

Installed Cabling

- forecast to 2005 -
update (March 2003)

Alan Flatman

**Principal Consultant
LAN Technologies UK**

a_flatman@compuserve.com

Acknowledgements

This study was commissioned by Cisco Systems.

Base cabling market data was provided by BSRIA.

Big Question

What kind of cabling for 10GBASE-T?

If 10GBASE-T becomes an approved 802.3 project, what will the installed cabling base look like when it is likely to be approved (early 2006)?

Market Data

- 1. Cable types by Category/Class**
- 2. Installation trends BC to 2005**
- 3. National & regional variations**
- 4. Global installed base to 2005**

Data Sources

BSRIA

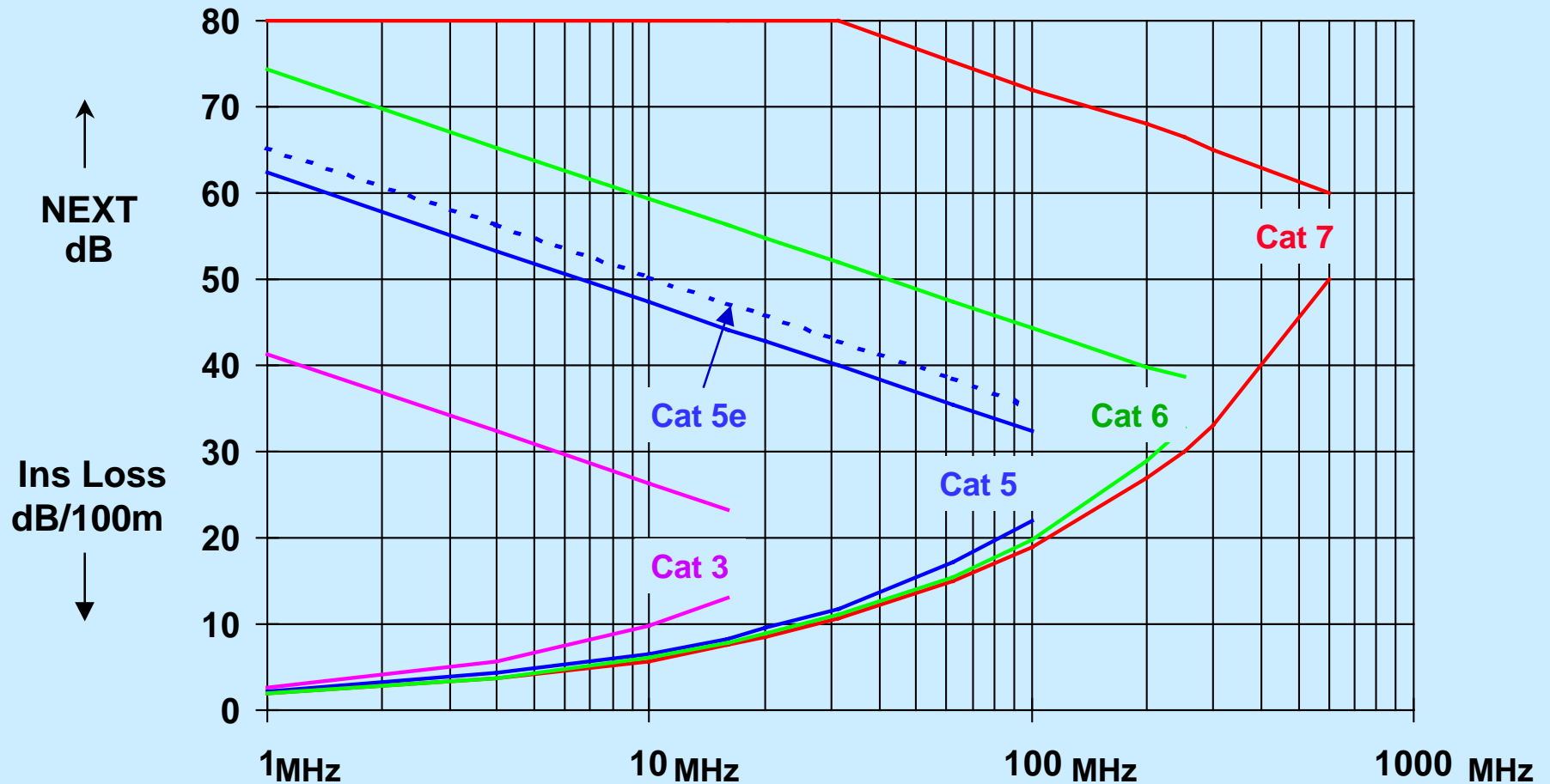
- Building Services Research and Information Association
- Cabling research since 1987
- 37 countries forecast to 2005
- Cat segmentation by country

