



*Challenge us  
to take you further*

# THE #1 WIRELESS BACKHAUL SPECIALIST

Investor Presentation // November 2019



# Safe Harbor

*This presentation contains statements concerning Ceragon's future prospects that are "forward-looking statements" as defined in the Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on the current beliefs, expectations and assumptions of Ceragon's management. Examples of forward-looking statements include: projections of demand, revenues, net income, gross margin, capital expenditures and liquidity, competitive pressures, order timing, growth prospects, product development, financial resources, cost savings and other financial matters. You may identify these and other forward-looking statements by the use of words such as "may", "plans", "anticipates", "believes", "estimates", "targets", "expects", "intends", "potential" or the negative of such terms, or other comparable terminology. These forward-looking statements are subject to risks and uncertainties that may cause actual results to differ materially, including the risks relating to the concentration of a significant portion of Ceragon's expected business in certain geographic regions and particularly in India, where a small number of customers are expected to represent a significant portion of our revenues, including the risks of deviations from our expectations of timing and size of orders from these customers; the risk that the current slowdown in revenue from India could extend for a longer period than anticipated; the risk of delays in converting design wins into revenue; risks associated with any failure to effectively compete with other wireless equipment providers; the risk that the rollout of 5G services could take longer than anticipated; and other risks and uncertainties detailed from time to time in Ceragon's Annual Report on Form 20-F and Ceragon's other filings with the Securities and Exchange Commission, that represent our views only as of the date they are made and should not be relied upon as representing our views as of any subsequent date. We do not assume any obligation to update any forward-looking statements.*

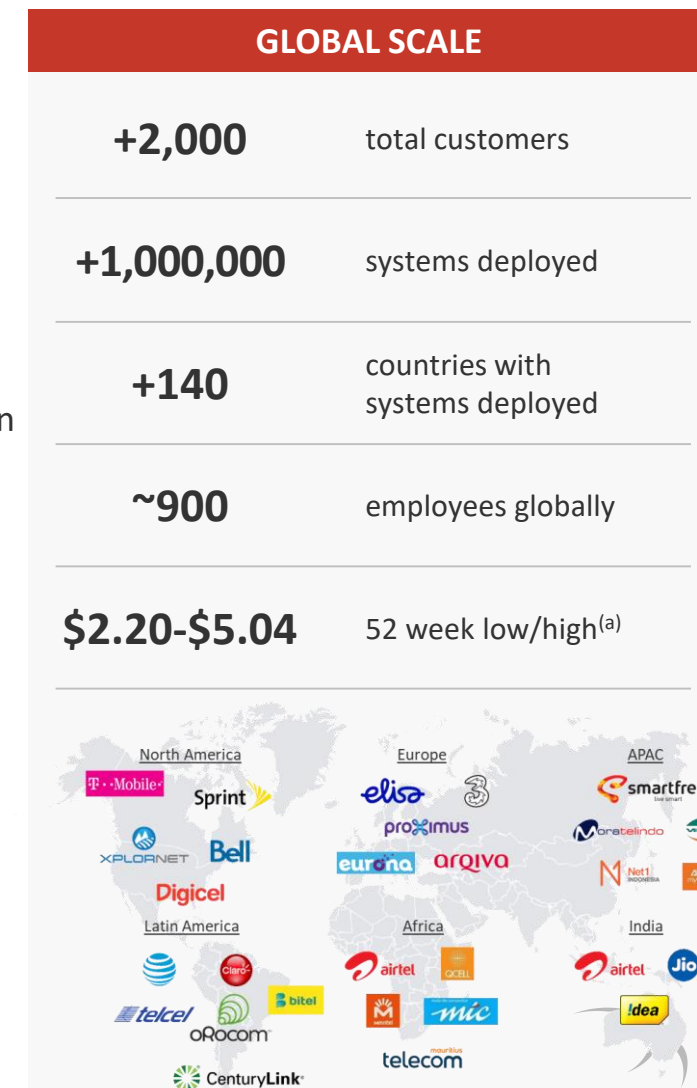
# Ceragon Snapshot

- Ceragon is the leading provider of wireless transport solutions for mobile operators and private networks globally
- Enabling agile and flexible network deployment, evolution and modernization to 4G & 5G
- Leading market position is driven by strong technology advantage:
  - Vertically integrated solution, from chipset to system, drives unmatched performance
  - Cutting edge technology and expertise to meet any network approach, including open networks & virtualization
  - Ceragon's solutions have been adopted by Tier 1 mobile operators and leading private networks globally



- 20+ years of R&D driving significant barriers to entry
- Founded in 1996 and headquartered in Tel Aviv, Israel
- Strong execution has driven strong net income growth and significant margin expansion:
  - Gross margins have increased from 25.2% to 33.9% (b)
  - During 2019, 4G to 5G transition affected net income

(a) Source: Nasdaq as of 11/1/2019  
 (b) Represents non-GAAP gross margin in FY2014 and FY2018





An aerial, high-angle photograph of a dense urban skyline, likely New York City, featuring numerous skyscrapers and a river in the background. A semi-transparent dark blue banner is overlaid across the center of the image, containing white text. The overall image has a blue-tinted, slightly desaturated appearance.

