

UiO • **Department of Technology Systems**
University of Oslo

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Empower the Unconnected Generation for a Sustainable Future

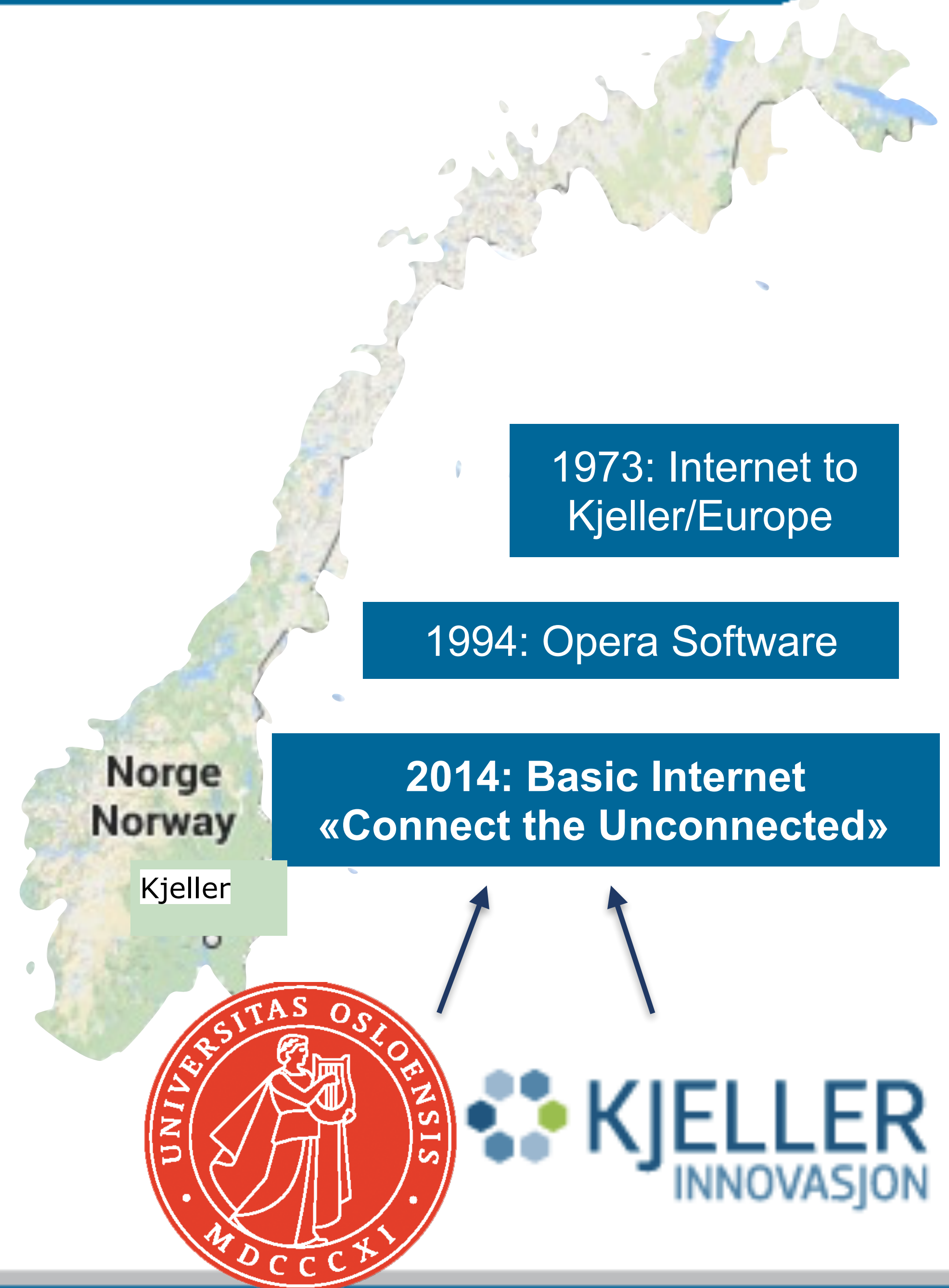
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About the Basic Internet Foundation

- **Information** is the **basis** for **education, health** and entrepreneurship
- **Digitalisation** is the engine of **economic growth** and wellbeing of people
- **Sustainable development** requires **digital inclusion**, which necessitates Internet for all
- **Impact** lives of the **unconnected** 3.5 billions of **people** in the world
- **University of Oslo** (UiO/UNIK) and **Kjeller Innovation** co-founded the Basic Internet Foundation
 - Special Purpose Vehicle (SPV)
 - **"Internet Lite for all"**
 - free access to information for all



United Nations Sustainable Development Goals

1 NO POVERTY 	2 ZERO HUNGER 	3 GOOD HEALTH AND WELL-BEING 	4 QUALITY EDUCATION 	5 GENDER EQUALITY 	6 CLEAN WATER AND SANITATION 
7 AFFORDABLE AND CLEAN ENERGY 	8 DECENT WORK AND ECONOMIC GROWTH 	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	10 REDUCED INEQUALITIES 	11 SUSTAINABLE CITIES AND COMMUNITIES 	12 RESPONSIBLE CONSUMPTION AND PRODUCTION 
13 CLIMATE ACTION 	14 LIFE BELOW WATER 	15 LIFE ON LAND 	16 PEACE AND JUSTICE STRONG INSTITUTIONS 	17 PARTNERSHIPS FOR THE GOALS 	 THE GLOBAL GOALS For Sustainable Development

