

# Urban Fiber in Europe

## Investment for intra-modal competition



unbundled  
point-to-point  
dark fiber  
to-the-home  
provider

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European capitals : high density, multidwelling units, underground cables



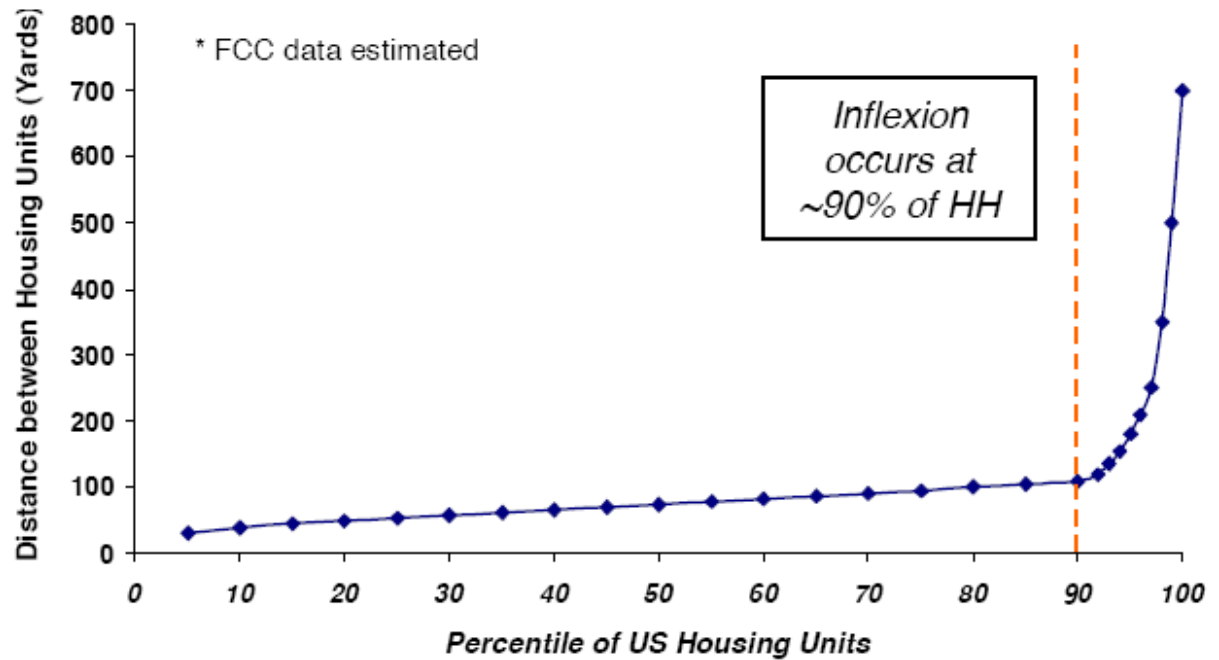


**Capex**

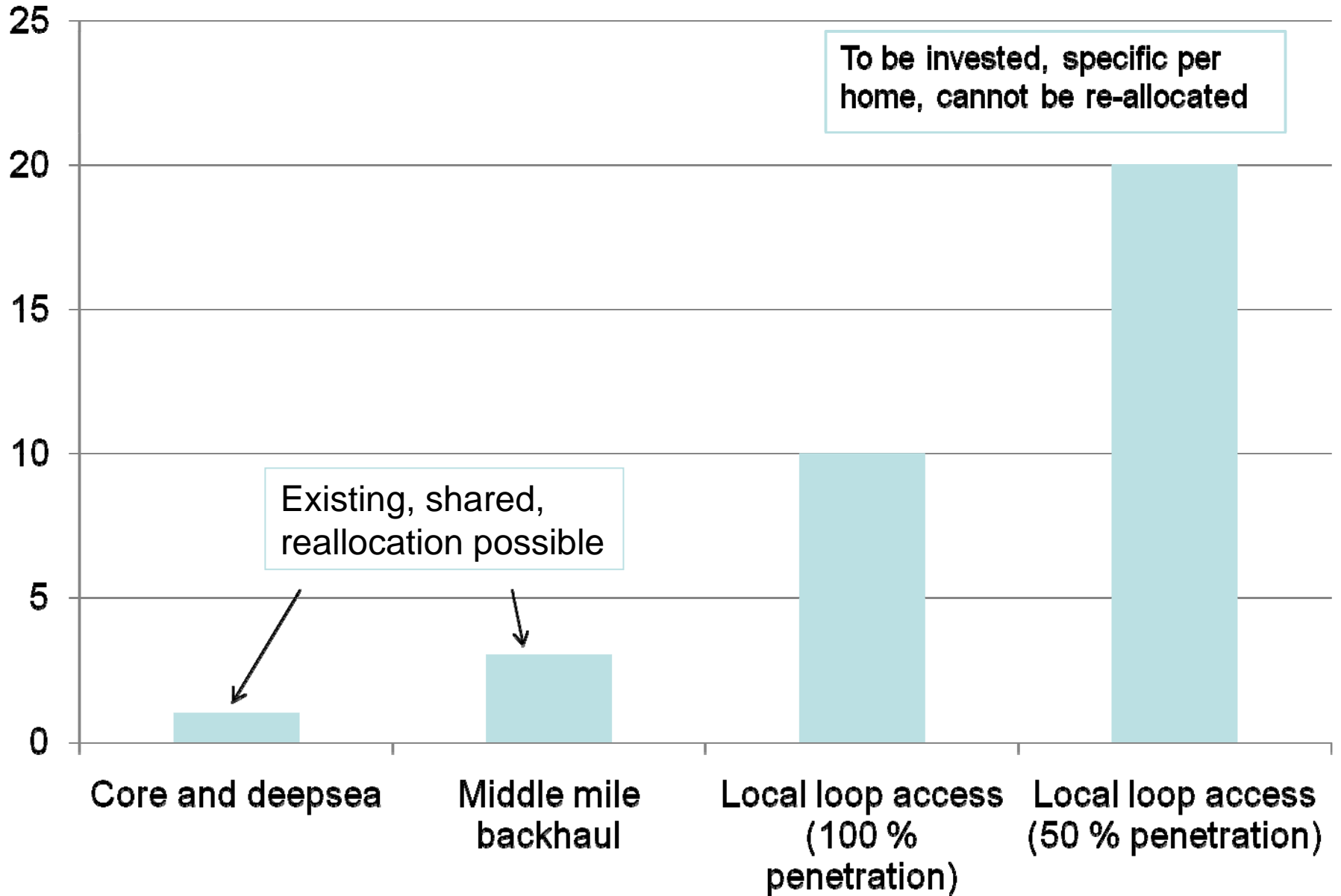
- Fiber
- Materials
- Labor (Inside)
- Labor (Outside)