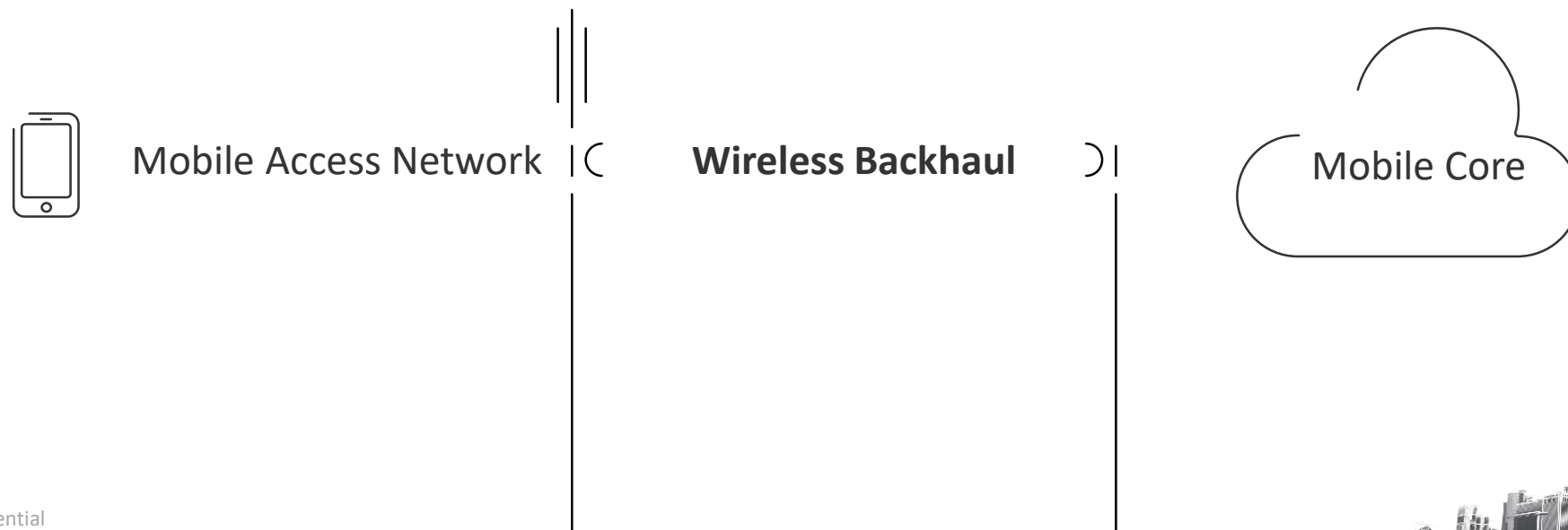
# CERAGON'S BUSINESS AND LEADERSHIP POSITION



# Wireless Backhaul

## Critical Technology to Gigabit-LTE and 5G Networks

- Wireless backhaul serves as an alternative to fiber-optic transport networks and a primary solution for network densification
- Critical since it is a faster and more cost-effective deployment vs. fiber-based deployment
- Connects approximately 50% of all cell sites globally
- Proportion of fiber vs. wireless backhaul is expected to remain fairly constant through the evolution to 5G networks



# Best-of-Breed Strategy: Sell Customer Value

## Seek Best-of-Breed Focused Deals

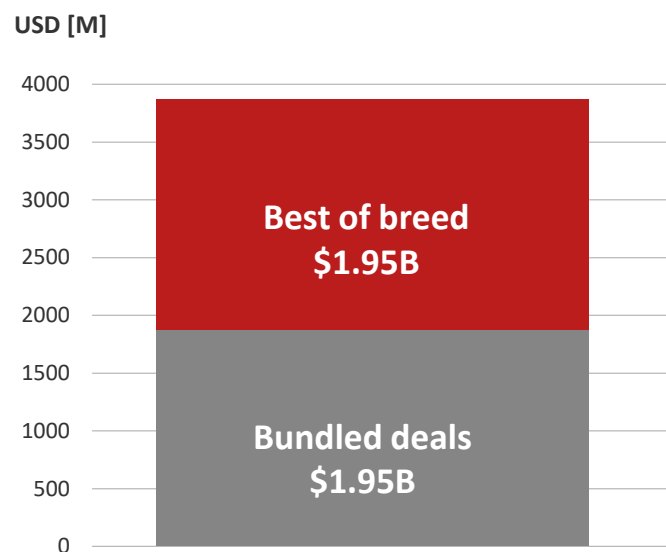
- Focus on service providers seeking the best wireless backhaul solution as main factor for vendor selection
- Focus on those customers that invest resources to assess vendors' ability to address their network-specific challenges
- Most private network customers are part of this category
- Increasing importance in 5G

