Telecommunications Infrastructure Sharing

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Outline

- Introduction to Infrastructure Sharing
- Telecom Infrastructure in Thailand
- Role of Infrastructure Sharing in Thailand 4.0

Introduction to Infra Sharing

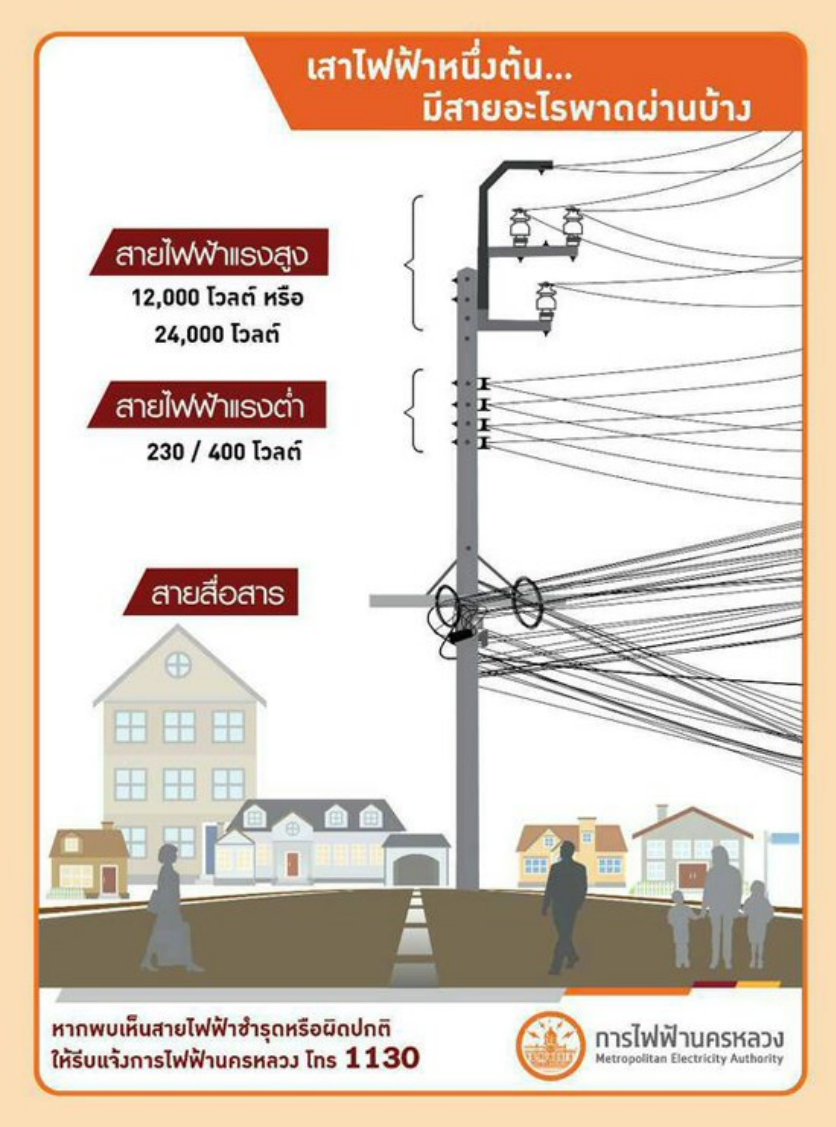
- **What is Infrastructure?**
  - Equipment vs Service
  - Passive vs Active
  - For Own use vs To Wholesale
  - Improving Utilization vs Eliminating Bottleneck
- **Types of Infrastructure**
  - Pole, Duct, Tower/Mast, Dark Fiber, IRDN, etc.
  - Access Services, Domestic Roaming, MVNO, Domestic Leased Line, IPLC, IIG/NIX, Voice Gateway, WBA, Interconnection, etc.
- **Who shares Infrastructure to Whom**
  - Own Network Telecom Operator > Own Network Telecom Operator (same market)
  - Own Network Telecom Operator > Not Own Network Telecom Operator (same market)
  - Telecom Operator > Telecom Operator (different market)

