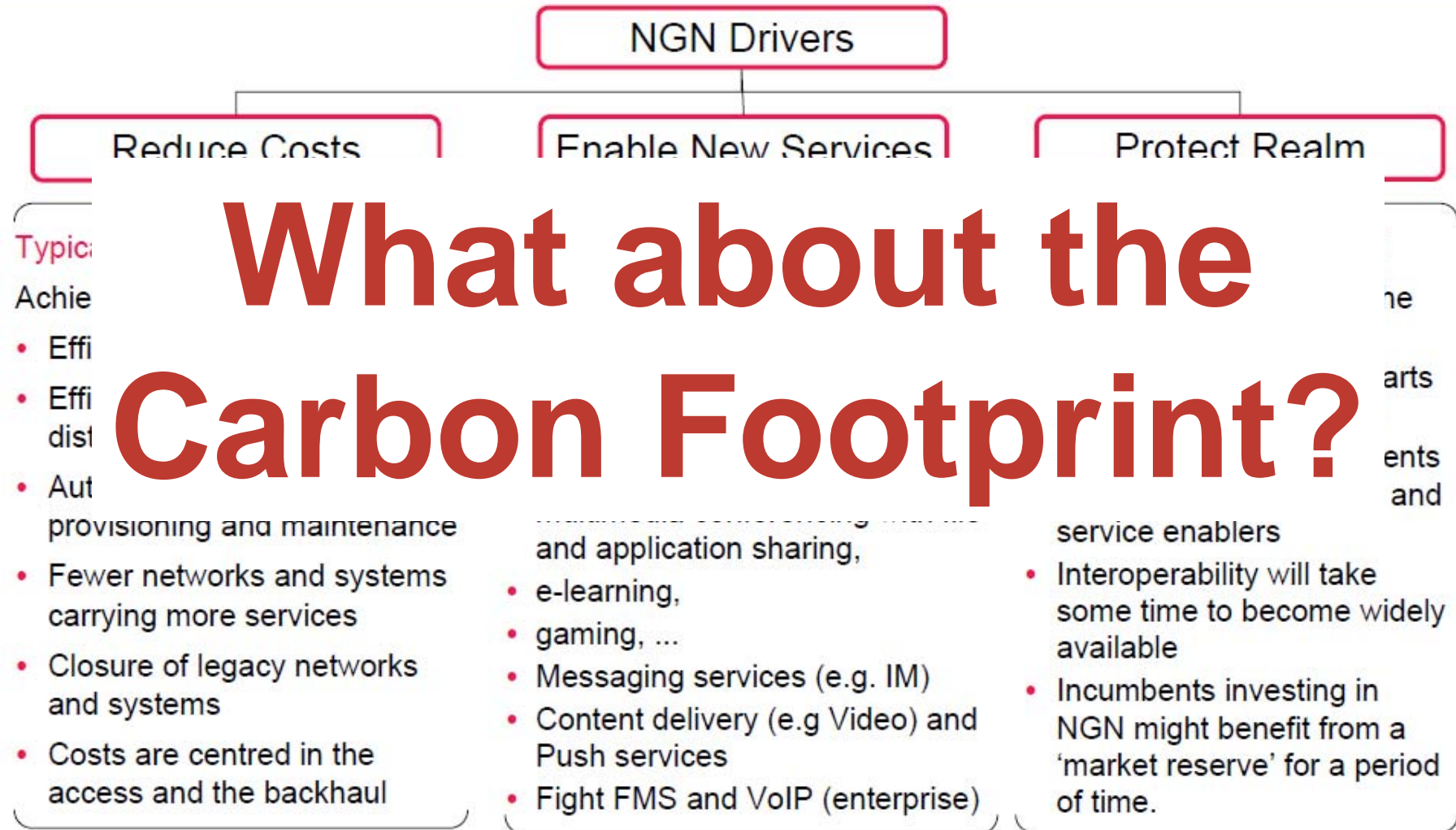
# Next Generation Networks: Why



Operators cannot stay in the old world, a new way is needed

Typical NGN Argumentation

# Next Generation Networks: Why



Operators cannot stay in the old world, a new way is needed

## Cost Optimization in a CLEC

### OPEX Savings

Expense	Metrics	TELES MGC with 3 X M8K's 50,000-port IP/TDM Softswitch	Nortel DMS 100 40,000-port TDM Switch	Savings
<b>Power Consumption</b>	<b>Amps (-48 VDC)</b>	<b>273</b>	<b>1140</b>	
	<b>Kilowatt Hours</b>	<b>15</b>	<b>156</b>	
	<b>Cents per Killowatt Hour</b>	<b>\$0.30</b>	<b>\$0.30</b>	
	<b>Cost per Hour</b>	<b>\$4.50</b>	<b>\$47</b>	
	<b>1-Year Power Cost</b>	<b>\$39,420</b>	<b>\$409,968</b>	