## Avoid Bundled/Price Focused Deals

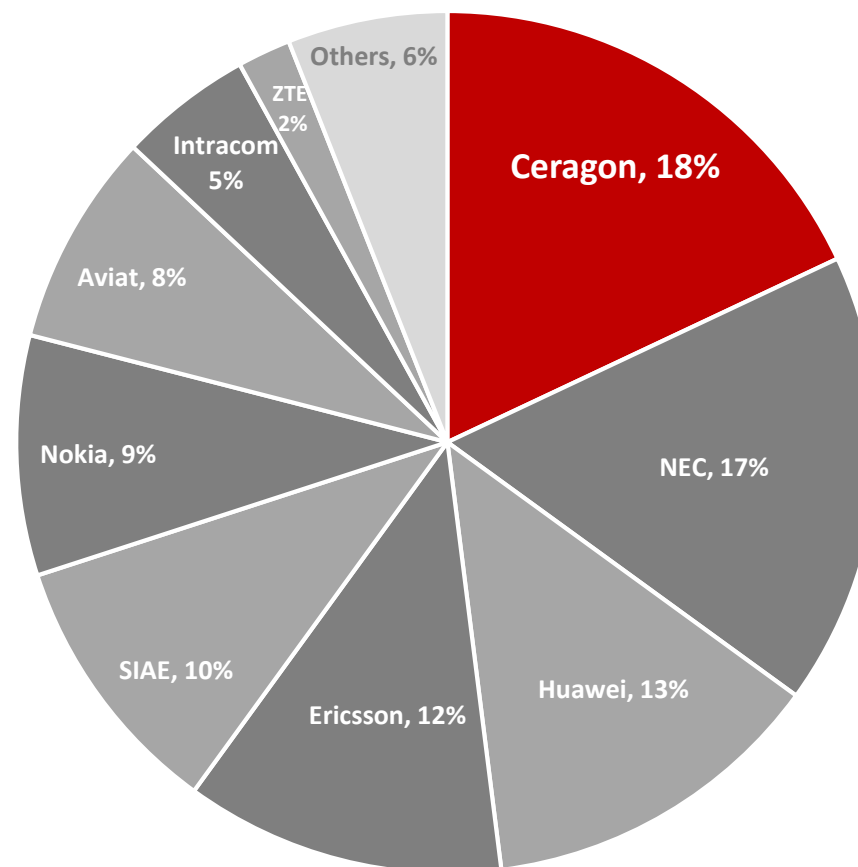
- Avoid end-to-end network bundling, with no specific vendor selection process for wireless backhaul
- De-emphasize customers that lack the skills/ resources for thorough evaluation of wireless backhaul vendors
- Avoid situations where price is the primary or only factor to determine vendor selection

# Largest Specialist Serving the Best of Breed

Global Wireless Backhaul Market (2018)



Best-of-Breed Market Segment (2018)



Sources: SkyLight Research, March-2019.  
Ceragon estimates, March-2019.

# Technological Industry Leadership

Ceragon's Multicore technology resolves  
the key challenges associated with wireless backhaul as networks transition to 5G  
**Capacity | Spectrum | Energy | Real-estate**

