

Economic Feasibility 10G vs 40G vs 100G

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Introduction

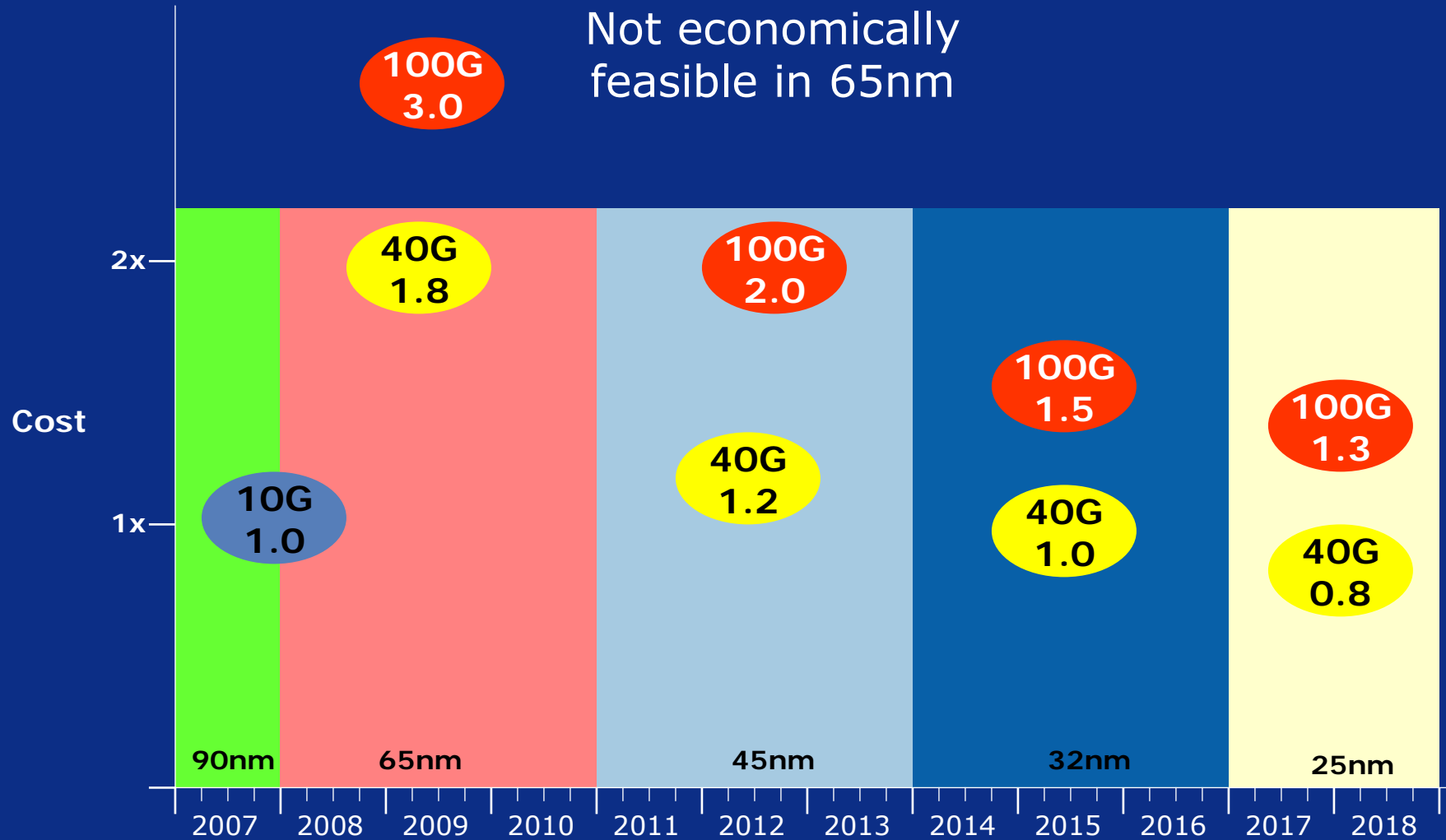
This presentation shows:

- The economic feasibility of a LAN Controller for end-station (NIC) comparing 40G vs 100G
- The economic feasibility of PHY and cable assemblies comparing 40G vs 100G
 - based on data from Paul Kolesar, CommScope Inc.

