Global Forum
Shaping the future 2015

National Strategy Development for 5G

Adoption

KOMINFO

Dr. Basuki Yusuf Iskandar
Head of ICT Research and HR Development Agency
Ministry of Communications and Information Technology
Republic of Indonesia

Scope of Overview

- Introductory Words
- Present ICT Network 3G with 4G
- Current Status of Indonesia's Palapa Ring
- Characteristic of 5G
- Challenges for Adopting 5G
- Action to be Taken

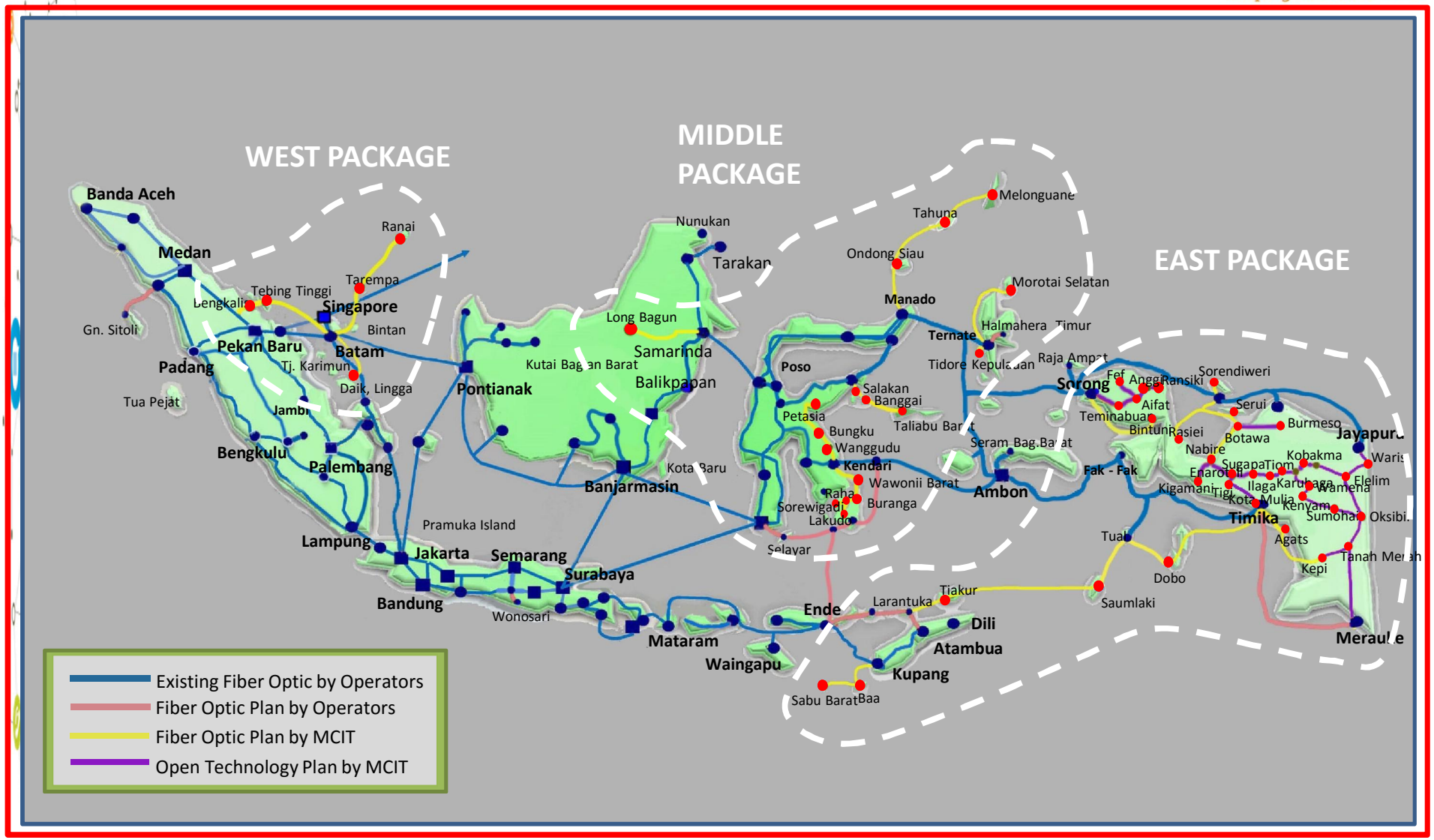
Intoductory Words

- We all question: why 5G Technology, as earlier ones are not fully utilized, particularly in Indonesia and many developing countries
- Ten (10) years from now, ICT technologies is expected to be integrated in common high performing platforms and provide a malleable service defined 5G infrastructure, with seamless integration of heterogeneous wired and wireless capabilities, and powering business solutions, while offering multi-tenant technical and commercial control
- You all understand, that 5G Technology is more than providing an evolution in network technologies, it is envisioned as a revolution
  - not just about increased data rates with a new radio access technology,
  - also new services: MTC (Machine-type Communication) supporting massive numbers of devices, millisecond latency communications, cloud and caching, high reliability, and energy efficiency. aside from traditional services (voice, user data),
  - the standardization process is still ongoing, including issues for considering the combination of SDN (Software Designed Network) and NC (Network Coding)
- Anyway, Indonesia has to face the unavoidable the challenges

