

UiO : Universitetet i Oslo

TEK5110

L12 Basic Internet Infracture





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Secretary General and Co-Founder at BasicInternet.org, Professor at UiO, Head of Research at Movation

Oslo Area, Norway | Telecommunications

Current	Basic Internet Foundation, University Graduate Studies (UNIK), University of Oslo (UiO), Movation AS
Previous	MobileMonday, Telenor R&I, Telenor R&D
Education	Ruhr University Bochum



Maghsoud Morshedi

PhD Fellow at Eye Networks AS

Oslo, Oslo, Norway

Information Technology and Services

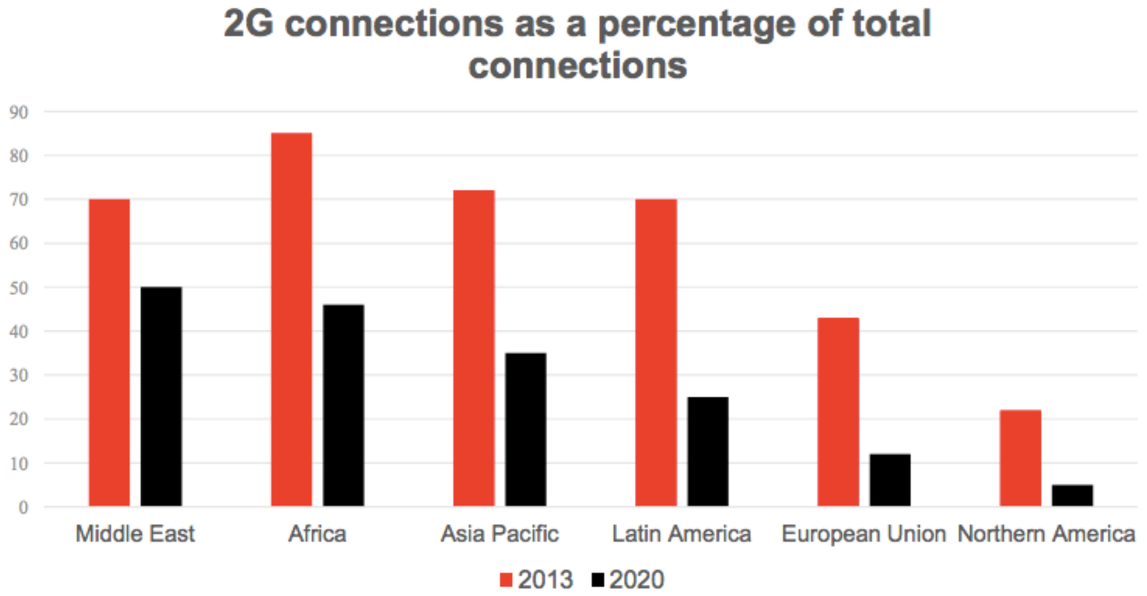
Current	Eye Networks AS
Previous	Høgskolen i Oslo og Akershus, State Organization for Registry of Deed & Property, Karaj Islamic Azad University
Education	University of Oslo (UiO)

The challenge of area coverage

- Land area Norway, 385.178 km^2 - 7500 basestasjons
  - http://www.mynewsdesk.com/no/telenor/pressreleases/sjekk-naar-du-faar-4g-der-du-bor-1399662

- Tanzania 947,303 km^2 = 3 x Norway,
- Mali 1.240.000 km^2 = 4 x Norway
- DR Congo 2.345.000 km^2 = 8 x Norway