Introduction to Infra Sharing

- **Why Infrastructure Sharing?**
  - Cost reduction
  - Infrastructure spread
  - Environmental benefits
- **Types of Regulatory Approach**
  - Optional Sharing
  - Mandatory Sharing

Telecom Infra in Thailand: Regulations

1. Pole



Electrical Wire

Telecom Wire

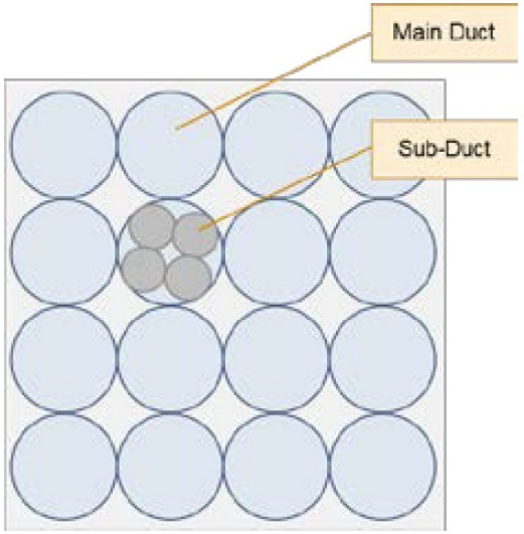
Telecom Infra in Thailand: Regulations

1. Pole

Name of Regulation: NBTC Notification Re: Rights of Way B.E. 2560 (2017)
What Service to Regulate: Pole
Who to Regulate: Telecom Network Operator (Buyer) rolling out network via pole (of Seller, usually Electricity Authority)
Who buys the Service: Telecom Network Operator
How to Regulate: Submit rollout plan to NBTC
Price Regulation Method: Negotiated Rate

Telecom Infra in Thailand: Regulations

2. Duct



Telecom Infra in Thailand: Regulations

2. Duct

Name of Regulation: NBTC Notification Re: Duct Access B.E. 2560 (2017)

What Service to Regulate: Duct

Who to Regulate: Telecom Operator owning Duct

Who buys the Service: Telecom Operator

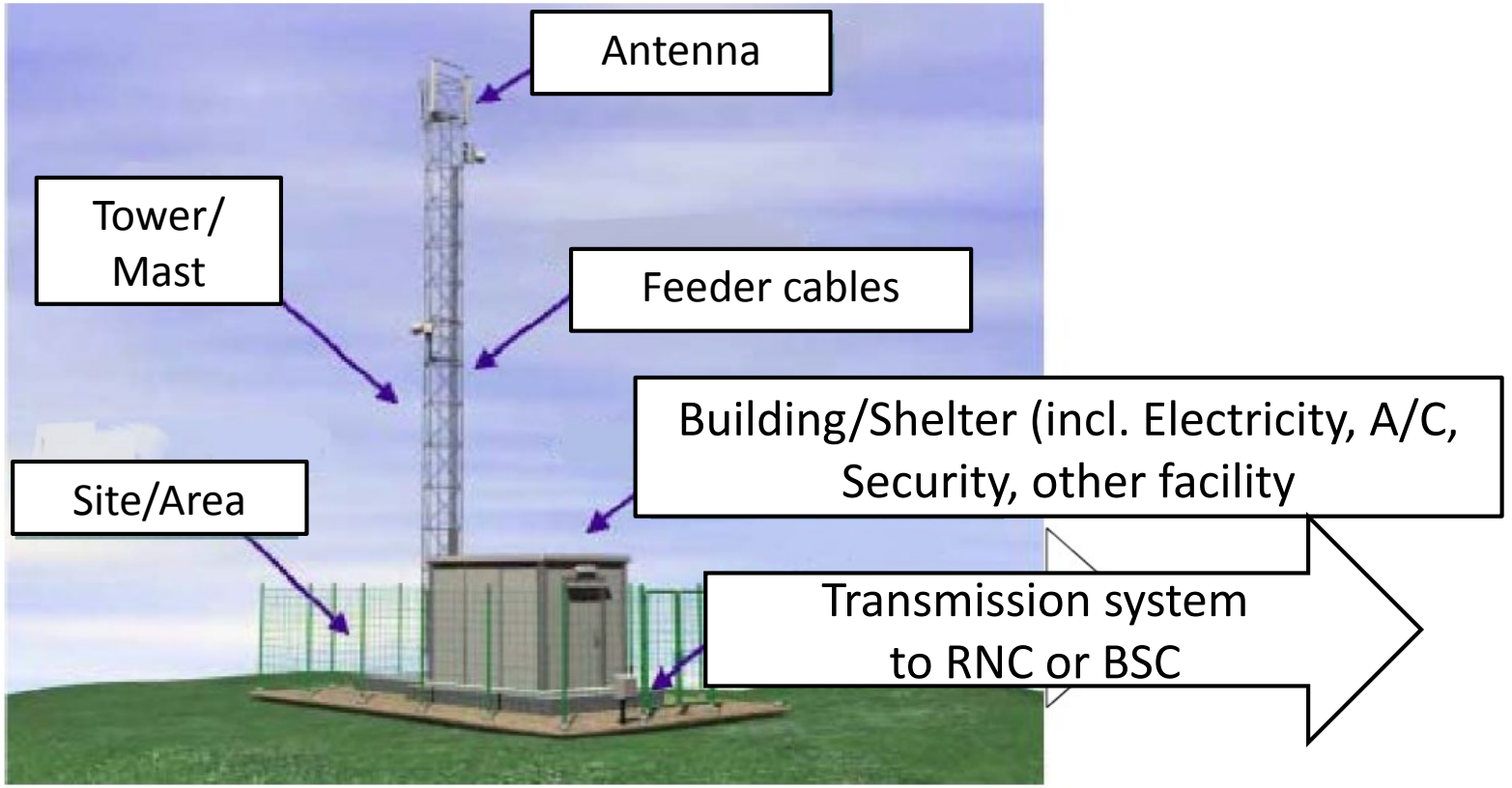
How to Regulate: RDO, Contract (Approved + Published)

