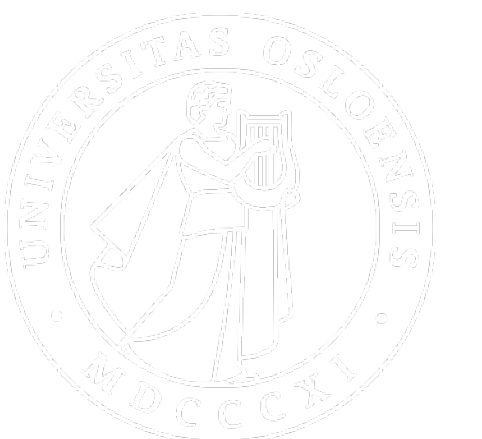# Africa and the Internet

Prof Josef Noll[1,3] & Sudhir Dixit[2,3]

[1]University of Oslo (UiO)

[2]IEEE CTU

[3]Basic Internet Foundation, Norway

An inclusive
Next Generation Internet

1973 Kjeller

Yngvar Lundh

Pål Spilling

1973: Internet to Kjeller/Europe

1994: Opera Software

Kjeller

2014:

Basic Internet FOUNDATION Connect The Future

Norge Norway
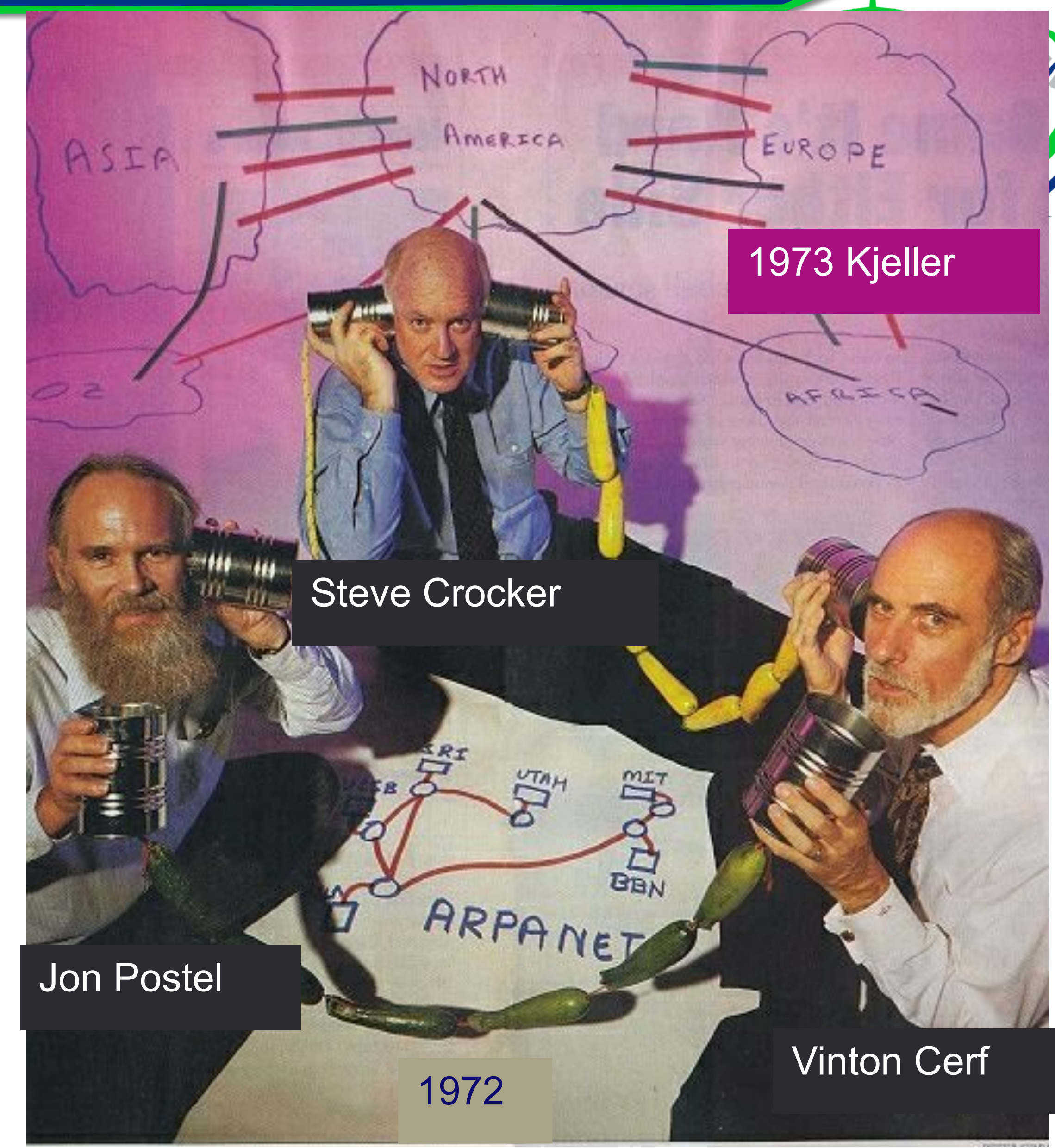
Steve Crocker

Jon Postel

Vinton Cerf

1972