**Local loop investment urban (high density)**

**FCC – Distance Between US Housing Units**



# Investment per connection in dark fiber (relative)



# Topology , technology, unbundling

## Point to point

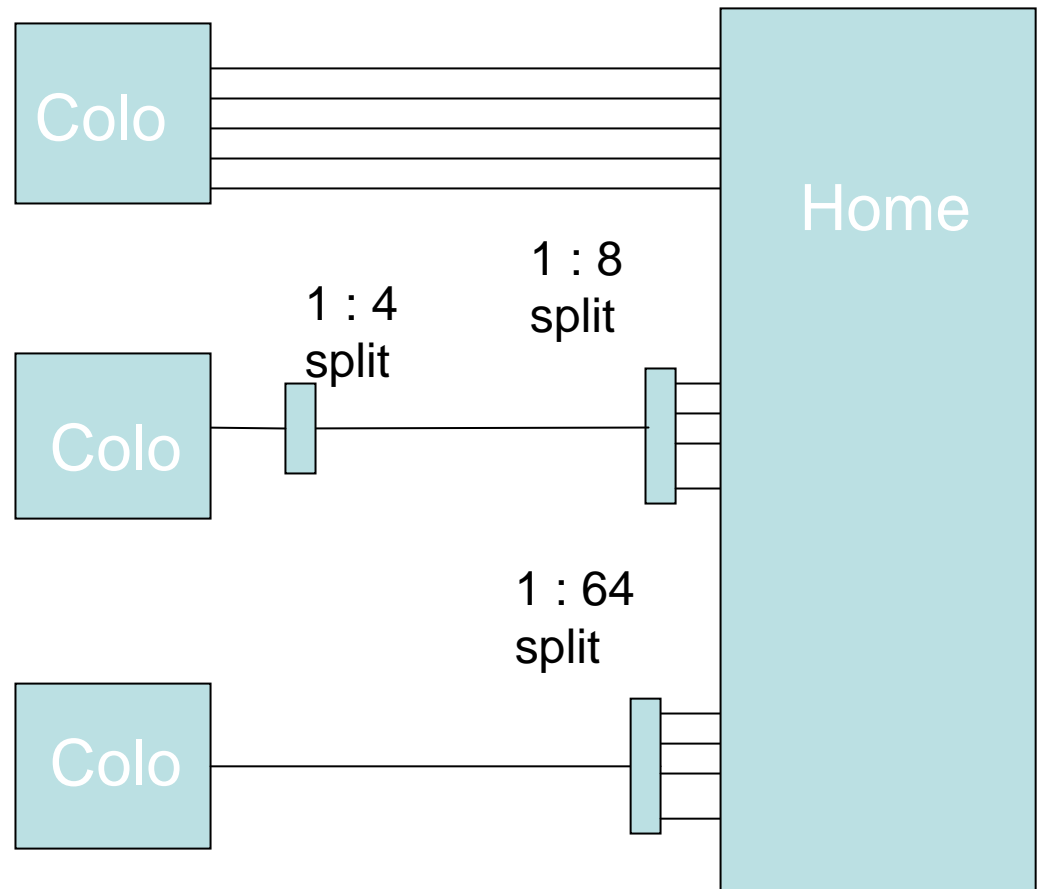
Any technology ( Ethernet, Gpon, 10 Gpon, Lambda) in any mix  
Full unbundling loop for competitors

## Staged PON

Gpon, 10 Gpon upgrade  
Unbundling per 8, or patch closet in street

## Deep PON

Gpon,  
Only Bistream wholesale , or patch closet in street



# Ethernet, PON and ??