Cabling Industry

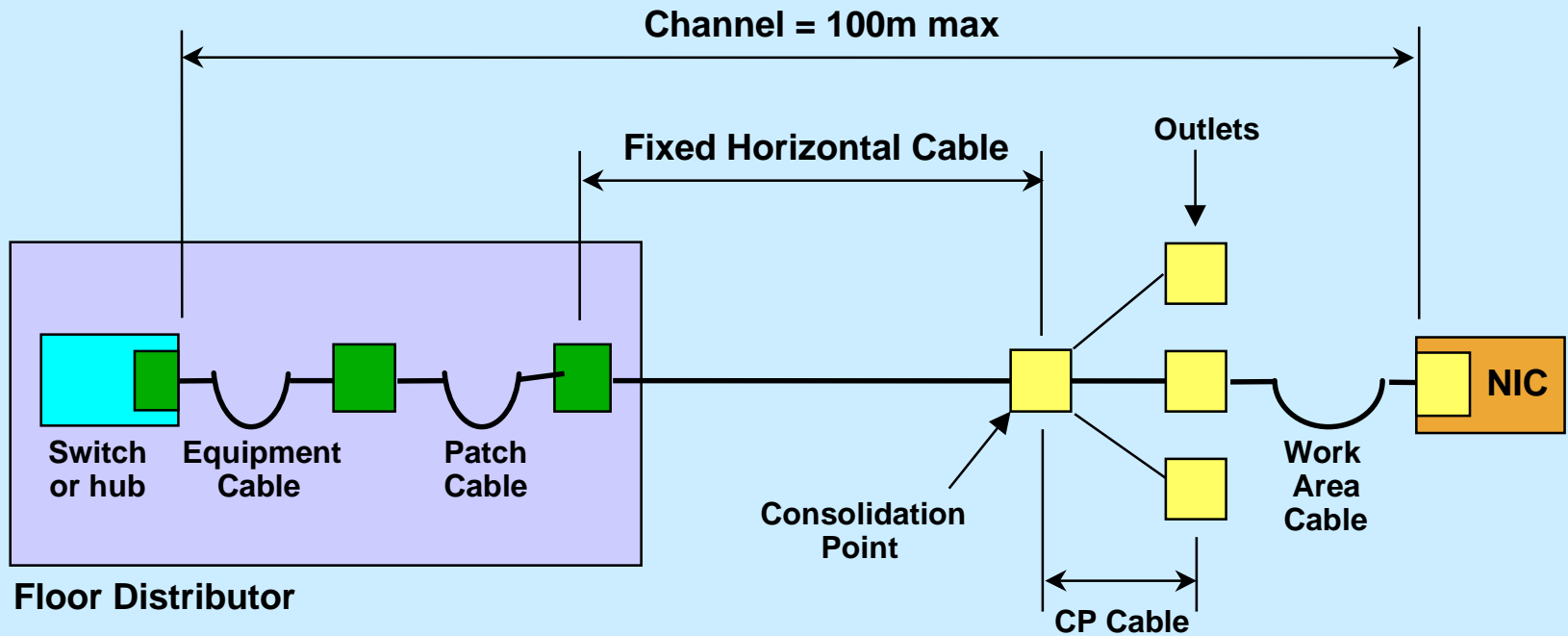
- providing replacement data
- 10 suppliers being surveyed (owning 60% market share)
- consultants also surveyed
- replacement rate guide Jan/
detailed data in March 2003