- Economy in building Wireless Broadband
  - #5Gforall - *Discuss*



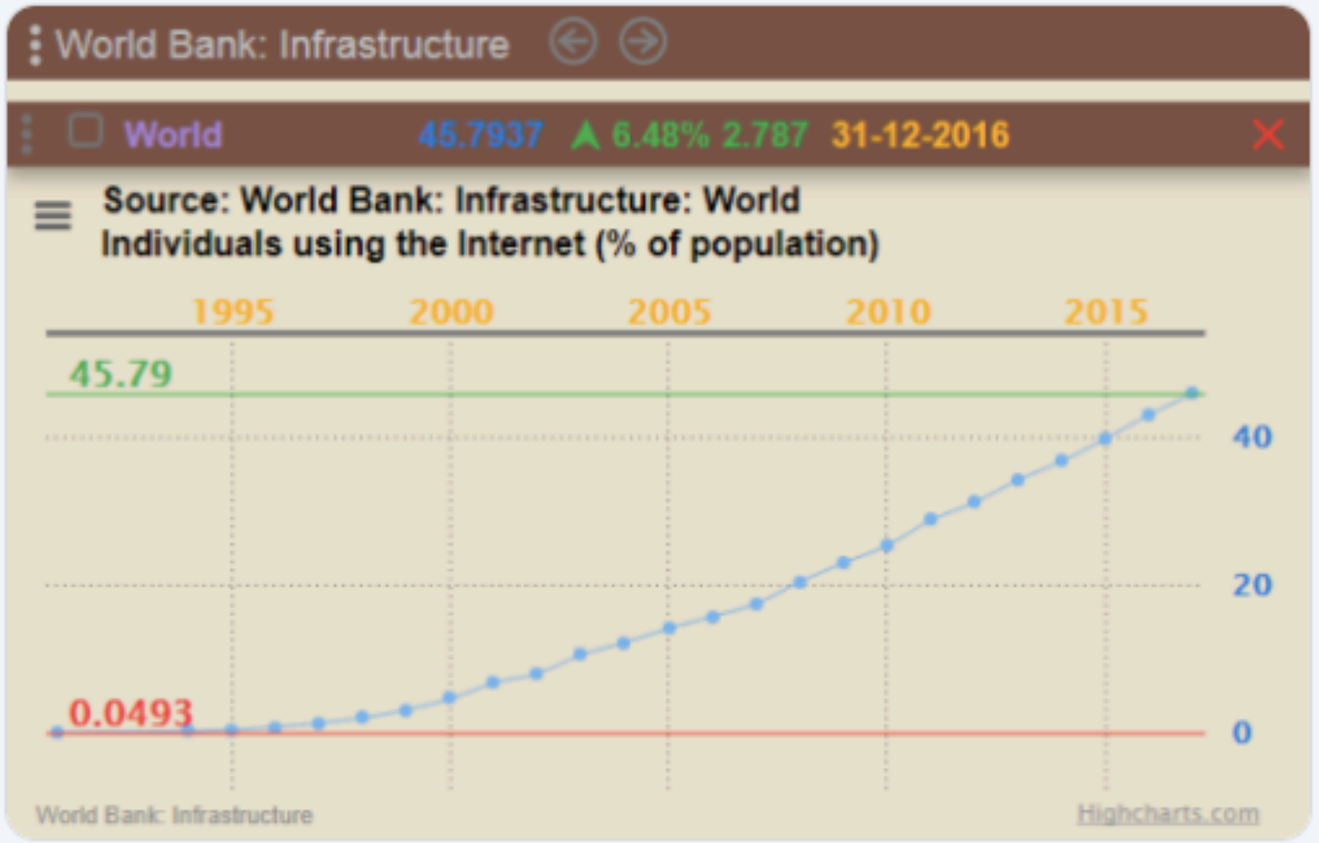
Digital Divide

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

webapperc @webapperc · Nov 5

Replying to @timberners_lee

Addition information in form of chart World individuals using the Internet as percent of population to 2016 according @worldbankdata by web app ERC (Economic RESTful Client) #OpenData #dataviz #webapp