	<b>5-Year Power Cost</b>	<b>\$197,100</b>	<b>\$2,049,840</b>	90%
<b>Facility Space</b>	<b>Racks Needed</b>	<b>2</b>	<b>110</b>	
	<b>Rackspace Rental per Rack</b>	<b>\$300</b>	<b>\$300</b>	
	<b>1-Year Facility Cost</b>	<b>\$7,200</b>	<b>\$396,000</b>	
	<b>5-Year Facility Cost</b>	<b>\$36,000</b>	<b>\$1,980,000</b>	98%

- Results will vary depending on each company's OPEX variables, but savings are significant
  - Assumptions for this model: Nortel DMS100 in a trunk-configuration (Class4)
  - Ports = 39,720

## Freenet TDM Replacement

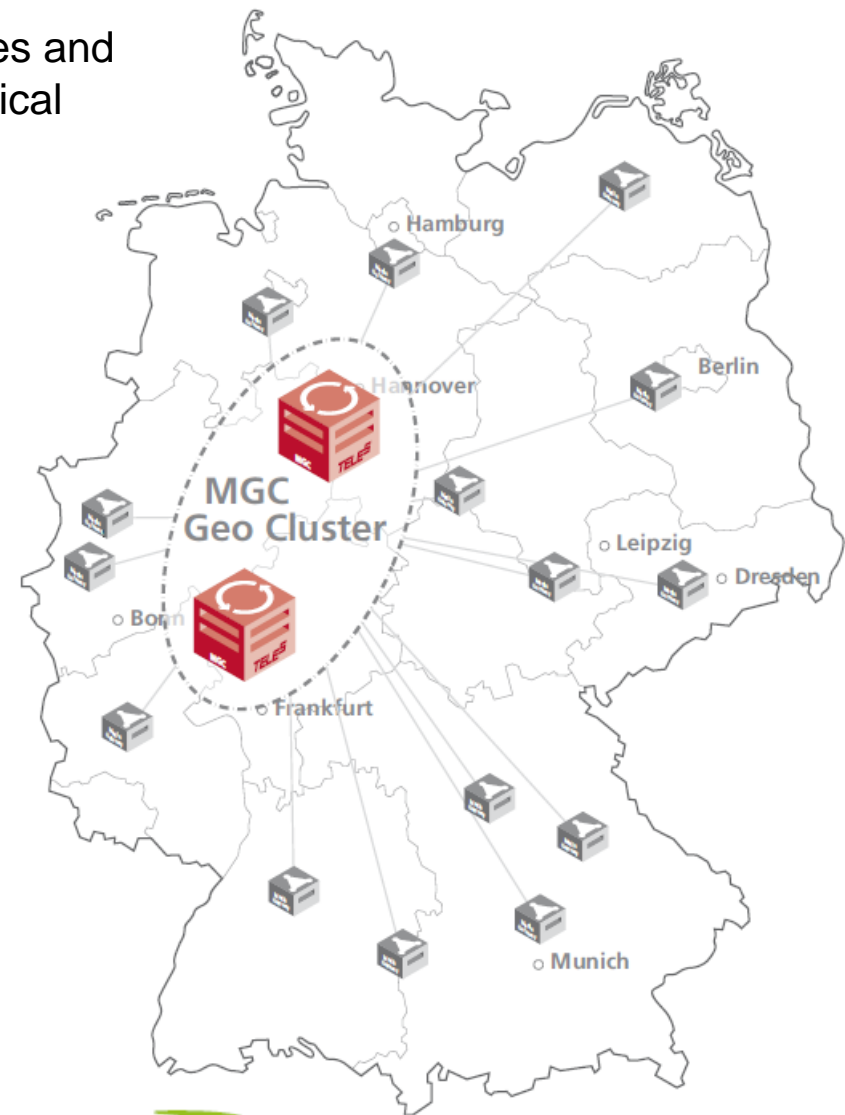
- Replacement of 10x Siemens EWSD Switches and SDH with NGN and IP Core. NGN: geographical MGC Cluster in two POPs and 16 x Media Gateway POPs