Source: http://www.michaelkaul.de/History/history.html

Mission

Framework Conditions

Partnerships

How can we "Connect The Future"?

Josef Noll @josefnoll · Jun 2

Amazing opening by @ITU @ITUSecGen Houlin Zhao, setting the scene for connecting every single human by 2030, and @meilinfung, addressing the history of the Internet and #NRENs to connect schools. We're in @CateKimambo @RosalynnMworia @UcsafT @AheriNet @cisskisumu @WSISprocess
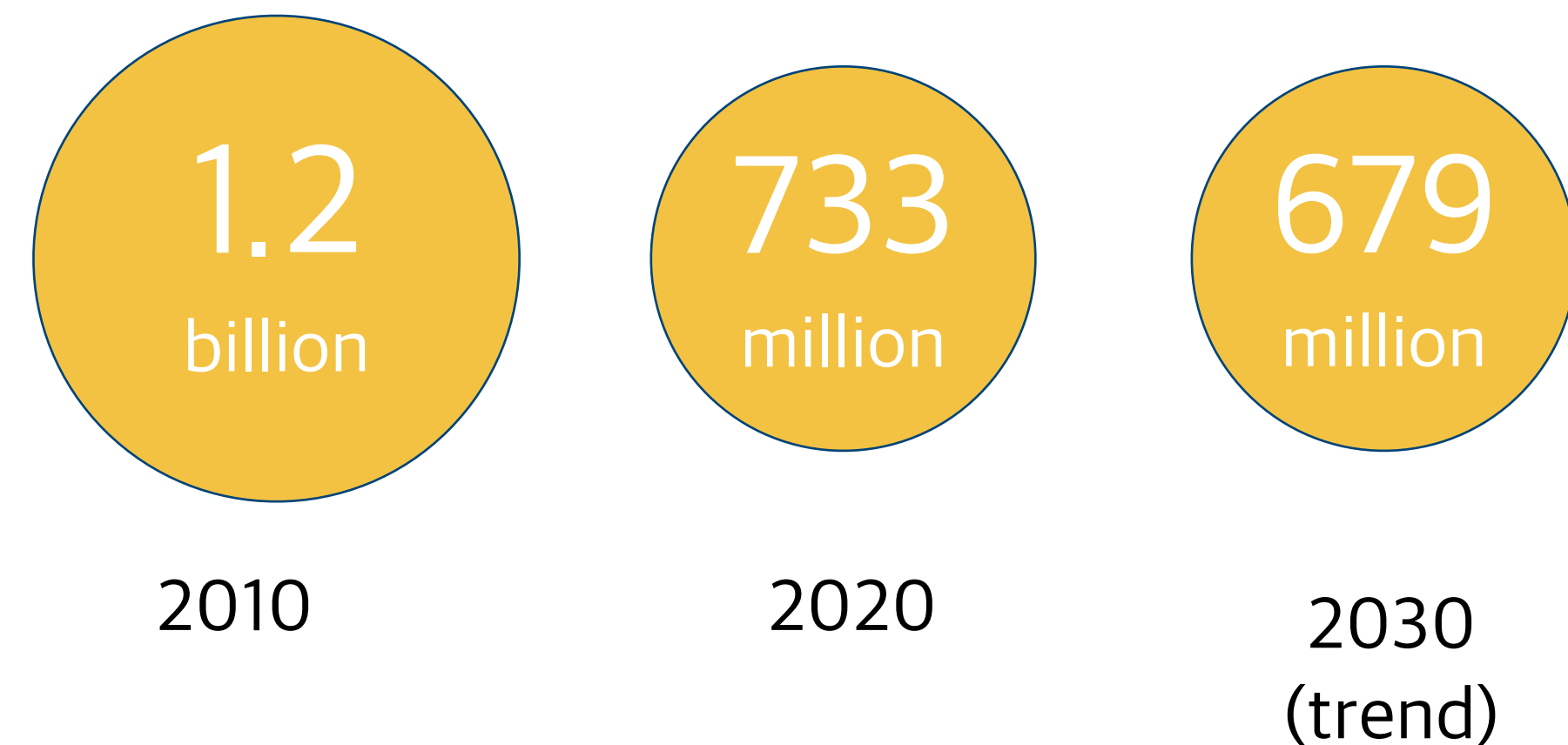
Energy & Digital, enablers for the SDGs

