ITU-T SG15/WP1
Access Network Transport,
Energy Saving Checklist - An Overview

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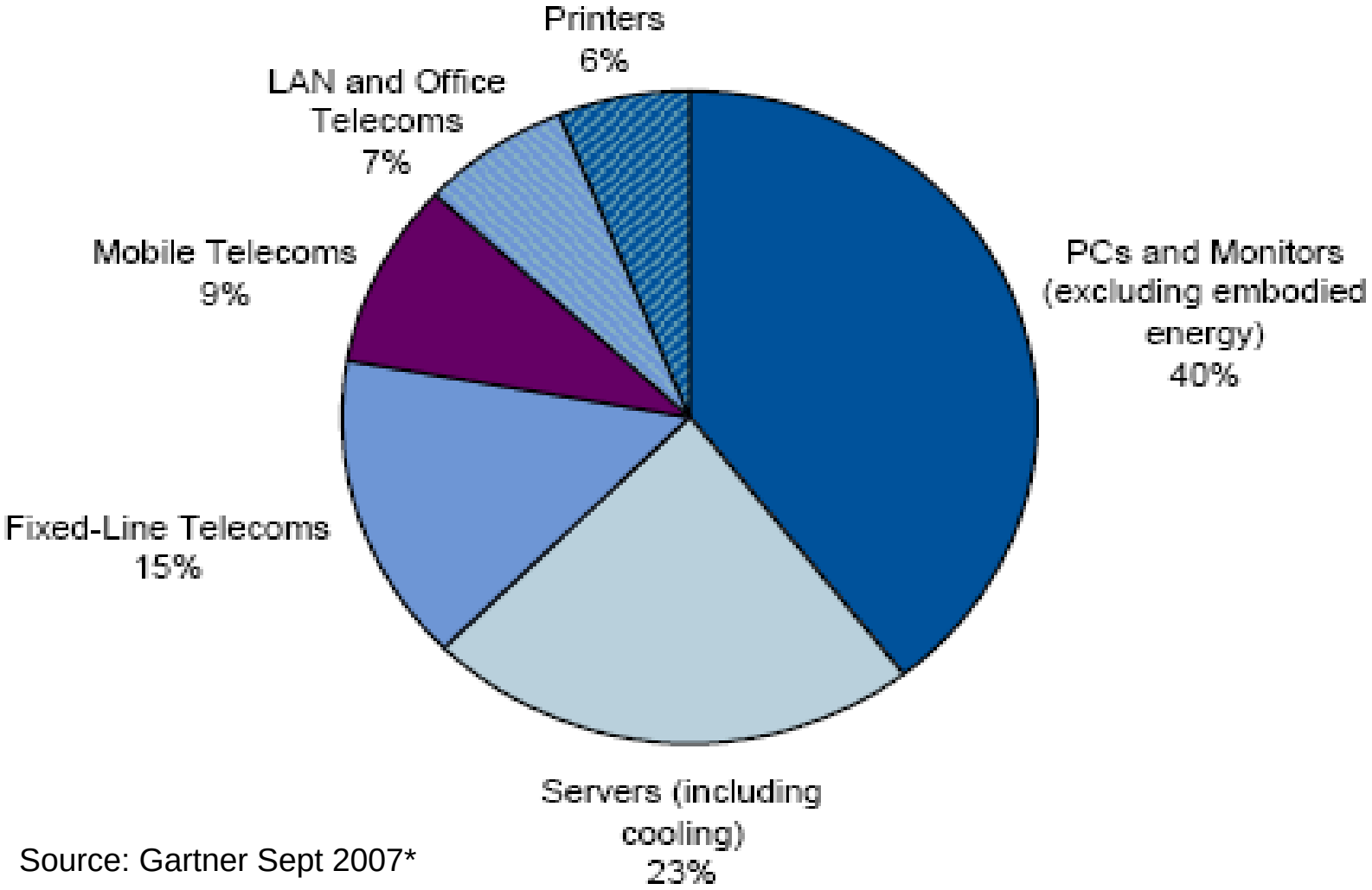
What is an Energy Saving Checklist?

