Market Update

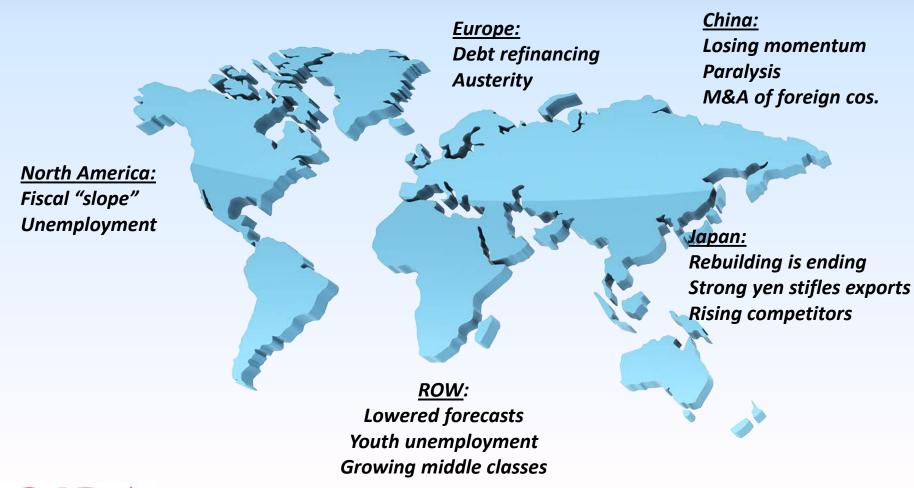
March 21, 2013

Tom Hausken, PhD OIDA





Global economics: slow recovery and transition







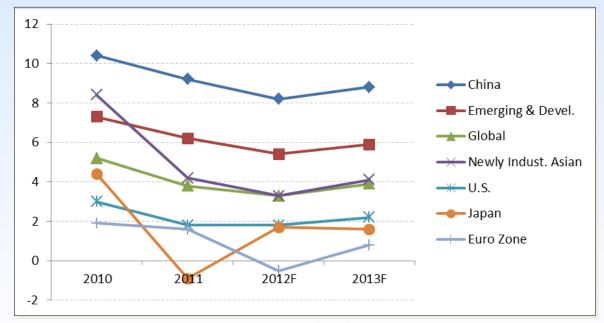
Global growth rates are down

Global demand and trade are slowing.

Political uncertainty and/or gridlock in Europe, U.S., China, and Japan.

2013 will look approximately the same as 2012.

GDP Growth (%)

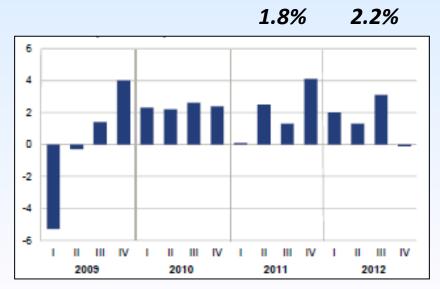


Real annual percent growth in economic output (GDP). Source: IMF, World Economic Outlook, updated January 2013.



U.S. growth outlook is modest

2% annual growth is the new normal, through 2013. Political uncertainty over the fiscal "slope," sequestration, etc. Continued tight fiscal conditions & unemployment.