7 AFFORDABLE AND CLEAN ENERGY

People without electricity

SDG 7.1 calls for universal access to …. energy by 2030

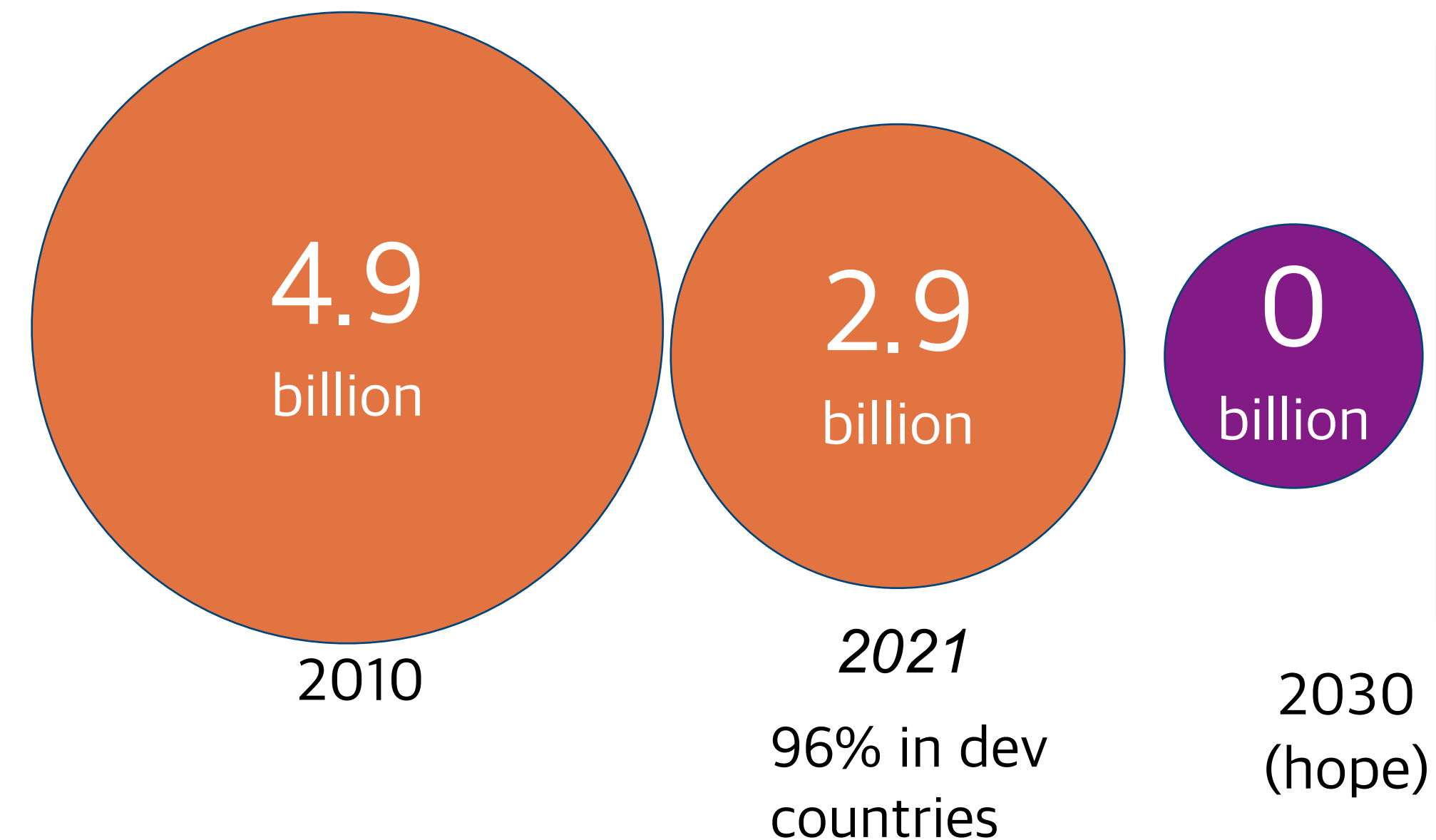| 1.2 billion	733 million	679 million
2010	2020	2030 (trend)