Types of Copper Cabling

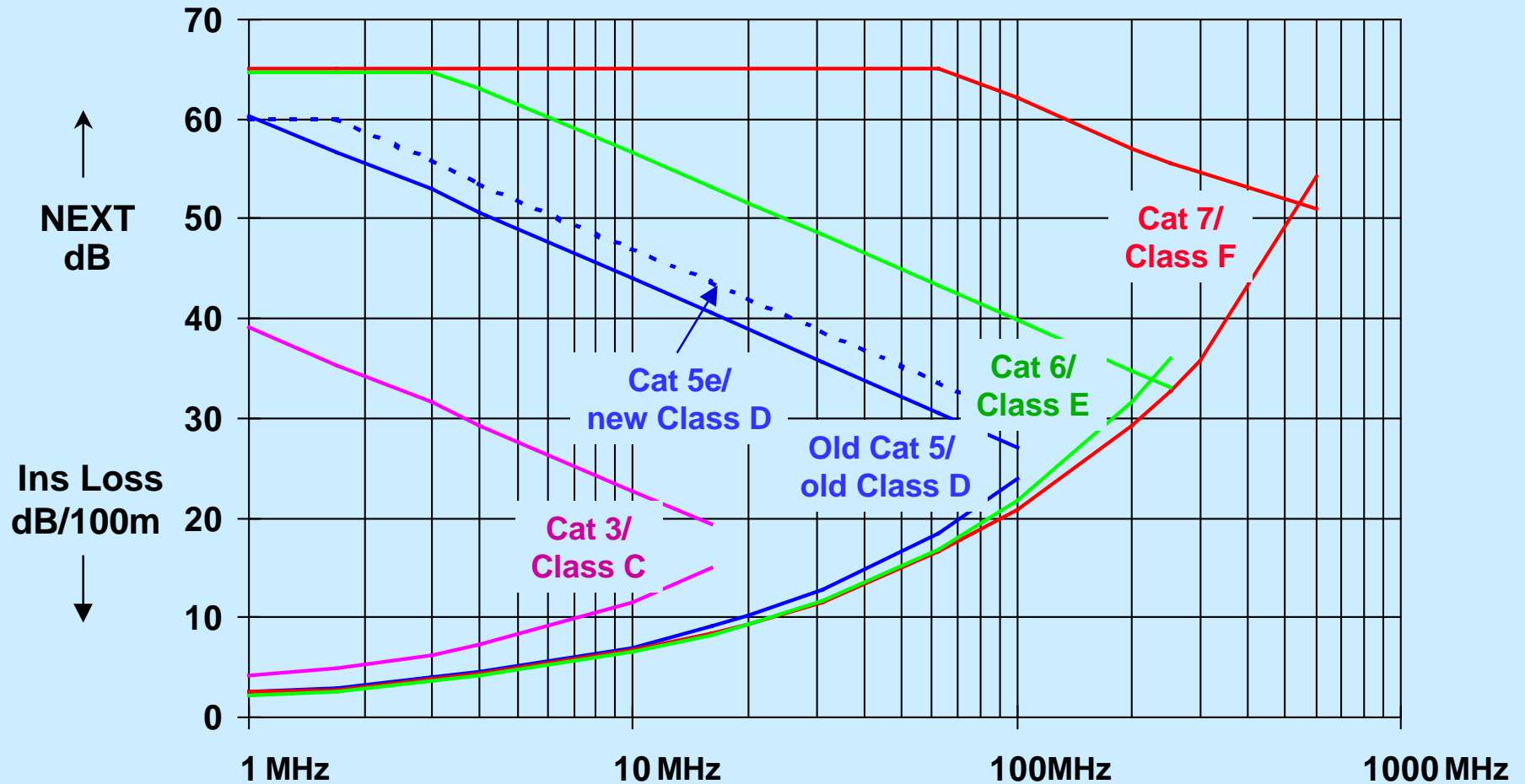
Cable Insertion Loss & NEXT



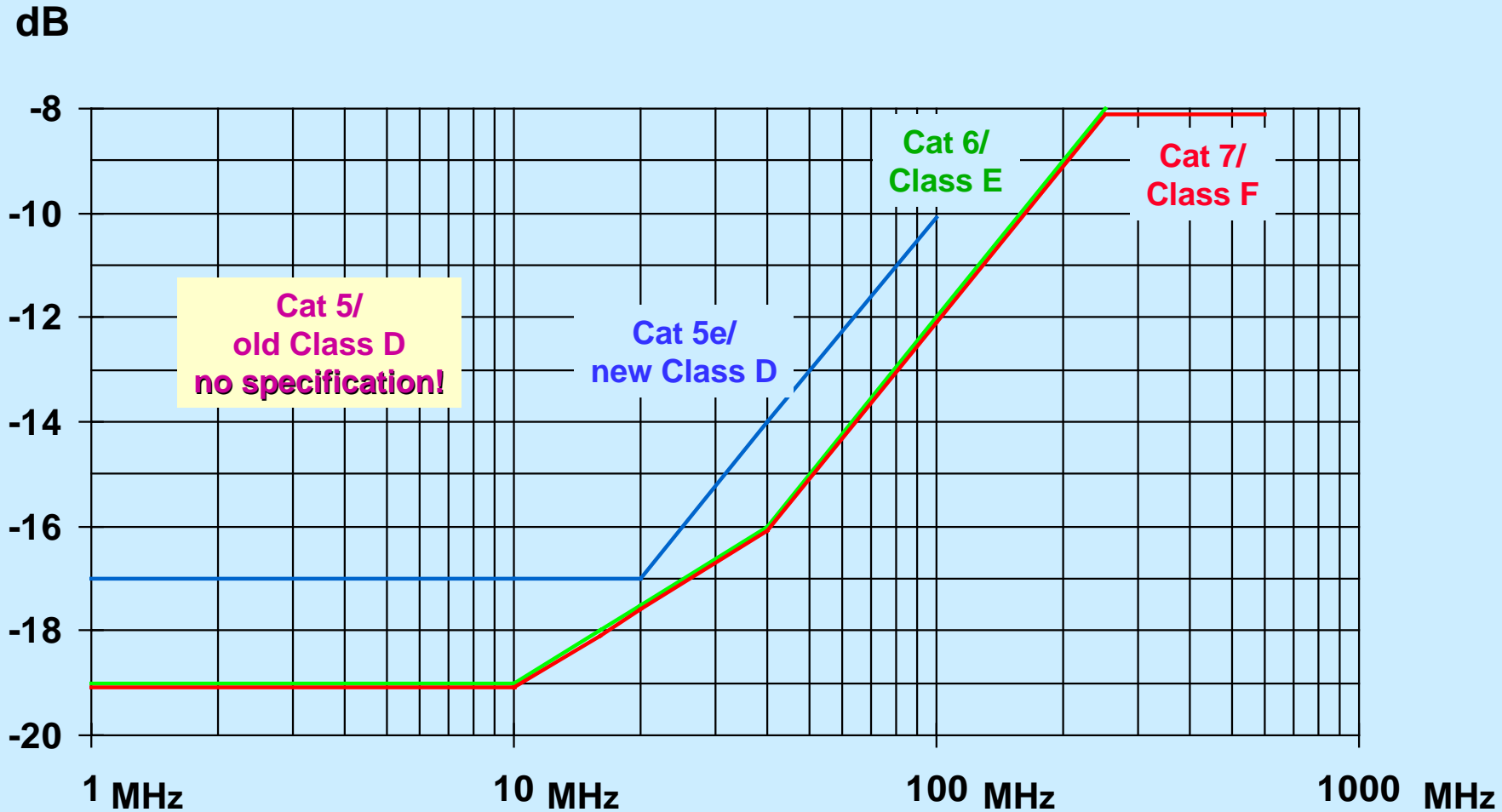
Channel Configuration



Channel Insertion Loss & NEXT



Channel Return Loss



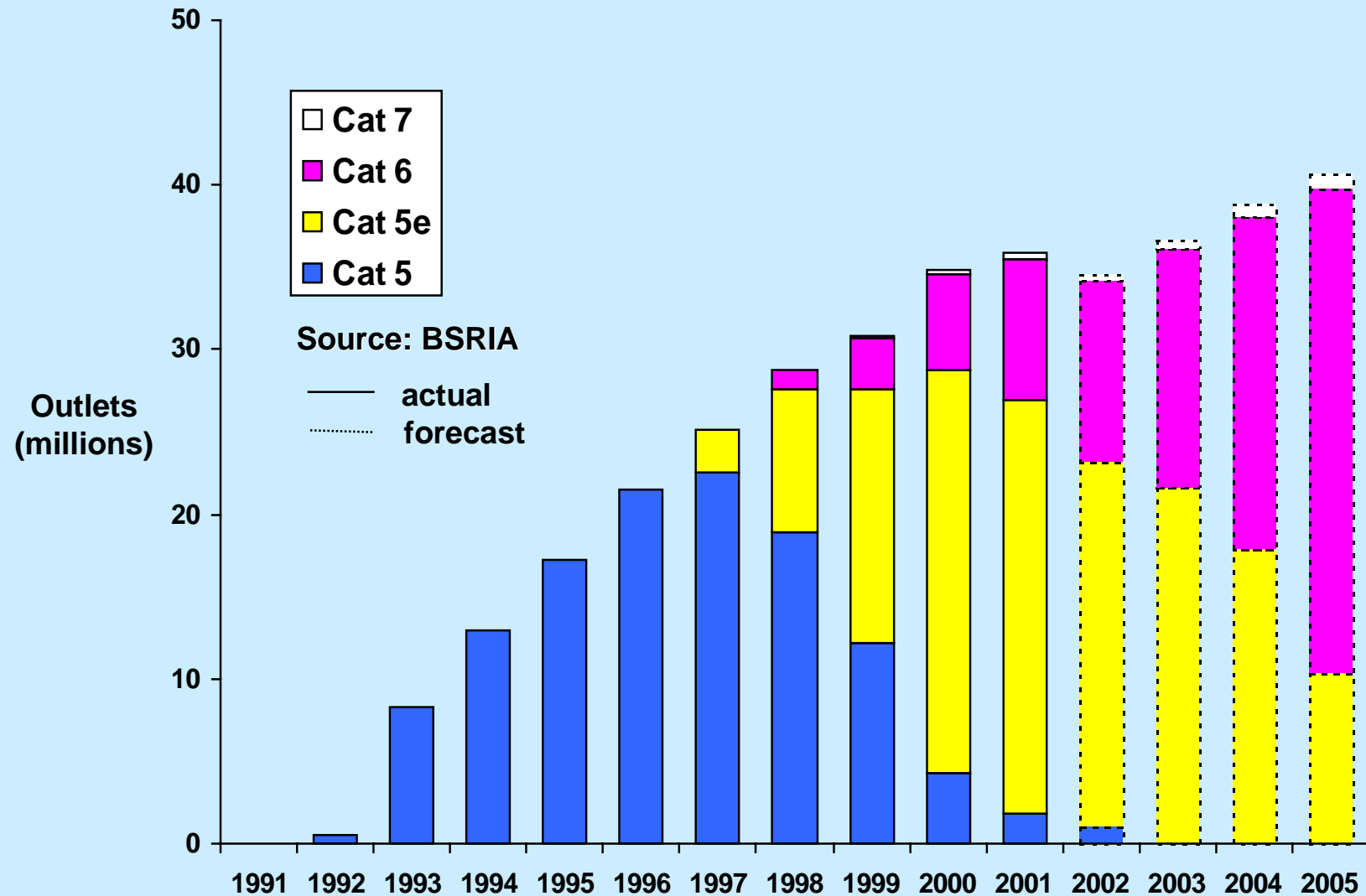
Installation Trends

Segmentation

- Outlets segmented by Category
- Outlets segmented by region:
 - » *Western Europe* *30% in 2002*
 - » Eastern Europe
 - » *North America* *42% in 2002*
 - » Latin America
 - » *Asia-Pacific* *22% in 2002*
 - » Middle East
- *Regional variations highlighted*