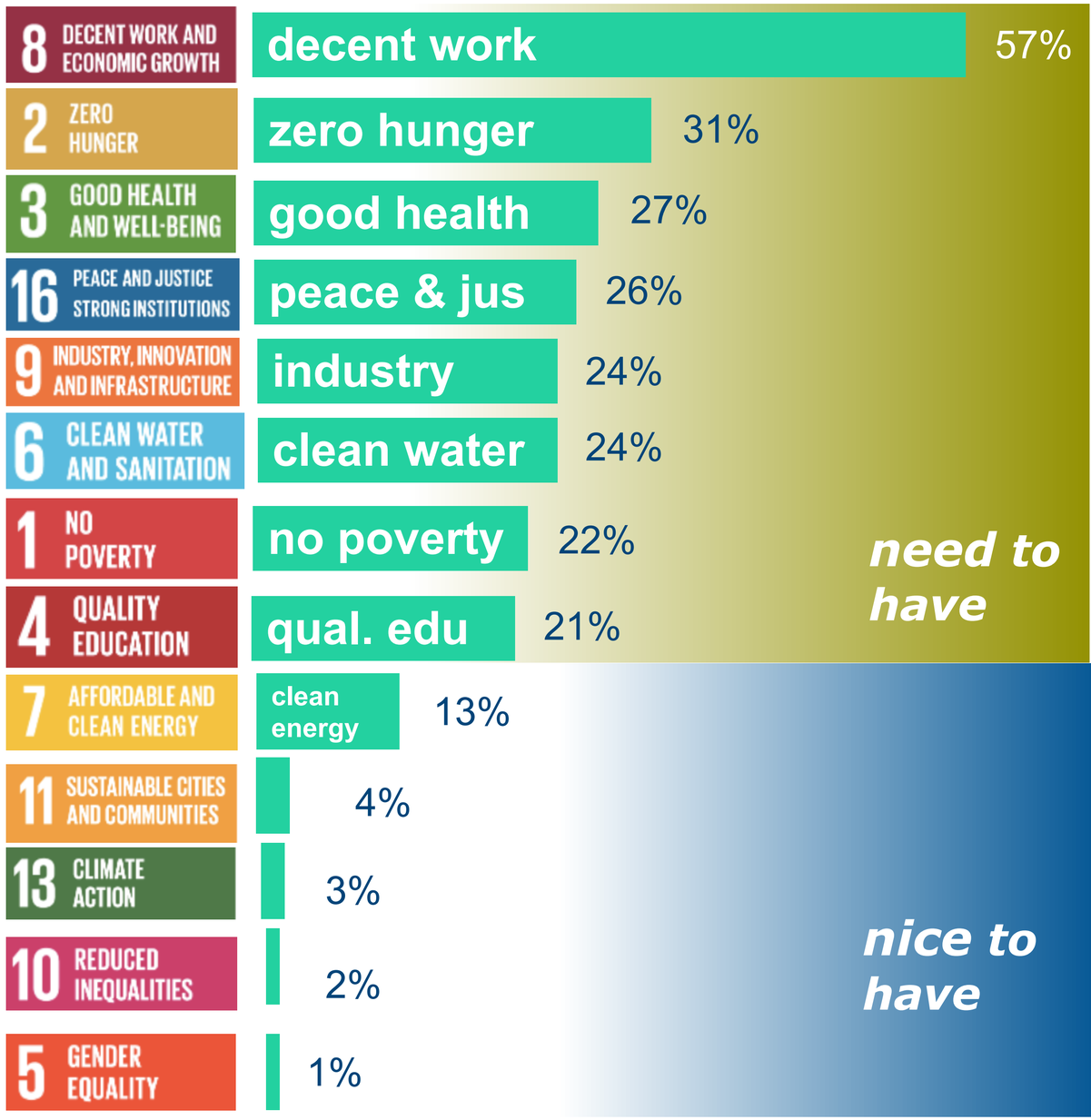


United Nations
Sustainable Development Goals



Public Opinion on SDGs (afrobarometer.org)

- Priorities by people in Africa
  - decent work
  - zero hunger
  - good health
  - …



https://blogs.worldbank.org/africacan/how-do-africans-priorities-align-with-the-sdgs-and-government-performance-new-results-from

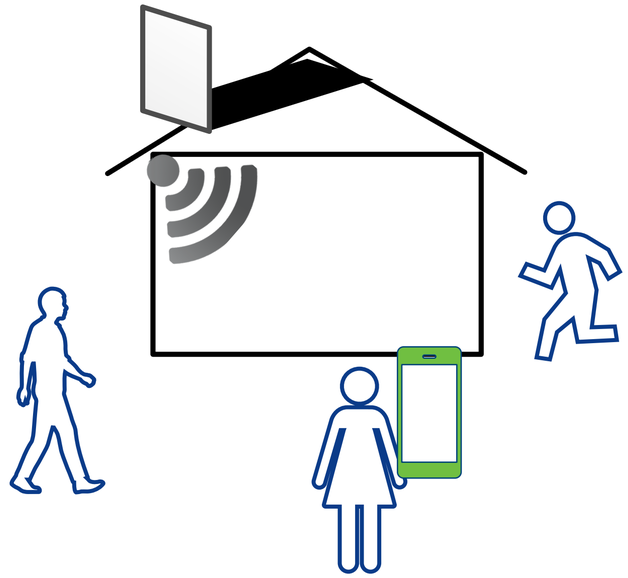
Digital Inclusion of everyone

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

➡ Business aspects
- OPEX, CAPEX
- Income models?

- Traditional business models are too slow
  - Mobile broadband roll-out dominated by return on investment
  - Premier league, Bollywood outranges non-profit content

- Providing at least one Information Spot in each village
  - **Internet lite for all** - free access to information
  - Paid access to profitable content - sustainable solution



Providing Internet for All

- **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



Operator model - tower

1

- Example: Digital Tanzania
  - ➡ Unconnected: 13 Million people in 4.000 villages