[WorldBank 2021]

https://www.worldbank.org/en/news/press-release/2021/06/07/report-universal-access-to-sustainable-energy-will-remain-elusive-without-addressing-inequalities

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

People not using Internet

SDG 9c calls for universal, affordable internet access by 2020

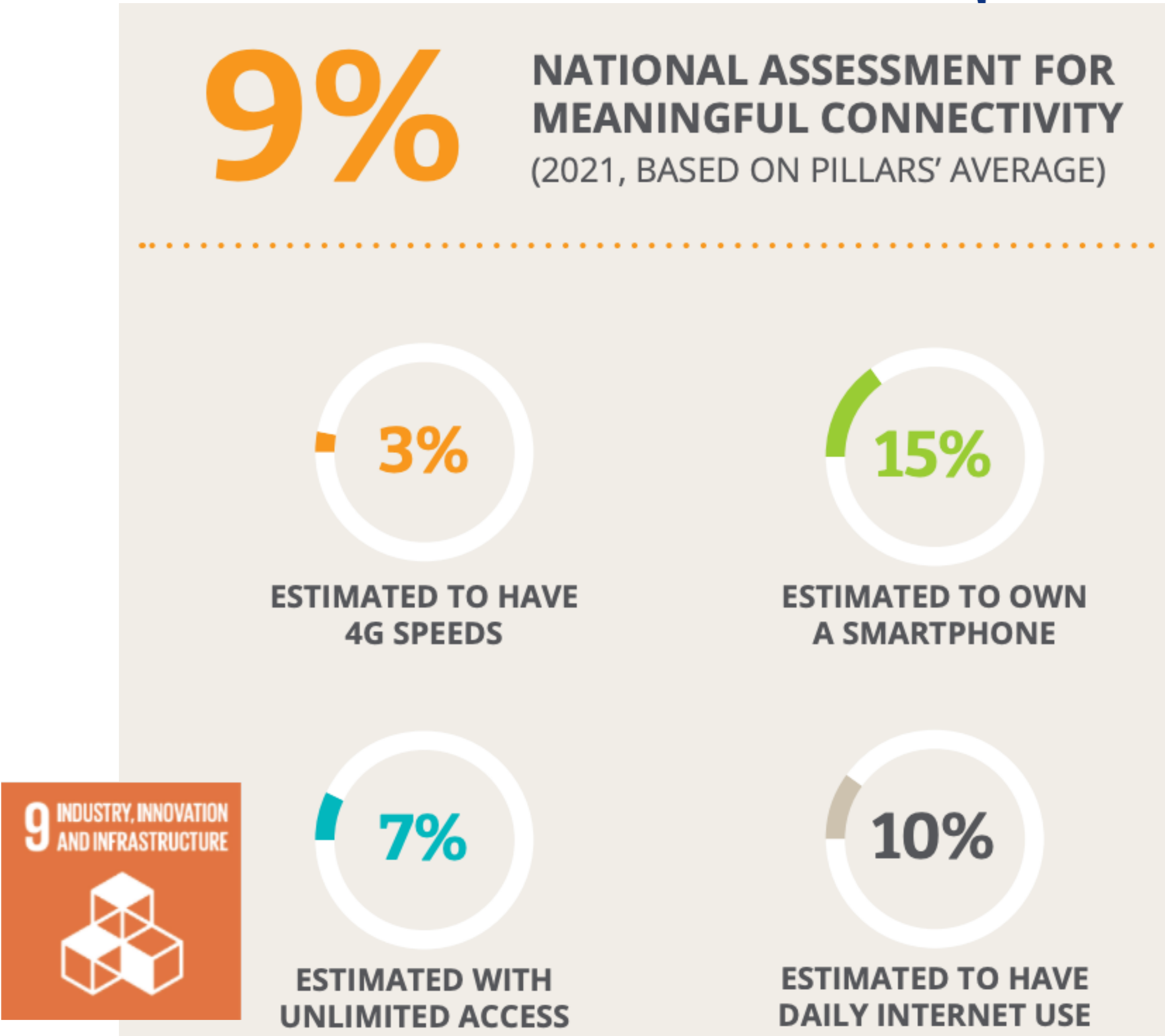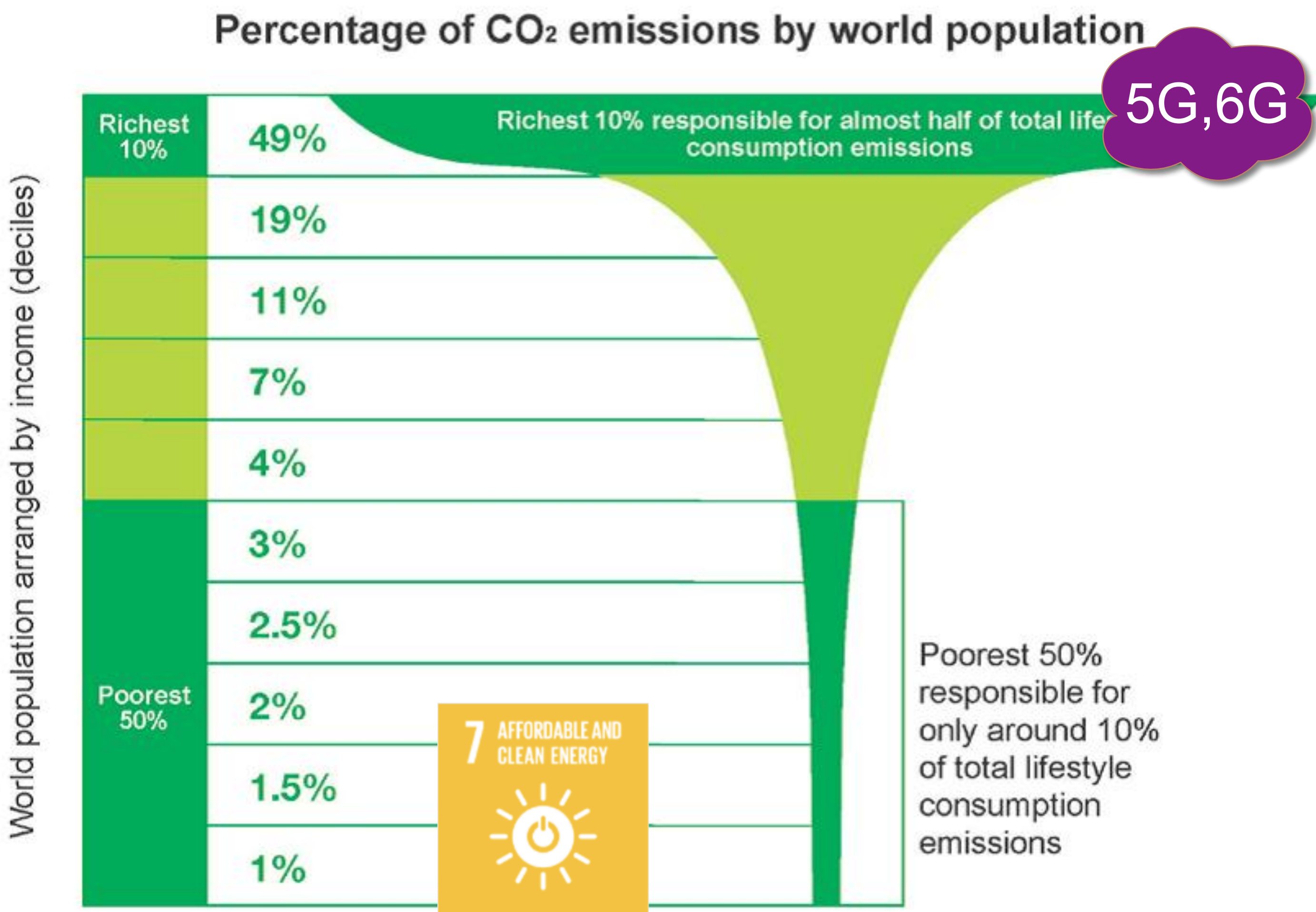| 4.9 billion	2.9 billion	0 billion
2010	*2021*	2030 (hope)
	96% in dev countries	

WSIS Forum 2022

[ITU 2010, 2021]

https://www.itu.int/hub/2021/11/facts-and-figures-2021-2-9-billion-people-still-offline/

Inequality in Energy & Digital Access

Percentage of CO_2 emissions by world population

World population arranged by income (deciles)

Richest 10% — 49%
19%
11%
7%
4%
3%
2.5%
Poorest 50% — 2%
1.5%
1%

Richest 10% responsible for almost half of total lifestyle consumption emissions

5G,6G

Poorest 50% responsible for only around 10% of total lifestyle consumption emissions