Present ICT Network 3G with 4G

- Inadequate Network capacity and speed
  - Current Cellular Network Subscribers (2014): ~340 mio
  - Mobile operator BTS composition (2014) = 3G (41%) : 2G (59%)
  - Indonesia has still to upgrade its present 3G network capacity in the rural areas as well as the city cellular network
  - 4G Service have been introduced, since End of 2014, mostly in the big cities, although the network's inadequacy for meeting 4G quality requirements
  - 4G terminals has already been manufactured in Indonesia
- The National Backbone Network, the Palapa Ring
  - Will be completed with the last implementation in the submarine cable in the most eastern part, Papua Province
  - The National Network capacity and speed would be much improved with its completion
  - A network failure or disconnection in the Ring would be compensated by rerouting traffic through the other side

Current Status of Indonesia's Palapa Ring



Characteristics of 5G

- Requirements for 5G:
  - More network capacity & speed
  - Massive growth in number of connected devices
  - Energy efficient / low power consumption
  - Service reliability
  - Opportunities of new business model for network operators
- Candidate technologies for 5G:
  - Enabling new spectrum: higher frequency spectrum (mmWave communication) and spectrum sharing (cognitive radio)
  - Increasing spectral efficiency: multi-node / multi-antenna transmission (MIMO), full-duplex
  - Heterogenous network: multiple radio access technology (RAT)

Characteristics of 5G

- Speed wich is 100-1000 times the present technology
  - Speed and capacity required to support the MTC (Machine-type Communication) with a low latency (<1ms)
  - Increasing traffic requirements, providing added value, and foster utilization
  - Operator business challenge in order for the public to be able to use the tremendous available capacity of 5G: by *disseminating 3G/4G coverage nationalwide, followed by introducing 5G*
  - Hence, it is crucial for the Network to be distributed to all the people soonest and educate them in benefiting this capacity
- Support of massive connectivity
  - Everything could be connected to the wireless network, enabling monitoring and control of devices
  - Massive of devices to be connected simultaneously to support MTC service and Internet of Things (IoT)
  - A wide range applications and services become a future trend. Besides the incremental growth of mobile data traffic, there will be more variations in the traffic volume

Challenges for Adopting 5G

- Technology Challenges:
  - Technology is not matured yet.
  - Limited of Human Resources and Budget for R&D
  - High Possibility to fall in technology dependency trap
  - Because it is product of radical change of technology, it is window opportunity to take apart in production system of 5G technology but need BIG efforts and need focus on special components
  - Additional cost of social learning in adopting new 5G technology

Challenges for Adopting 5G

- Infrastructure Challenges:
  - High switching cost due to unused of most existing infrastructure
  - Limited fiber optic backbone
- Regulation Challenge:
  - Need some adaptation of existing regulation
- Social Challenges:
  - The use of ICT is more consumptive rather than productive
  - Indonesia is an archipelago that consists almost 17.000 islands which need to be connected, that each region has different level of development stage

Action to be Taken

- Frequency Allocation Plan discussion for 5G
  - ReUse of 2G alocated frequency bands
  - Utilization of Digital Devidend Band after following Analog Switch Over (ASO)
  - Utilization of higher frequency band (e.g. beyond 10 GHz) with wider bandwidth
- Strengthening Local Industrial players
  - CPE Industries
  - Chipset Industries
  - Other Industries: Antenna manufacturer, PSU Manufacturer
  - Application Software
- Coordinate and colaborate research among stakeholders (academic, industries, government)
- 5G gradual implementation
- Public Education for productive use of backbone
- Promote innovative business model
- Promote creative industries in application and content
- Regulatory and policy adjustment

Adoption Strategy of 5G

- Adoption will be initiated if switching cost can be covered by the future benefits based on rational economic adjustment.
- Social and industrial readiness should be prepared

Global Forum 2015

Oulu, Finland

Thank you very much for your kind Attention

Basuki Yusuf Iskandar

KOMINFO