Dean Bubley & Disruptive Analysis @disruptivedean

- Tech/telecom analyst & strategic consulting since 1991
- Covering Internet, 5G, 6G, Spectrum, FTTX, Wi-Fi, Edge/Cloud…
- Regulatory, economic, societal & geopolitical aspects of telecoms
- Advisor to telcos, large & small vendors, investors, government
- Biases: Against monopolies, lazy incumbency & hype

Network Tech, Policy & Business Models
Communications Apps & Services
Telecom-Futurism
Industry Analyst Consulting & Reports
# Top level themes for wireless in the 2030s

<table>
<thead>
<tr>
<th>Less homogeneity of “telcos”</th>
<th>More InfraCos &amp; shared assets</th>
<th>6G growing but evolutionary &amp; patchy</th>
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</thead>
<tbody>
<tr>
<td>Wi-Fi &amp; satellite has some 5G/6G integration...</td>
<td>… but still not that much</td>
<td>Very broad use of private / dedicated 5G networks</td>
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<td>More home FWA / satellite access, but FTTX rules</td>
<td>Systematic identification &amp; mitigation of “lock-ins”</td>
<td>Very little “monetised” QoS or network slicing</td>
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<tr>
<td>Network disaggregation, virtualisation &amp; “AI native”</td>
<td>Nope: DeWi, RCS, 5G PCs, metaverse-primary.</td>
<td>Leftfield disruptions from cybersecurity, quantum etc</td>
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The first industry transformed by 5G is telecoms itself

4G-Era Mobile Operators

- National MNO #1
- National MNO #3
- National MNO #4
- TowerCo’s
- MVNOs

5G-Era Mobile Operators

- Consolidated national MNOs
- National MNO
- Fixed Wireless MNO
- Private / industrial MNO
- Hybrid MNO / MVNO
- Active TowerCo
- City / region MNO
- Rural or indoor neutral host
- Govt Testbed
- Transport MNO

Plus Wi-Fi, satellite, LoRa, FTTX etc
Many new B2B/B2C use-cases, apps & devices are indoors

Indoor

Outdoor

Structural impact: how can public services be delivered on private property?
Neutral host networks (wholesale infra to tenant MNOs)
Why are we talking about 6G now? Isn’t 5G enough?

- 10-year R&D + investment cadence built-in to system
- New tech enablers not available in 5G era
- Frictions, disappointments & limits of 5G
- New patterns of demand, applications & industry structure
- Changing external factors beyond the mobile industry
Design priorities for 6G

- Improved speed & latency
- Greater capacity density
- Better indoor coverage
- Support for remote coverage
- Improved locational accuracy
- Native sensing functions
- Energy optimization
- Interconnection with Internet / cloud
- In-built support for network sharing
- Support for diverse models and owners

6G era reality of multiple networks often loosely coupled
Changing our assumptions & semantics for 2030

Services  Capabilities

Competition  Substitution

Harmonisation  Diversity

Managed  Intelligent

Ubiquitous  Tailored
Key priority for policymakers: **Good stats, not Easy stats**

**Easy Statistics**
- Overall retail data traffic, PB/mo
- Overall telecoms capex
- Telco reported profits
- Market capitalisation
- Consultant top-down “GDP impact”
- Consultant “traffic demand forecast”
- Vendor reports (Cisco VNI, Ericsson Mobility, Sandvine etc)
- Homes passed by FTTX

**Good Statistics**
- Traffic / value split between
  - Indoor vs. outdoor use
  - Consumer vs. business
  - Mobile bband vs. FWA
  - Solo vs. shared networks
  - Uplink vs downlink
- Impact of tower/infra spin-outs
- Requested vs. “sent” data
- Impact of outliers
- GDP impact vs. baseline/alternatives
- Homes connected to FTTX
<table>
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<th>Over-hyped</th>
<th>Under-hyped</th>
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<td>5G network slicing</td>
<td>Neutral host mobile networks</td>
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<tr>
<td>“Always Best Connected”</td>
<td>Open-access fibre</td>
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<tr>
<td>Satellite direct-to-device</td>
<td>Edge interconnect / exchanges</td>
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<td>Metaverse (esp. “The MV”)</td>
<td>Dual-broadband homes / bonding</td>
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<tr>
<td>DeWi / cryptocurrency networks</td>
<td>OpenRoaming for Wi-Fi</td>
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<td>6G “teleportation” &amp; THz</td>
<td>Indoor wireless solutions</td>
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<td>Telco “cost recovery” from tech-co’s</td>
<td>HAPS (maybe)</td>
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<td>CO2 “enablement” savings</td>
<td>Wi-Fi 7 for enterprise</td>
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<td>In-network edge computing</td>
<td>Potential 6G energy-efficiency</td>
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<tr>
<td>Interoperable messaging / RCS</td>
<td>Non-telephony voice</td>
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<td>Massmarket FWA</td>
<td>Local government 5G/FTTX</td>
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