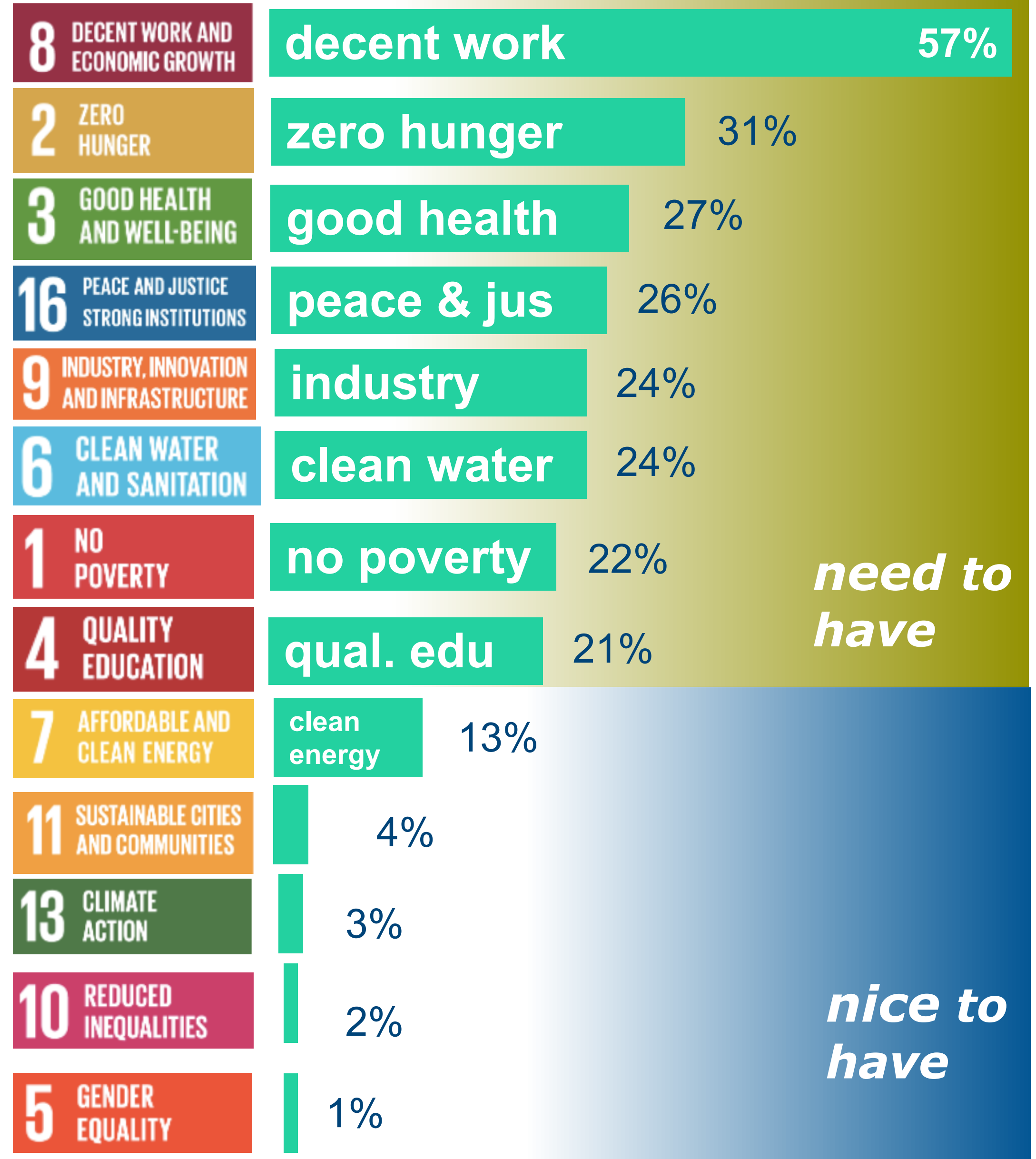
Public Opinion on SDGs (afrobarometer.org)

→ Priorities by people in Africa

- decent work
- zero hunger
- good health
- ...

→ Priorities in India

- both highly educated
- and regions with





Example: Decent Work

- Centre for Monitoring the **Indian Economy**:
- 11 Million jobs lost in 2018
 - 9 Million in **rural areas**
 - 8.8 Million **women** lost work
- 31 Million look for work
 - most of them in RUrban area
 - from 80/20% Rural/Urban to
 - 70 / 15 / 15% Rural / RUrban / Urban
- How can we create a **sustainable future** for the young generation?
 - Rural
 - RUrban (Smart Cities)

Tall publisert i januar av Centre for Monitoring the Indian Economy (CMIE) viste at hele 11 millioner indiske jobber gikk tapt i 2018.

Brorparten av disse jobbene, rundt ni millioner, var på landbygda. Og hele 8,8 millioner av dem som mistet jobben, var kvinner.

Samme organisasjon rapporterte i mars i fjor at 31 millioner indere aktivt leter etter jobb.

Feilslått pengepolitikk

Hurtig vekst har vært sentral i Modis politiske visjon om å gjøre India til Kinas største økonomiske utfordrer.

Et av hans mest omfattende økonomiske tiltak kom i 2016. Da trakk han 86 prosent av kontantene ut av sirkulasjon over

Josef Noll @josefnoll · Feb 8

Dystert lesing i dagens @Aftenposten om at 11 Mio jobber gikk tapt i 🇮🇳 i 2018, og at 80% av de som mistet jobben var #Kvinner. Knappt 90% av jobber forsvant i Landsbyer.

#DigitalInclusion #InternetLite #DigitalEmpowermentPlatform @dagiulstein @NorwayMFA

@nikolaiastруп

India



Republikken er v
nest største land
enn 1,3 milliarder
gere og forvent
passere Kina i f
løpet av noen å

Reality of the Digital Divide

→ “Boys have the toys”

- digital divide in both devices
 - ▶ Example Smartphone ownership: 33% male, 16% female (Bangladesh)
- mobile broadband access

→ Costs of Access

- School connectivity (SDG indicator 4.A.1)
 - ▶ TZ: ~3% of schools are connected to Internet
- Digital Health for primary health facilities
 - ▶ <1% of primary health facilities have Internet (TZ)
- Community involvement/digital transformation

“Internet had the ability to dismantle the divide. Internet failed miserably, the divide is bigger than ever.”
Kate Gilmore, Human Rights, UNO