Price Regulation Method: Model from FCC, FDC (in case of dispute)

Telecom Infra in Thailand: Regulations

3. Infrastructure Sharing for Mobile

Examples of Infrastructure for Sharing



Telecom Infra in Thailand: Regulations

3. Infrastructure Sharing for Mobile

Name of Regulation: NBTC Notification Re: Infrastructure Sharing for Mobile B.E. 2556 (2013)

What Service to Regulate: Infrastructure Sharing for Mobile

Who to Regulate: Mobile Network Operator

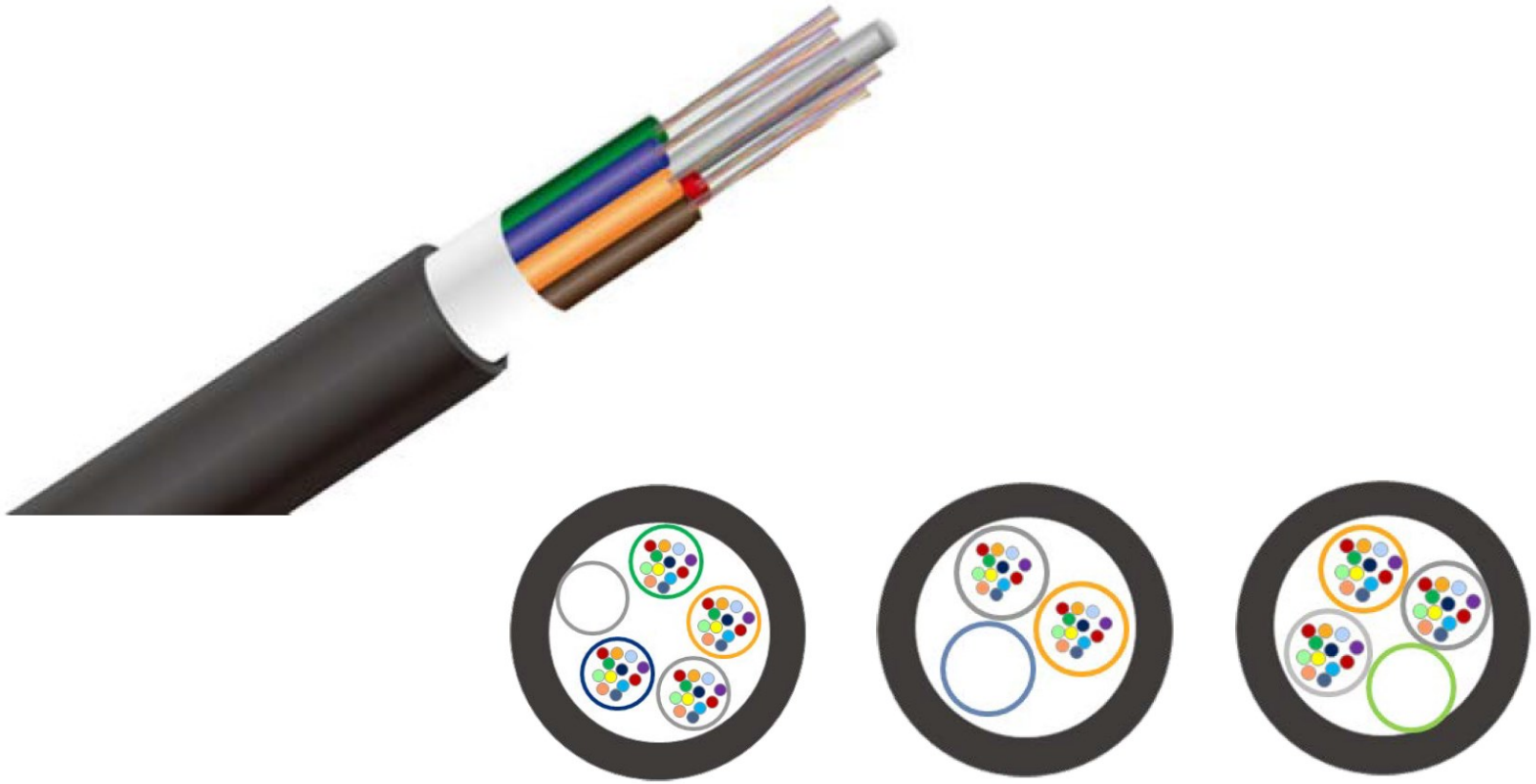