Annual Shipments: 1991 to 2005

Western Europe

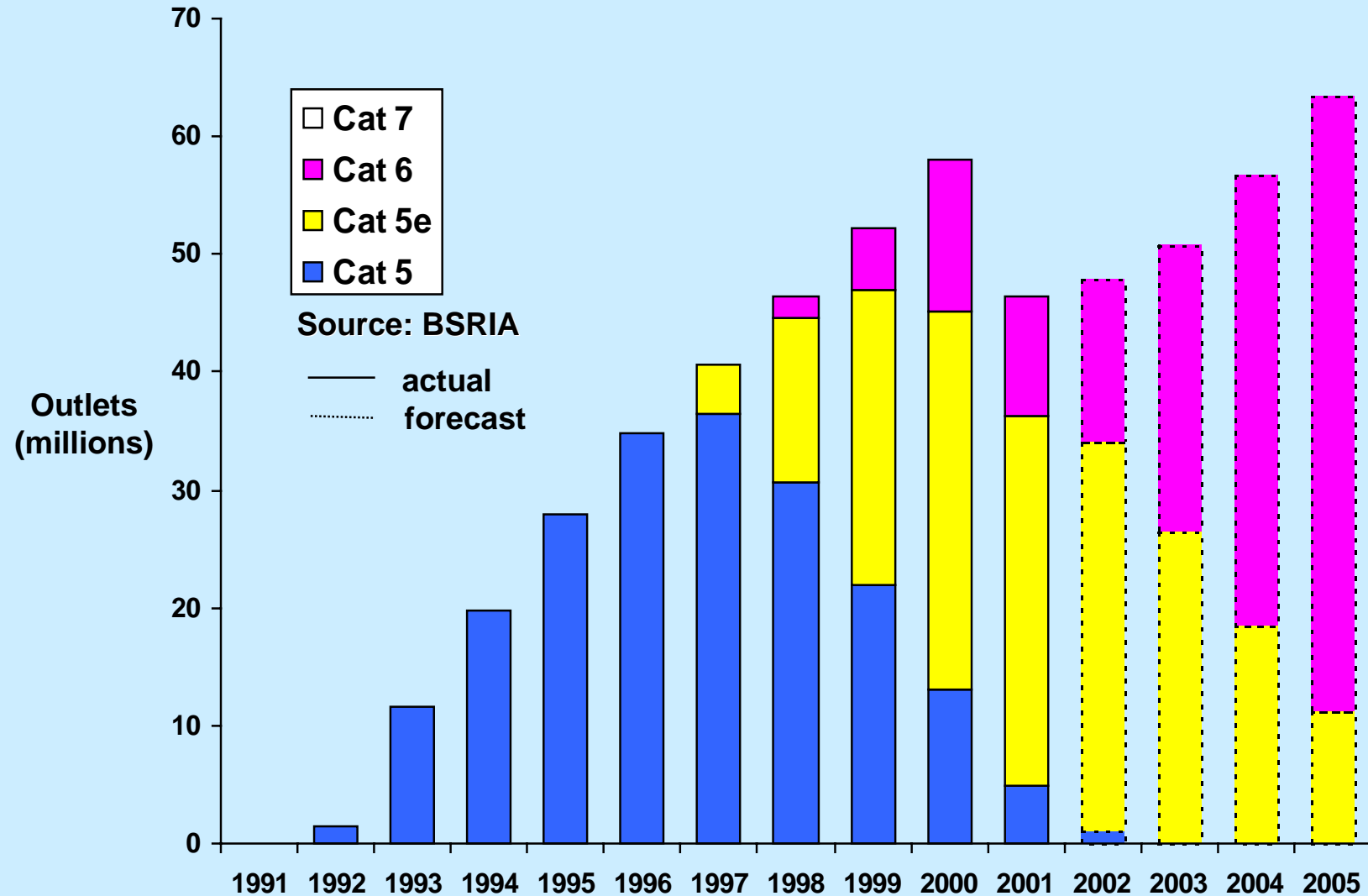


Western European Trends

- **Latest research points to approx 4% deeper recession from 2001 to 2002**
- **Approx 50% horiz'l cables screened**
 - » overall foil-screened cables in France
 - » pair-screened cables in Germ/Aus/Switz
- **85% Cat 7 in Germany/Austria/Switz**
- **Significant levels of Cat 7 cable used for Class E channels (perhaps 50%)**
 - » equivalent to 18 million outlets
- **Fibre outlets 1.5% of total shipments (BSRIA 2002)**

