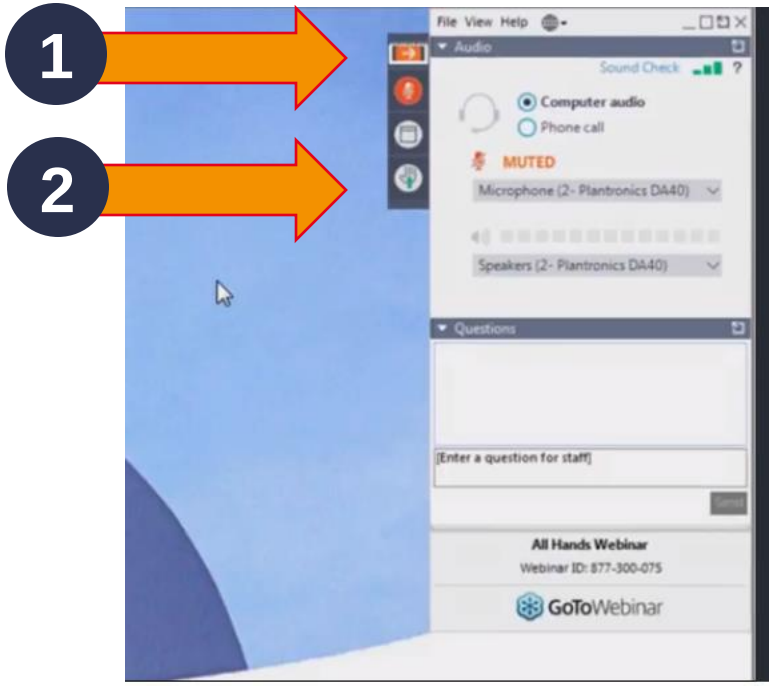
# Clean energy: critical for 5G's success?

**Tuesday 2nd March**

9am GMT | 1pm GMT+4 | 5pm GMT+8

STL PARTNERS

# GoToWebinar




- You're in listen only mode
- If you need us, please type a comment
- Feel free to type questions throughout the session for Q&A – if your question isn't addressed in the panel discussion, you will receive a Q&A document in our follow-up
- We'll send you the slides and a recording shortly after the session - do share with colleagues
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# Presenters and panellists

**Philip Laidler**
Partner & Consulting Director

*STL Partners*

**Matt Bamforth**
Consultant

*STL Partners*

**Reah Jamnadass**
Consultant

*STL Partners*

**Danny Wong**
Senior Director for Telecoms, Asia

*Vertiv*

**Yusheng Li**
Senior Architect

*China Mobile Group Design Institute*

**John Wang**
Consulting Engineer

*China Mobile Group Design Institute*

# Agenda

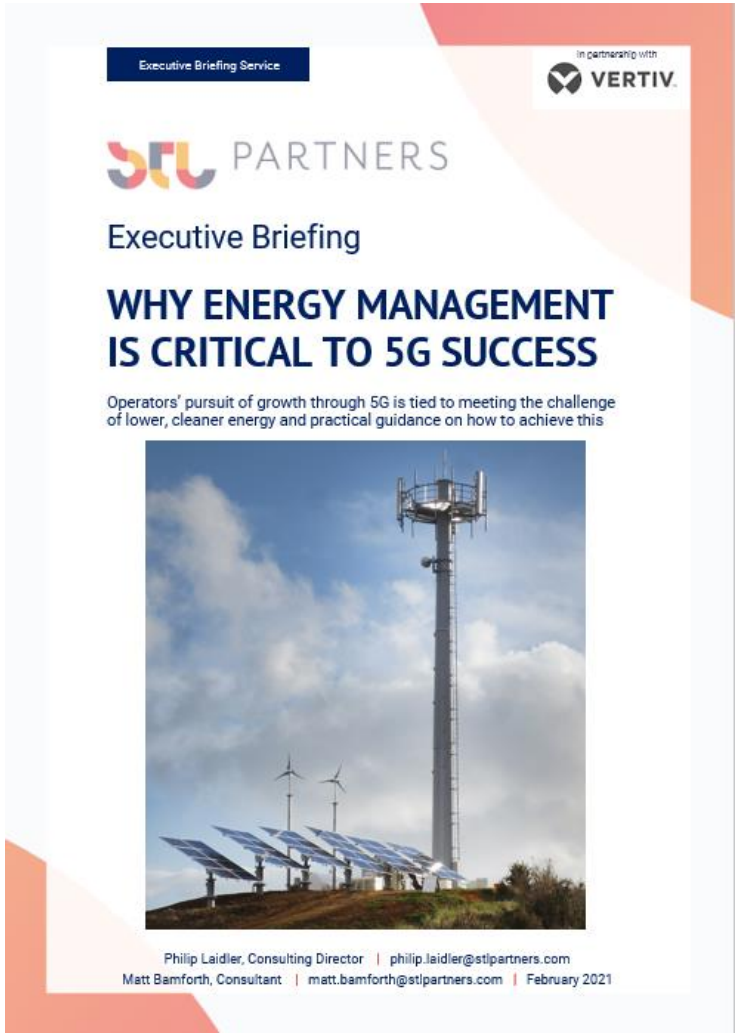
- **The 5G energy emissions challenge** *(STL Partners)*
- **The 5G deployment balancing act** *(Vertiv)*
- **Panel** *(China Mobile, STL Partners and Vertiv)*
- **Q&A** *(China Mobile, STL Partners and Vertiv)*

