

# **Bright House Networks and Extended EPON**

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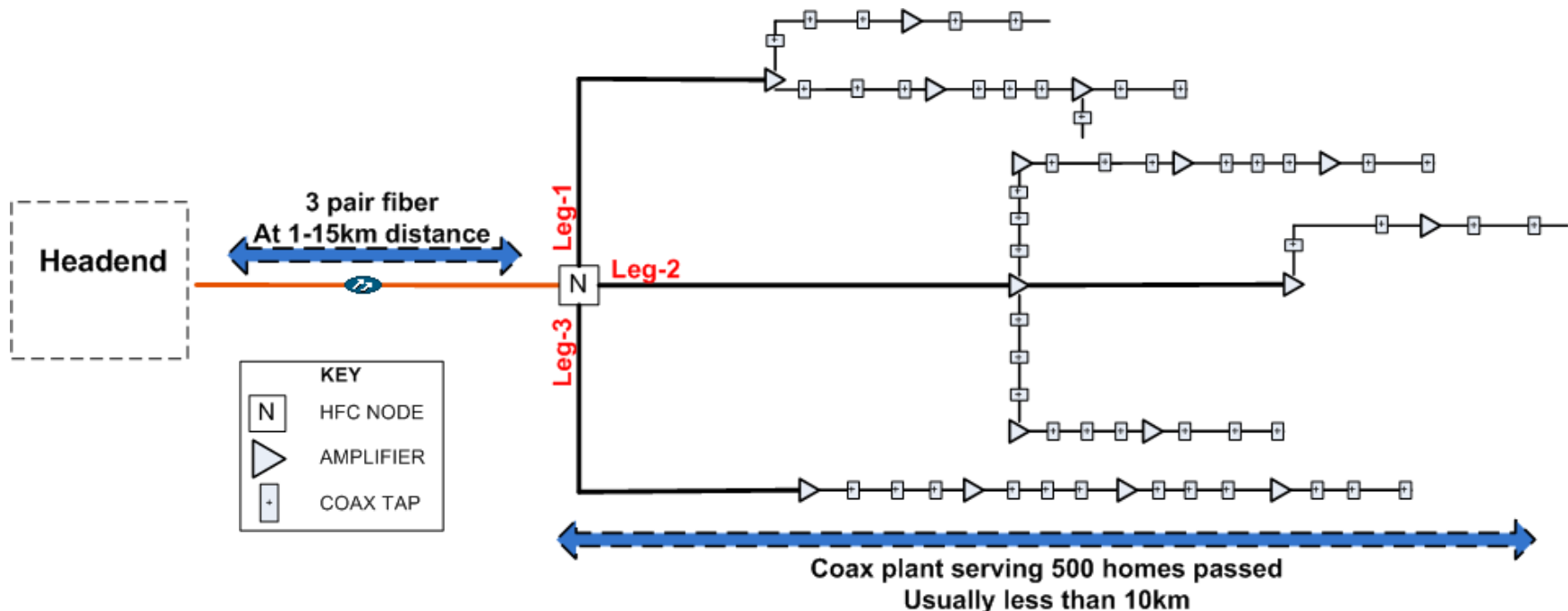


# Agenda

- © BHN Existing Hybrid Fiber Coax Model
- © All-Fiber Model
- © Loss Budget Calculation
- © Desired Power Budgets

# BHN Hybrid Fiber Coax

- Existing hybrid fiber-coax (HFC) plant typically has some “node” fiber – commonly 6 fibers or less pulled to the HFC Node though in more recent builds the number of fibers headend to node is much higher.
- Distance from Headend to Node is usually within 15km, average distance is between 5 and 10km.
- Common distance at BHN from Node to end of line on coax plant is less than 10km; average is 4-5km.