*"System maintenance has been considerably reduced. Previously, we had to have a database for each EWSD, so if we had 10 EWSDs, we needed 10 databases, which then, for example, each required a software update. We now require*

*a much smaller but more specialized maintenance team to oversee the entire system. I would also add that stability has been a major factor since we adopted the TELES solution and has also contributed to a reduction in maintenance costs and ensured that we are operating reliably. Implementation of the TELES solution meant that we were able to dismantle our Voice SDH network. Any company with a network similar in scale to freenet would be making a saving somewhere in the region of €1,000,000 if they needed to install SDH for voice. Looking back on the project, it is clear that there has been a very good return on our investment, which has also been successful within a very short timeframe."*

Andreas Jürgensen, Managing Director of the business unit fixed line technology of freenet Cityline GmbH



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# Carbon Footprint savings per Year: ~1.000.000 €



freenet 

**TELES**  
AG  
Informationstechnologien

## The Freenet System

- TELES MGC Cluster with geographical redundancy.
- Based on Standard X86 Servers
- Per Location: 24 Servers – total: 48 Servers – 2 Racks per Site
- Capacity: 175.000 concurrent calls
- Performance: **2000 calls per second: 10 Mio. BHCA**

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# What's next?

## Virtualization for Real Time Systems

- With Virtualization and Multi Core Architectures the performance can be improved by a factor of three!!! Available Q4/2010



In a four year hardware evolution we reach:  
**~65% Power Savings and**  
**~65% Facility Space Savings!!**

## Green NGN Benefits

€€€ and Carbon Footprint Savings:

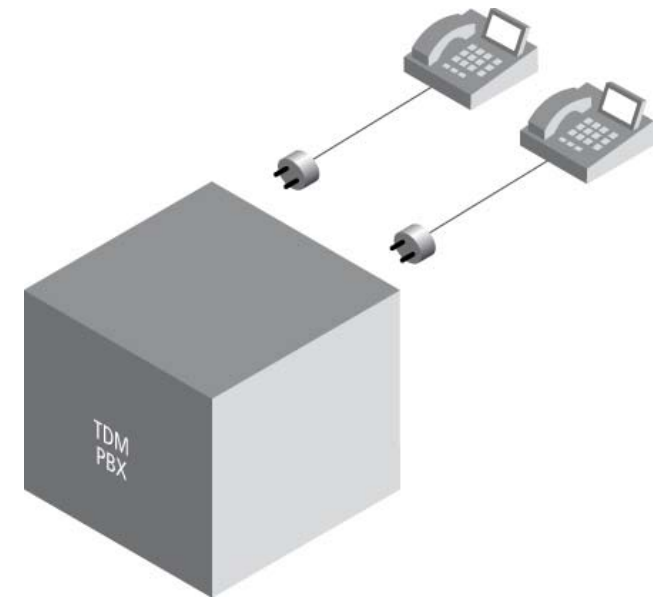
- Replace old, power-hungry legacy equipment
  - Migration to standard based technology
  - Utilization of new technology reduces carbon footprint dramatically
- Better use of existing space avoids new-build costs
- Reduced air conditioning/cooling needs
- Reducing of physical networks