1 USD/month for Telecom



GSM + Wifi
- ➡ 200W
- ➡ MicroBTS

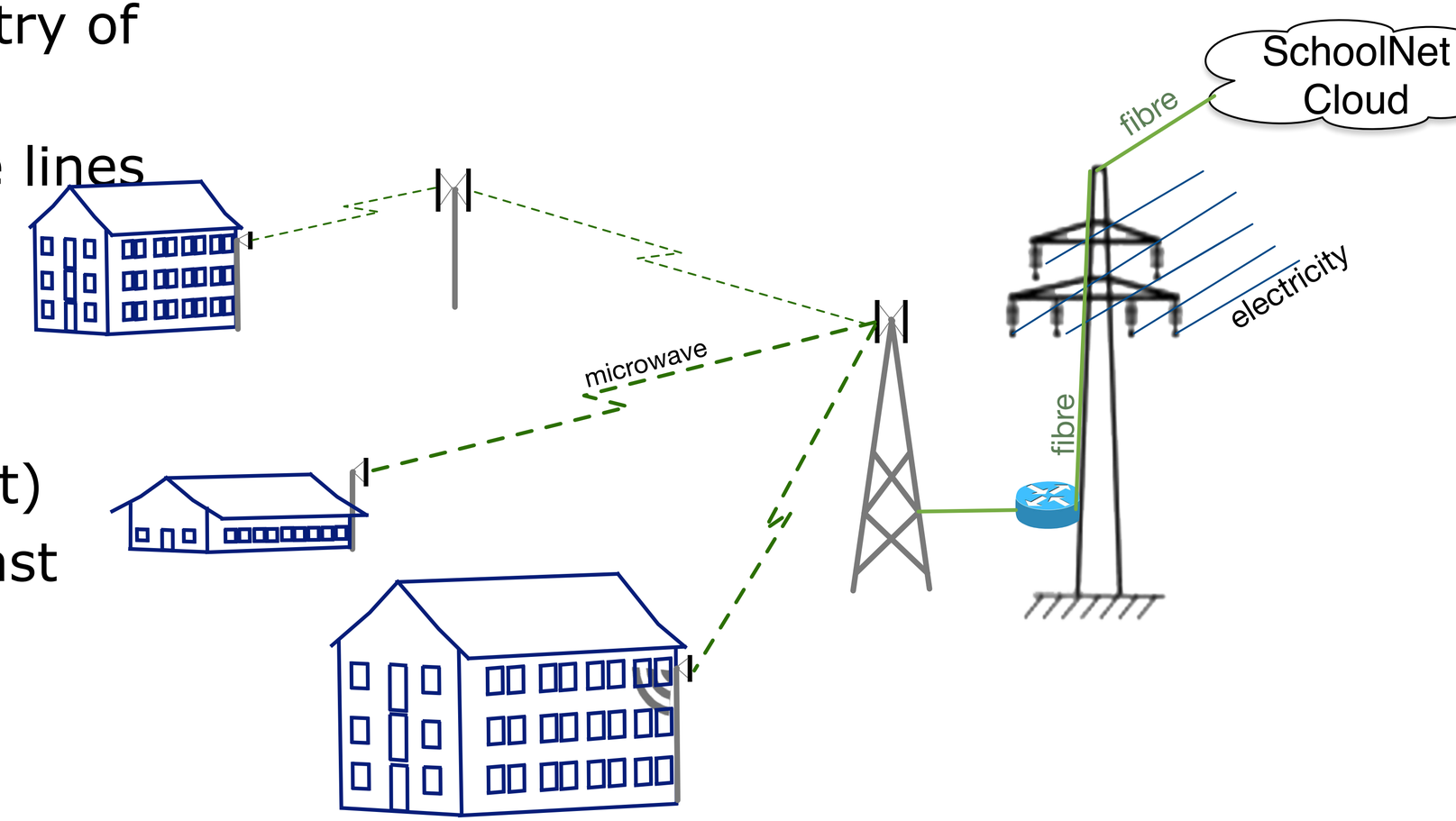
Cost: 70 kUS$/village

the village that got Internet:
http://www.bistandsaktuelt.no/nyheter/2018/landsbyen--som-fikk-facebook/

