Power Budget Ad Hoc

Ultimate Goal: Produce drafts of Tx and Rx characteristics tables, such as Tables 60-3, 5, 6, and 8 in Clause 60.

- Possible Steps to Achieve the Goal
  - Be sure we have a *common* understanding of the power budget and channel loss numbers and how to use them properly
  - Select technologies that are technically and economically feasible within the power budget that satisfy the objectives from which to work
    - Identify working assumptions, on parameters and relative costs
    - Review previous proposals based on our common understanding and working assumptions and select those from which to work
    - Double-check estimated penalties for these options
  - Extract draft numbers for tables
  - Cross-check against spreadsheet model
  - Iterate if necessary
  - Propose to address the 29 dB Channel IL case first, as it is most difficult

Proposed Schedule of Ad Hoc Calls

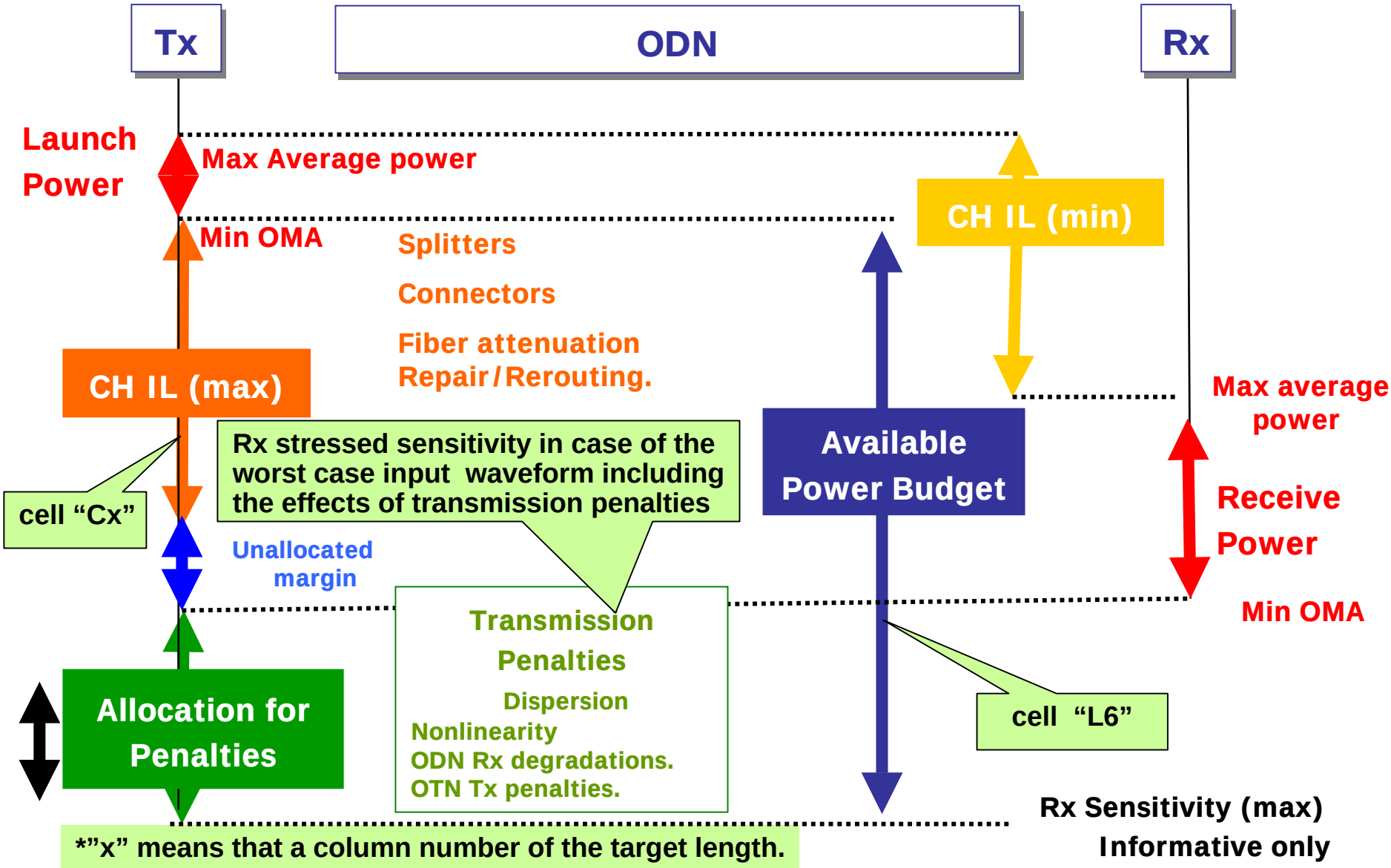
- 1/30 & 31
- Week of 2/5
- Week of 2/19
- Week of 3/5 (early)