# The 5G energy challenge

Philip Laidler, STL Partners

# This presentation is based on STL's recent research

- 10 Interviews with CSPs & experts
- Survey of 500 enterprises globally
- Download from Vertiv.com
  - Full report in English
  - Abridged version in:
    - German
    - Spanish (European and LATAM)
    - French
    - Italian
    - Polish
    - Portuguese (European and LATAM)
    - Russian
    - Turkish



# The Coordination Age: A new role for telecoms

| | Need | Result | What's new? |
|---|---|---|---|
| 2020 | Resource availability, efficiency, and conservation | Coordination Age  | • Connects: sensors, actuators, processes, automated decisions, things…<br>• Benefits: better resource outcomes |
| 1990 | Universal access | Information Age  | • Connects: people and computers<br>• Benefits: access to content, reduced transaction costs |
| 1850 | Faster remote communications | Communications Age  | • Connects: people to each other<br>• Benefits: distance overcome & time saved |

# Our global challenges: Managing our planet's resources

## Resource availability

- Employment
- Healthcare
- Capital
- Education

## Resource efficiency

- Productivity
- Energy usage
- Water & land use
- Food distribution

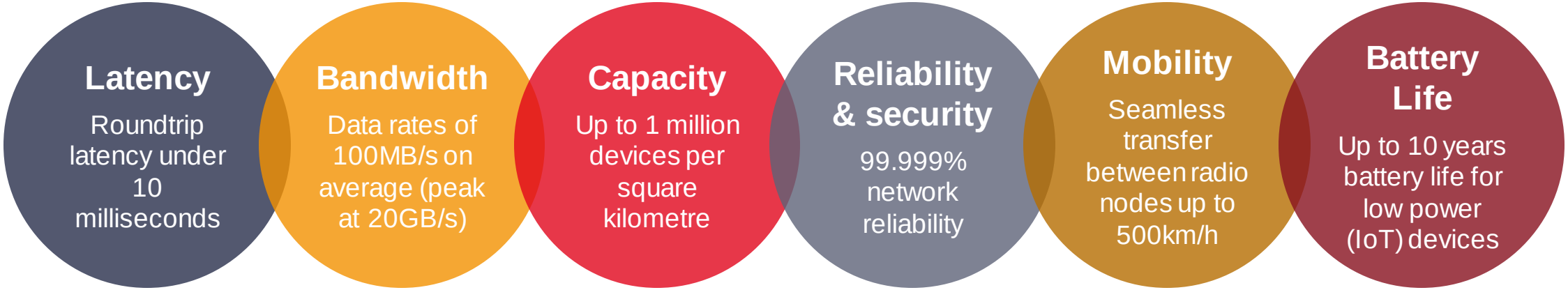
## Resource conservation

- Sustainability
- Climate change
- Pollution
- Waste

Note: Non-exhaustive list

These are issues for governments, enterprises, & consumers. Solutions must come from all constituents.