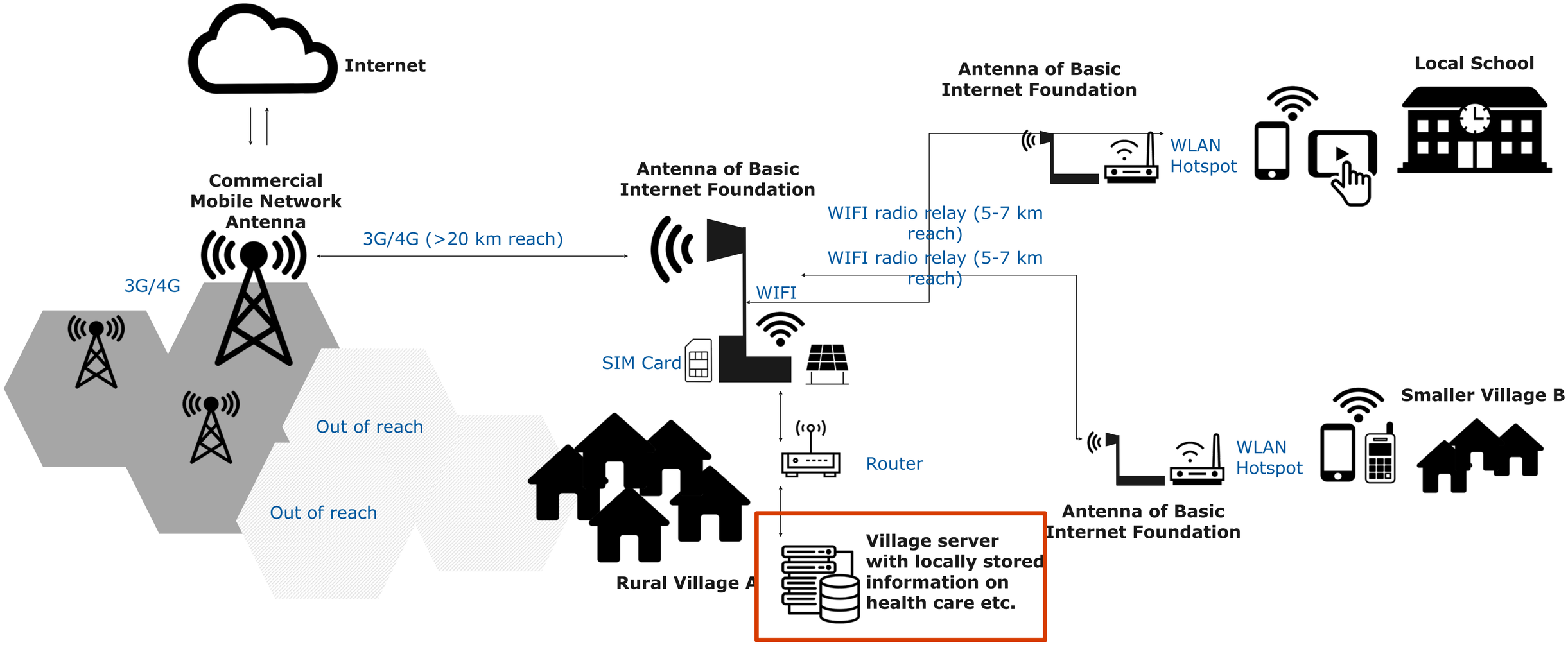
Governmental / Community model

2

- SchoolNet distribution (Ethiopia)
  - educational network by Ministry of Education (MoE)
  - national fibre on high-voltage lines
  - fibre to microwave
- Microwave distribution
  - 0-5 km: point to multipoint
  - 5-15 km: point to point (mast)
  - >15 km: microwave relay mast
- Local school
  - receive microwave antenna
  - local Wifi distribution: local network controller & school server