- **Tool for assessment of existing and new ITU-T Recommendations in the light of climate change (TSAG LS 30)**
  - **ITU-T/SG15 Document, TD-288 GEN, provides guidance on energy saving in access networks for Rapporteurs and Editors and proposes a checklist**
  - **Intended to ensure that drafting Recommendations leads to an economic and energy efficient solution**
  - **A step towards achieving GHG sustainability in the ICT industry**
- **A set of questions relating to energy saving in networks**
  - **The Checklist:**
  - **needs to be distilled down at the Question level to offer "tips and tricks" which will stimulate energy efficient thinking throughout the editing process**
  - **will provide the trigger to liaise with device groups such as IEC**

Estimated Distribution of Global Carbon Dioxide Emissions from ICT



Source: Gartner Sept 2007*

* Rakesh Kumar and Lars Mieritz, “Conceptualising ‘Green IT’ and Datacentre Powering and Cooling Issues”, Gartner Research paper ID number G00150322, 7 Sept 2007.

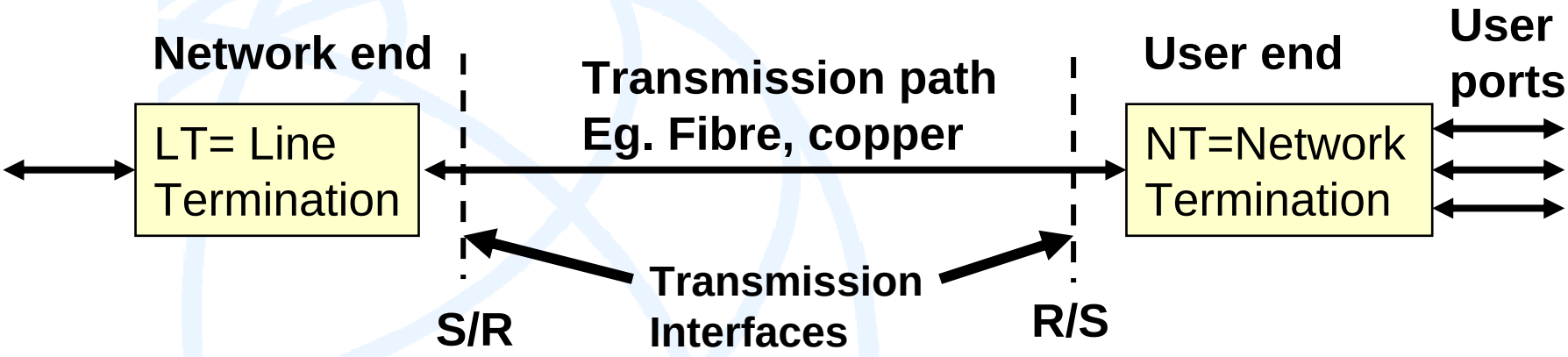
What are the Benefits of Energy Saving in Telecommunications?

- **Reduces the cost of energy**
  - **for operators or end-users.**
- **Reduces the carbon footprint**
  - **where electricity is sourced from fossil fuel**
- **Reduces the size and cost of backup battery/generator**
  - **to support lifeline services during power outage**
- **Low power makes new technology solutions feasible**
  - **such as line-powered remote nodes (e.g. fibre/xDSL)**

Scope of SG15 for Energy Saving

- **Broadband Access Technologies: Serve mass populations over the final drop**
  - **potential for large energy savings in end devices**
- **Transport Technologies: Carry aggregated traffic, sharing devices across whole populations**
  - **energy savings are possible**
  - **but energy saving per customer is smaller**

SG15 Broadband Access
Scope of ITU-T "Recommendations"