# 5G: conceived for the Coordination Age




## The successful telco in the Coordination Age

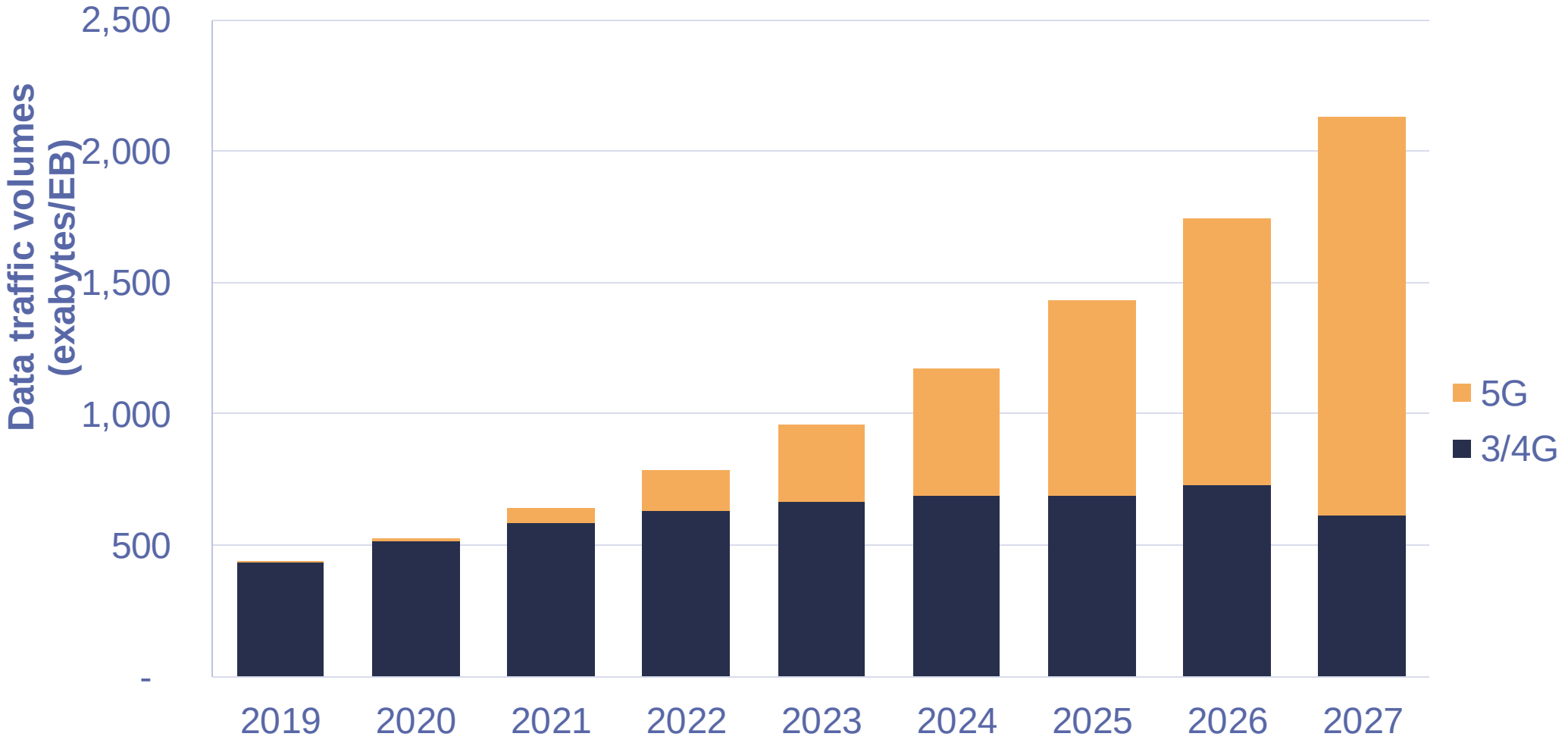
**Virtualised & Programmable Infrastructure**

- CNF / SDN (and everything related)
- Highly automated
- Distributed computing
- Third-party integration through APIs

**Cloud Native Business Practices & Platforms**

- DevOps / agile innovation / fast pivot
- Partnership co-creation / enablement
- Flexible and automated service platforms
- Data-centric / new business models

# Projected 5G traffic volumes (Europe, Africa and Asia)



# 5G has some energy opportunities….and challenges

| 5G can curb excess energy use… | …. but challenges remain |
| --- | --- |
| + 90% more energy efficient (energy to transmit same amount of data) than 4G<br>+ Greater 'energy elasticity' means that 5G can be turned down during off-peak times<br>+ Virtualisation means faster, cheaper renewal cycles and continuous improved performance in software and hardware<br>+ Greater opportunity for resource sharing<br>+ Decommissioning 2G/3G/4G networks | - Growth in traffic due to more, higher-performance services and reduced perGB cost to users<br>- Up to twice as many cell sites to achieve same levels of coverage<br>- Cloud native infrastructure (COTs hardware) that require data centre environment (cooling, UPS)<br>- Many more edge data-centres, including brownfield conversions |

# 5G roll-out coincides with a decade of transition: in energy, emissions and attitudes

## Regulatory pressures on 5G will increase

Scrutiny for 5G will only increase after COVID-19

- **Regulations** and **legal action from advocacy groups** will affect telcos' bottom line