Assumptions for Area and Power

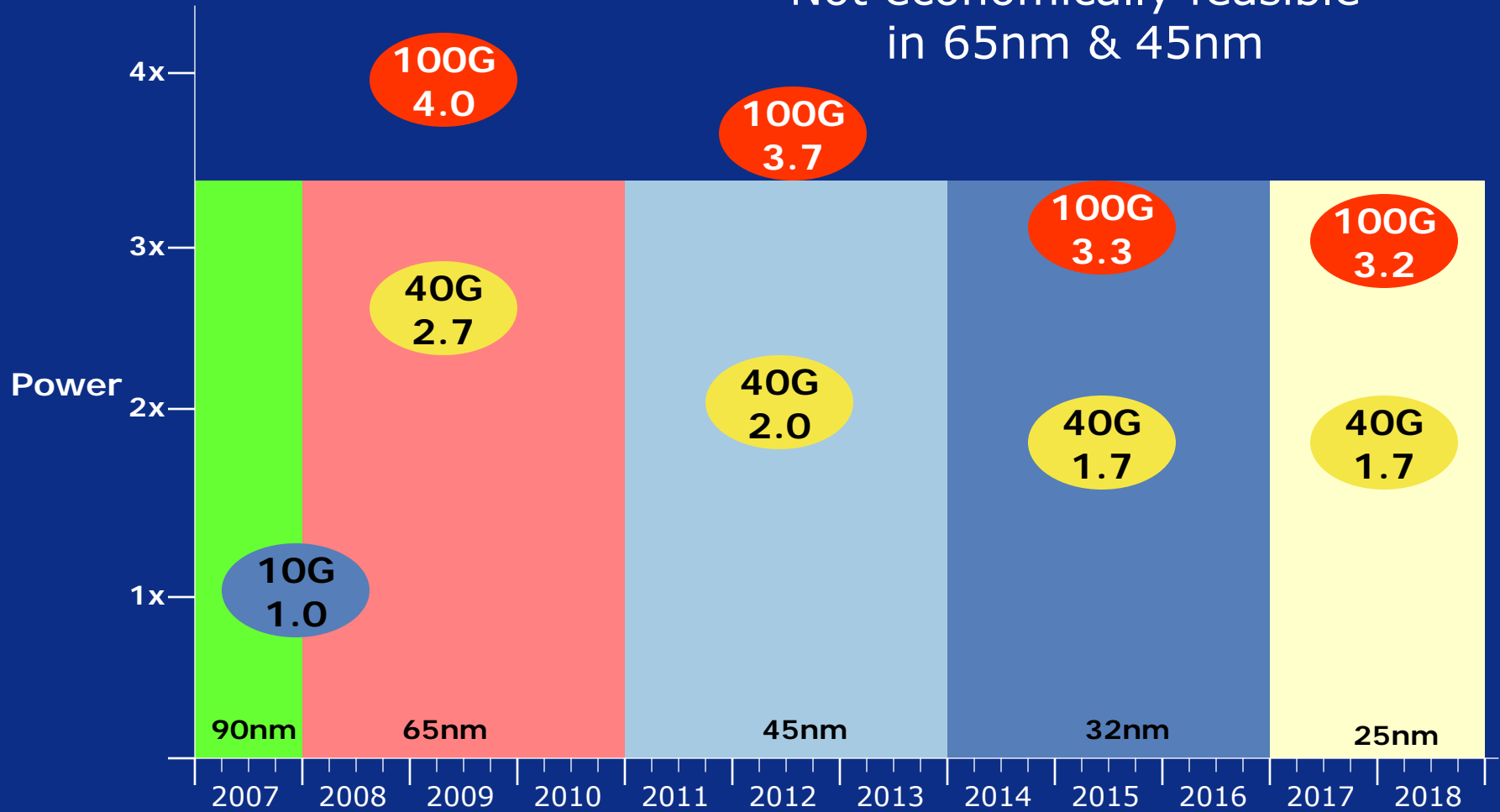
- The expected die area and power of a 40G or 100G LAN Controller is based on extrapolation of 1G and 10G products
- The LAN Controller is comprised of a Host interface, MAC and MAC/PHY interface. PHY is not included.

Die Area Estimation



Power Estimation

Not economically feasible
in 65nm & 45nm



Assumptions for PMD

- For parallel MMF connectivity the cost of the cabling for 4x10G will be half that of 10x10G.
 - 40G uses 1 ribbon cable, 100G uses 2 ribbon cables
- Future 40G QSFPs are 2x the cost of 20G QSFPs (i.e. 2x XFP cost), and that 100G PMDs are 5x XFP cost.
 - Consistent with jewell_01_0107.pdf where 100G cost = 4x XENPAK cost.
- In order to compare cabling and PMD costs at the end user level, a PMD cost adjustment factor to account for integration by the OEM was be applied.