7 AFFORDABLE AND CLEAN ENERGY

[Source: Oxfam.org, 2015]

9% NATIONAL ASSESSMENT FOR MEANINGFUL CONNECTIVITY
(2021, BASED ON PILLARS' AVERAGE)

3%
ESTIMATED TO HAVE
4G SPEEDS

15%
ESTIMATED TO OWN
A SMARTPHONE

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

7%
ESTIMATED WITH
UNLIMITED ACCESS

10%
ESTIMATED TO HAVE
DAILY INTERNET USE

[https://webfoundation.org/docs/2022/02/MC_Rwanda_FS_Screen_V1.pdf]

Our Goal

2 000 schools
1 820 000 students
Q4.2024

105 schools
77 632 students
Q4.2022

55 schools
37 632 students
Q4.2021

10 schools
10 131 students
Q1.2021

1100 USD/installation
0.6 $/student

1800 USD/installation

2500 USD/installation
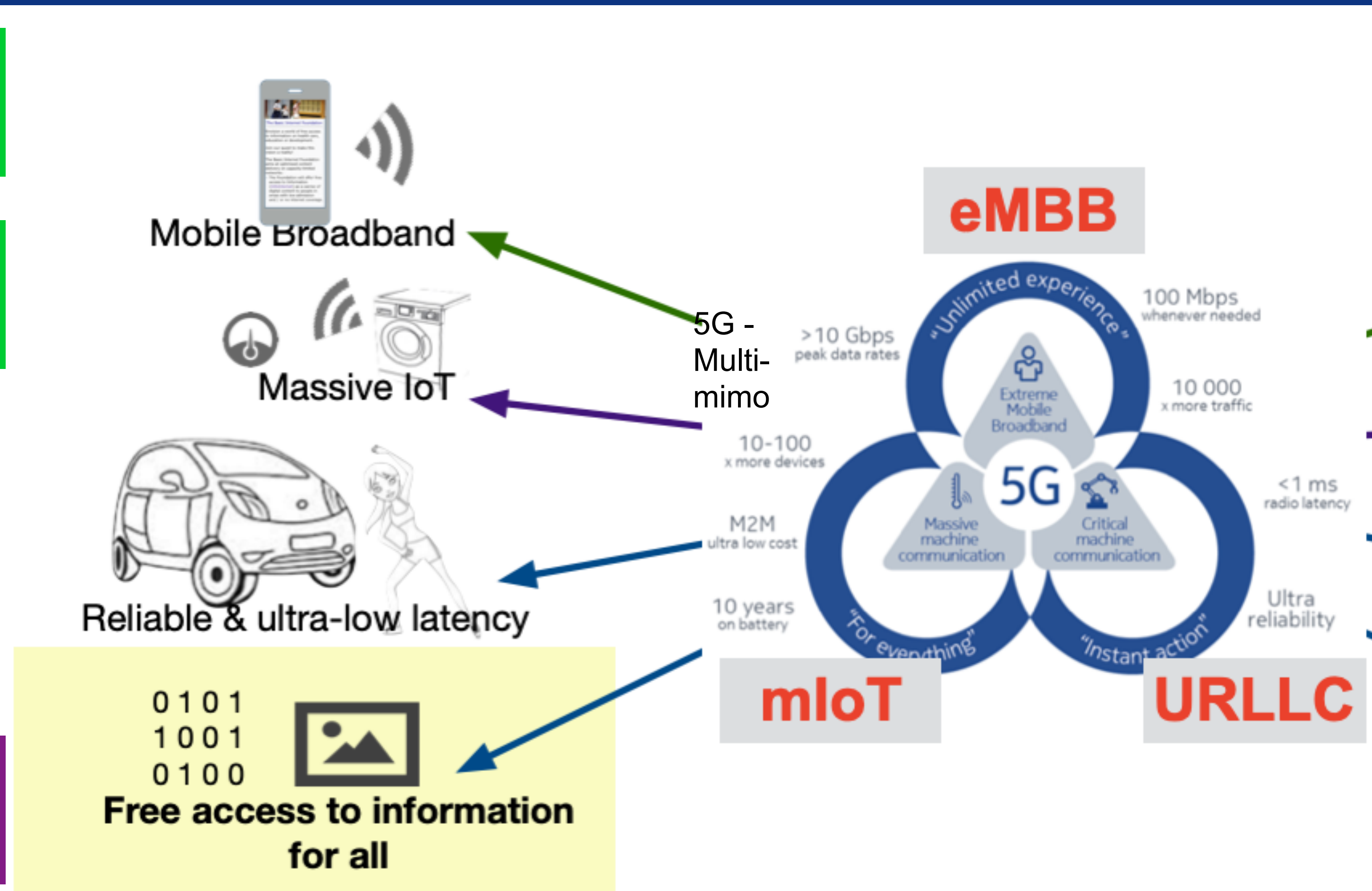4 $/student

3 000 USD/installation
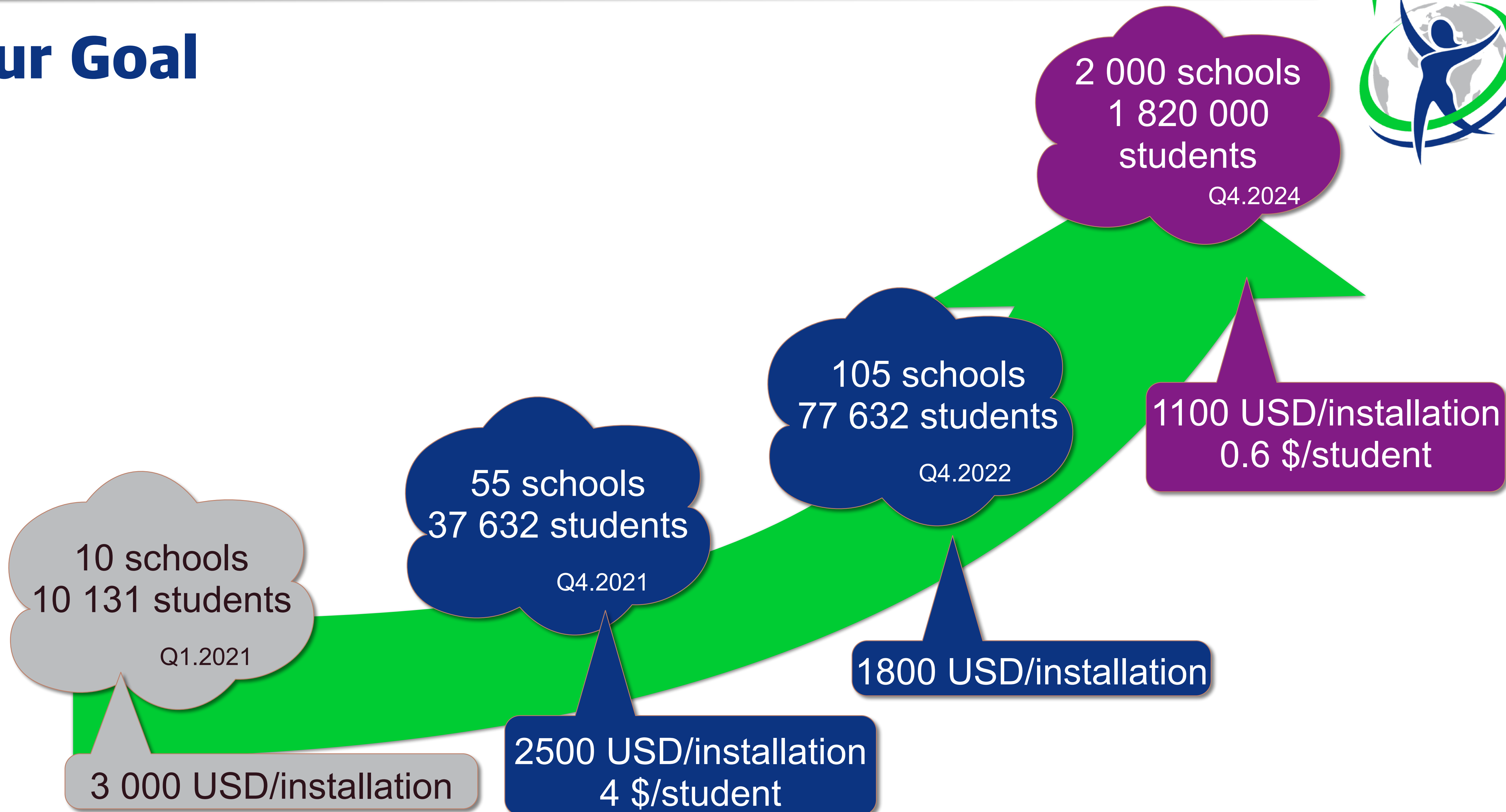
Mission

Framework Conditions

Partnerships

Digitalisation (5G/6G)