4G evolution to 5G

Industry's only



**Dual-core solutions**

**X4 Capacity, x2 Spectrum reuse gain, ½ Energy**

CERAGON

2013

2014

2015

2016

2017

2018

2019

2020

NEC

SMC

siae microelettronica

ERICSSON

HUAWEI

NOKIA

Aviat

NETWORKS

**Two separate Cores solutions**

**X2 Capacity, NO Spectrum reuse gain, NO Energy savings**

Industry's only



**Octa-core solutions**

**X16 Capacity, x4 Spectrum reuse gain, ⅛ Energy**

CERAGON



# Key to Innovation is Vertical Integration

Enables design-to-cost and first-to-market advantages

- Chip design
- Software design
- Hardware design
- Systems

Full  
Vertical  
Integration



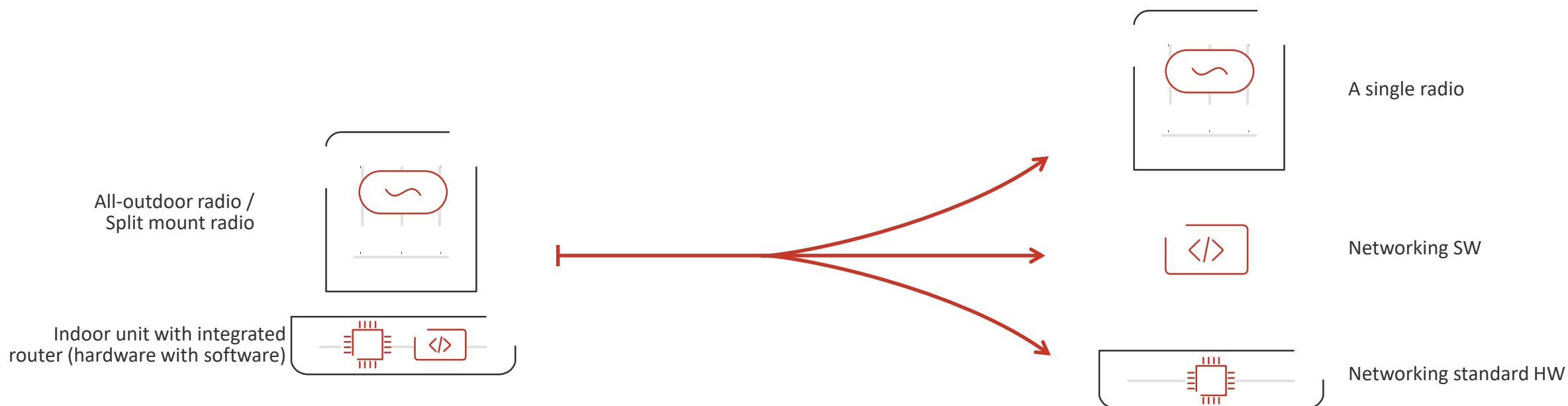
## FIBEAIR IP-20 & IP-50 PLATFORMS

### MULTICORE EVERYWHERE - IN ALL DEPLOYMENT SCENARIOS



# Disaggregated IP-50 Wireless Backhaul

## Resolves growing 5G challenges



**Displacing  
proprietary hardware-software combinations  
from generalist vendors**

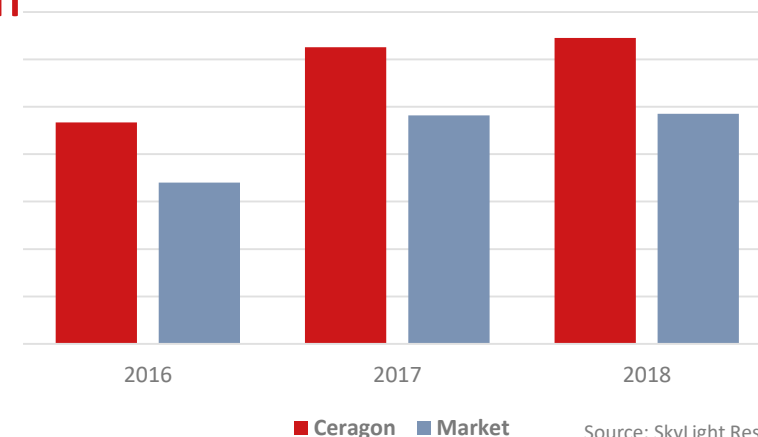
**Separating software from hardware in order  
to innovate both more rapidly**



# IP-20 All-Outdoor Solutions Lead the Market Since 2013

Increasing demand for all-outdoor wireless backhaul

- Simplified site acquisition
- Fast installation and commissioning
- Efficient use of limited spectrum
- Super-fast capacity upgrade path
- Enabler for fast 5G deployment in many scenarios

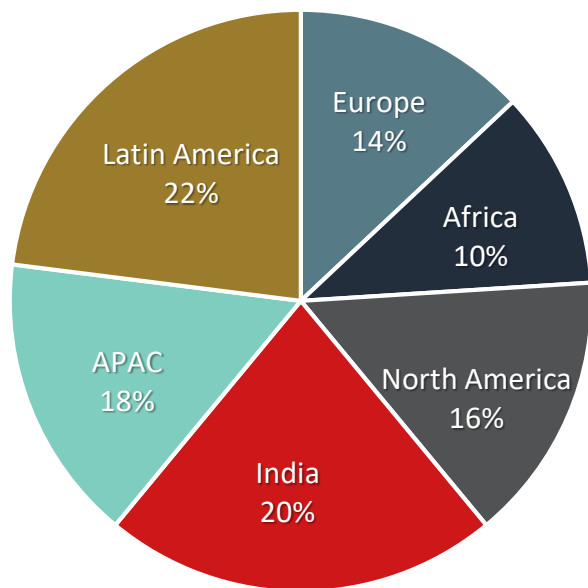


Proportion of Ceragon's equipment shipments represented by all-outdoor units has increased significantly to >60%, compared to <50% all-outdoor units in the overall best of breed market



# Global Reach and Strong Customer Base

- Over 1 million radios installed in over 140 countries
- Supplier for major global Tier 1 operators
- Multiple new 5G design wins in 2019



## Revenue by Geography — Last 12 months

- Presence in all regions
- Purchasing decisions made both centrally and regionally