PMD Cost Comparison

Using 2007 XFP cost as base=1,
the basic projected cost comparison could be:

Data rate	10G	40G	100G
PMD cost	1	6	15
Cable cost	0.2	1	2
Total cost	1.2	7	17

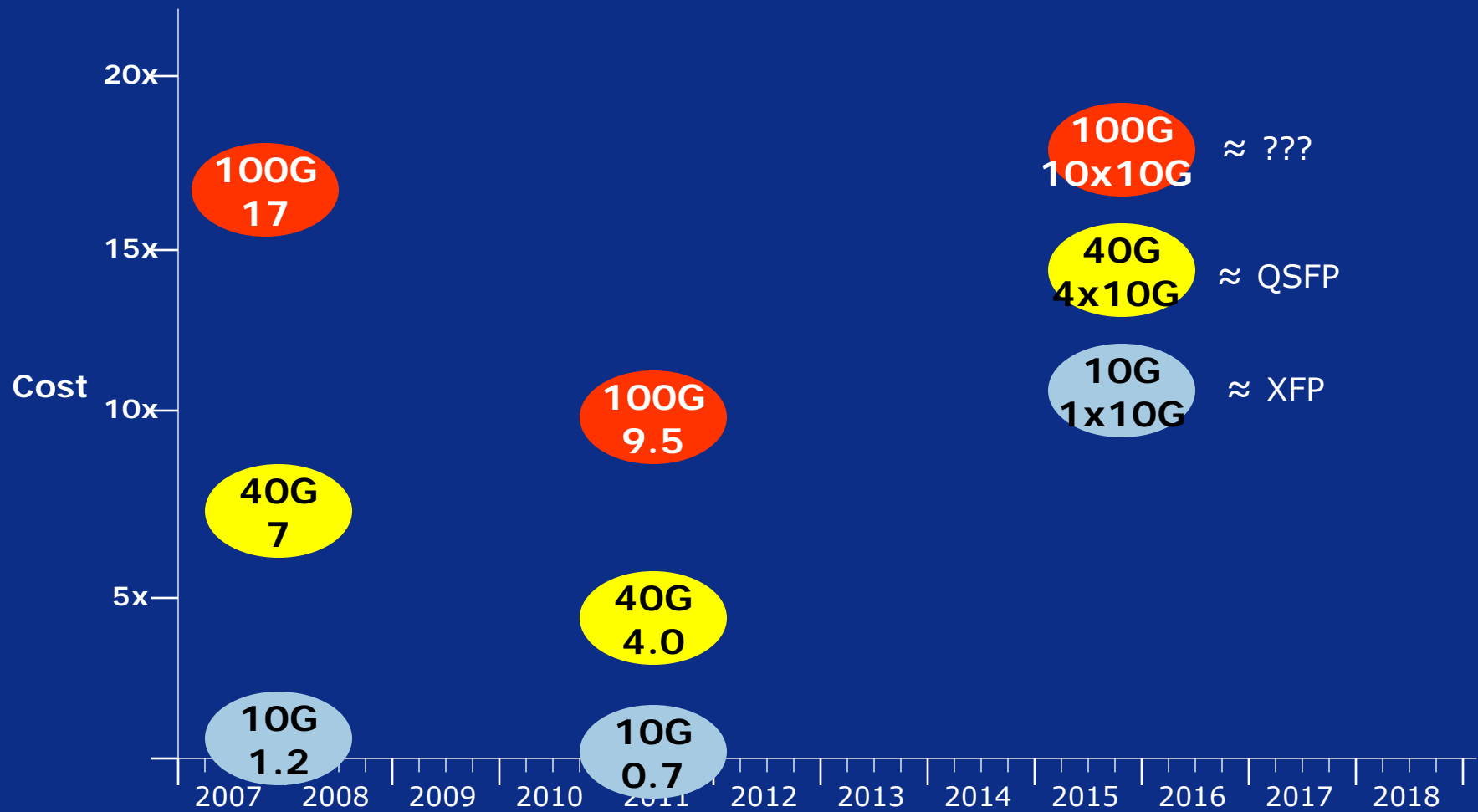
40G total cost is ~0.4x of the 100G total cost.

In about three to four years (assuming both 40G and 100G MM PMDs have the same initial availability date) the cost is:

Data rate	10G	40G	100G
PMD cost	0.5	3	7.5
Cable cost	0.2	1	2
Total cost	0.7	4	9.5

40G total cost is ~0.4x of the 100G total cost.

PMD Cost Comparison



Conclusion

The 40G LAN controller is estimated to be $\sim 1.0x$ the cost and $\sim 1.7x$ the power of a 10G LAN controller by 2015

A 40G LAN controller is estimated to be $\sim 0.6x$ the cost and $\sim 0.5x$ of the power of a 100G Controller by 2015

The cost of a 40G PMD including cabling is estimated to be $\sim 0.4x$ the cost of 100G by 2011

We expect 40G TTM to be 3-4 years earlier than 100G because it will be cost-effective in 65nm