Annual Shipments: 1991 to 2005

North America

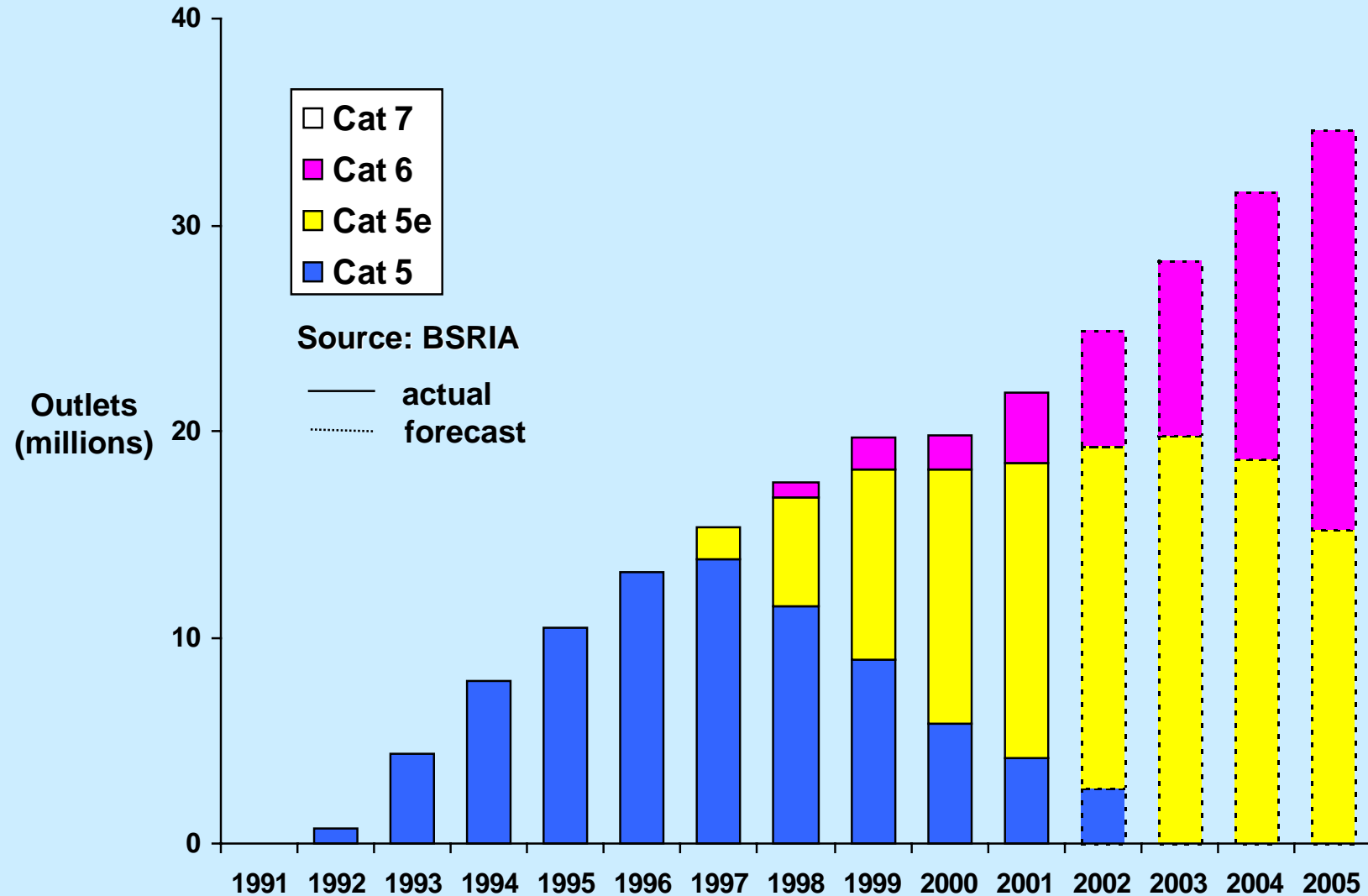


North American Trends

- **Marked recession from 2000 to 2001**
- **99% horizontal cables unscreened**
- **Early & aggressive market for Cat 6**
- **Fibre outlets 1.0% of total shipments (BSRIA 2002)**

