Network Committee Overview

Kerry Hinton (Rod Tucker)
Chair, GreenTouch Network Committee

Network Committee

- Technology challenges and targets
  - Forecast "business as usual" (BAU) trends
    - Used in network power modelling
  - Identify key challenges & targets for energy efficiency improvements
    - Focus of Work Group projects
  - Forecast impact of GreenTouch innovations on network power consumption towards 2020
    - Technologies, architectures, protocols, etc

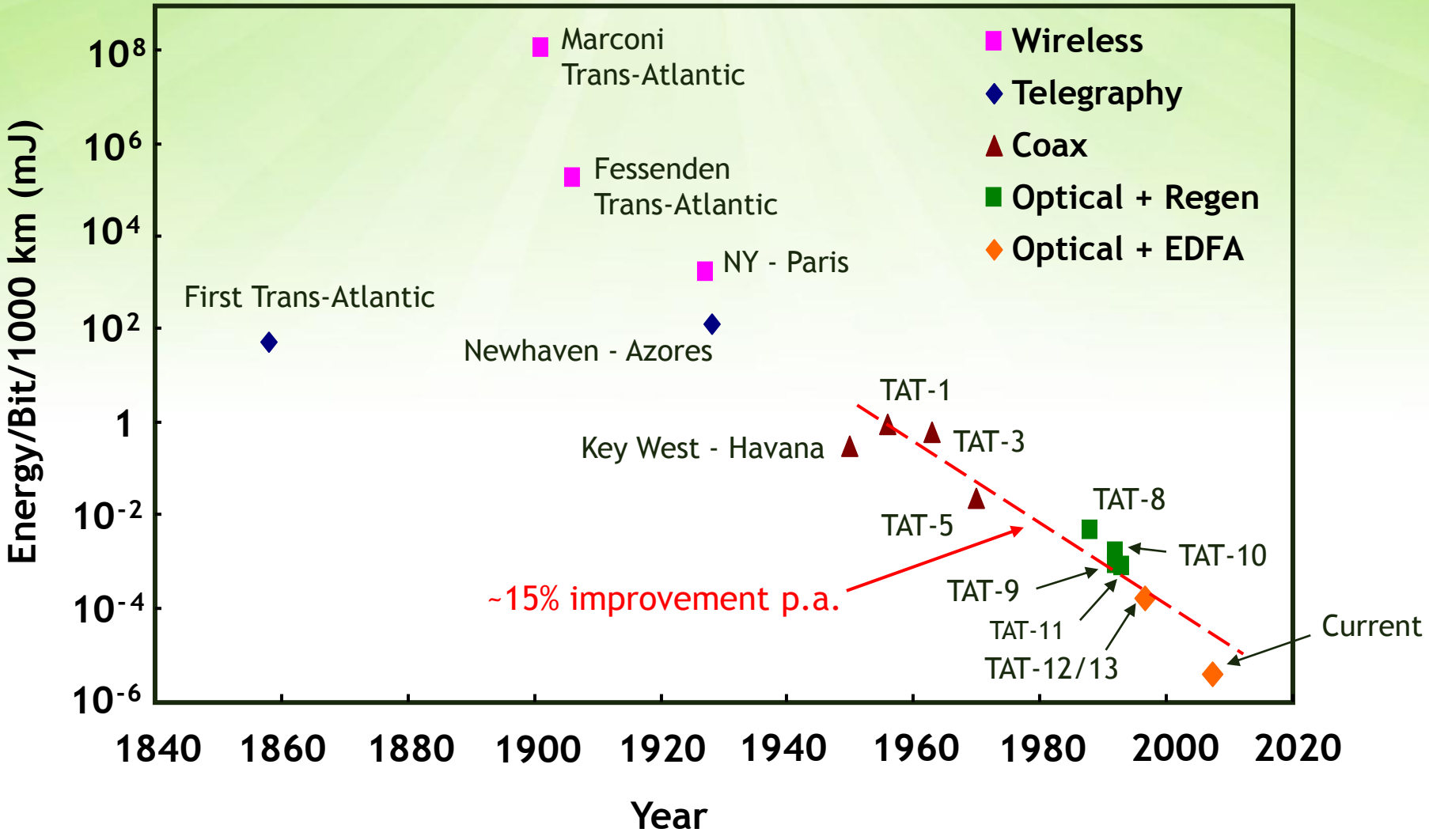
Network Committee

- Excel based power model
  - Used to calculate “BAU” power trends
  - Used to calculate impact of GreenTouch innovations
  - Provide guidance on attaining 1000x improvement target