## Key stakeholders will take their business elsewhere

Commit to sustainability targets and reporting, or risk…

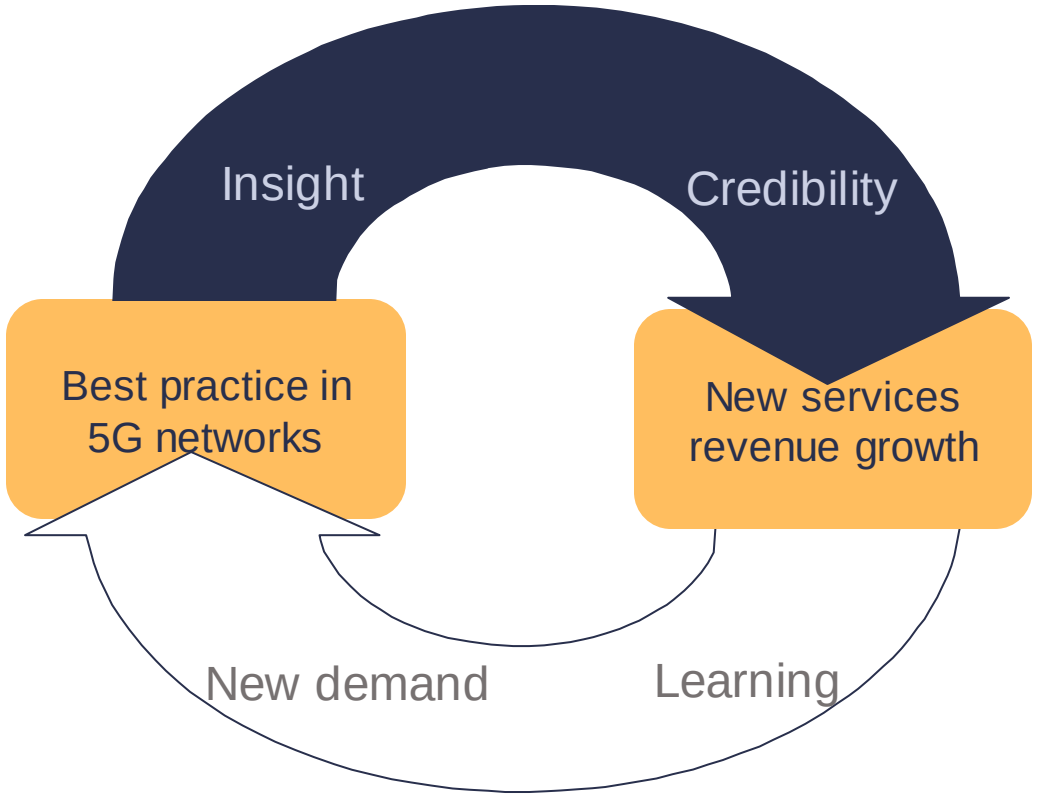
- **Decreasing revenues**
- **Higher cost of capital**
- **Reduced access to top talent**

## Operating costs will mount

Reduce costs by better managing energy use across their networks

- **Lifecycle savings in energy and other costs** (operations staff, truck rolls) will offset additional energy investments