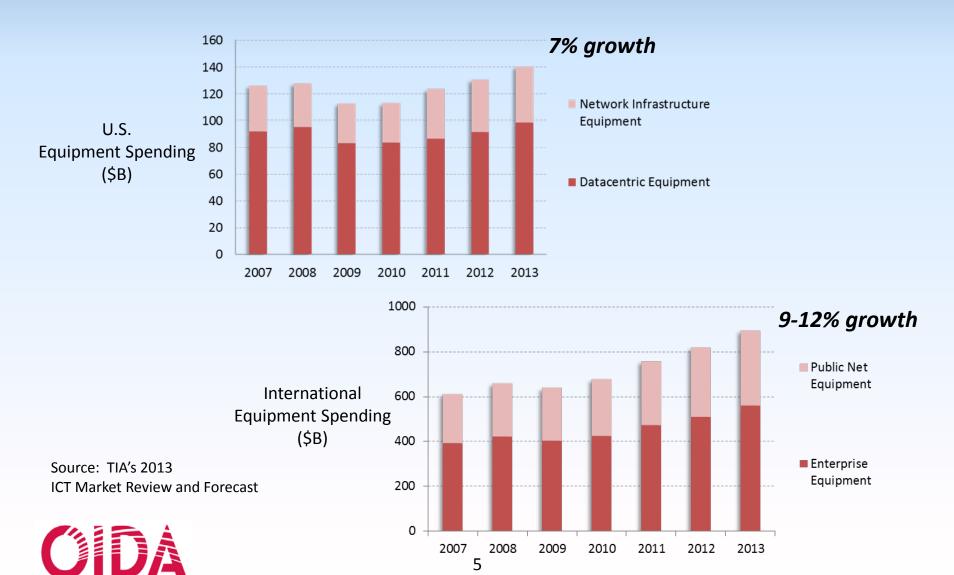


Source: U.S. Bureau of Economic Analysis.

U.S. real q-over-q (annualized, seasonally-adjusted) percent GDP growth.

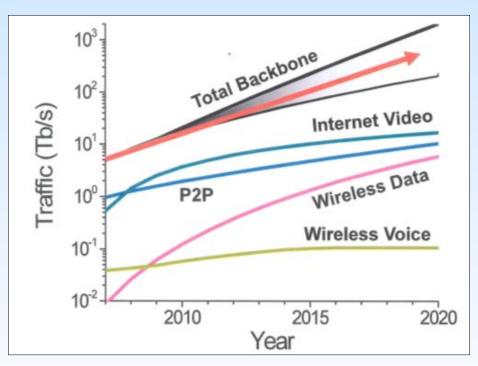


Comm equipment spending is better



GreenTouch forecasts strong NA backbone traffic growth

30x per decade

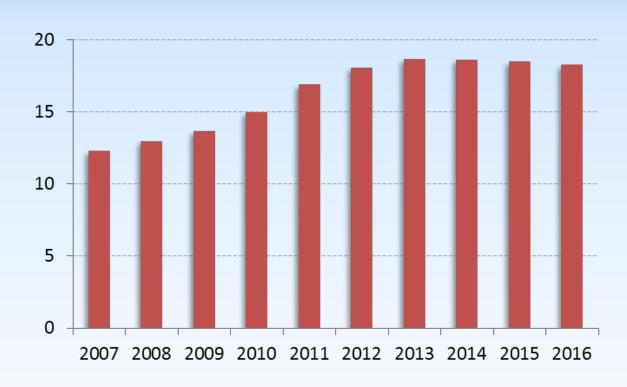


Source: D. Kilper, Alcatel-Lucent (presented at the 2011 OIDA aggregation network workshop).



U.S. data center construction is strong

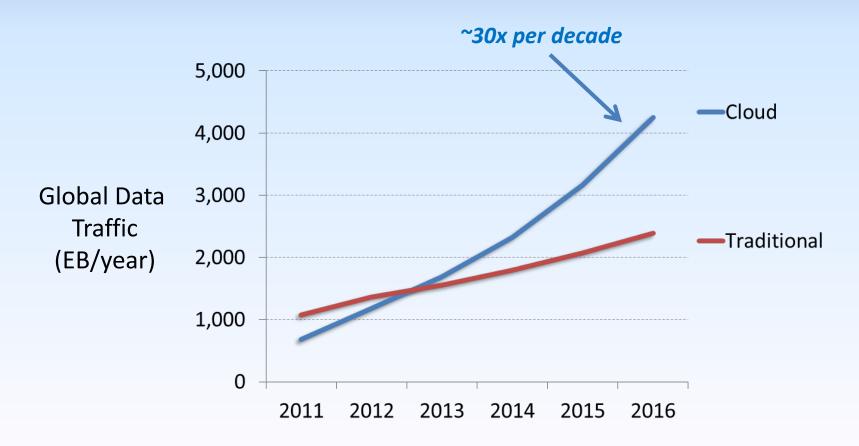




Source: TIA's 2013 ICT Market Review and Forecast



Cloud traffic is exploding



Source: Cisco Global Cloud Index (2012)



Optical component supplier revenue: at the end of the whip

Selected
Optical Communication
Component Supplier
Revenues
(\$US Millions)



Source: OIDA (2013)