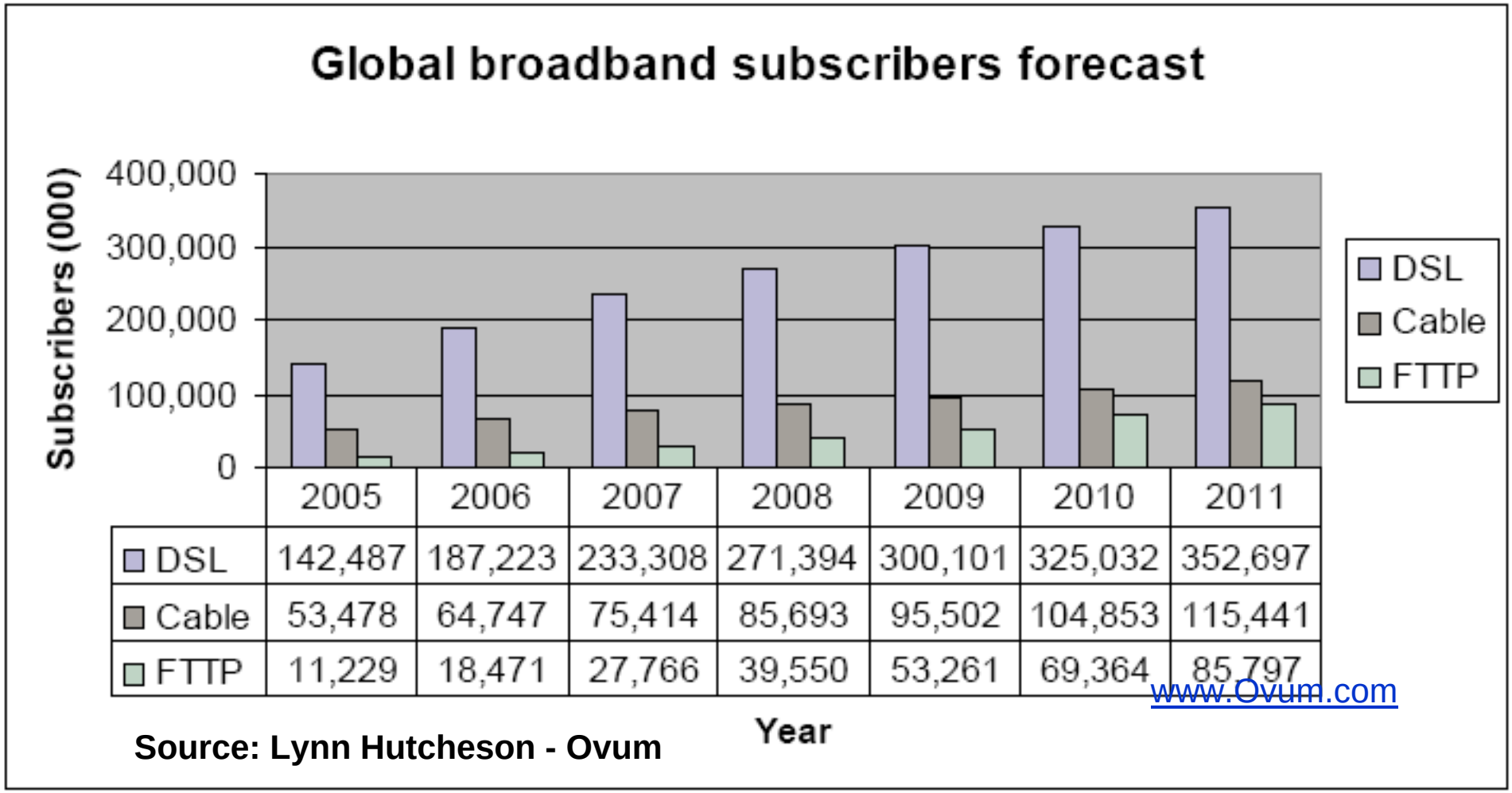
- **Focus is on transmission interfaces**
  - **Describing "the signals passing through"**
  - **But the "black boxes" at the ends consume most of the energy**
- **Liaison is needed with other bodies about devices**
  - **International standards bodies such as International Electrotechnical Commission (IEC)**
  - **Regional policymakers such as European Commission "Code of Conduct for Broadband Equipment"(EU/CoC)**

What is the power consumption of SG15 Broadband Access Technologies?