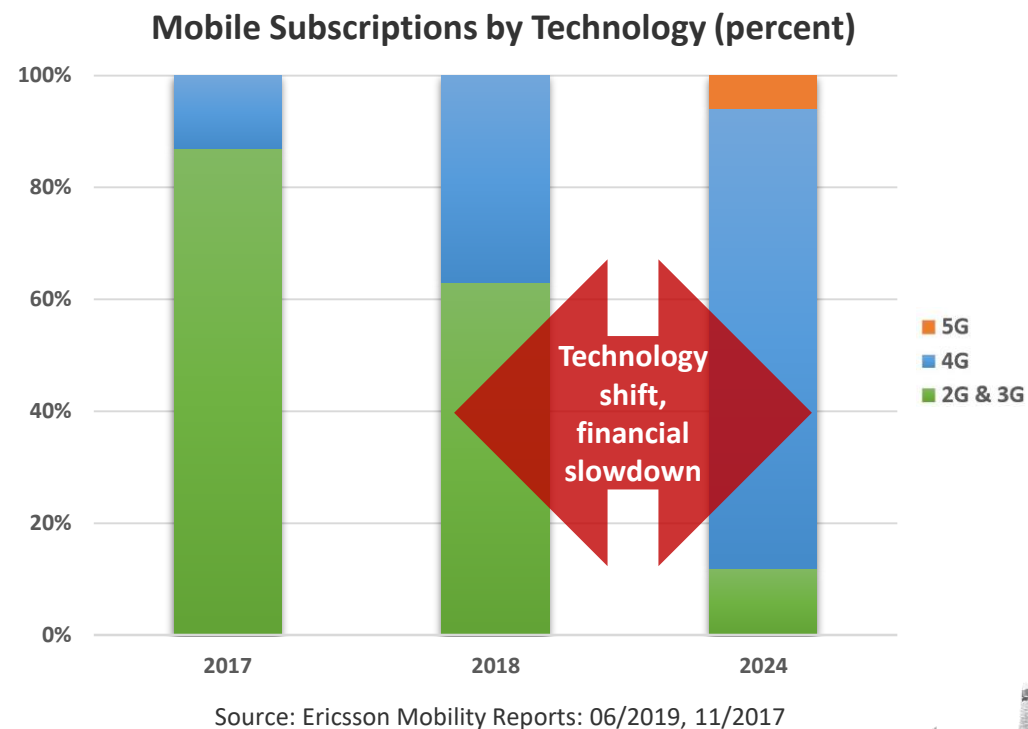
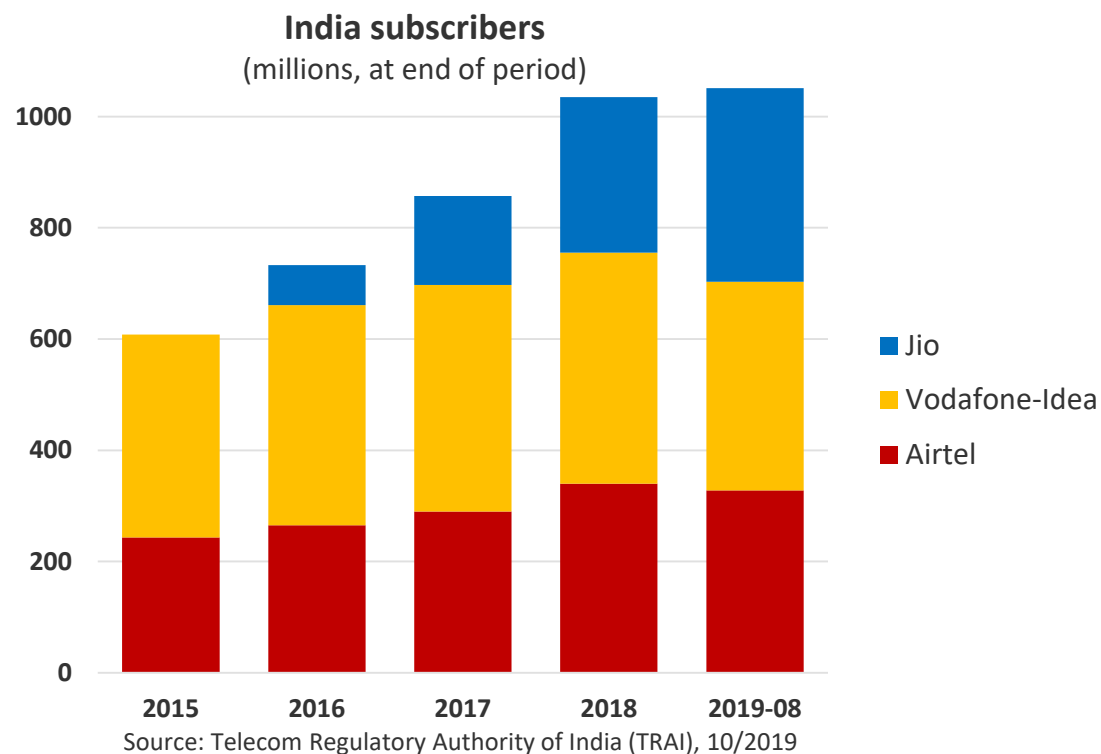


# Network Spending in India Moving at a Slower Pace

BIG-3 operators' net subscriber growth in 2018: 178M; **moderating in 2019**

Data consumption growth expected to continue with 72% CAGR through 2022

Aggressive 4G & 5G network investments expected due to hyper-competitive market, **with temporary near-term slow down for local dynamics of 4G to 5G transition**