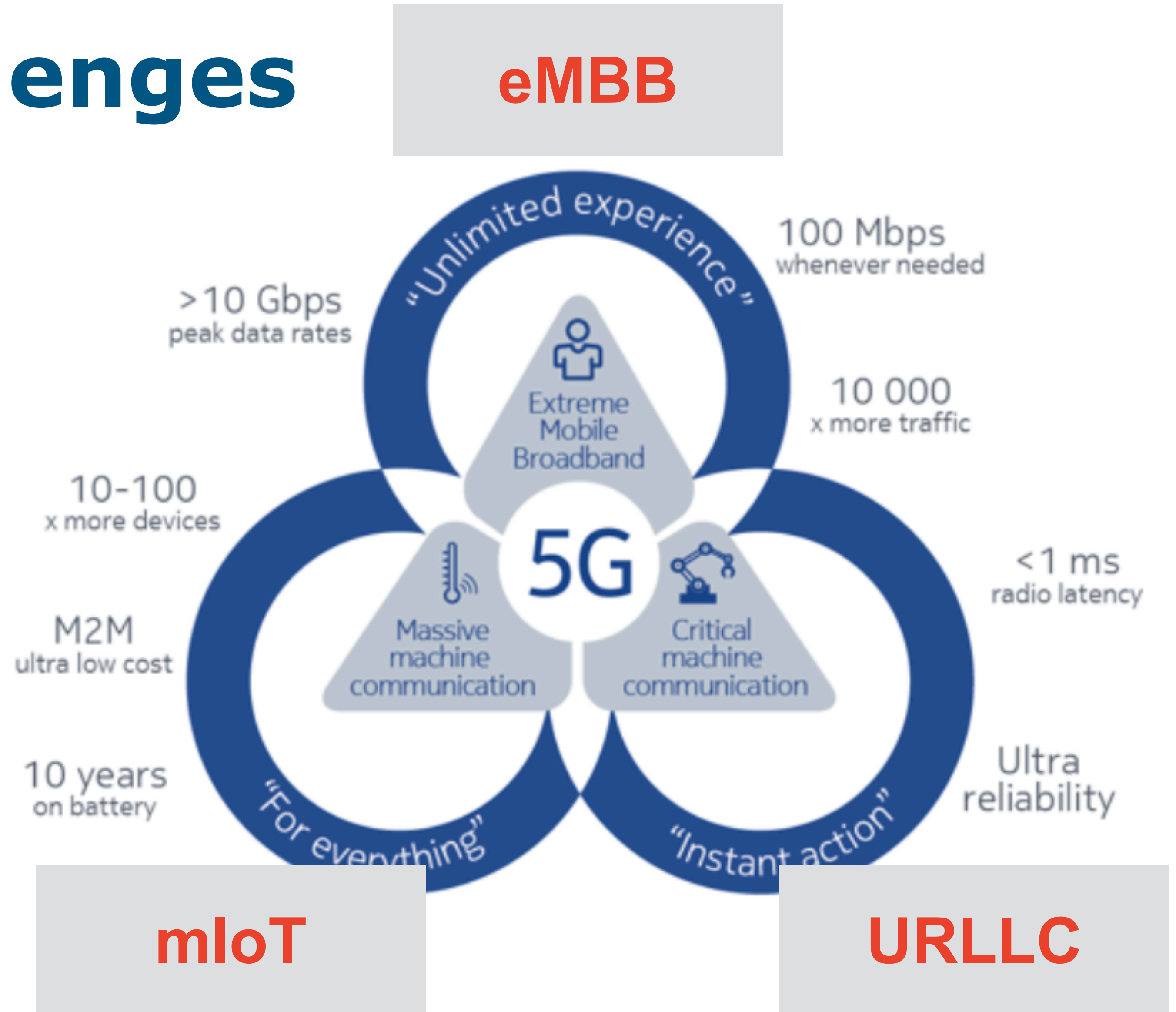
CAPEX

OPEX



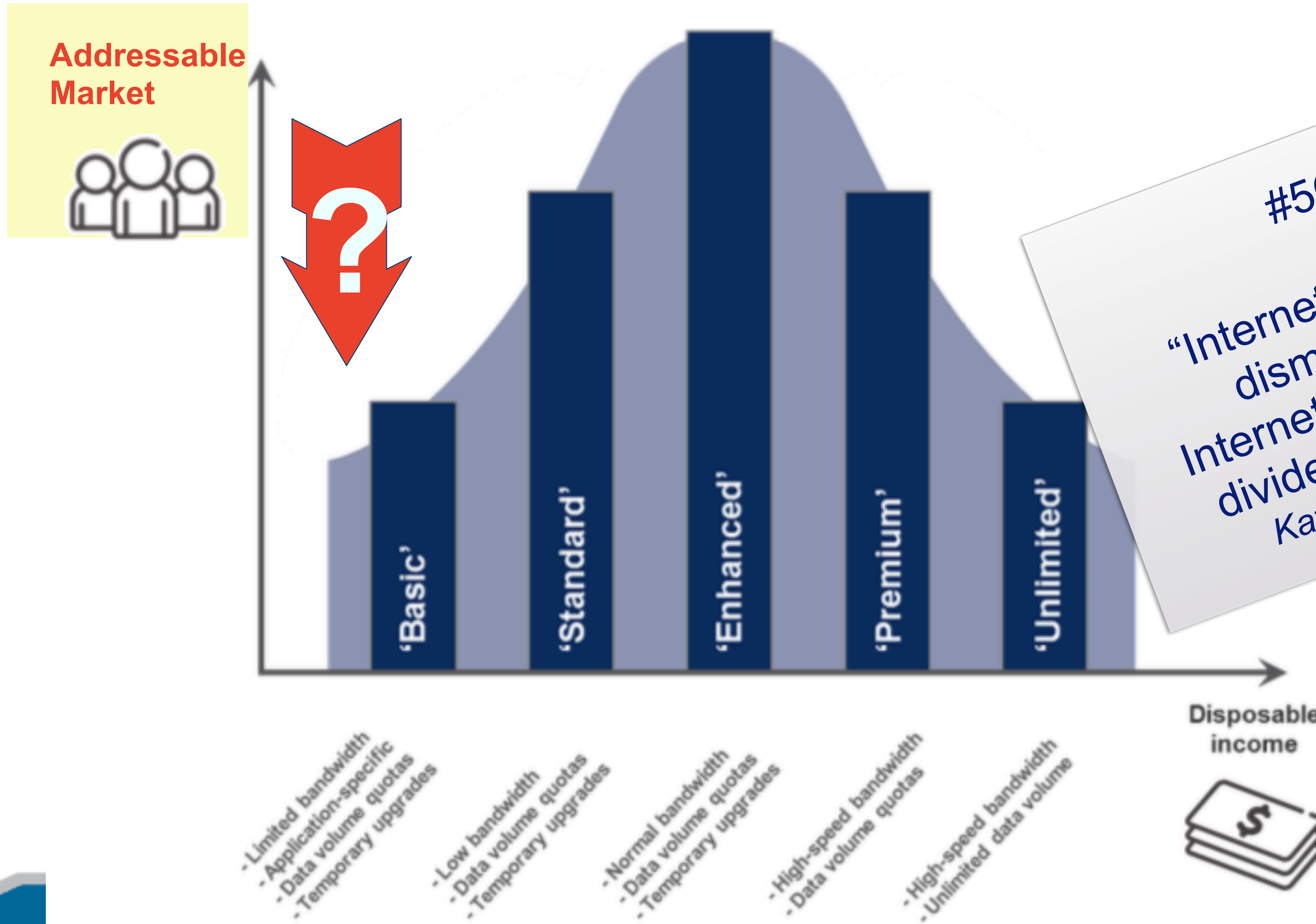
5G: Industrial Challenges

- enhances Mobile Broadband
- massive IoT
- ultra Reliable, Low Latency communication



[source: Nokia <https://networks.nokia.com/5g/get-ready>]

Our (telecom) view on digital inclusion



#5Gfor All?

“Internet had the ability to dismantle the divide. Internet failed miserably, the divide is bigger than ever.”
Kate Gilmore, Human Rights, UNO

Source: Service Innovation through Smart Networks, Ericsson,
<https://www.ericsson.com/assets/local/networks/documents/service-innovation-through-smart-networks.pdf>

Public Opinion on 5G

- 5G - opinion by people