- **Power consumption of a modem pair per line (approximate without user ports)**
  - **ADSL 3 W (1.5W NT plus 1.5W LT)***
  - **VDSL 6.75 W (4W NT plus 2.75WLT) ***
  - **PON 3 W (2W NT including a 1/32 share of OLT@1W)**
- **User Ports typically add up to a further 5 W and include**
  - **Router/Firewall, 4 Ethernet, Wifi, and VOIP ports**
  - **Not standardised in ITU-T**
- **Currently these are 'always-on' technologies**

***http://re.jrc.ec.europa.eu/energyefficiency/html/standby_initiative_broadband%20communication.htm**

Broadband Subscriber Forecast

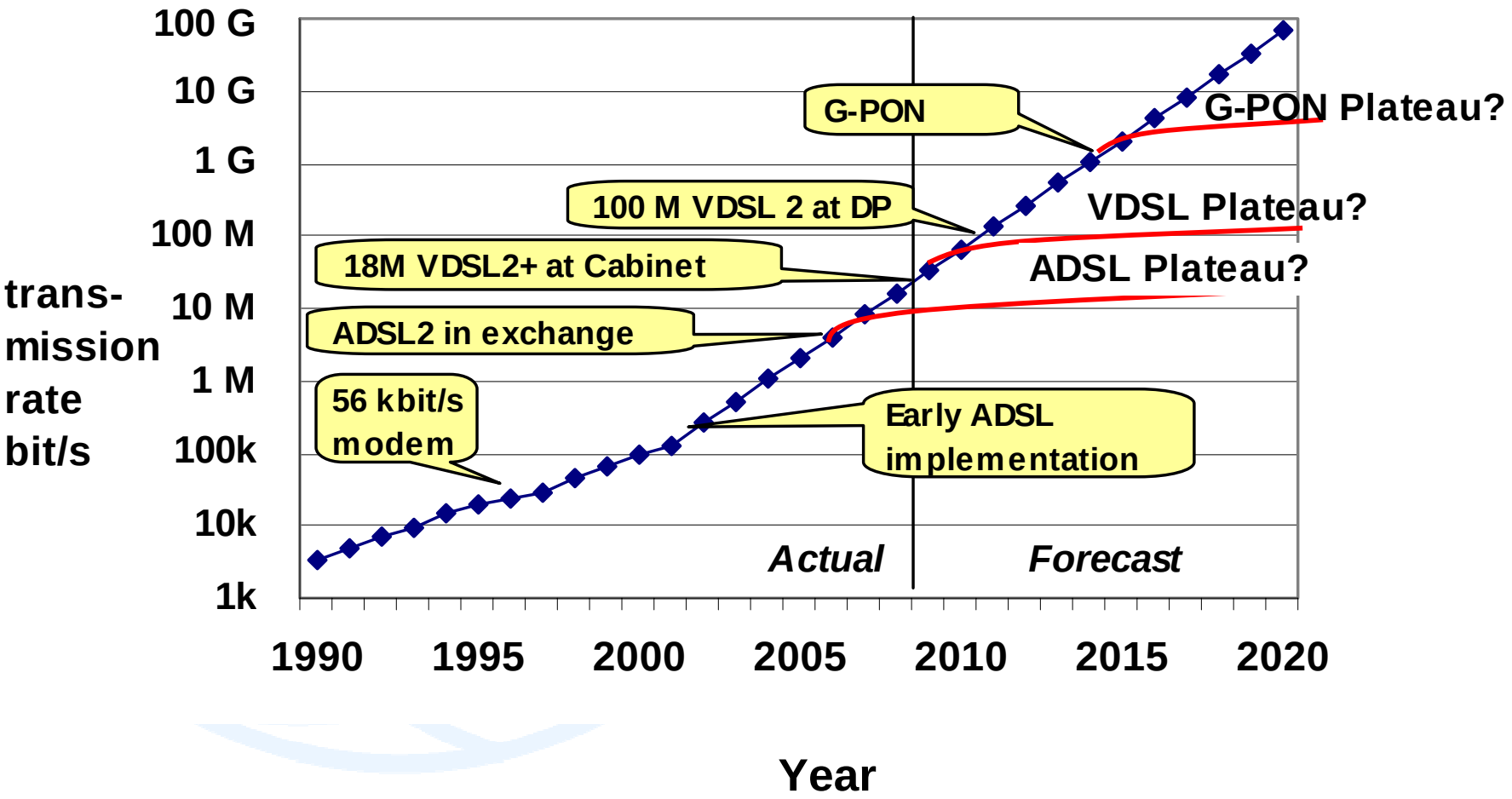


DSL and FTTP are within scope of SG15

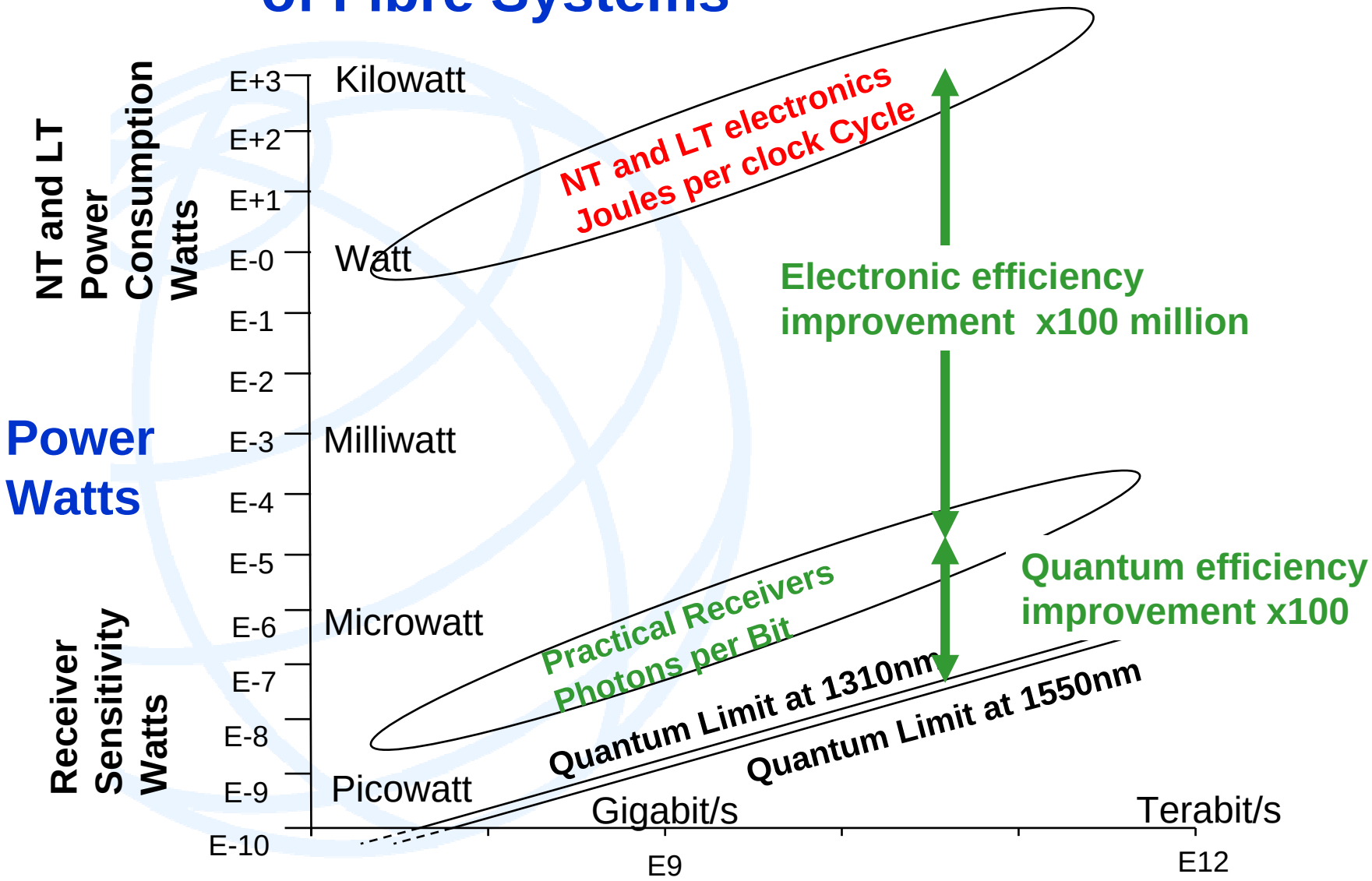
What are the energy consumption trends?