Annual Shipments: 1991 to 2005

Asia-Pacific

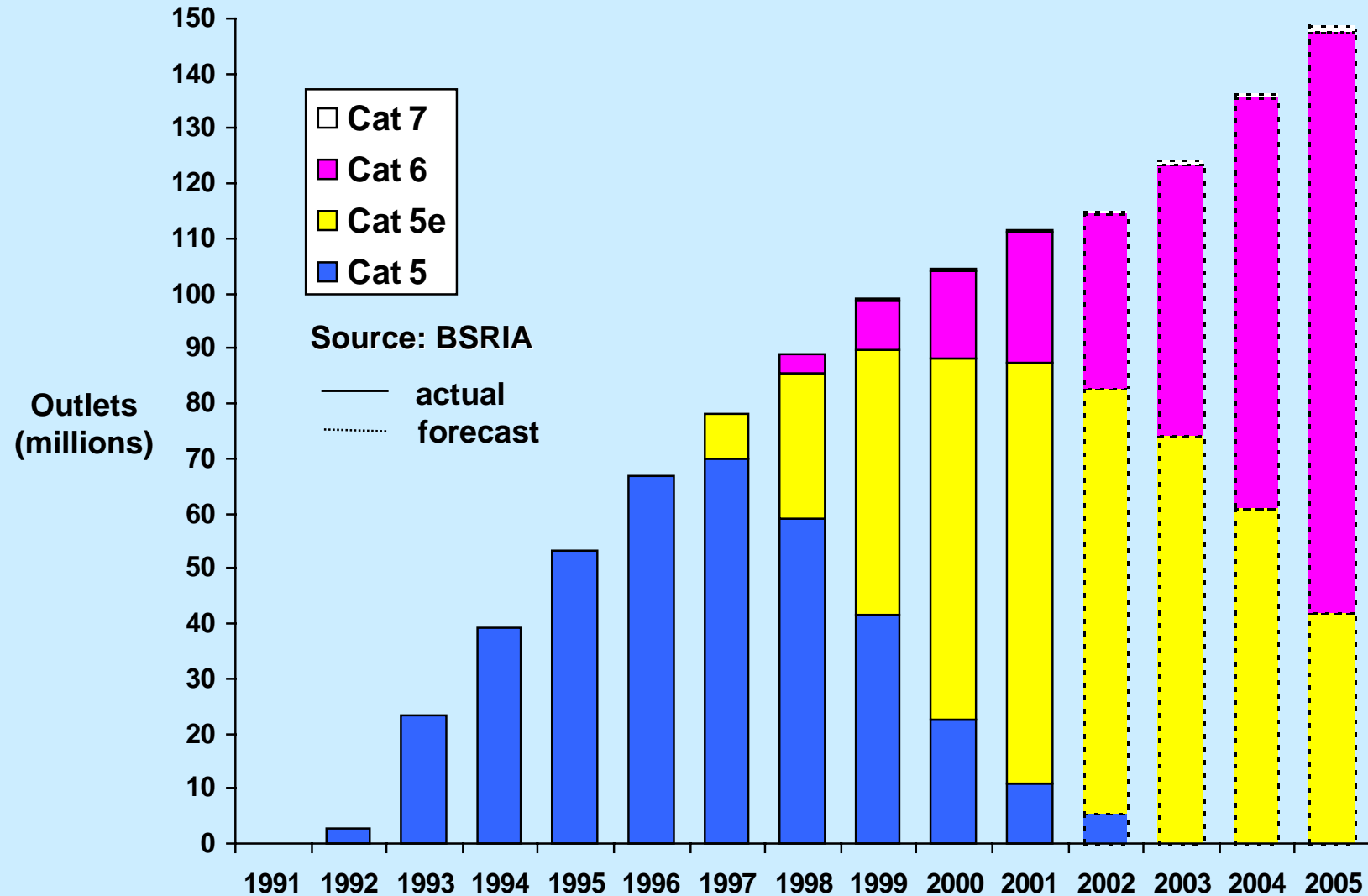


Asia-Pacific Trends

- **Earlier recession from 1999 to 2000**
- **98% horizontal cables unscreened**
- **40% outlets in China, strong growth**
- **Fibre outlets 0.5% of total shipments (BSRIA 2002)**

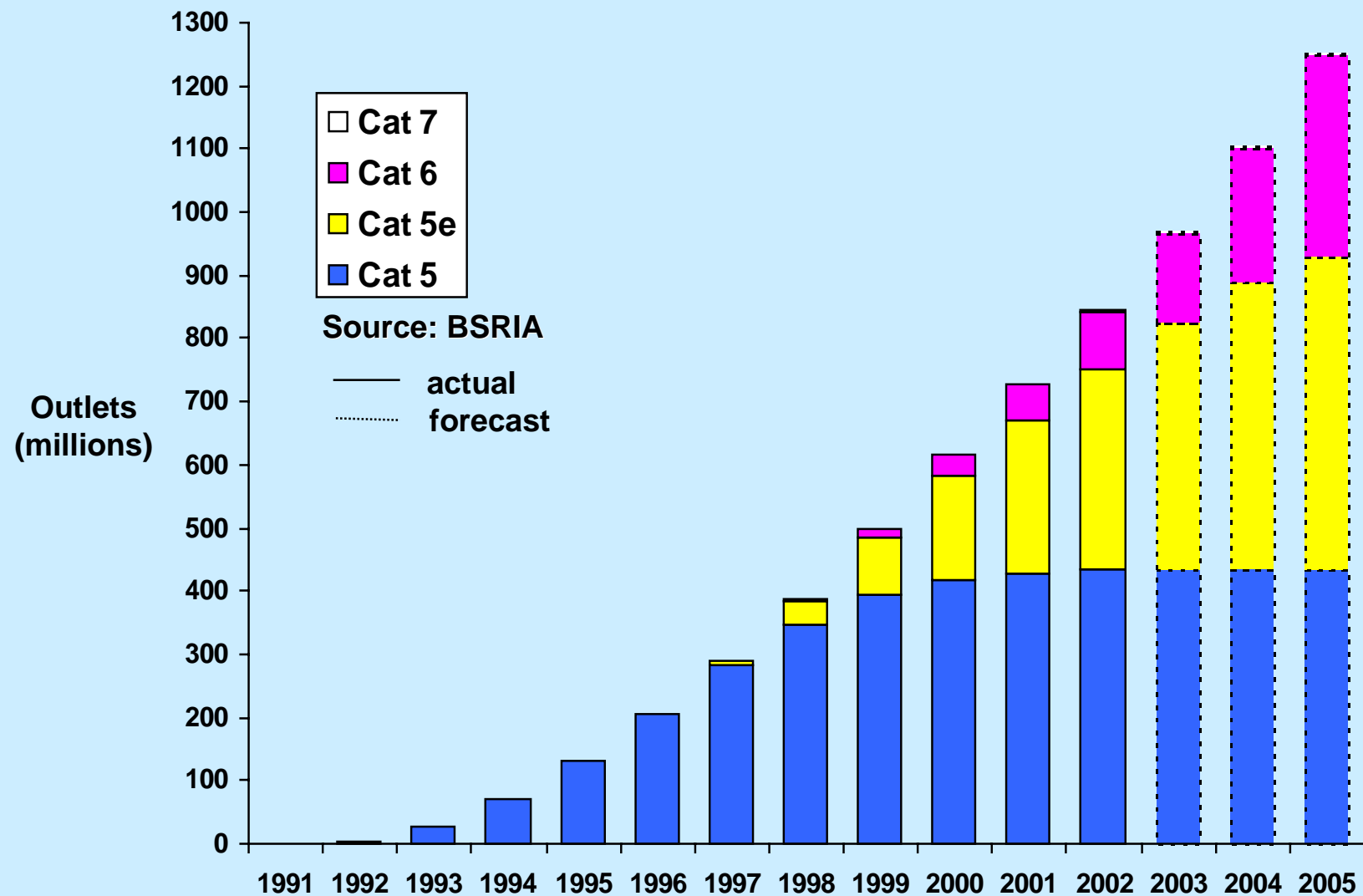
Annual Shipments: 1991 to 2005

World-wide



Installed Base

Cumulative World-wide Shipments



Installed Base Model Assumptions

- **40% new shipments replace existing cabling**
 - » for cabling upgrades & building refurbishment
 - » some regional and industry sector variation
 - » world-wide trend from 1997, in/out of recession
- **new shipments apportioned to Cat 5/Cat 5e:**

	1997	1998	1999	2000	2001	2002	2003	2004	2005
Cat 5	40%	40%	40%	40%	35%	35%	35%	35%	35%
Cat 5e					5%	5%	5%	5%	5%