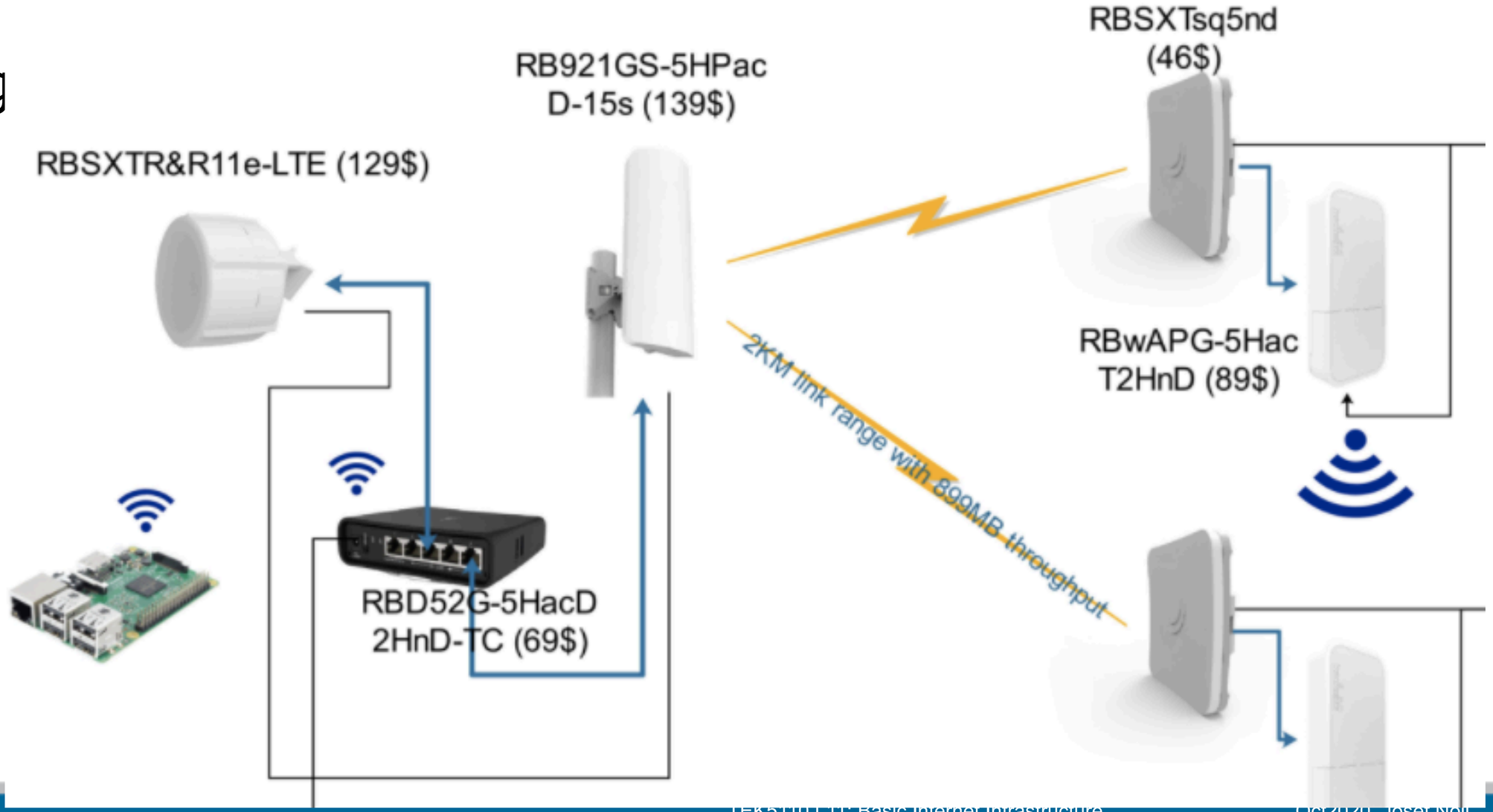


Set-up and Design – Connecting Rural Villages



Wireless infrastructure

- Creating



“Connect the Unconnected”
Selela Market Place







- Antenna in 6 m height
- Reaches Tigo tower > 20 km away

Digital Health Spot for 300 €

Creating digital access for the unconnected











- Digital society
- Agricultural and rural development
- Education
- Health
- Food, water and shelter

Digital inclusion

The catalyst for sustainable development

300 € digital health hotspot
60.000 € connecting a village in TZ
250.000.000 € connecting all villages in TZ
89.000.000.000 € EU border control per year

80 € Solar panel	30 € Regulator
50 € Hotspot	20 € USB-charger
50 € Tablet	15 € LED light
20 € Battery	20 € Materials

digi.basicinternet.no

Basic Internet

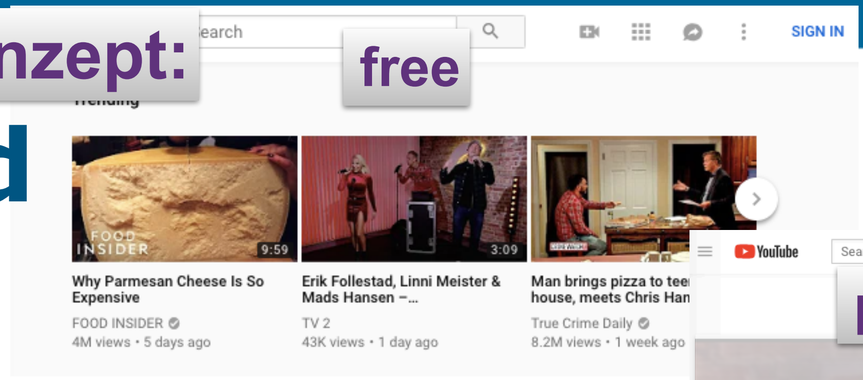
Founded by: UiO : University of Oslo, KJELLER INNOVASJON

InfoInternet Standard

- Network responsiveness

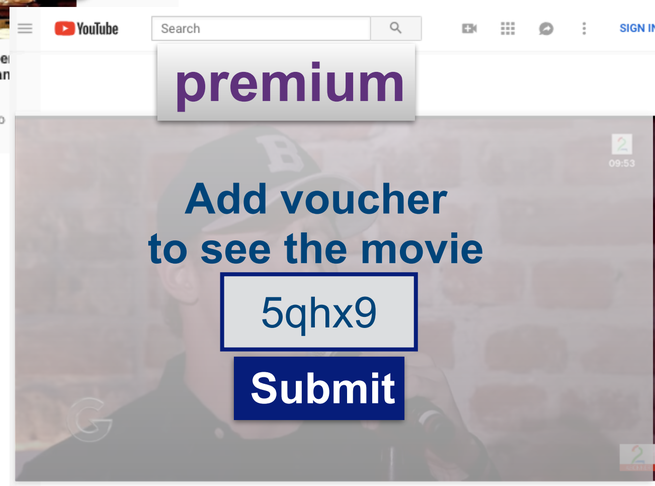
- InfoInternet Standard development
  - **Konzept**: www-filtering
    - free: text & picture, premium: video
  - **Pilot**: www metadata & inspection
    - address, port & deep packet analysis
  - **Standard**: proxy & html5 standard,
    - http://BasicInternet.org&standard=InfoInter