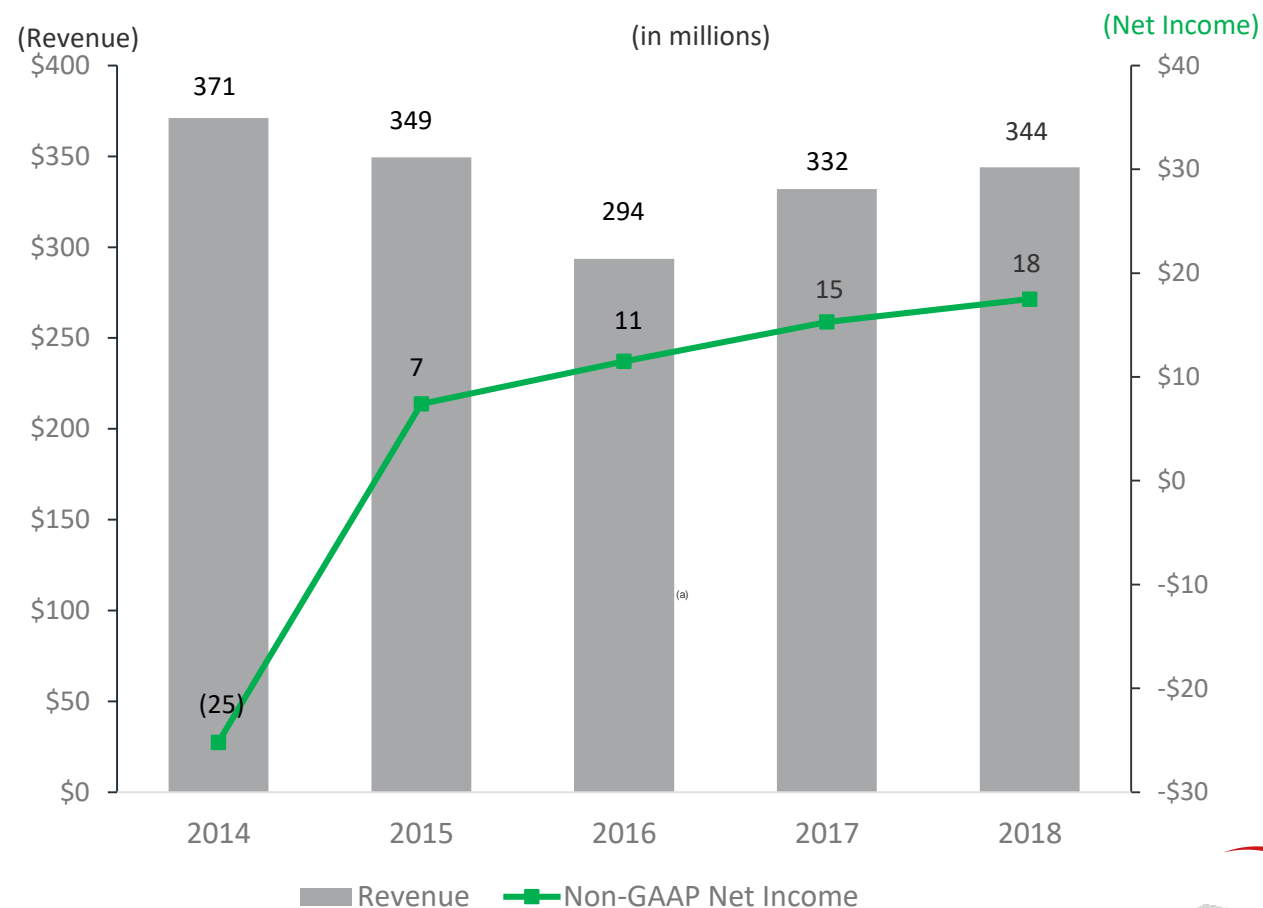
An aerial photograph of a dense urban skyline, likely New York City, featuring numerous skyscrapers and a river in the background. A semi-transparent dark blue banner is overlaid across the center of the image, containing the title text in white. The image has a subtle grid pattern.

# CERAGON'S OPERATING MODEL AND FINANCIAL POSITION



# Track Record of Execution

- Focus on maximizing gross profit dollars
- Consistently profitable business model during past 4 years
- **During 2019, 4G to 5G transition negatively affected revenue and net income**



Note: Financial metrics are presented on a non-GAAP basis.

# Strong Balance Sheet

- Short-term bank debt; >\$22 million unused borrowing capacity
- Credit facility is used as business tool to accommodate short-term increase in working capital needs

	(U.S. dollars in millions) (Unaudited)
	a/o September 30, 2019
Cash & cash equivalents	20.5
Bank debt	17.4
Inventory	67.7
AR	126.2
DSOs	154

# Characteristics of Operating Model

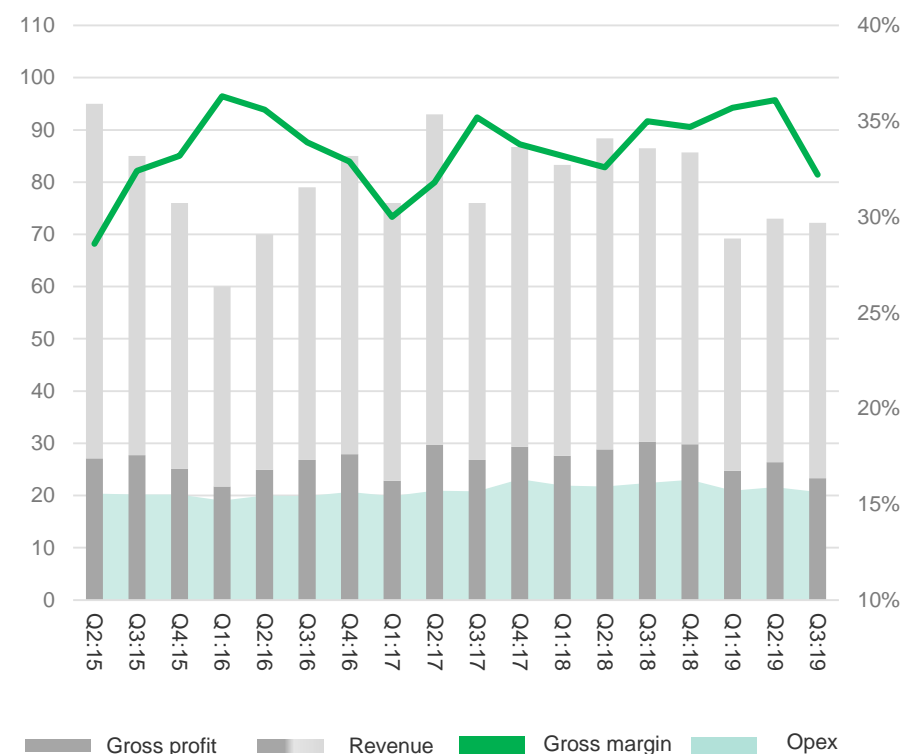
## Controllable elements are well-controlled

- Deals accepted based on contribution to gross profit dollars
- Tendency toward trade-off between revenue and gross margin
- Stringent operating expense control sustained for 2+ years

## Quarter-to-quarter fluctuations caused by factors difficult to control

- Changes in geographic mix of revenue – based on significant variations in GM by region
- Local regulatory shifts and decisions causing fluctuations in decision making within the operators
- Timing of recognizing revenue for various elements of project – based on large customers dictating delivery timing of each element
- Currency fluctuations, interest rates, seasonality, orders lumpiness, changes in raw materials and components market

## Quarterly Operating Model



Note: Financial metrics are presented on a non-GAAP basis.