Interpretation of Objectives

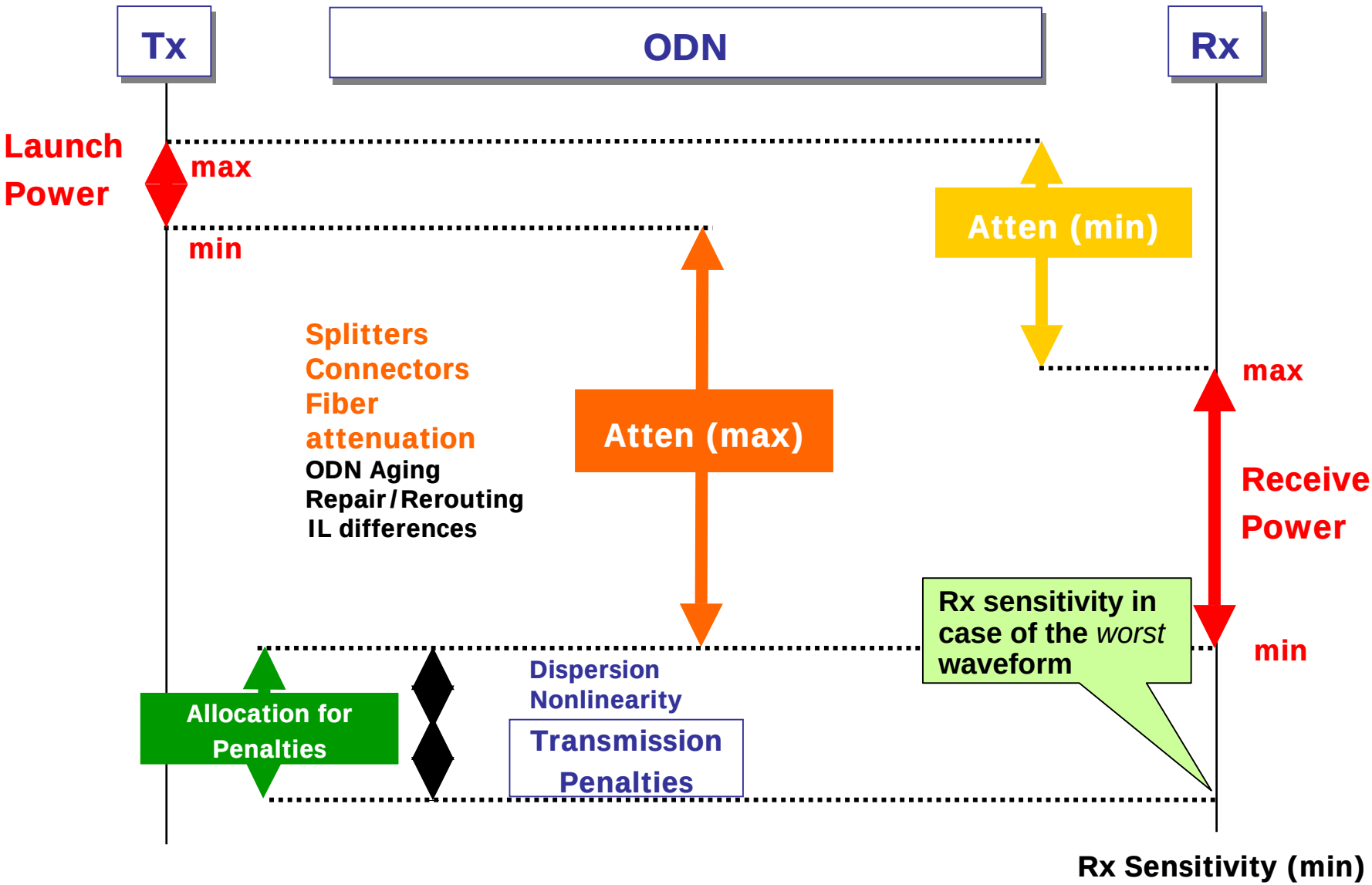
- 802.3ah EFM Objectives
  - 1000 Mbps up to 10km, split ratio of 1:16 (PX10)
  - 1000 Mbps up to 20km, split ratio of 1:16 (PX20)
- 802.3av 10GEPON Objectives
  - Define up to 3 optical power budgets that support split ratios of 1:16 and 1:32, and distances of at least 10 and at least 20 km.
- At November meeting, a straw poll found significant support for channel IL values of 20, 24, and 29 dB.