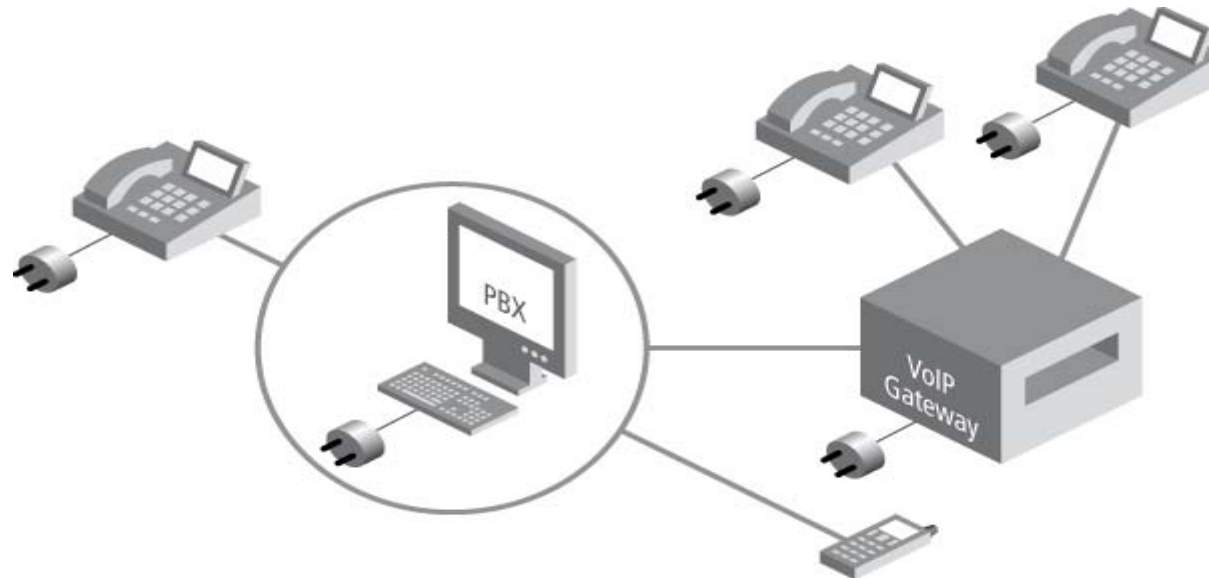
**But what can be  
done outside  
the operators?**

**■ Past**

- TDM PBX has been used on dedicated HW
- Power feeding of Telephones from PBX
  - Very efficient and power-saving