 - convenience <-> privacy,
 - national competitiveness <-> national security
 - speed <-> price
- need to have? 0% ?
- nice to have? 5% ?
- Opinion: no contribution to SDGs

<https://www.politico.com/news/agenda/2020/02/25/poll-5g-what-do-people-really->

The 5G World: What People Care About

The coming fast wireless network will require policy tradeoffs, from convenience to national security. In a new survey, we asked citizens what they really value.



Illustration by Sam Chivers | Graphics by Andrew McGill

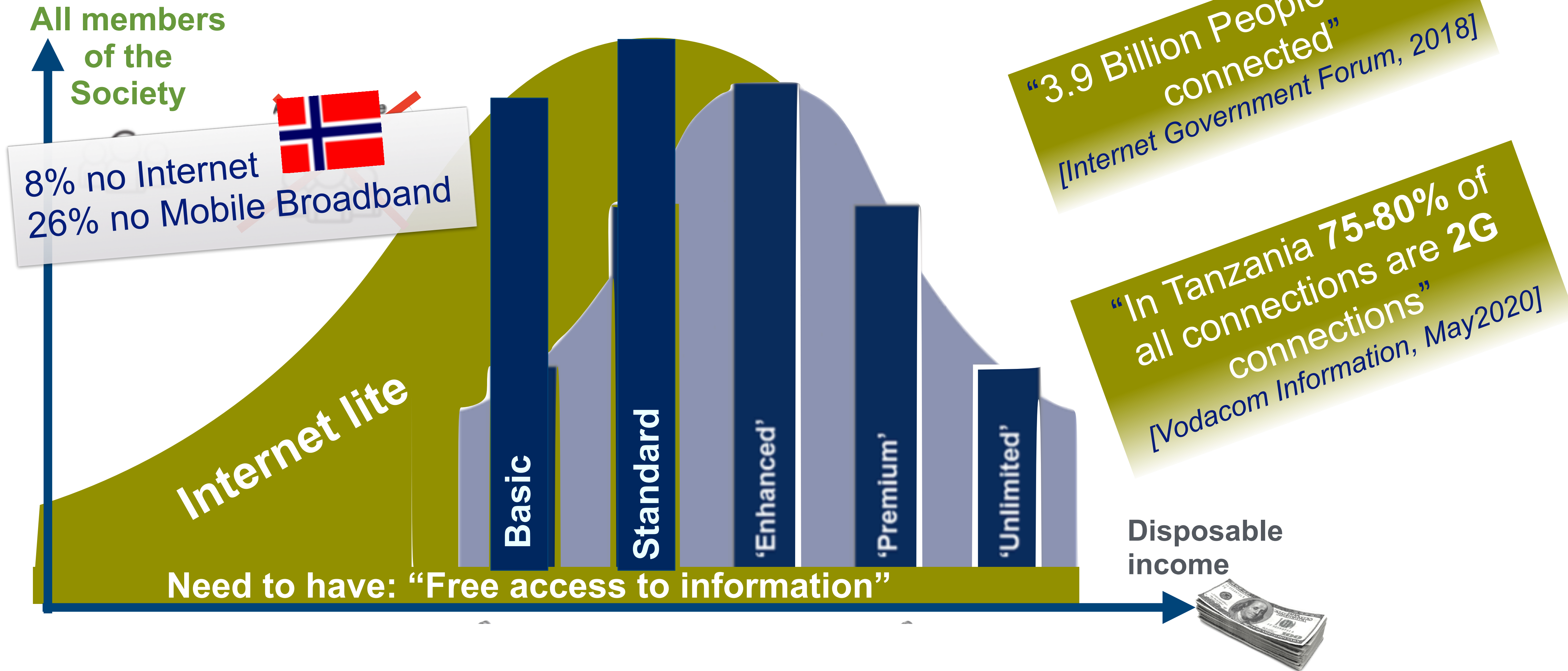
By JOHN HENDEL

02/25/2020 04:30 AM EST



Around the world, 5G is a buzzword, a sales pitch—and, increasingly, a policy challenge.