An aerial, high-angle photograph of a dense urban skyline, likely New York City, featuring numerous skyscrapers and a river in the background. A semi-transparent dark blue banner is overlaid horizontally across the center of the image, containing white text. The entire image has a light blue tint and a subtle grid pattern.

THE FUTURE IS 5G -  
A GRADUAL DEVELOPMENT

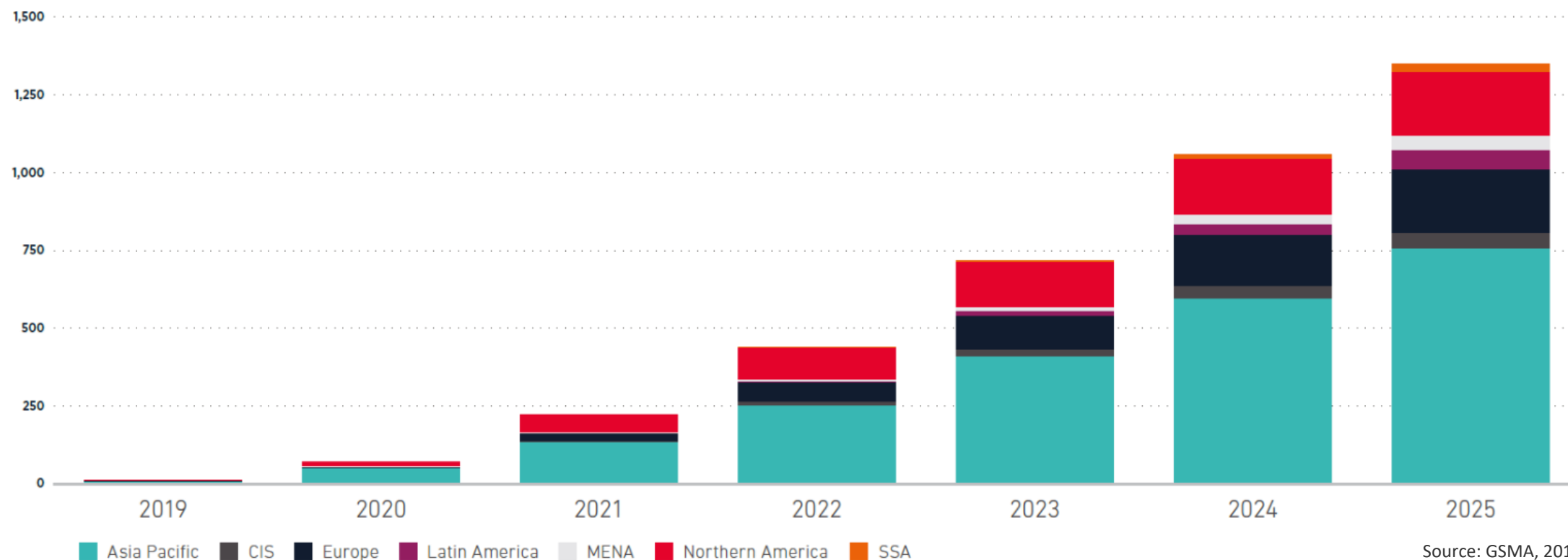


# 5G Evolution, Not a Single Event

## Gradual Development

**5G connections will reach 1.4 billion worldwide by 2025**

Global 5G connections\* (million)



Source: GSMA, 2019

\* Asia Pacific includes China, which is served mainly by fiber and Chinese vendors