# Turn challenge into opportunity

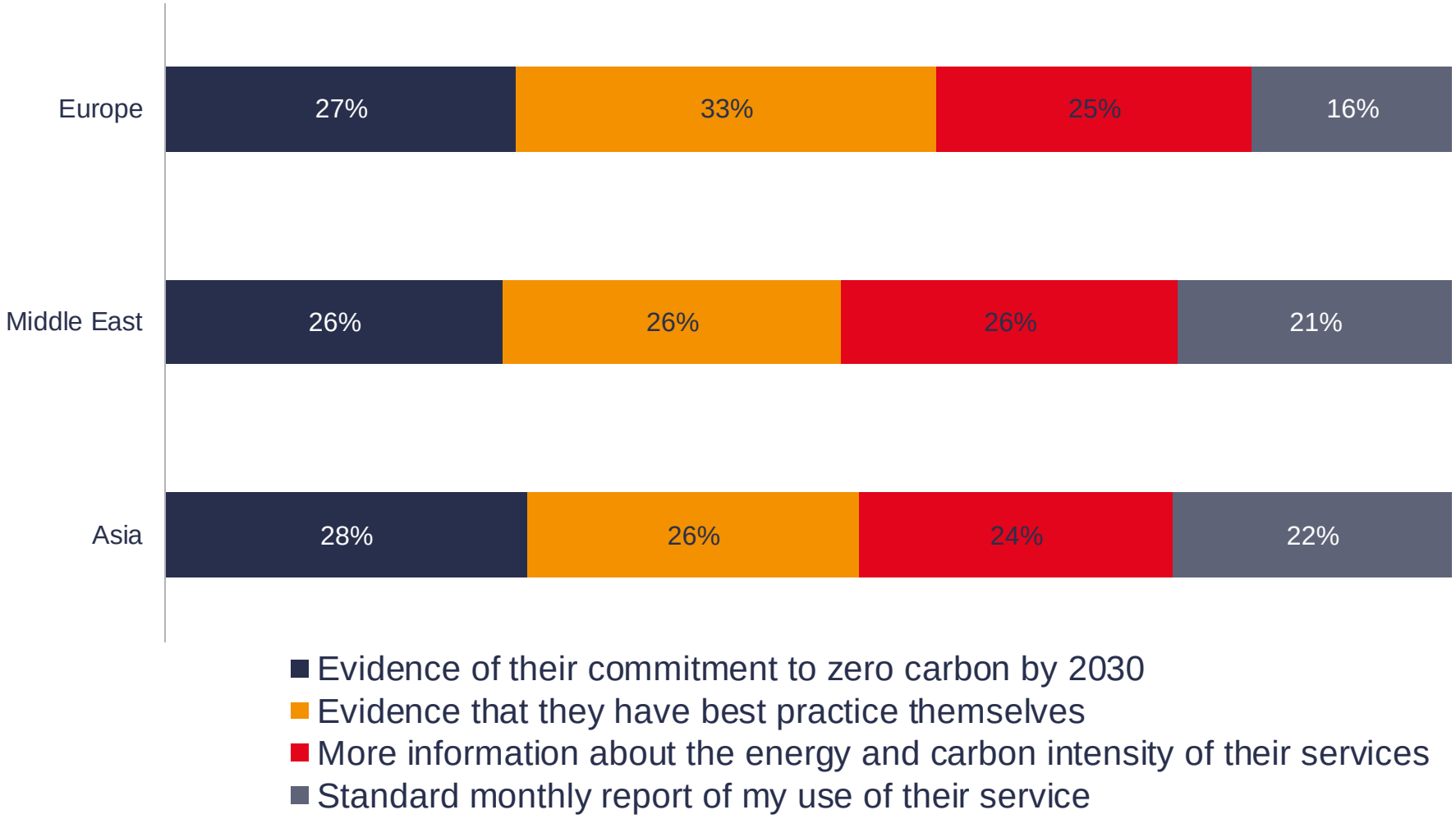


## Best practice examples

in 5G network design, deployment and management

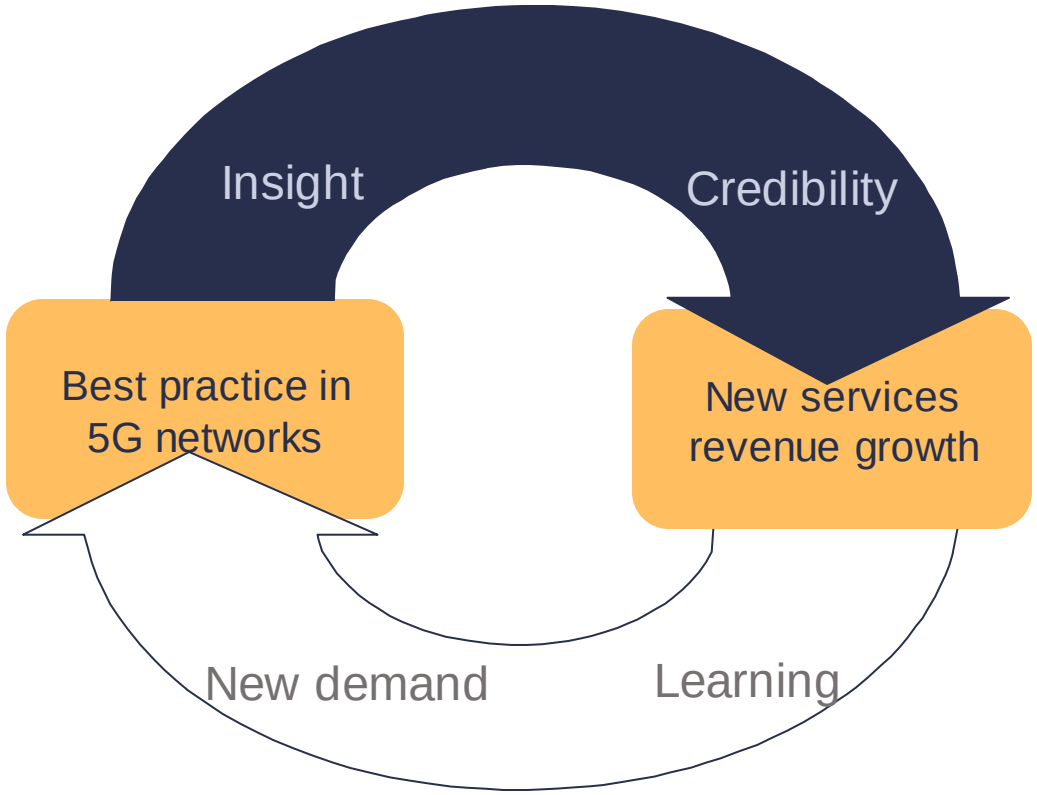
| | | Potential energy reduction impact | |
|---|---|---|---|
| | | Short term | Long term |
|  | **Network technology** | • Use power-efficient network hardware<br>• Optimise active software components (e.g. SON, AI-augmented sleep modes) | |
|  | **Facilities infrastructure** | • Use high-performance power & cooling systems<br>• Replace diesel generators with on-site renewables | |
|  | **Infrastructure management** | • Leverage granular data to improve remote monitoring and management of telco sites | |
|  | **Organisation & evaluation** | • Prioritise efficiency over short-term CapEx by taking a 'full' lifecycle perspective<br>• Take a holistic approach across organisation | |
|  | **Work with others** | • Participate in energy ecosystem as 'prosumers'<br>• Innovate commercial models with suppliers, e.g. ESaaS | |

# If you were to consider partnering with a telco to help reduce your organisation's carbon emissions, what would you expect to see?