Business-as-Usual Power Trends

- Advances in technologies and system design provides ongoing improvements in energy efficiency
  - Optical WDM systems, EDFA's, etc
  - Moore's Law
  - Conventional router & switch design
  - Evolution toward PON access
  - Conventional evolution of mobile networks
- 2010/11 baseline data being collected by Work Groups

Transport Efficiency Trends



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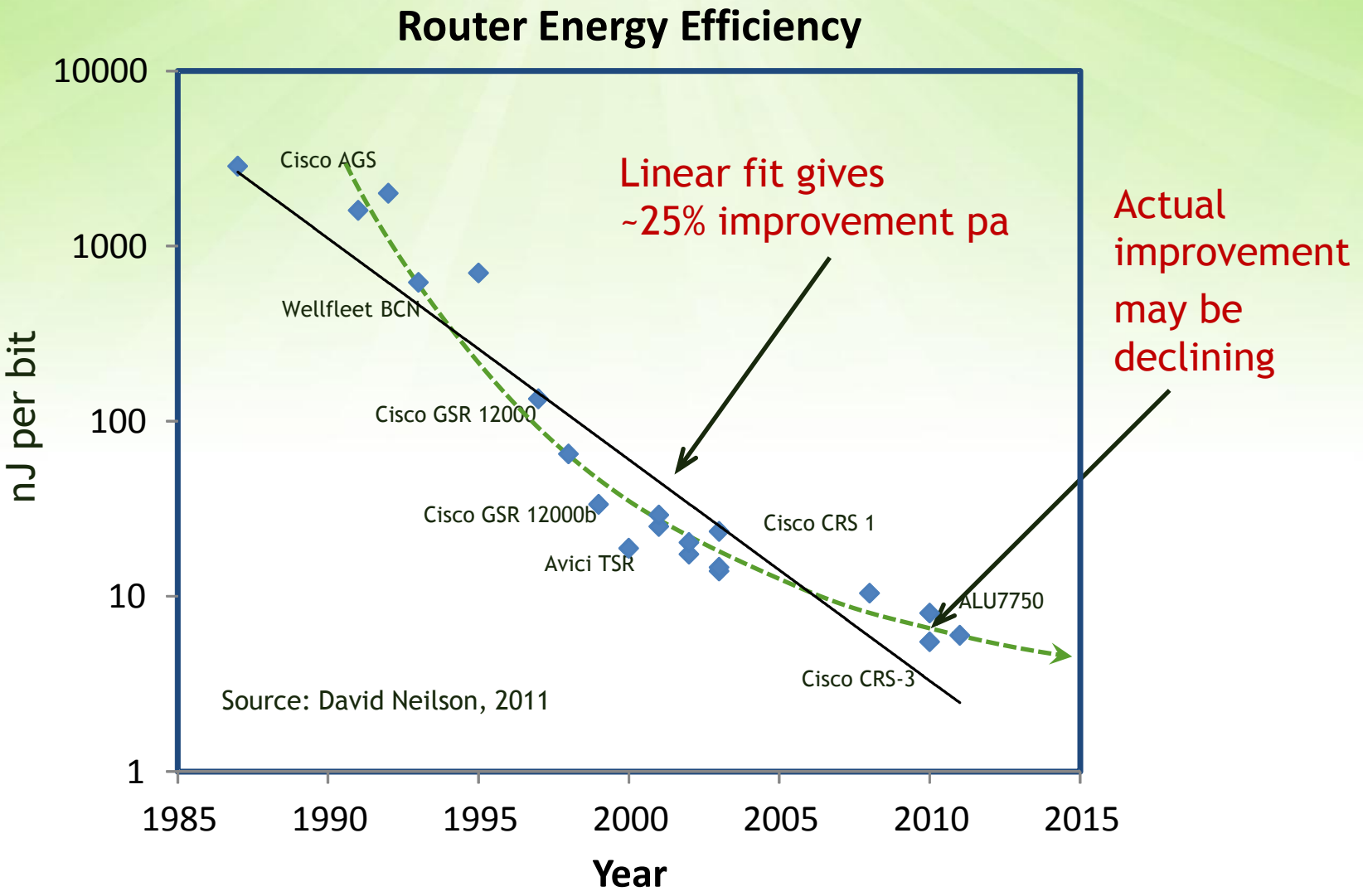
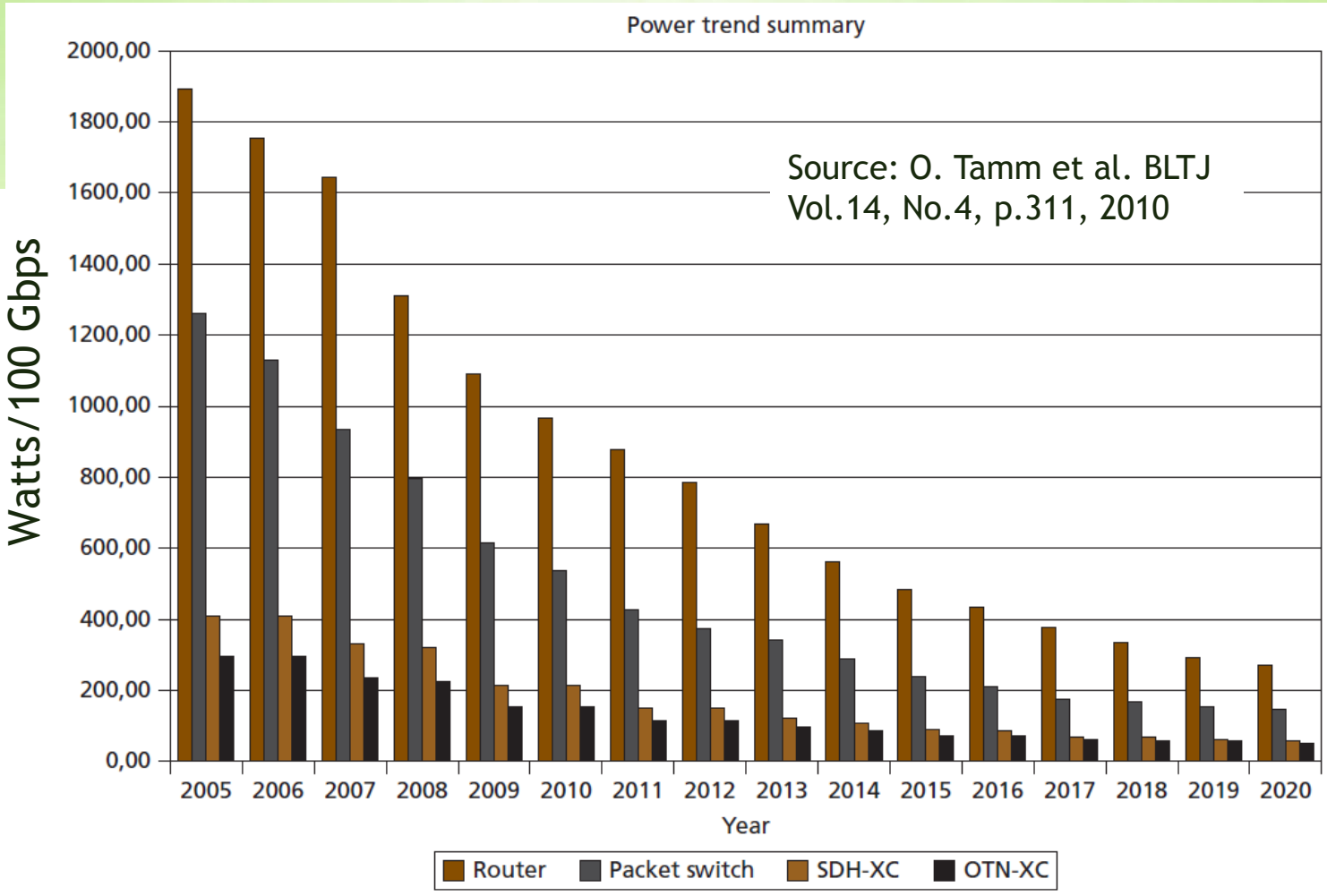
Router Efficiency Trends