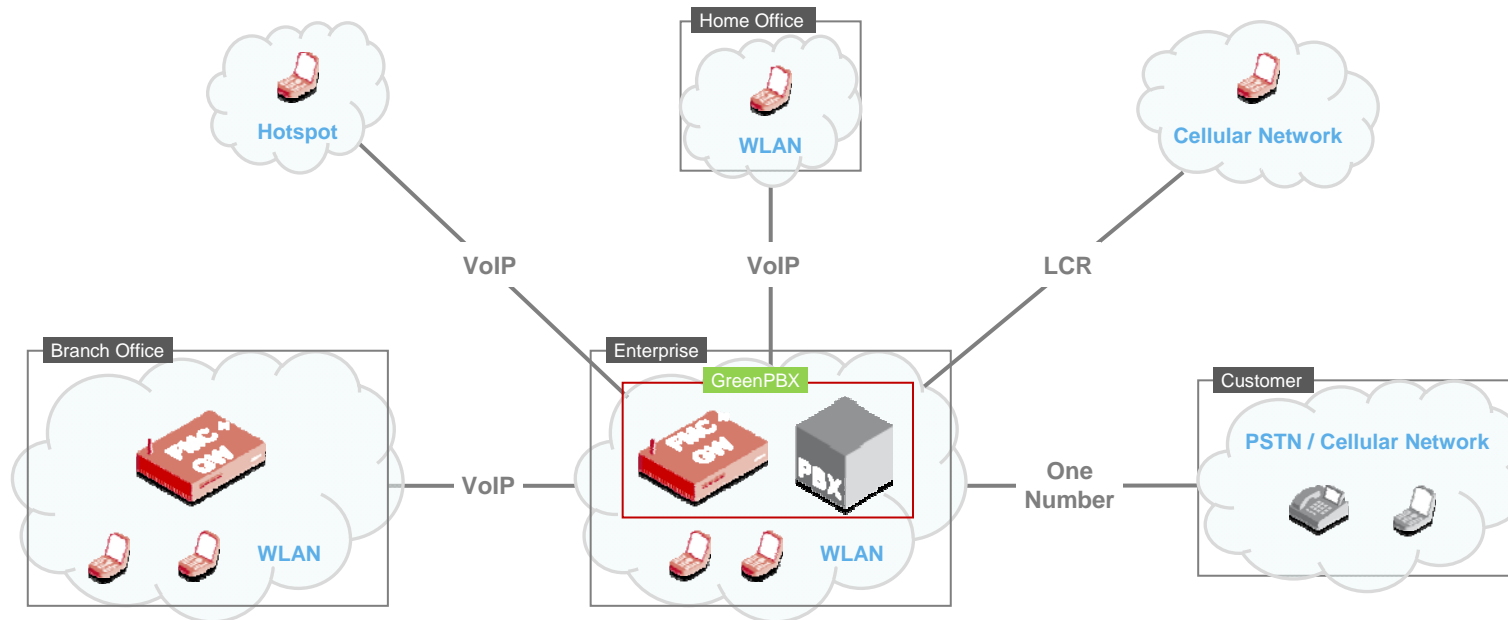


Today



- **Mostly today existing**
  - **PBX (Asterisk) runs mostly on extra PC → 5 to 10 times higher energy usage**
  - **Extra VoIP telephony uses much power**
  - **Often more than one HW system is used - Laptop, Handset, Cell phone, PC, Gateway, IP internet structure (Ethernet-Hubs, etc) - → high energy usage**

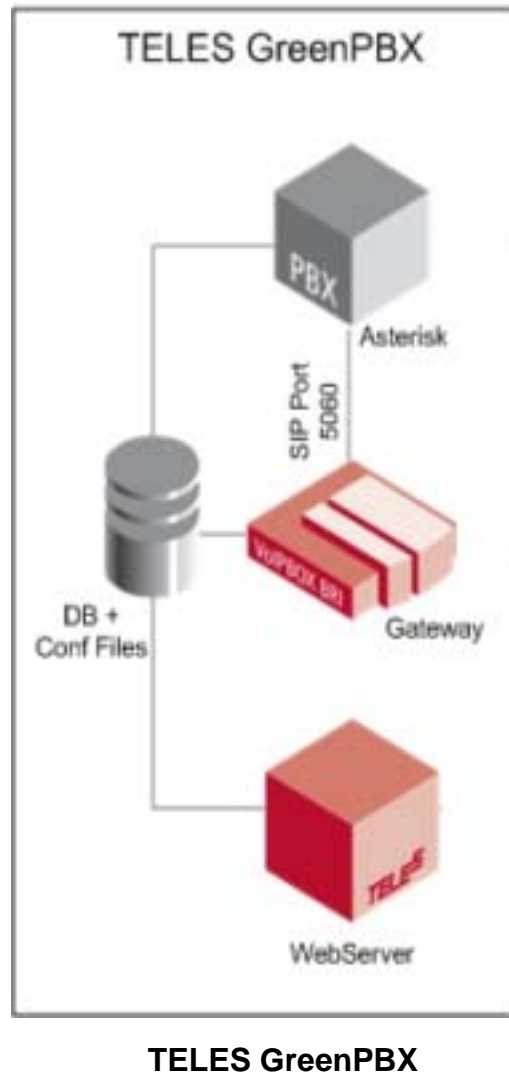
## Where to go



- Where to go for saving energy

- Reduce Hardware and local IP infrastructure
- PBX Software needs to run on dedicated hardware
- Soft-Clients (FMC) should be used existing environment of cell phones as handset replacement