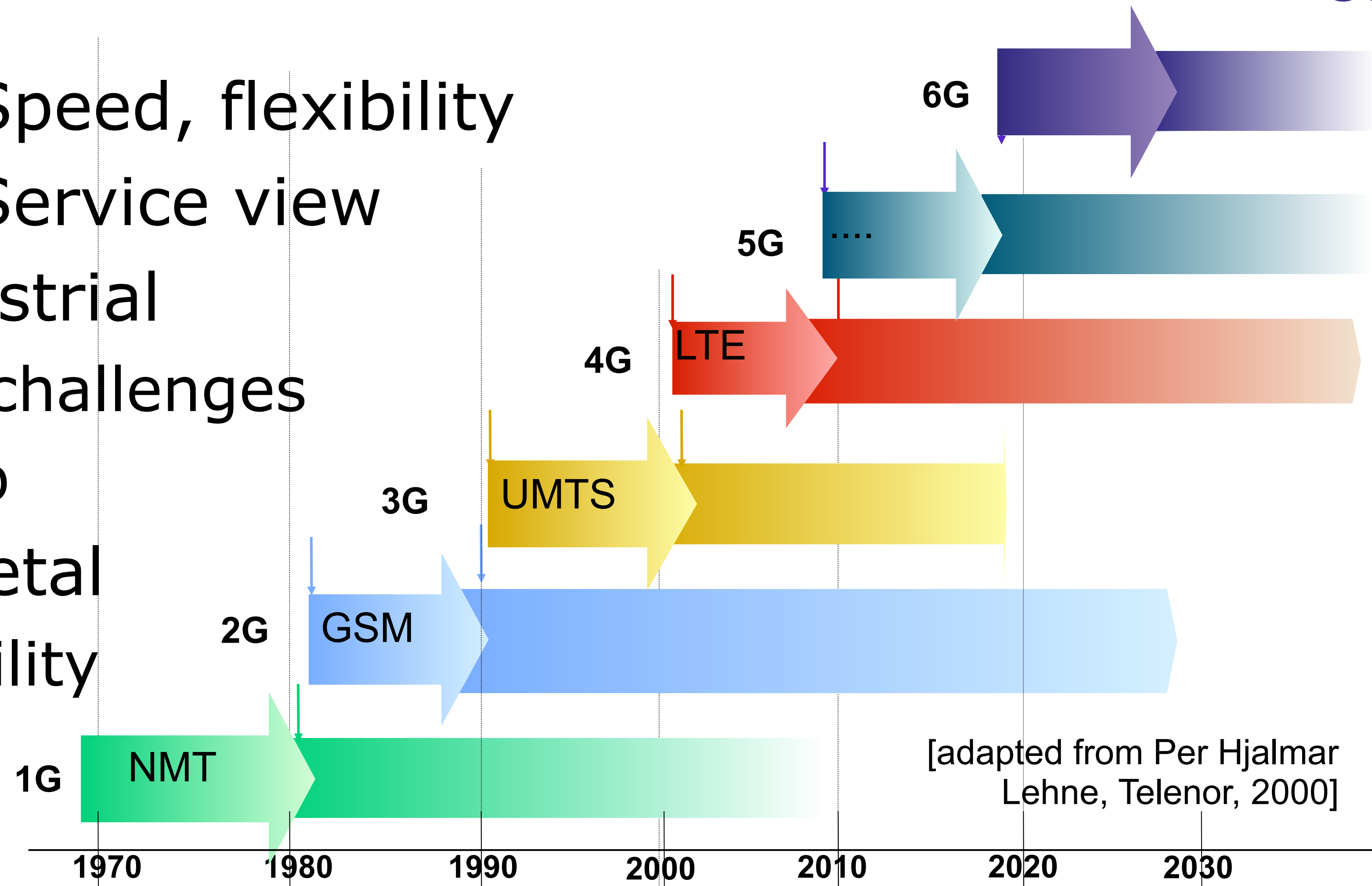
6G (#5GforAll) for digital inclusion



[Adapted from: Service Innovation through Smart Networks, Ericsson, 2018]

6G: Digitisation of the Society

- 1G-3G: Speed, flexibility
- 3G-4G: Service view
- 5G: Industrial
 - Business challenges
 - ownership
- 6G: Societal
 - sustainability



Services & Society

- ↑ Sustainability, SDGs
Societal challenges
- ↑ Industrial challenges,
IoT
- ↑ Mobile broadband
services
- ↑ Web, Multimedia,
Communications
- ↑ Mobile telephony, SMS,
FAX, Data
- ↑ Mobile telephony

[adapted from Per Hjalmar
Lehne, Telenor, 2000]

Affordable Energy & Internet Lite for All

the catalysts for the goals

Showcase
 “Non discriminating access”
 project

- funded by RCN and Mfa/Norad (14.9 MNOK for 2017-2020)
- Tanzania: digital health
- Mali: energy

3 GOOD HEALTH AND WELL-BEING

4 QUALITY EDUCATION

5 GENDER EQUALITY

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

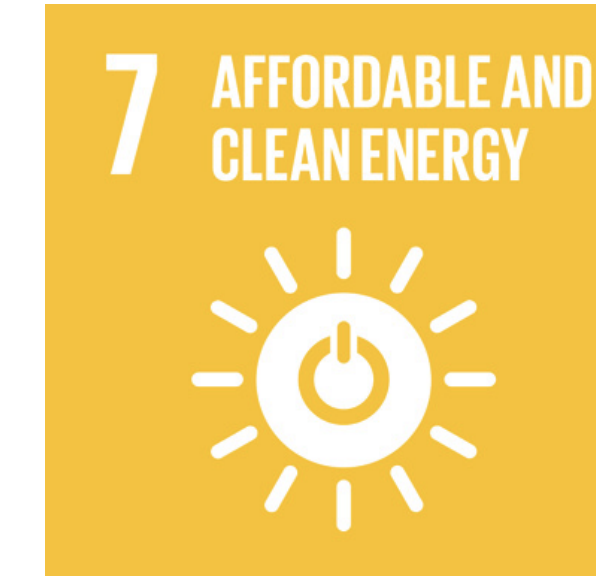
16 PEACE, JUSTICE AND STRONG INSTITUTIONS

17 PARTNERSHIPS FOR THE GOALS

Energy & Internet Lite for All

Target 7.1&7.2 Target 9.C Target 16.10

SDGs addressed by B5G and 6G



→ SDG 9.C:

Significantly increase access to information and communications technology and strive to **provide universal** and **affordable access** to the Internet in least developed countries **by 2020**

→ SDG 16.10:

Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements with

- 16.10.2 Number of Countries that adopt and implement constitutional, statutory and/or policy guarantees for **public access to information**.

- SDG 7.1 By 2030, ensure **universal access** to affordable, reliable, and **modern energy** services
- SDG 7.2 Increase substantially the **share of renewable energy** in the global energy mix by 2030
- 7.b By 2030, expand infrastructure and **upgrade technology** for supplying **modern and sustainable energy** services for all in developing countries, particularly LDCs and SIDS



Addressing the 3.5 billion people not connected to the Internet through 6G

- Government of Norway Report - **Priorities**
 - Access, skills, regulations, inclusion
- “Boys have the toys”
 - digital divide in both **devices**
 - and **mobile broadband** access
- **Costs** of Access
 - School connectivity (SDG indicator 4.A.1)
 - Digital Health for primary health facilities
 - Community involvement/digital transformation

Meld. St. 11 (2019–2020) Report to the Storting (white paper)

Digital transformation and development policy

Access

Skills

Regulations

Inclusion



Providing 6GforAll

- ➔ **Free access to Information** (Internet Lite)
 - 1) Access - one **Information Spot** per village
 - 2) Skills - Health, Education, Agriculture
 - 3) Regulations - Freemium model
 - 4) Inclusion -
Free access for all #LeaveNoOneBehind
- ➔ Internet Lite & **Freemium** model for access
 - **free access to National Knowledge Portal** for all
 - **premium** access to **broadband**
 - sustainable solution

+18 dB
>20 km

“Providing Internet to the basic of the pyramid isn't a question of affordability, but rather a question of sustainability”
Internet Governance Forum, Panel, WIN

At least
one Information Spot
per village

Societal areas of focus

- **Digital Knowledge portal** initiative
- Open source software and content (Pro-Digital Public Goods - DPGs)
- Multimedial content strategically tailored for target groups and communities
- Educational programs and trainings
- Empowering and fostering 21st century digital skills

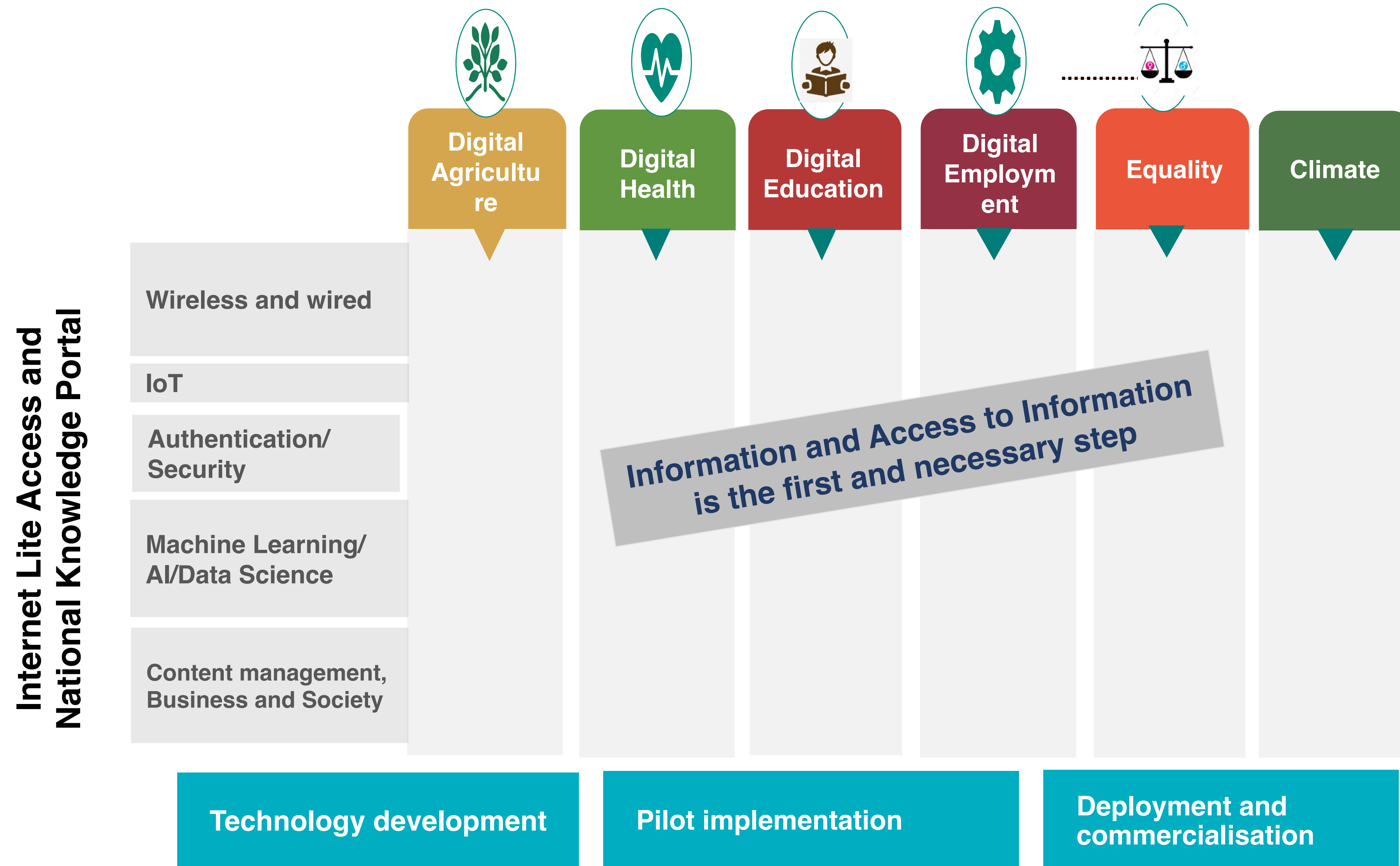
Societal goals: “leave no one behind” and social inclusion through digital -> mission.