# 5G Amplifies & Diversifies Operator Wireless Backhaul Challenges

GOAL

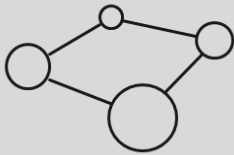


**Grow Profitability & Market Share**  
**Increase Competitiveness**

MEANS

**New revenue streams**  
**via 5G services launch**

NETWORK CHALLENGES

X5

DEPLOY MORE SITES

X100

PROVIDE MORE  
CAPACITY



ENABLE 5G USE-CASES



DEAL WITH  
MASS DEPLOYMENT

CONSTRAINTS



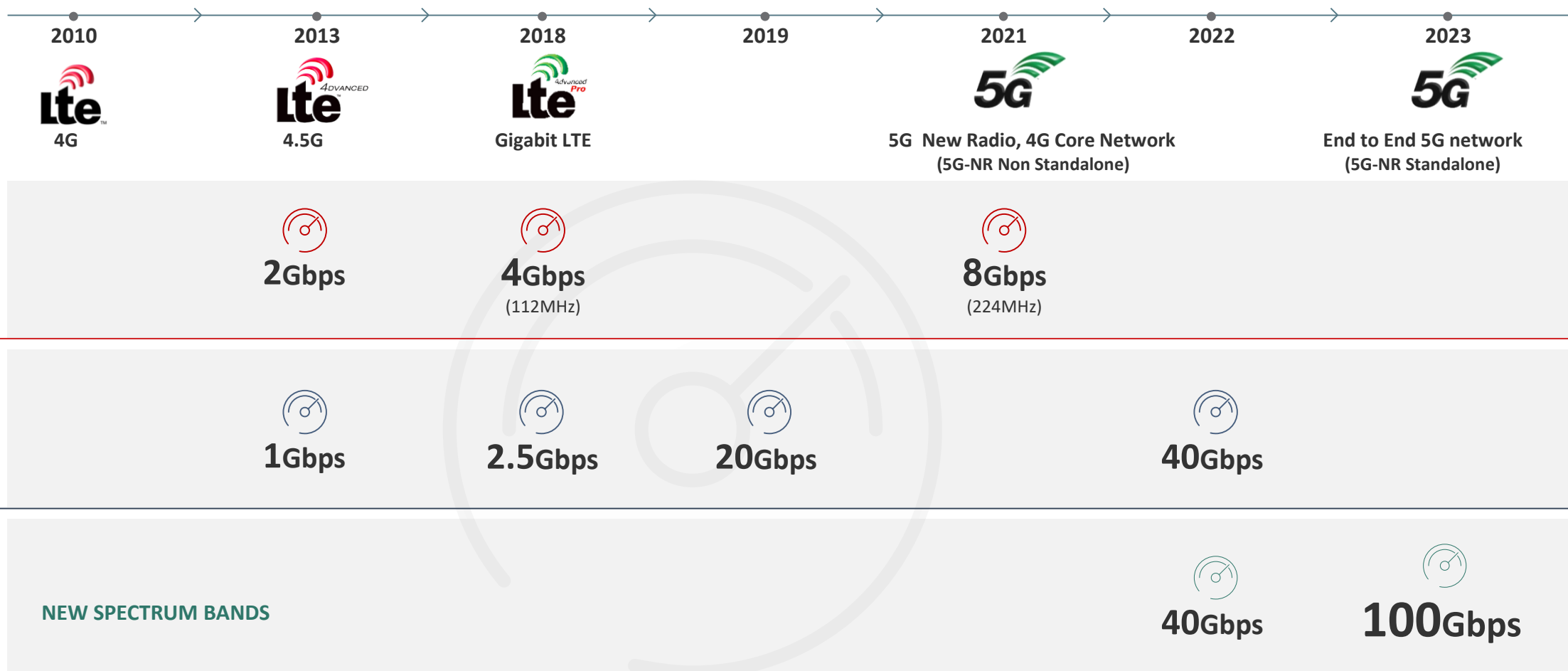
**On-budget:**  
**Improve operational efficiencies**



**On-time:**  
**Fast time to market**



# Ceragon Strategic Roadmap – Single Channel Capacity



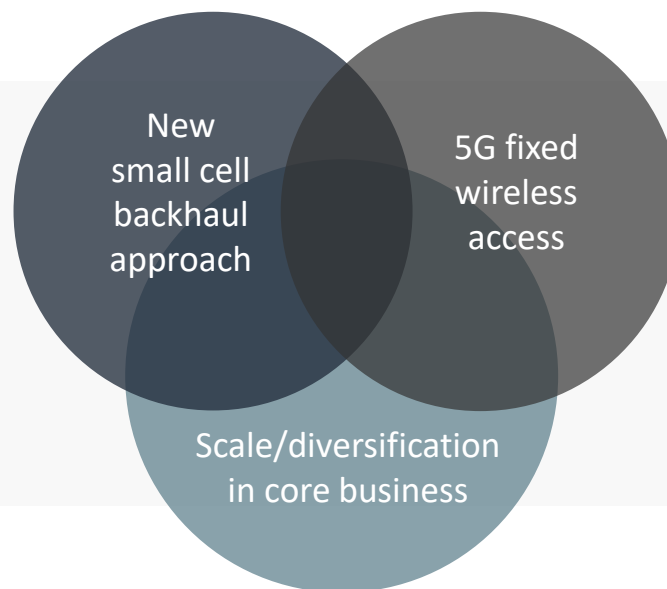
- Multiples of each capacity listed above are achievable using Carrier-Aggregation technology to combine several channels into a single link
- Multi-band technology also allows operator to combine MW and mmW to achieve higher capacity with greater reliability

# Formulating a Broader 5G Strategy

Continuously refining both offensive and defensive strategies

## Technology Fit/Business Risk Analysis

- Relevance to core competencies
- Potential competitive advantage
- Market size and maturity
- Market growth potential



## Value Creation/Financial Risk Analysis

- Time to revenue
- Magnitude of investment required
- Inherent profitability (gross margin)
- Impact on cash flow

**Seeking best risk-adjusted opportunity to generate profitable growth**



An aerial, high-angle photograph of a dense urban skyline, likely New York City. The image is dominated by numerous skyscrapers and high-rise buildings. A prominent, light-colored building with a grid-like facade is visible on the left side. The city extends to the horizon, with a body of water and a bridge visible in the distance. A dark, semi-transparent horizontal band runs across the middle of the image, serving as a background for the text.

# SUMMARY



# Investment Highlights

- ✓ **Leader in premium segment of the market**
- ✓ **Time-to-market advantage with technologically-advanced IP-20 and IP-50 platforms**
- ✓ **Competitive strengths provide ability to be selective, obtain major share of highest-value opportunities**
- ✓ **Financial stability enables continuous innovation and design-to-cost investment**
- ✓ **Multiple new 5G design wins during 2019**
- ✓ **Positioned to capitalize on network evolution from 4G to 5G to generate long-term profitable growth**





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