## TELES GreenPBX Architecture



### ■ Four main components of TELES GreenPBX

- **Gateway:** SIP shall be used as the communication protocol between VoIPGate and Asterisk module.
- **Asterisk:** The power of Asterisk lies in its customizable nature, applications such as voice mail, call queuing and agents, music on hold, and call parking are all standard features built into the software
- **Web GUI:** is installed in the system with the capability to edit / review configuration reports in order to configure the system over a web GUI
- **FMC Clients:** For Supporting GSM Telephones

## Combine Hardware to save Energy



- Reduce the company's carbon footprint and save more than 90% of energy consumption costs; especially on standby power costs.
- The TELES Green PBX has no special cooling and space requirements hence the integration of PBX and gateway in a single box, with convenient installation possible anywhere in an office environment.
- TELES VoIPBOX technology enables complete and flexible scalability.
- Additional functionality can be leveraged from combinations of the PBX with TELES VoIPBOX variants → **SW based**

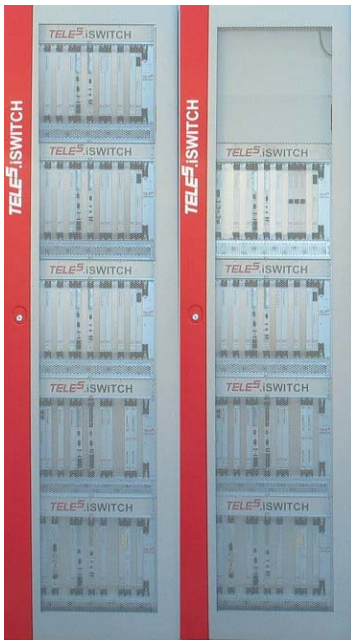
More information on <http://www.teles.de>

Thank you

# BACKUP

## TELES Hybrid Switching vs. NGN Approach

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>■ TELES iSwitch S1024</li> <li>■ Up to 15.000 concurrent calls</li> <li>■ Traffic Assumption: 50% IP 50% TDM</li> <li>■ 9 x 9 Rack Units + EMS</li> <li>■ 9+9 PSU @ 450 W</li> </ul> | <ul style="list-style-type: none"> <li>■ TELES MGC Compact /ACLM8k</li> <li>■ Up to 15.000 concurrent calls</li> <li>■ Traffic Assumption: 50% IP 50% TDM</li> <li>■ 2x 2 Rack Units + 1x 12 Rack Units</li> <li>■ 2+2 PSU @ 600 W → MGC</li> <li>■ 1+1 PSU @ 1000 W → MGW</li> </ul> |
| <ul style="list-style-type: none"> <li>■ Total: 81 Rack Units</li> <li>■ Average Power Consumption: ~2000W</li> </ul>   | <ul style="list-style-type: none"> <li>■ Total: 20 Rack Units</li> <li>■ Average Power Consumption: ~850W</li> </ul>  |