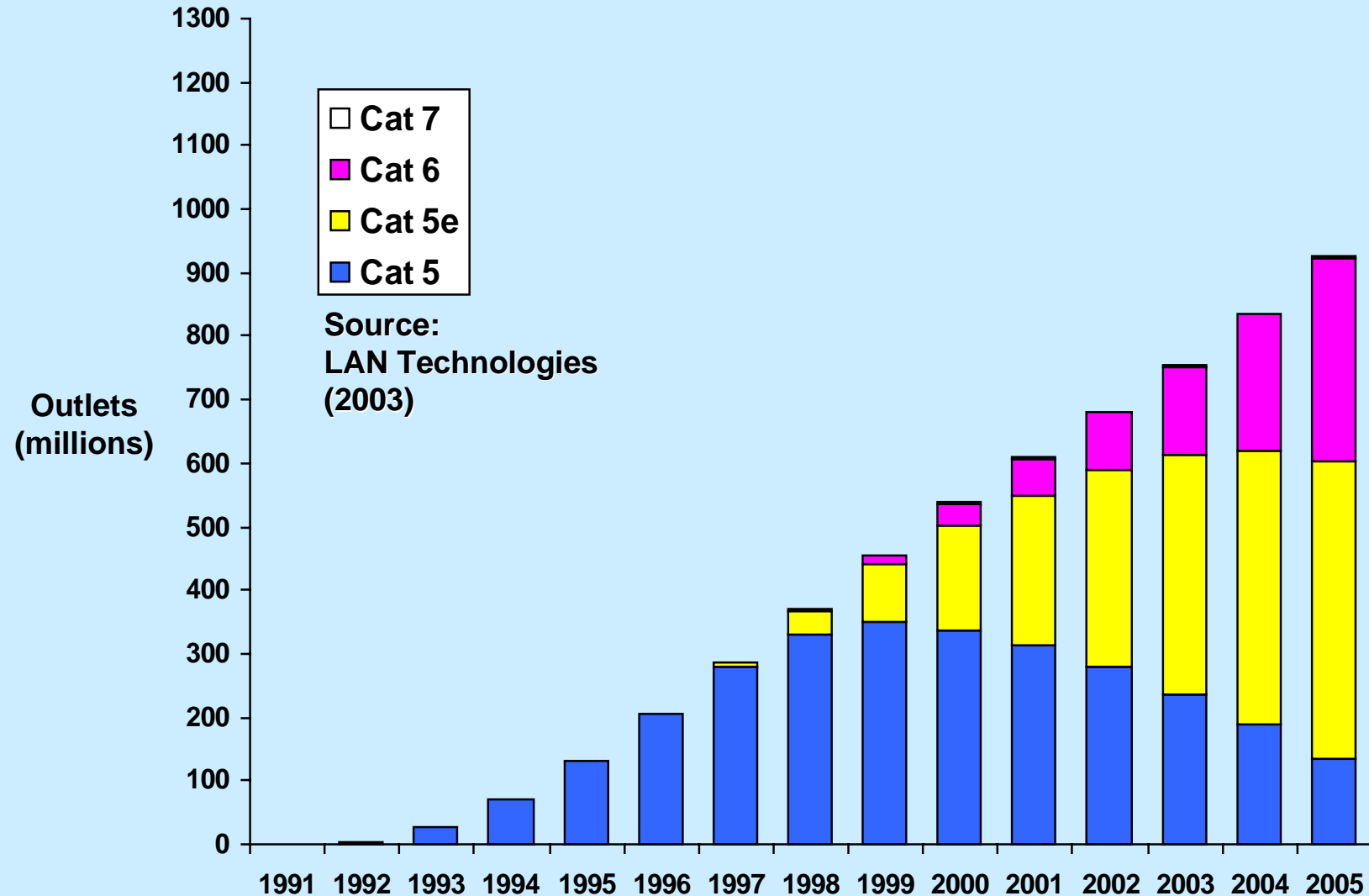
Jan 2003 - spreadsheet forwarded to selected major cabling suppliers



Feb 2003 - assumptions supported by several major cabling suppliers

Estimated World-wide Installed Base

(40% new shipments replaces existing cabling)