# In summary: Energy considerations should not constrain 5G growth… they should power it

- Set ambition in the coordination age – connectivity and beyond
- Adopt best practice across the organisation
  - Top down commitment & governance
  - Good intentions are not enough
- Drive customers' transformation
  - Be your best case study



# The 5G Deployment Balancing Act

**Danny Wong, Vertiv**

# Vertiv at-a-glance

**Sales**
4.4 B

**Employees**
~20,000

**Customers Include**
Alibaba, Alstom, America Movil, AT&T, China Mobile, Equinix, Ericsson, Reliance, Siemens, Telefonica, Tencent, Verizon, Vodafone

**Manufacturing Sites:** 19
**Service Centers:** 270+
**Reach:** 130+ countries

We bring together **hardware, software, and ongoing services** to ensure our customers' vital applications run continuously and perform optimally.

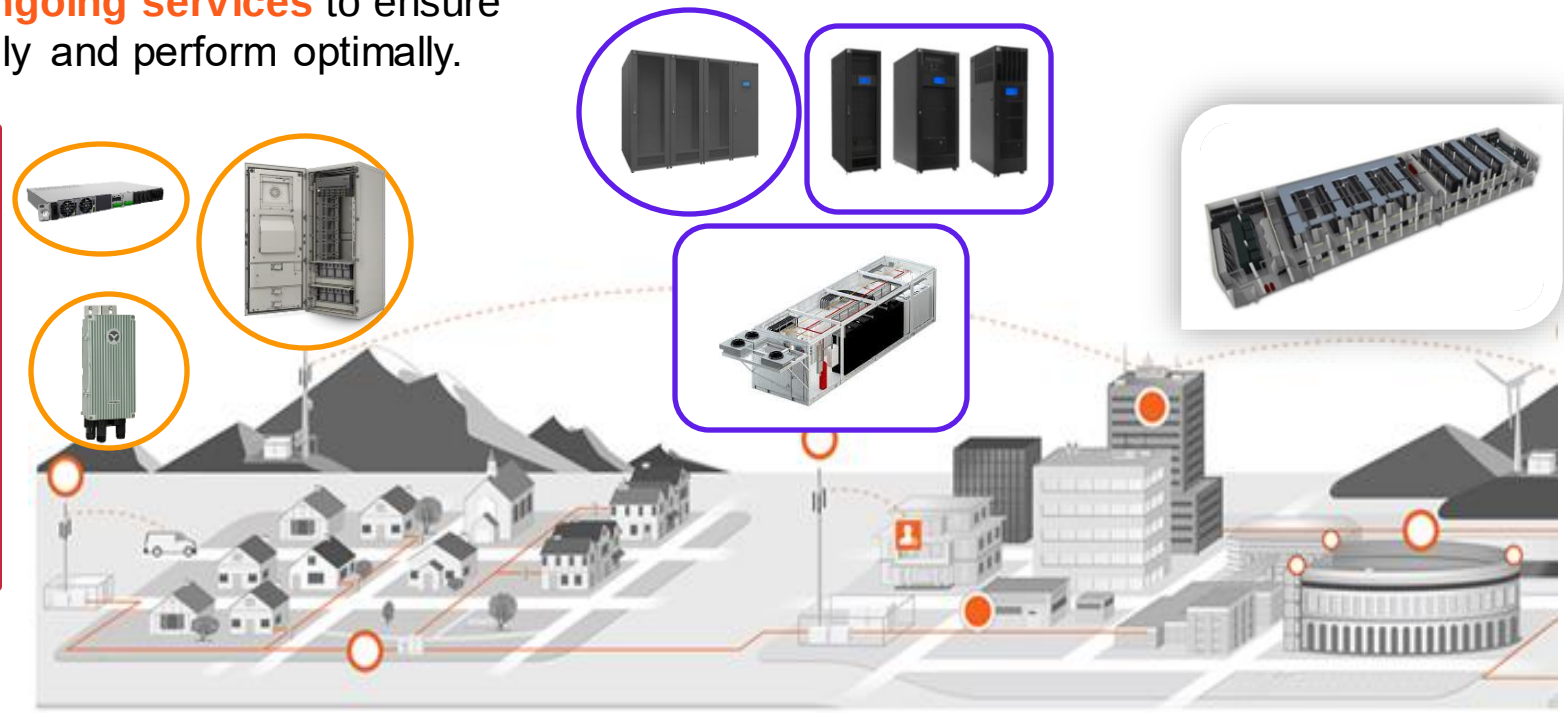
**Services and Software**

**Solutions**

**Large Infrastructure**
AC Power, DC Power, Energy Storage, Industrial Solutions, Thermal

**IT and Edge Infrastructure**
Edge Systems, IT Systems, Rack, Rack PDU, Rack Thermal, Rack UPS

NetSure™ Avocent® Cybex™ Geist™
Liebert®
Energy Labs
A VERTIV Company



Access Network

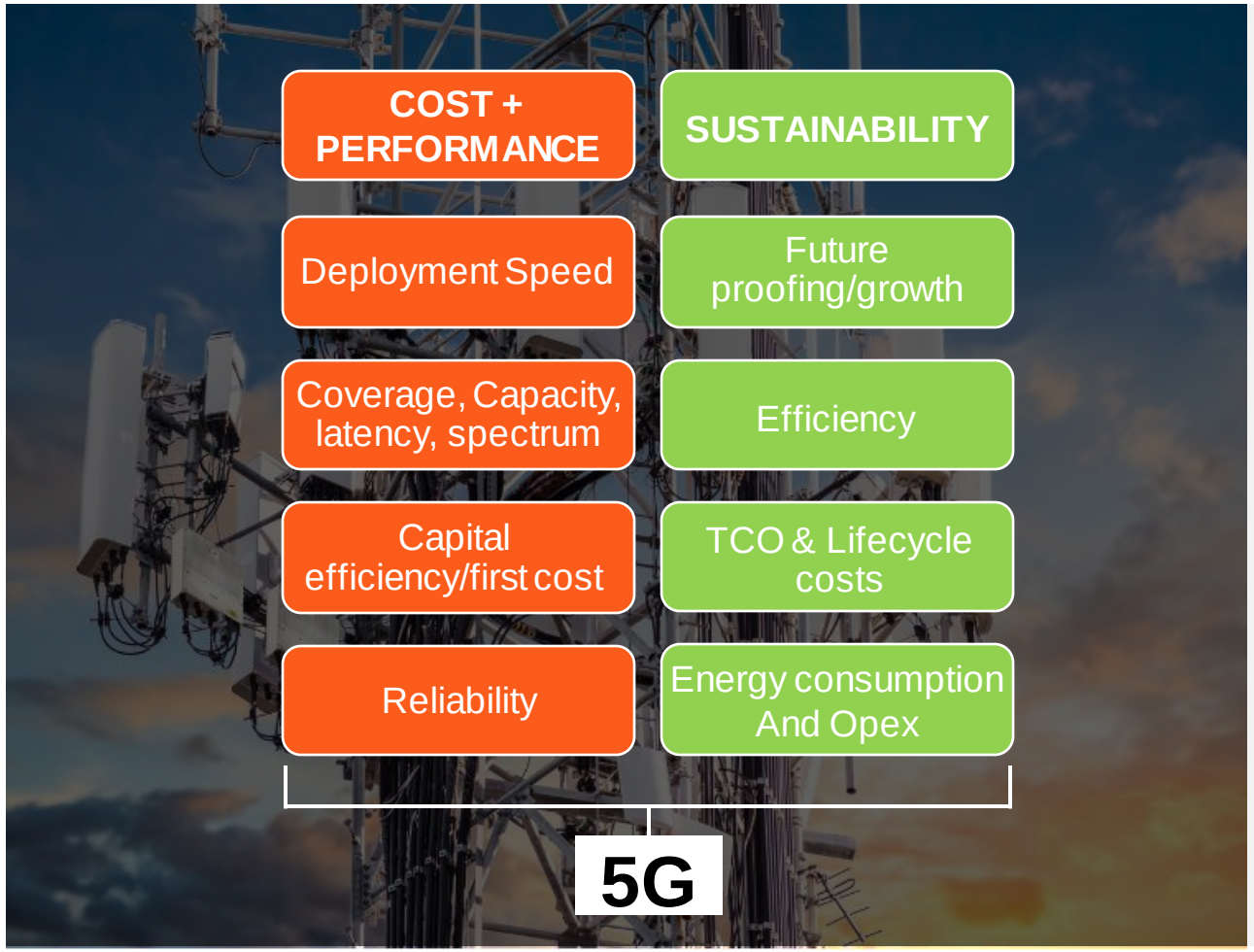
EDGE Network

Core Network
Data Center

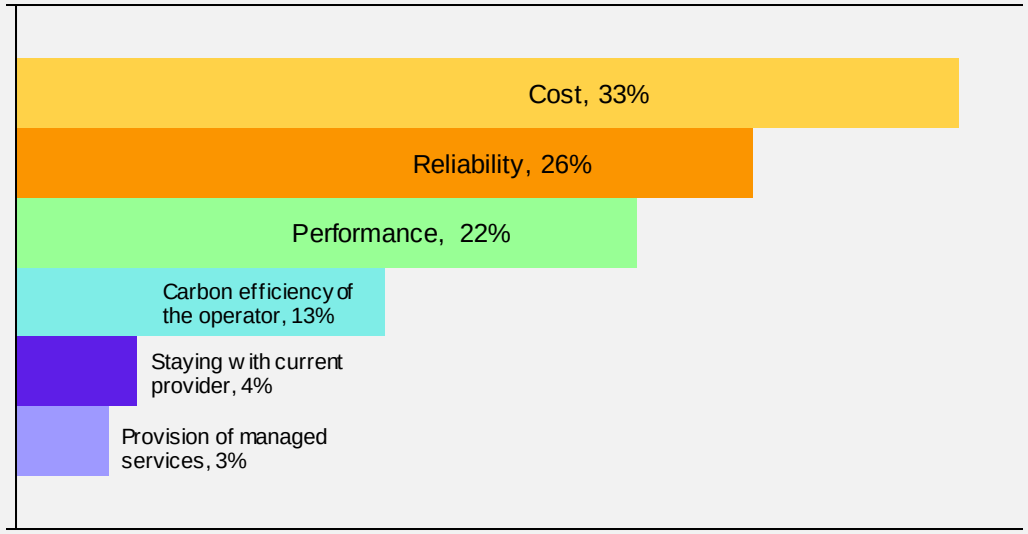
VERTIV.

# Rolling out 5G will be a balancing act

## But 5G has put more emphasis on sustainability than previous ‘G’s




**Which of the following is most important when selecting communications products / services?**




% of factors ranked “most important”