Equipment Power Consumption

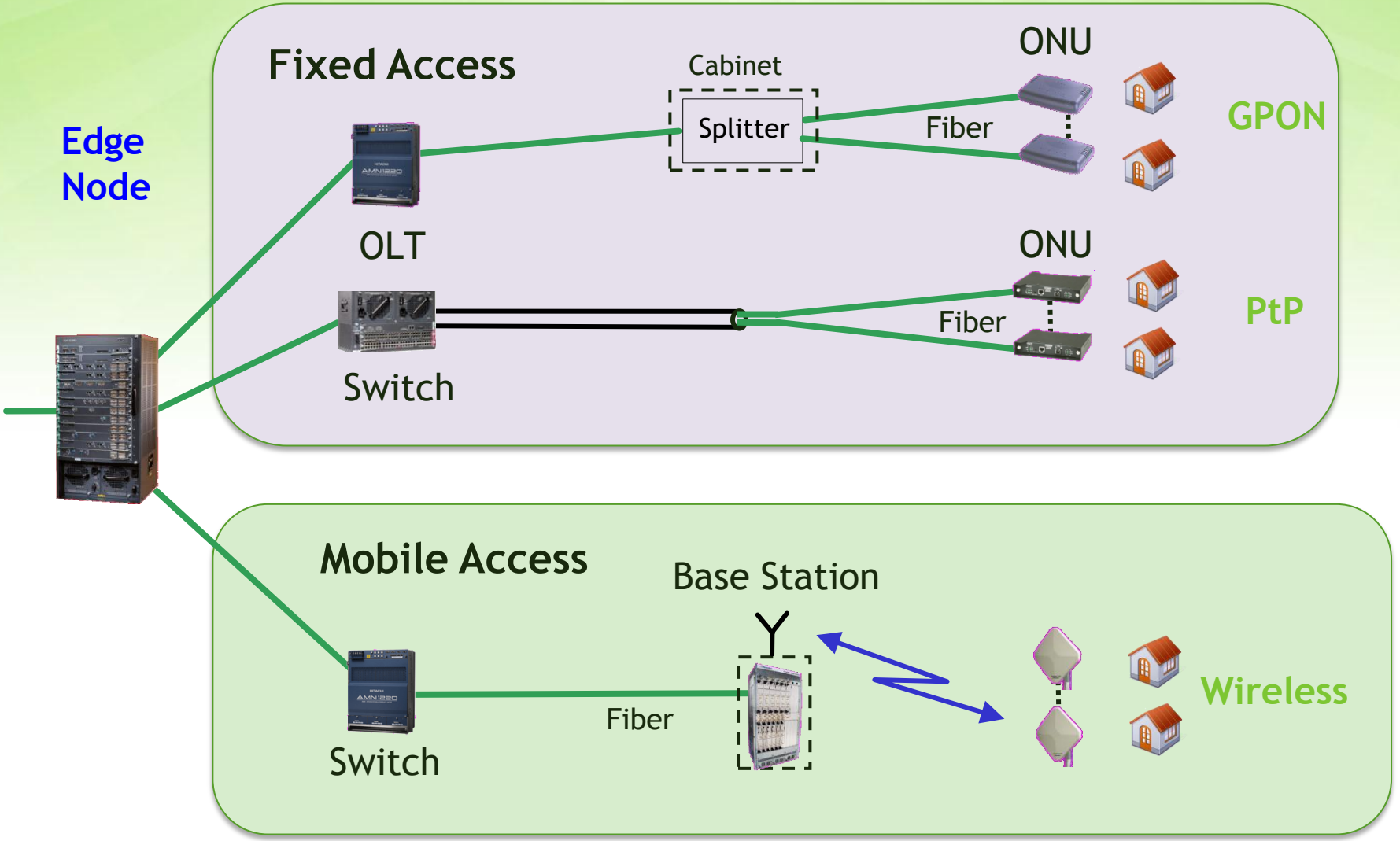


SDH—Synchronous digital hierarchy
OTN—Optical transport network
XC—Cross-connect

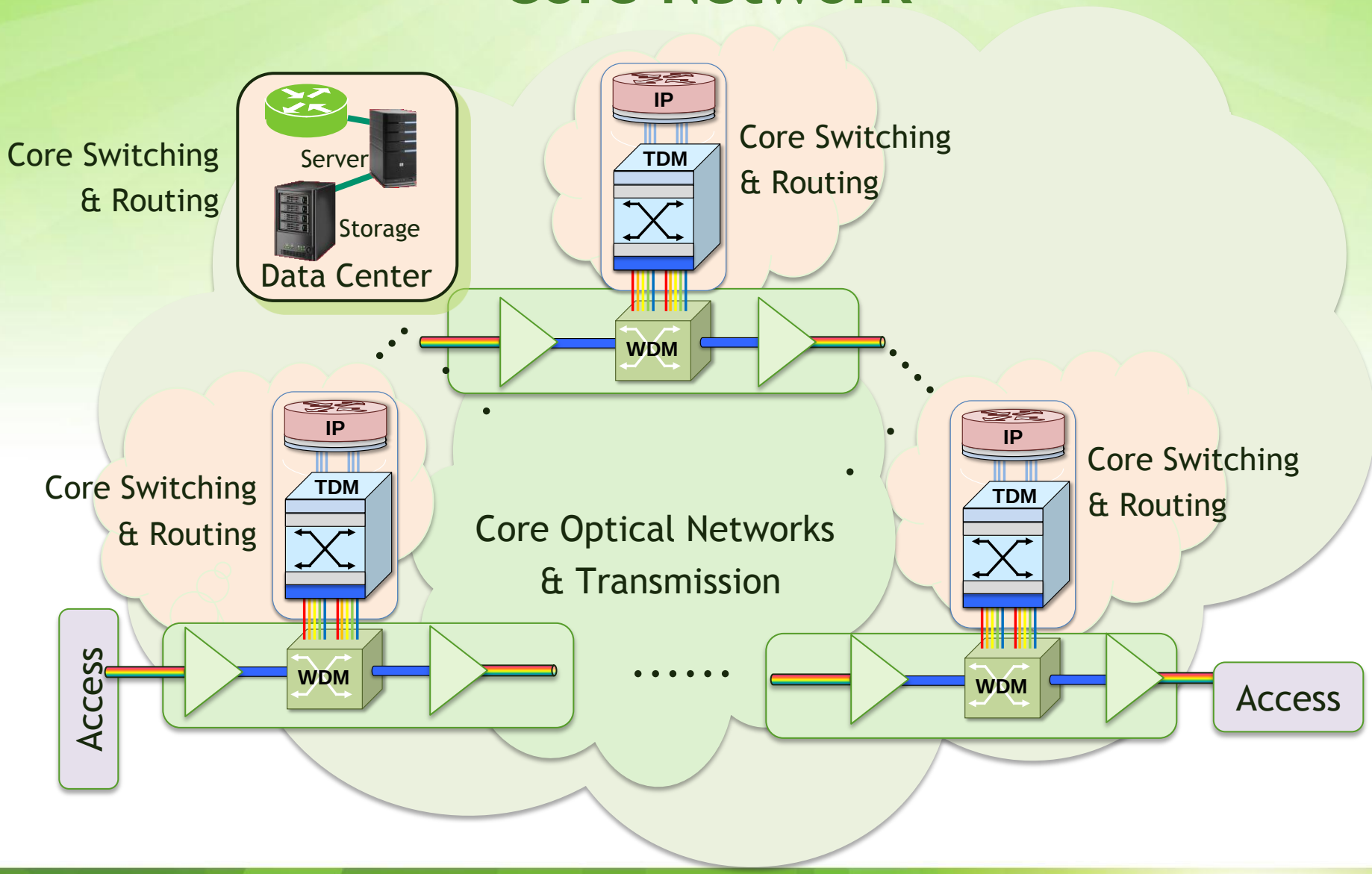
Network Energy Model

- Work Groups provide focus on segments of the network
  - Fixed Access
  - Mobile Access
  - Core & Optical Networks & Transmission
  - Core Switching & Routing
- Study Groups cover “cross-disciplinary” issues and modelling