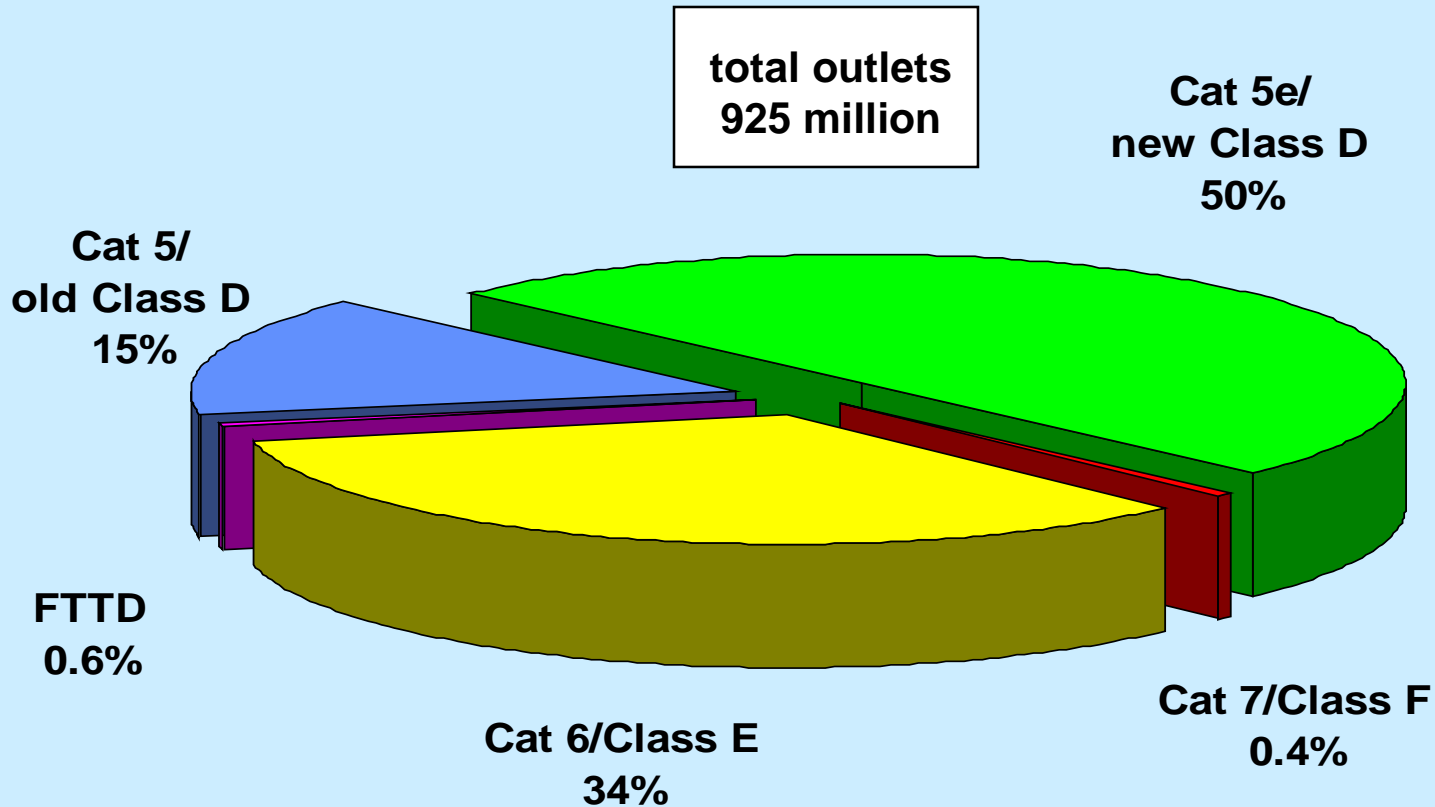
Estimated World-wide Installed Base

Source: LAN Technologies (2003)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Cat 5	100%	97%	89%	77%	63%	51%	41%	31%	23%	15%
Cat 5e	0%	3%	10%	20%	31%	39%	45%	50%	51%	50%
Cat 6	0%	0%	1%	3%	6%	10%	13%	19%	26%	34%
Cat 7	0%	0%	0%	0%	0.1%	0.1%	0.2%	0.2%	0.3%	0.4%

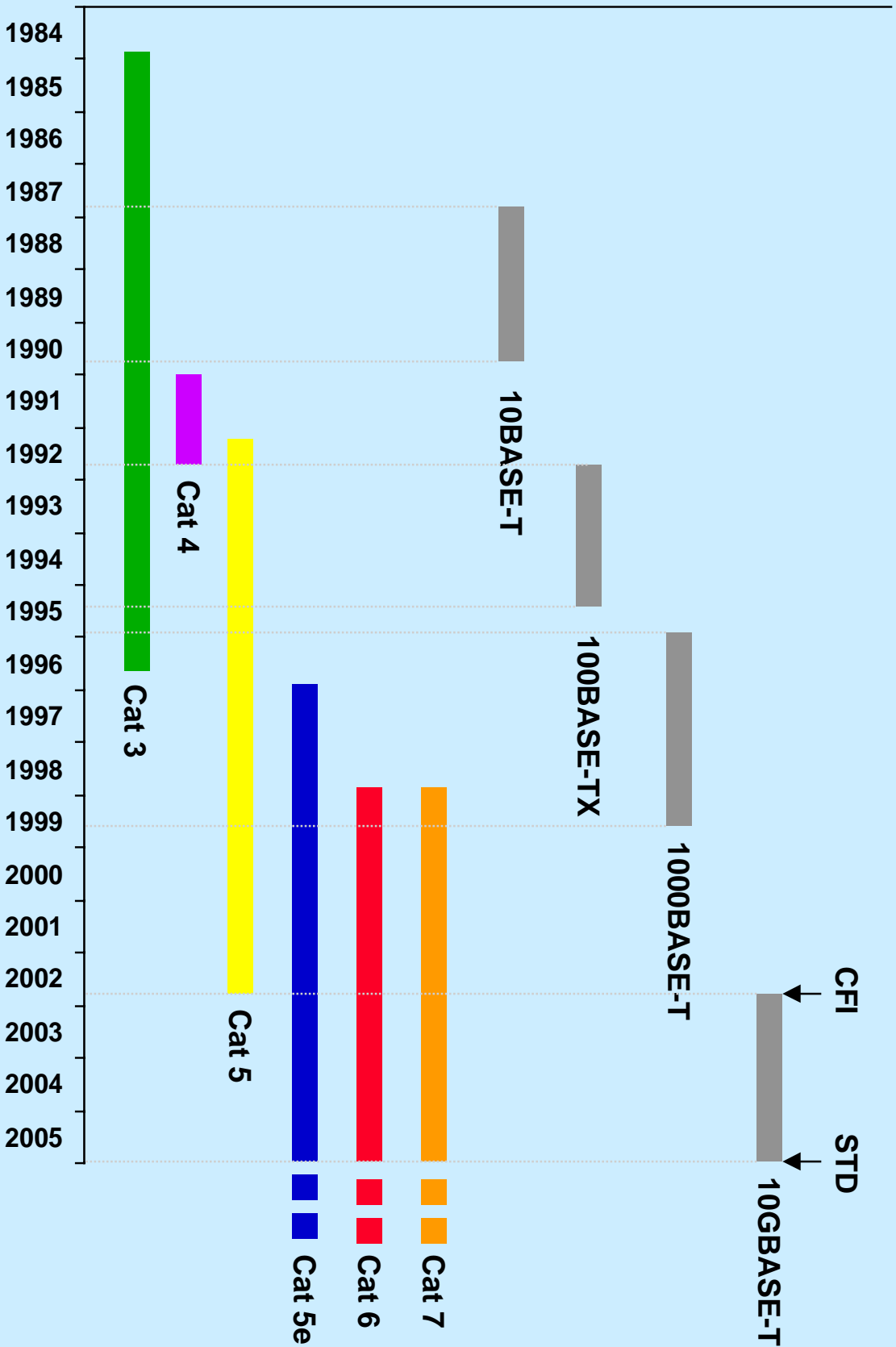
Summary

Estimated World-wide Installed Base in Dec 2005



Source: LAN Technologies (2003)

Lifecycles



Ethernet Cabling Estimates at Birth

Source: LAN Technologies (2003)

Ethernet Type	IEEE 802.3 Std Approved	Number Installed Outlets		
		Cat 5	Cat 5e	Cat 6
100BASE-TX	June 1995	100m	-	-
1000BASE-T	June 1999	340m	65m	8m
10GBASE-T	Jan 2006??	136m	465m	320m

Questions?