# Best practice in deploying 5G

## Range of opportunities to control energy use in the short and long term

| Best practice examples<br>in 5G network design, deployment and management | | Potential energy reduction impact<br>Short term | Potential energy reduction impact<br>Long term |
|---|---|---|---|
|  **Network technology** | • Use power-efficient network hardware<br>• Optimise active software components (e.g. SON, AI-augmented sleep modes) | ϟϟϟ | ϟϟϟ |
|  **Facilities infrastructure** | • Use high-performance power & cooling systems<br>• Replace diesel generators with on-site renewables | ϟϟϟϟ | ϟϟ |
|  **Infrastructure management** | • Leverage granular data to improve remote monitoring and management of telco sites | ϟϟϟ | ϟϟϟ |
|  **Organisation & evaluation** | • Prioritise efficiency over short-term CapEx by taking a 'full' lifecycle perspective<br>• Take a holistic approach across organisation | ϟ | ϟϟϟ |
|  **Work with others** | • Participate in energy ecosystem as 'prosumers'<br>• Innovate commercial models with suppliers, e.g. ESaaS | ϟϟ | ϟϟϟϟ |

# Best practice in deploying 5G in ACCESS sites

## Optimizing energy consumption is key consideration in key network locations

### PROBLEM STATEMENT

High energy cost ($0.3 / kWH)

Energy availability differs across sites

### VISION

Optimize energy consumption by ~**4%**

Improve power availability by leveraging high-efficiency technology