Access Network



Core Network



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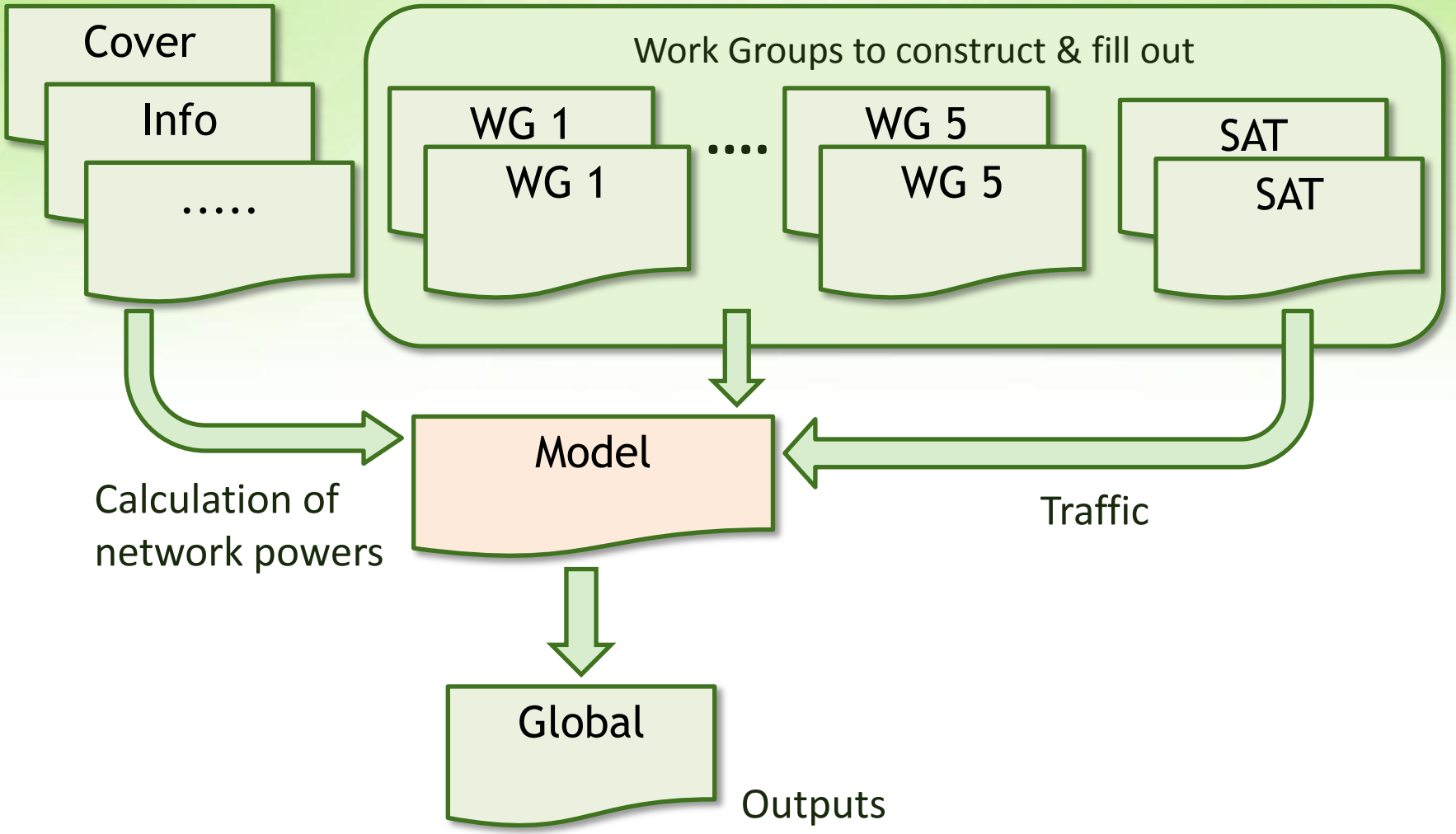
Network Model

Excel-Based workbook

- Scenario component
  - Geographical location of network
- Equipment component
  - Equipment types and power
- Architecture component
  - Network structure & dimensioning
- Traffic component
  - Traffic types and magnitudes
- Other
  - Simulation, optimisation etc.