Channel IL (dB)	802.3ah EFM	802.3av 10GEPON
20	10km with 1:16 split (PX10)	10km with 1:16 split
24	20km with 1:16 split (PX20)	20km with 1:16 split 10km with 1:32 split
29	N/A	20km with 1:32 split

Definitions of Terminology in 802.3-2005 (Dudek)



Definitions of Terminology in ITU-T (Anslow)

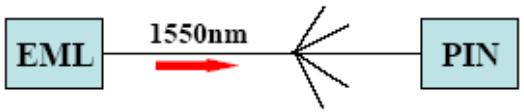
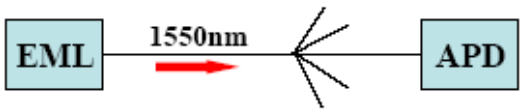
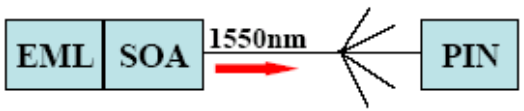
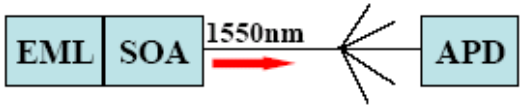
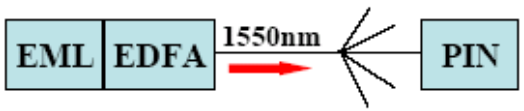


Common Assumptions?

- Should the Ad Hoc assume that 29 dB channel IL + 3 dB allocated penalties yields a working assumption of 32 dB power budget for a 20km link with 1:32 split ratio?
- What are common assumptions most can support for evaluating previous proposals on common basis? As one example, consider pages 8-12 of 3av_0611_lee_1.pdf from Dallas plenary.
  - Rx sensitivity assumptions for APD and PIN
  - Output powers for lasers, gains from amplifiers
  - Based on straw poll C from Monterey interim, 23 / 38 considered that FEC should be mandatory to implement. Should we assume it in our work? At a coding gain of 3 dB? 4 dB?
  - Relative costs of components

Example of Need for Common Assumptions

Taken from p11 of 3av_0611_lee_1.pdf

#	Configuration	Tx Power [dBm]	Rx Sen. [dBm]	FEC Gain [dB]	Power Budget [dB]	Split Ratio &Dist.	Relative Optic Cost per Subscriber	Relative 1:32
D1		1 (does not meet power budget)	-18	(4)	19 (23)	1:16 10km	1X	1X
D2		1	-26	(4)	27 (31)	1:32 20km	2.0X	2.5X
D3[2)]		11	-18	(4)	29 (33)	1:64 10km	0.9X	1.5X
D4[2)]		11	-26	(4)	37 (41)	1:128 20km	2X	3X
D5[2)]		17 [1)]	-18	(4)	35 (39)	1:128 10km	0.9X	2X