We focus on:

- - vulnerable groups, girls and women, bridging the gender gap
- - discriminated groups in the society
- empowering people in rural areas, semi-literates and illiterates,
- empowering women businesses



Examples: Address real-world challenges of connectivity and access to information for everyone and by everyone



"interdisciplinary projects with social impact with sustainable business models"

Snapshots from platform, HIV and Cysticercosis animations

Mwanzo Afya Kuhusu Wasiliana nasi Repoti- Videos- English Login

Epuka Tegu

Kisababishi ya Tegu

Mnyoo bapa aitwae *Taenia solium*, husababisha binadamu kuugua vibaya sana. Binadamu hupata minyoo hao kwa kula nyama ya nguruwe mbichi au isiyoviva vizuri, yenye malengelenge ya minyoo (cysts). Ndani ya utumbo wa binadamu, malengelenge hayo hutoka katika nyama na kujishikiza kwenye ukuta wa utumbo na kufanyika minyoo ambao hukua na kutaga mayai.

Dodoso ya Tegu

Tafadhali jaza utafiti kuhusu Tegu

Jinsia yako ni ipi?

- A) Me
- B) Ke

Je, umewahi kusikia kuhusu minyoo aina ya tegu?

- A) Ndio
- B) Hapana
- C) Sijui

Je! Umewahi kusikia kuhusu minyoo ya tegu kwenye wanyama aina ya nguruwe?

- A) Ndiyo
- B) Hapana



First Results: **Knowledge increase** in
 Cysticercosis (TSCT) 60%
 Tuberculosis 30%
 HIV/AIDS 13%

Addressing Education 5.0 and Global Challenges

→ Cognitive skills

- literacy and numeracy
- critical thinking
- problem solving

Edu 3.0

→ Social and emotional skills

- empathy, teamwork
- leadership, cultural awareness
- fraternity & social friendship

Edu 4.0

→ Global challenges

- Climate, Sustainability (SDGs)

Edu 5.0



No magic, exist today.... Lightweight Protocols, e.g. AMP

<https://basicinternet.org/internet-lite-to-the-migoli-high-school/>

<https://basicinternet.org/internet-lite-to-the-migoli-high-school/?amp>

Basic Internet Foundation

MISSION PROJECTS ABOUT PARTNERS MEDIA

Full Web experience

INTERNET LITE TO THE MIGOLI HIGH SCHOOL

By josef | 4 May 2019 | Uncategorized

The Migoli High School has 1271 pupils (Apr2019) and 35 full-time teachers. The high school is located about 3 km outside of Migoli in the Iringa district in Tanzania.



Basic Internet Foundation

Internet Lite - AMP experience

Internet Lite to the Migoli High School

josef 8 months ago

The Migoli High School has 1271 pupils (Apr2019) and 35 full-time teachers. The high school is located about 3 km outside of Migoli in the Iringa district in Tanzania.