Konzept:

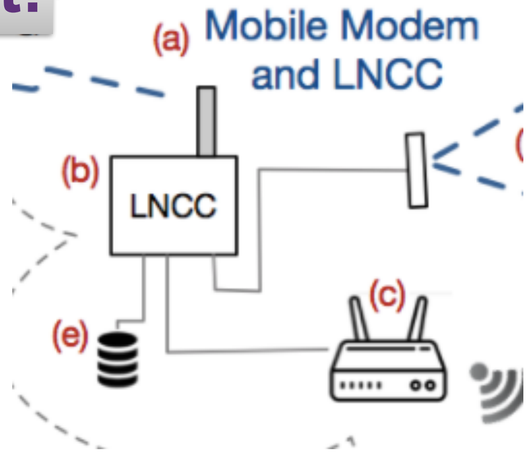


free

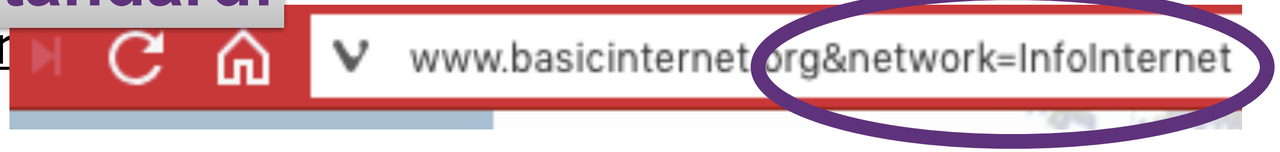
premium



Pilot:



Standard:



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

Full Web experience

Internet Lite - AMP experience

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MISSION PROJECTS ABOUT PARTNERS MEDI

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.

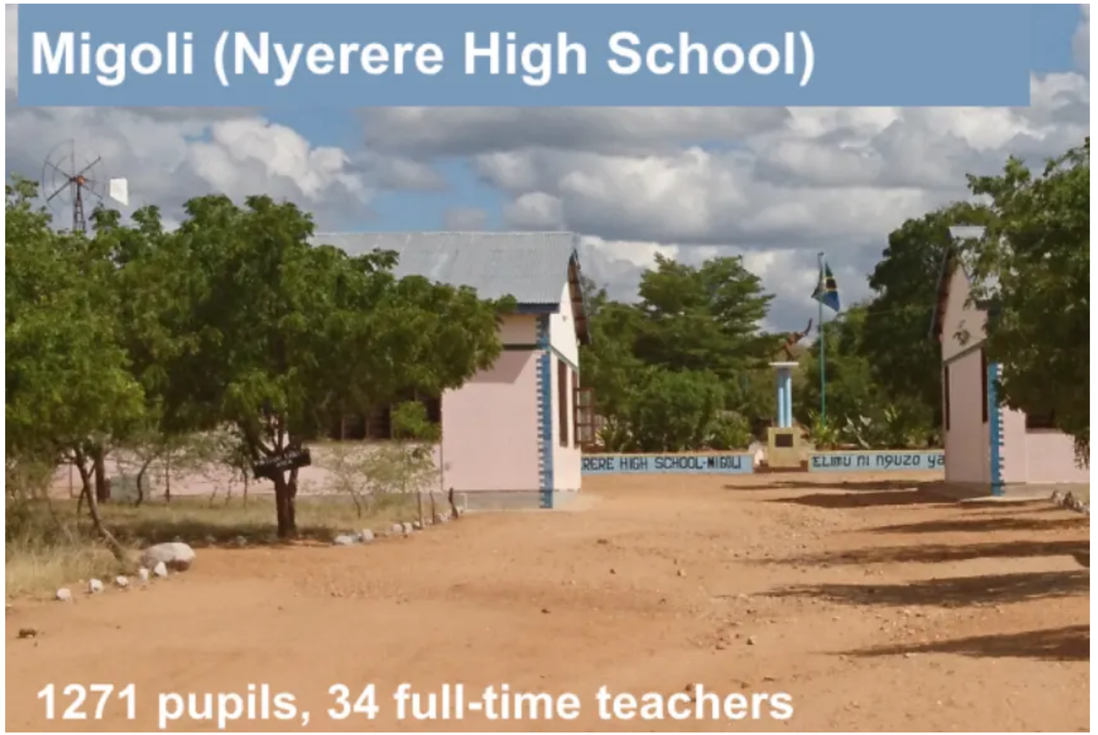


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Internet Lite to the Migoli High School

josef 9 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.