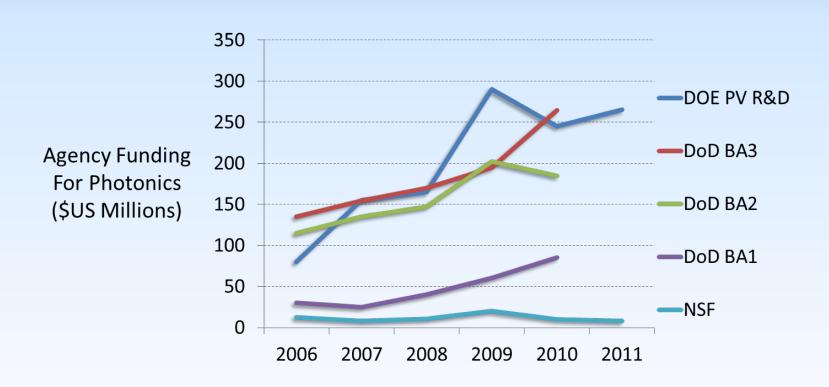
Communications supply chain

	Company	Revenue
Content Providers & Network Provision	AT&T Verizon Comcast Google Apple iTunes Facebook	\$ 127 B 116 63 46 14 5
Network Equipment	Cisco Huawei ALU Juniper	\$ 46 B 32 19 4
Optical Components	Finisar JDSU Oclaro	\$ 0.93 B 0.62 0.55

Source: Company financial statements.



U.S. agency photonics funding

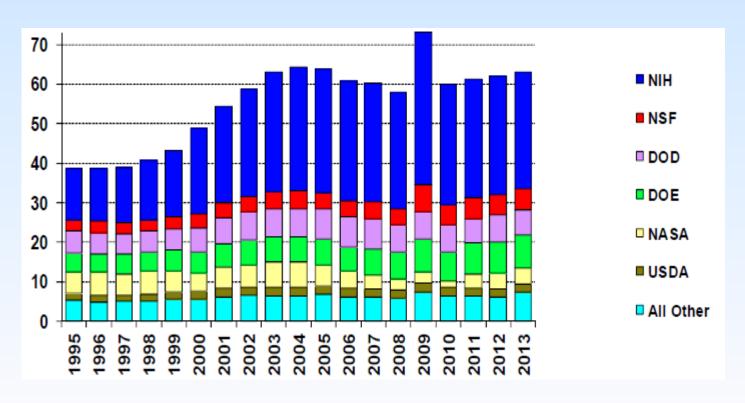


Source: NRC Harnessing Light Committee report (2012). DOE and DoD values represent fiscal years. BA1=Basic Research. BA2=Applied Research. BA3=Advanced Technology Development.



U.S. government R&D budget is tight

U.S. Government Basic & Applied Research Budget (\$US Billions)



Source: U.S. Office of Science & Technology Policy (2012). Values represent constant (real) dollars. The 2013 values shown represent the requested budget.

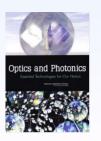


National Academies reports

NRC Report	Selected Recommendations
Photonics (1988)	 Establish an industry organization (OIDA) Labs should share use of fab tools (eg, foundries) Create a government-funded national project
Harnessing Light (1998)	 Promote fiber-to-the-home Establish a multi-agency working group (eg, as existed for supercomputing R&D)
Optics & Photonics (2012)	 Calls for a "National Photonics Initiative" Maintain data center leadership Photonic integration









Recent & upcoming OIDA events

When	Where	Topic	
Nov 2013	Washington DC	OIDA Forum	
Oct 2013	Paris	ASSL Industrial Laser Market Update	
Oct 2013	Orlando	FiO Market Update	
Sept 2013	Washington DC	Workshop on Photonic Integration Systems	
Sept 2013	Orlando	Florida Cluster: Market Update	
May 2013	Washington DC	Focus Group Meeting on Photonic Integration	
May 2013	Boulder, CO	Colorado Cluster: Market Update	
March 2013	Anaheim	Data Center Metrics Workshop	
Oct 2012	Rochester, NY	FiO Market Update	
June 2012	Colorado Springs	Photonic Integration Workshop	
May 2012	Miami	Biomedical Photonics Rump Session	