Road model: pedestrians & cyclists

Internet: text & pictures

Internet Lite

Mobile Broadband

Massive IoT

Reliable & ultra-low latency

0101
1001
0100
Free access to information for all

5G - Multi-mimo

eMBB

mIoT

URLLC

>10 Gbps peak data rates

100 Mbps whenever needed

10 000 x more traffic

10-100 x more devices

<1 ms radio latency

M2M ultra low cost

Ultra reliability

10 years on battery

"Unlimited experience"

"For everything"

"Instant action"

Extreme Mobile Broadband

Massive machine communication

Critical machine communication

5G

- **Research for the (digital) Society**
- **Competence for the Digital Transformation**
- **Connect Schools & unconnected Communities practical experiences**
- **Real world search based on needs from the communities**

4G/5G Multi-MIMO
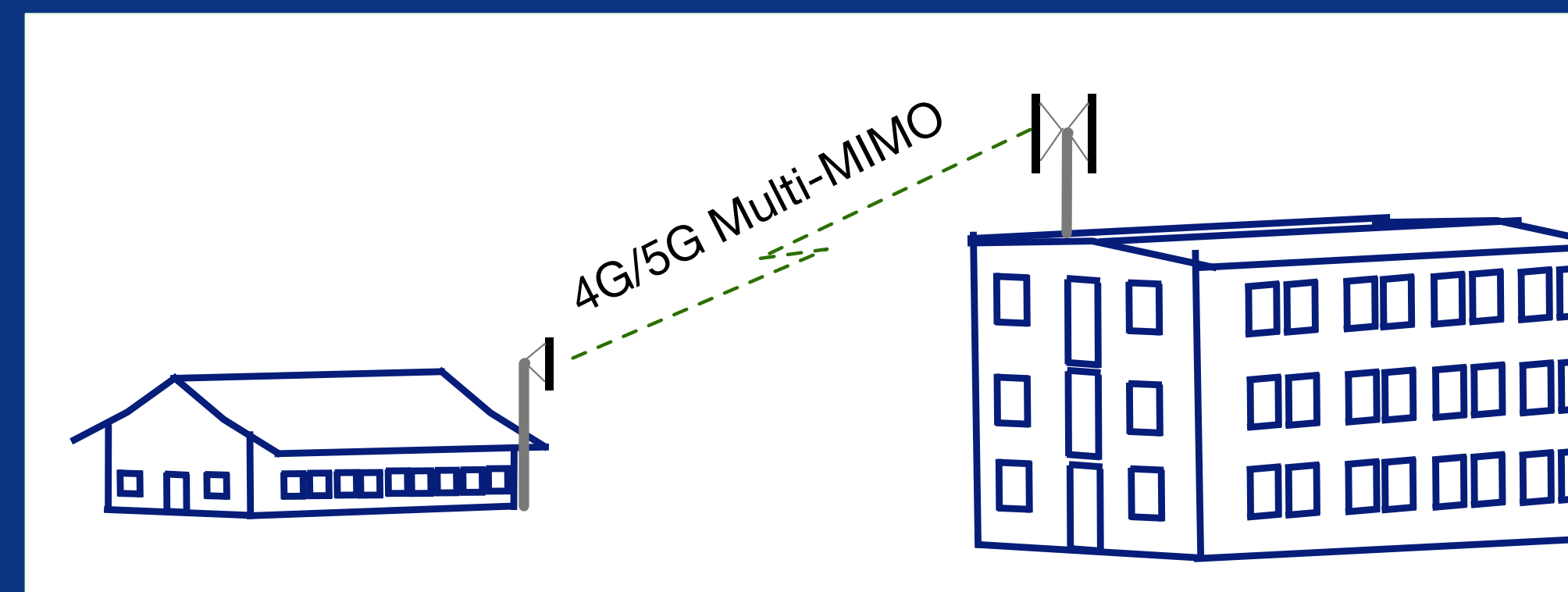
Conclusion
Partnership for Connectivity

➡ Universities

■ Real-world knowledge

■ Decentralised, empower the communities

■ Knowledge4Africa, 5GforPeople

➡ Community Networks

■ extension of NRENs?

➡ Commercial actors

■ Mobile operators: Research with 5G as backbone

■ ISPs, satellite

➡ Government, ITU, UNICEF, UNESCO, ⋯

■ Framework conditions (spectrum, Internet Lite)