School Connectivity (ET)

- Koye Secondary and Preparatory School
  - connected as part of African Innovation Week 2019
  - using mobile network
- Local knowledge portal
  - yeboo.com health



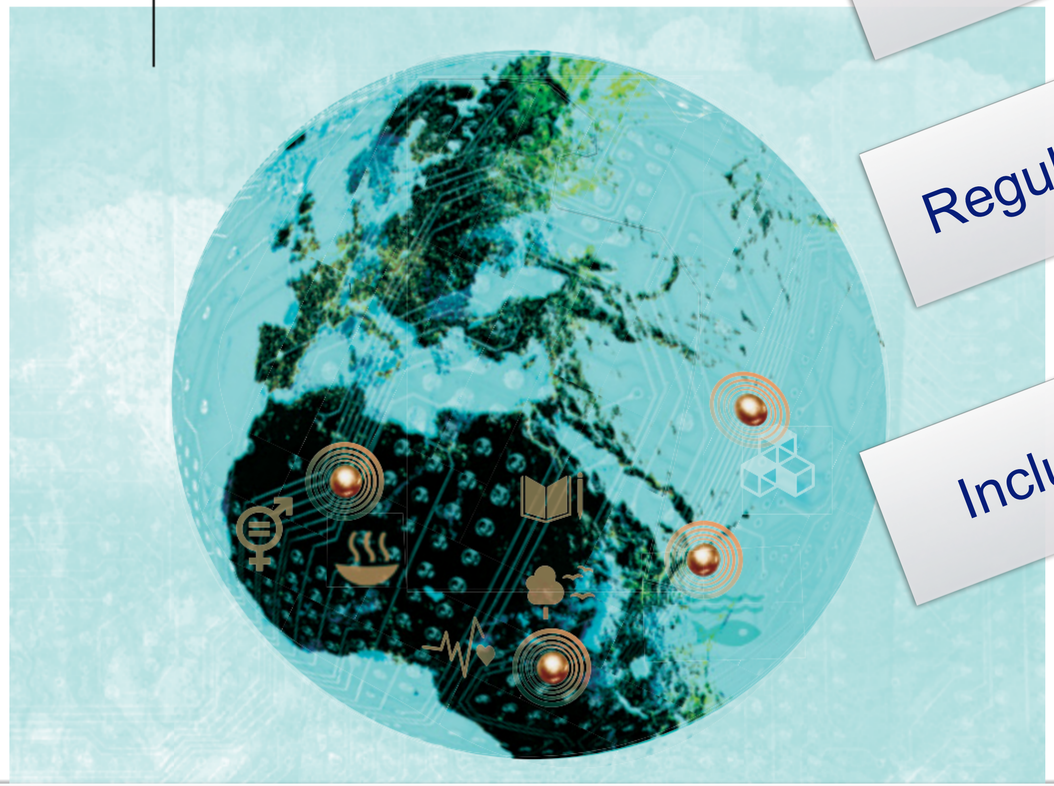


Addressing the Priorities of Norway

- Report to Stortinget 11 (2019-2020), Priorities
  - Access, skills, regulations, inclusion

- "Boys have the toys"
  - digital divide in both devices
  - and mobile broadband access

- Integrated model for digital inclusion
  - School connectivity (SDG indicator 4.A.1)
  - SchoolNet as Knowledge Portal
  - Knowledge transfer
  - Community involvement



https://www.regjeringen.no/no/dokumenter/meldst11_summary/id2699502/?ch=1

Challenges

3 groups:
- 20 min work
- 5 min presentation/discussion

- Radio coverage
  - how can we reach Izazi?
  - what is the expected capacity?

- Business model - (A) fixed line vs (B) mobile hot-spot
  - What needs to be the price for a voucher?
    - Time, Amount, Validity
  - Expense model based on OPEX
  - Goal: Break-even

Cost example

- Tanzania, Okt2018

Description	fixed costs TZS	fixed costs Euro	monthly costs TZS	monthly costs E
376,48	1 000 000	376,48	1 Mio TZS = 376 €	
Halotel 3G bundle				
HALO-KIT			118 000	€ 44,42
Leased 4Mb/s line			1 689 854	€ 636,20
Co-location (2sets)			706 820	€ 266,10
Installation				
4 Mbps line equipme	1 689 854	€ 636,20		
Deployment P2P	10 384 000	€ 3 909,37		

Upcoming Topics / To do for next week

Upcoming Topics

- L12 Hands-on Monitoring

To Do:

- Group work: Present specific plans
  - what do you want to achieve?
  - what is the outcome?

Goal oriented approach