### SOLUTION

Improve conversion efficiency by deploying upgrade to Ultra high-efficiency rectifier system that delivers up to 98% efficiency

### END RESULTS

**$7M**

Yearly savings based on 6,000 sites

**23GWh**

Estimated energy savings per year

**13.62k ton**

CO2 reduction per year

# Best practice in deploying 5G in EDGE sites

Effective system redundancy and monitoring will ensure efficient energy usage in an edge network

## PROBLEM STATEMENT

Concern over energy efficiency impact on **scalability** in deploying an edge network

## VISION

Optimize energy consumption by **evaluating key technologies and architecture**

## SOLUTION

Design and build edge network infrastructure with **Innovative containment**, **high capacity** in row cooling and **smart control**

**Standardized** platform to ensure consistent rollout and design replication in maximizing overall efficiency

## END RESULTS

**15-25%**

Improvement in PUE, compared to conventional build

Increased availability and overall performance

# Take-aways

- 5G is a balancing act
- Leverage Data Center (and other industry) best practices
- CapEx efficiency requirements
- Look at Network holistically – architecture & HW changes coming
- Scenario planning for balancing growth vs first cost
- Prioritizing technology and efficiency in point solutions
- High-volume custom – standard building blocks as best practice, but tailor solutions to site/region for optimization

# Panel discussion

# Q&A