**Facility Savings: ~75%**  
**Power Savings: ~55%**  
**On top:**  
**lowered Cooling Costs**

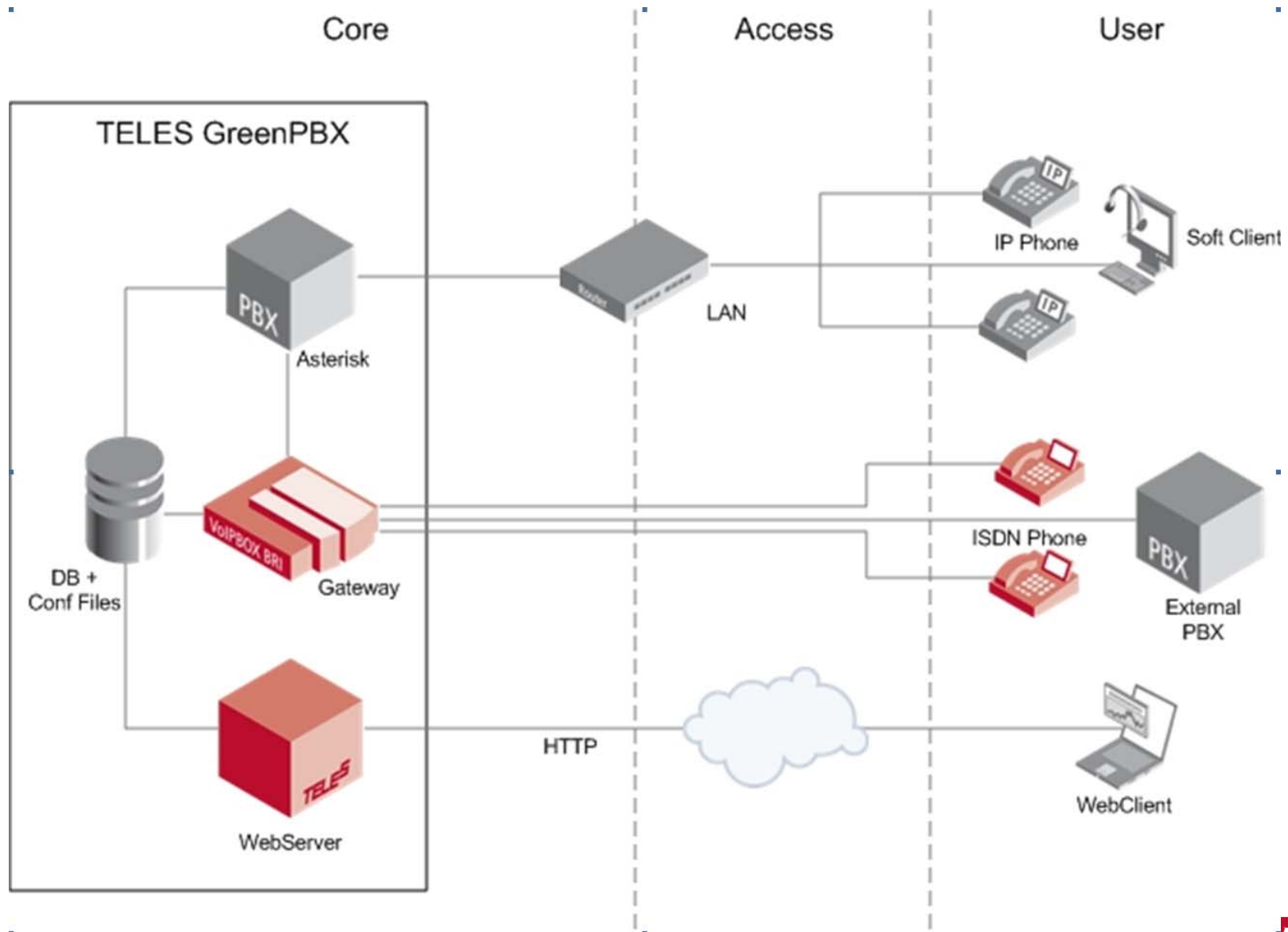


## Savings That Can Make

- **Energy Efficiency & Renewables**
  - Direct savings of ~55 tons CO2 in US alone
  
- **Telecommuting**
  - Existing 3.9M Telecommuters in US save 16 tons of CO2, equivalent to over 1M homes
  - Potential 63 tons CO2 net saving in US alone by 2012
  
- **Dematerialization**
  - Network based services vs. CPE (e.g. voicemail)
  - VOD in place of DVDs
  - Online vs paper bills

(source: ITU Symposium on ICT & Climate Change, 2008)

# GreenPBX - Concept



## Enterprise Mobile Communication Today

Mobile device usage in enterprise is rising:

- Mobile phones used more often than deskphones
- 40% – 80% mobile device usage at office or home
- 30% of workers are mobile or remote
- Mobile workers are outside the office 40% of time

Mobile communication costs are high and rising:

- Mobile voice is 30% – 40% of communication budget

High complexity adds to Total Cost of Mobility (TCM):

- Manage all devices, numbers, services and billing

Inefficient communication:

- Several numbers
- Several devices
- Several voice mailboxes and address books

→ **Major mobile communication issues: high rising costs and low efficiency**