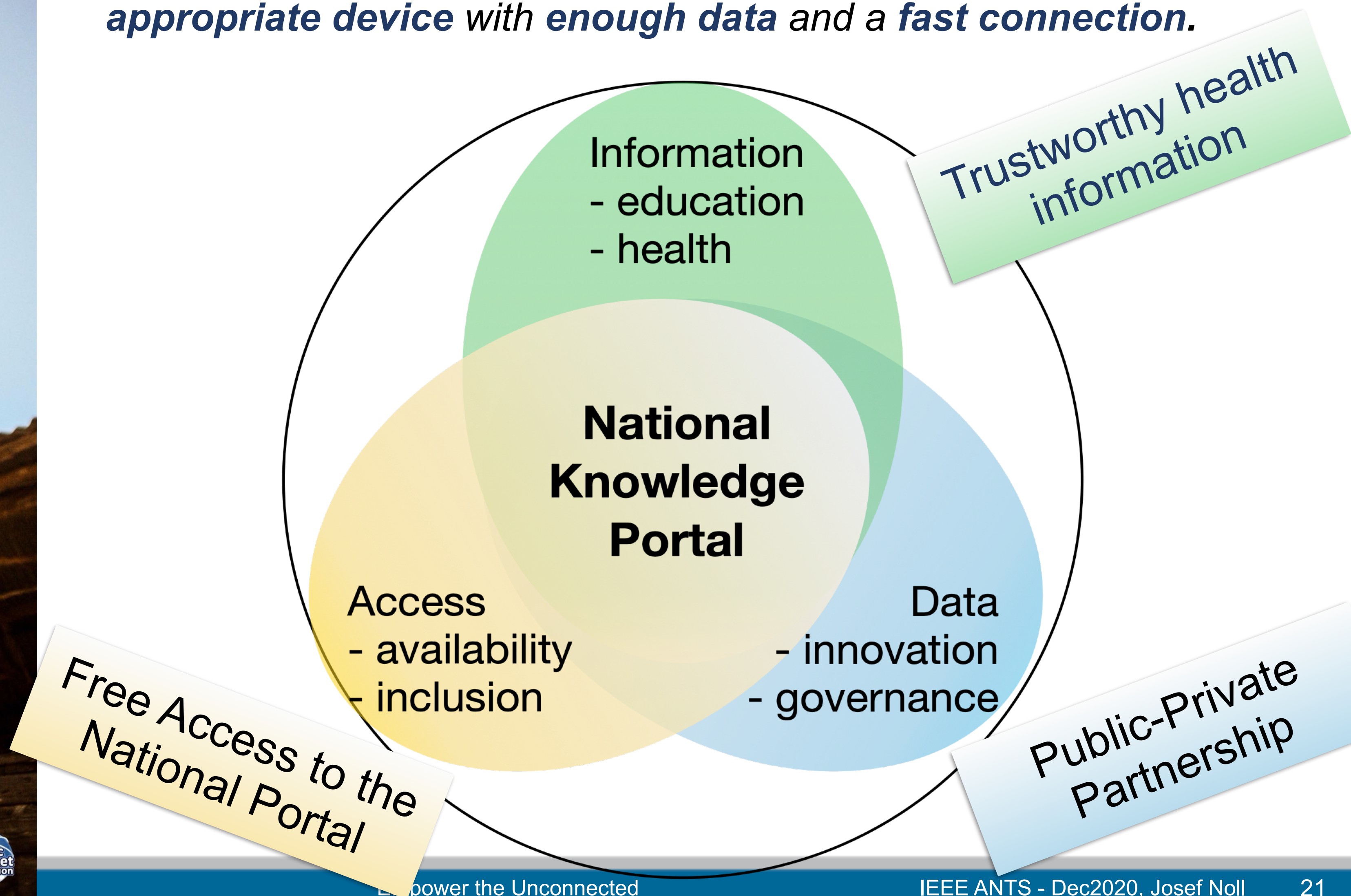


Digital Inclusion as catalyst for the SDGs

a Digital World through Innovations & Collaborations

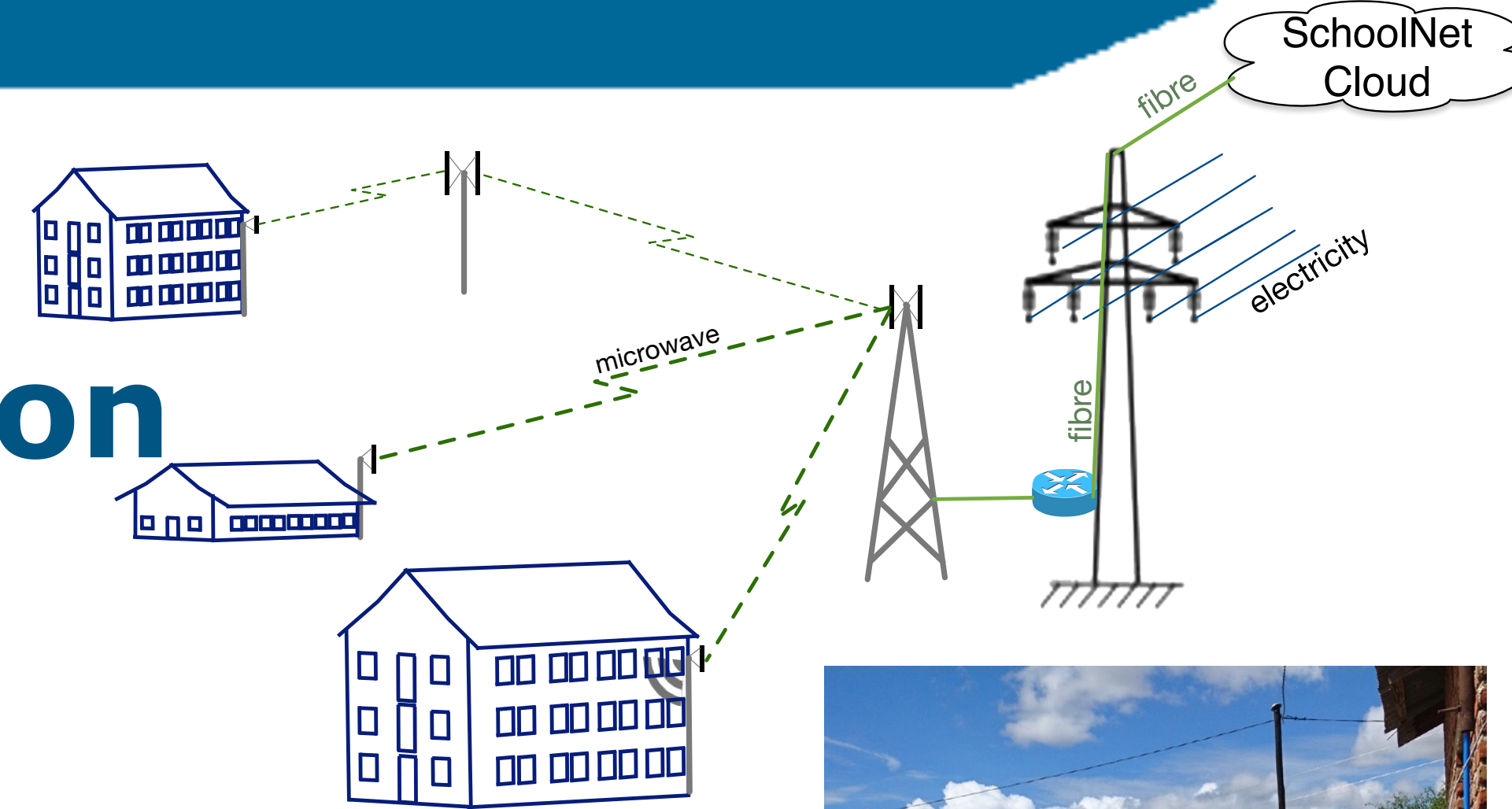


Meaningful connectivity to the Internet and skills for using an appropriate device with enough data and a fast connection.



Conclusion

Research Topics for Digital Inclusion



- A) Internet Lite for all
 - Bandwidth reducing technologies
 - InfoInternet Standard
- B) National Knowledge Portal (india.gov.in)
 - Availability for all
 - ▶ free access
 - ▶ offline availability
 - Village portal / InfoSpot in each village
- C) 5G as backbone
 - High-capacity backbone
 - Multi-MIMO for rural connectivity
 - Network slicing for information access