- Broadband market likely to double in next 5 years
- If the energy consumed per line is halved in this timescale?
  - this would maintain emissions at the current level
- The challenge is to reduce the energy consumption by more than half every 5 years
  - to reduce the energy consumption

Relationship between bit-rate and speed of access over time:-

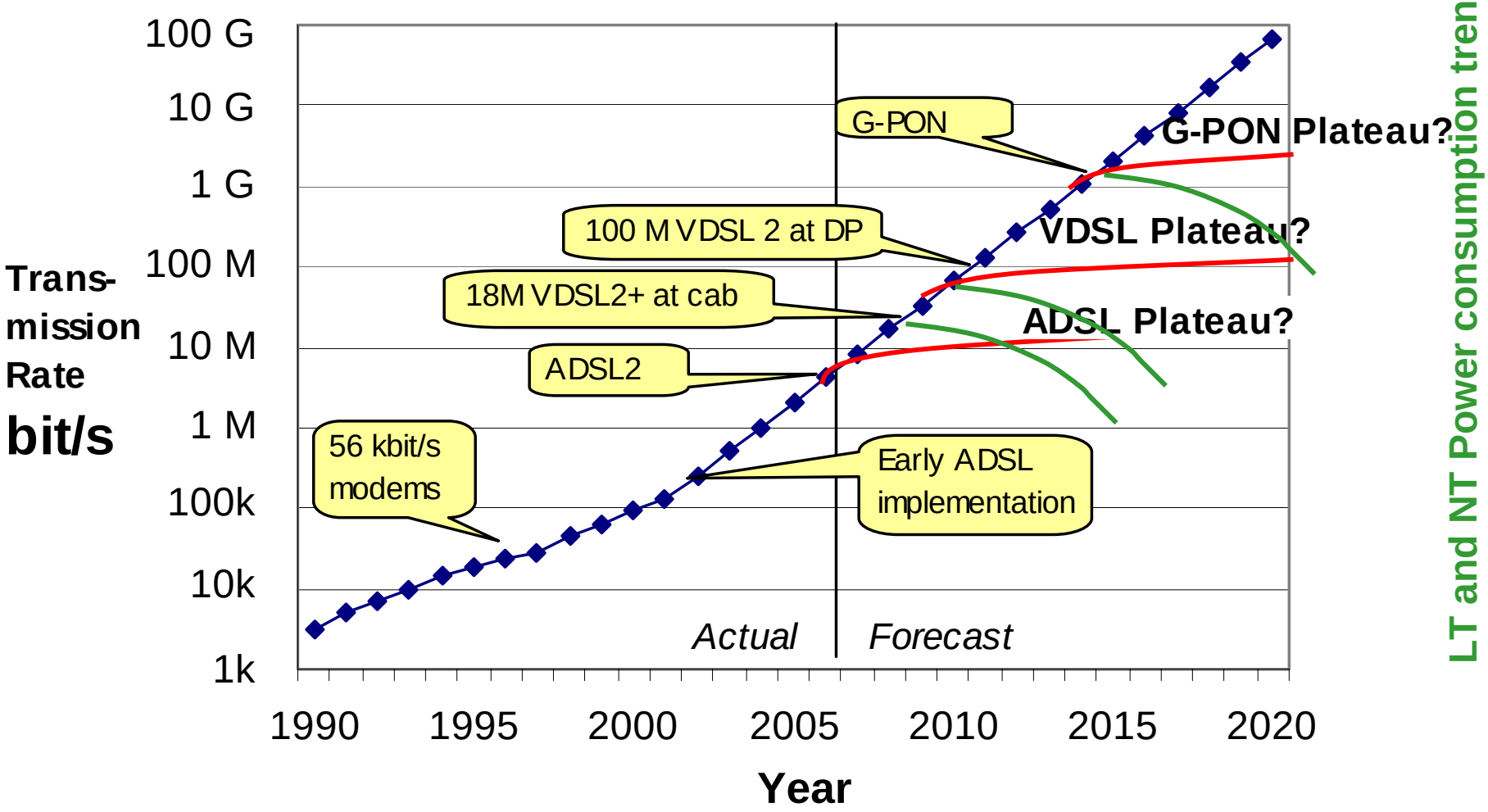


Relationship between Power and Speed of Fibre Systems



Relationship between bit-rate and power consumption over time:-

Can we increase speed while saving power?



Example Questions- 1. General

- **Does this ITU-T Recommendation foresee the development of devices or networks that will require the consumption of electric power?**
  - **YES / NO**
- **Will the implementation of this ITU-T Recommendation change the power requirements of existing devices or networks?**
  - **YES / NO**
- **If YES, please assign an approximate score to the significance of this Recommendation for climate change,**
  - **based on the following assumptions concerning power consumption and market potential (see next Figure)**

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Categorisation of power consumption and market potential for ITU-T Recommendations

	Power consumption per device / network				
Market-Million Users in 10 years	Below 0.1 Watt	Up to 1 Watt	Up to 10 Watts	Up to 100 Watts	1 kWatt Plus
0-1M	A	A	B	B	C
1-10M	A	B	B	C	C
10-100M	B	B	C	C	D
100M-1B	B	C	C	D	D
1B+	C	C	D	D	E