Workbook Structure



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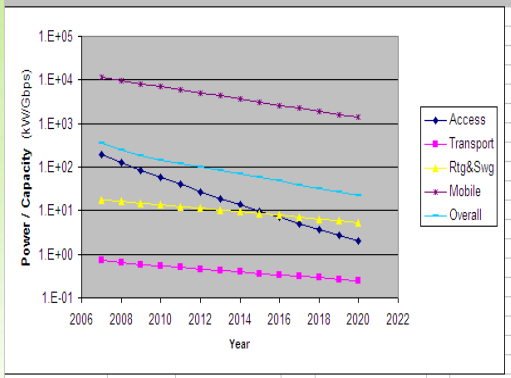
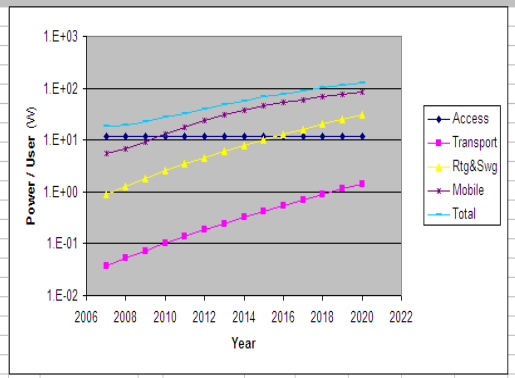
Global Worksheet (Outputs)

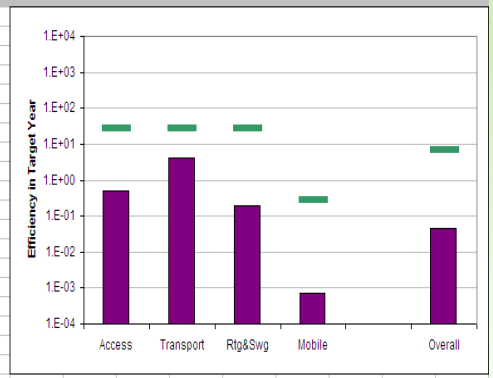
This sheet contains key architecture- and scenario-defining parameter inputs for Model and final results computations.

Select Architecture: Baseline
Select Traffic Scenario: Nominal

Reference Mode: Absolute
Target (1000): 1000 Tgt Yr: 2020







Global		Core / LH		Metro		Access		Enterprise		Wireless	
Network Parameters											
Protection: (2)	2	Hops: (3)	3	Hops: (5)	5	No. Term Units: (32)	32	Entr. over-prov: (10)	10	# BS:(7.26e5)	2.42E+05
Over-Provisioning:(2)	2	Trans Hops: (3)	3	Trans over-prov.: (5)	5	Total Acc. Factor:	1	Sw Factor	1	WAV over-pr (5)	5
Cooling: (2)	2	Trans LH Factor:	1	Routing over-prov.: (5)	5					WAD over-pr (5)	5
Si Alpha (.1)	0.1	Sw. Factor:	1	OTN over-prov.: (5)	5					Sleep Frac. (1)	1
Si Static (.1)	0.1	Routing Factor:	1	Eth over-prov: (10)	10					RF Alpha (0.15)	0.15
Year 0 (2008):	2008			Trans Hops: (4)	4					Sw Factor	1
Users: (1e8)	1.00E+08			Trans Metro Factor:	1						
				Sw. Factor:	1						
				Routing Factor:	1						

Architecture 1: Baseline

Global		Core / LH		Metro		Access		Enterprise		Wireless	
Network Parameters											
Protection: (2)	2	Hops: (3)	3	Hops: (5)	5	No. Term Units: (32)	32	Entr. over-prov: (10)	10	# BS:(7.26e5)	2.42E+05
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Year 0 (2008)	2008			Trans Hops: (4)	4					Sw Factor	1
Users: (1e8)	1.00E+08			Trans Metro Factor:	1						
				Sw. Factor:	1						
				Routing Factor:	1						

Thank You

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