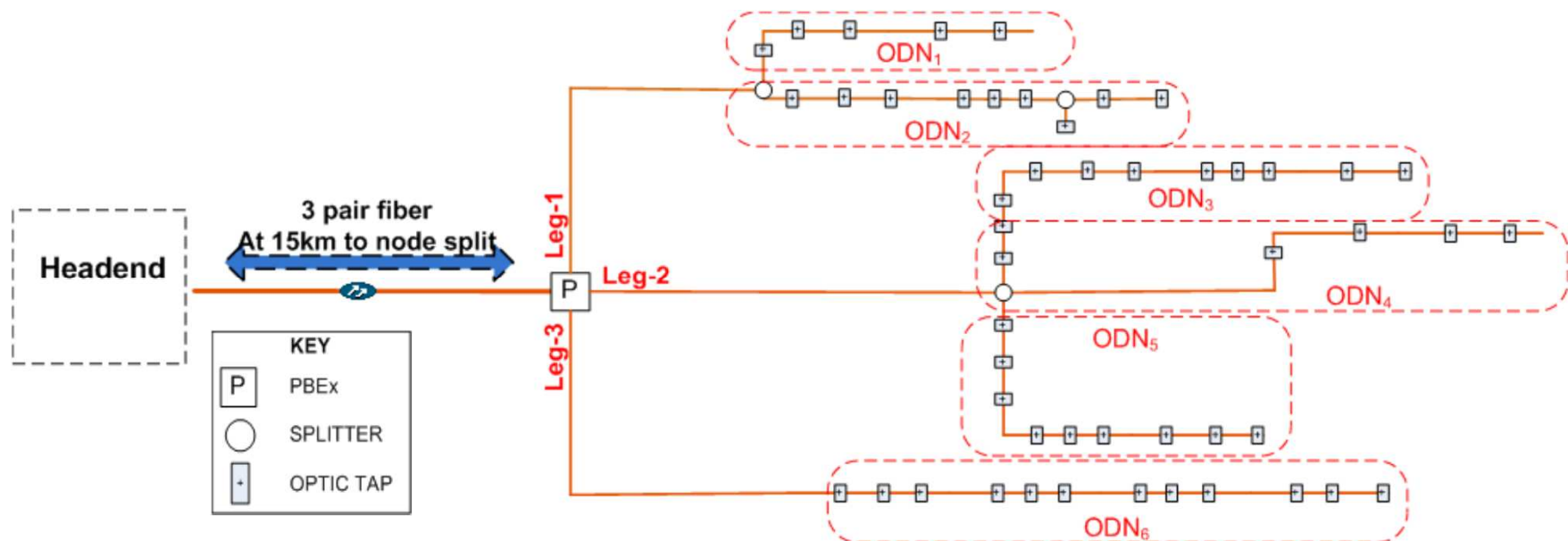


# All-Fiber Model

- The model below describes a scenario where all segments of the coaxial plant for a specific node is overbuilt with fiber.
- This model segments a grouping of ~500 homes passed into 5-6 ODNs.
- Distance from headend to node is 15km and distance from the PBEx to end of line is an additional 10km.
- Total distance is 25km with <128 splits per ODN.

## *Application Note:*

*Distance: 25km, Splits per ODN: <128.*





# Power Budget Calculation

- **The next slide describes desired power budgets and splits the power budget across a PBEx and passive optics.**
- **The table below defines the set of observed and assumed values in arriving at the needed power budget for the scenarios included on the following slide.**
- **The splice penalty is included in the upstream and downstream loss values.**
- **Connector loss for the splitter is included in splitter insertion loss.**

Parameters	Units	Value	Note
Upstream optical fiber loss	dB/km	0.4	Observed
Downstream optical fiber loss	dB/km	0.35	Observed
Connector Loss	dB/pair	0.3	Observed
Connectors	-	4	Assumed
Splitter Loss	dB	3.6 (normalized)	Assumed
Transmitter and dispersion penalty	dB	2	Assumed



# Target Power Budget

- Below are typical scenarios of interest which include supportable ODN designs with and without a PBEx.
- The assumption is that to support higher than PR(X)30 power budgets in the upstream and downstream, uniform power classes would be deployed across an ODN to avoid operational complexity.

*The model on page 4 only places the PBEx at the HFC node enclosure – 256 Splits at 25km = deeper PBEx placement.*

Scenario	PBEx (at NODE)	Passive Budget	Total Budget
<64 Splits at <20km	N/A	33dBm	33.5dBm
64 Splits at 25km	6+dBm Gain	29.5dBm	35dBm
<128 Splits at 10km	N/A	32.5dBm	32.5dBm
<128 Splits at 25km	6+dBm Gain	33dBm	39dBm
<256 Splits at 25km	9.5+dBm Gain	33.5dBm	42.5dBm



# Questions?