Example Questions- 2. Mitigation

- **Does the ITU-T Recommendation consider/enable lower power/energy consumption of the technology or network (e.g. NGN, ADSL2+), for instance by enabling multiple power modes? YES / NO**
- **If so, how well does the ITU-T Recommendation perform the action of reducing energy consumption?**
  - **For example, is power saving mandatory or optional?**

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SG15 Questions- The Challenge

- **All Questions are now requested to include climate change issues (e.g. energy saving, reducing greenhouse gases, etc).**
- **Each new Recommendation should identify**
  - **its impact on climate change**
  - **how it contributes towards measurable reduction in emission of greenhouse gases**

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Summary

- **The checklist (TD-288-GEN) is at a first draft stage for WP1**
  - **A General Technical Document with useful metrics and tools**
  - **Is it workable yet for old and new Recommendations?**
  - **See Annex 1 (old) and Annex 2 (new) respectively**
  - **What improvements can be made at the Question level?**
- **Can other WGs use it as a model?**
- **Can ITU work with other bodies to agree worldwide targets and check compliance?**
  - **IEC, IEEE and EU**
  - **Others: SEA, USA?**

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Thank You

For additional information, see www.itu.int/ITU-T/climatechange

and http://www.itu.int/ITU-T/studygroups/com15/index.asp