Who buys the Service: Mobile Network Operator

How to Regulate: RISO, Contract (Approved + Published)

Price Regulation Method: FRAND Negotiated Rate, FDC (in case of dispute)

Telecom Infra in Thailand: Regulations

4. Dark Fiber



Telecom Infra in Thailand: Regulations

4. Dark Fiber

Name of Regulation: NBTC Notification Re: Access & Interconnection B.E. 2556 (2013)

What Service to Regulate: Access Service

Who to Regulate: Telecom Network Operator

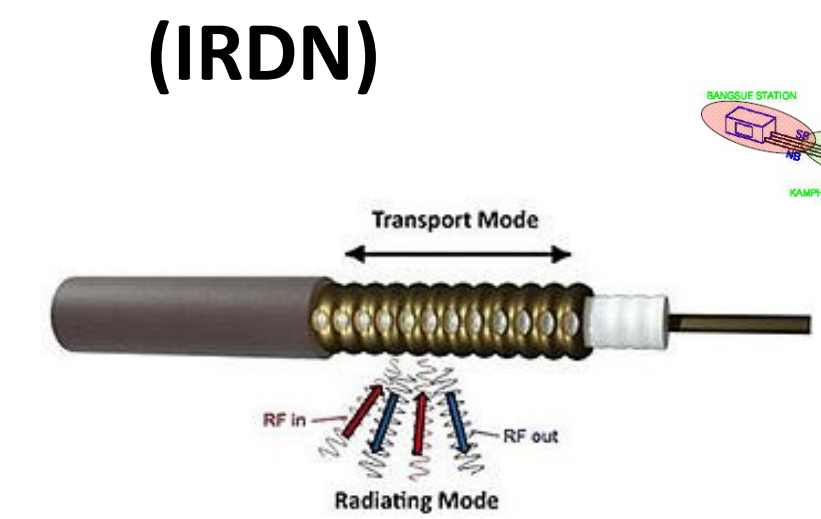
Who buys the Service: Telecom Operator

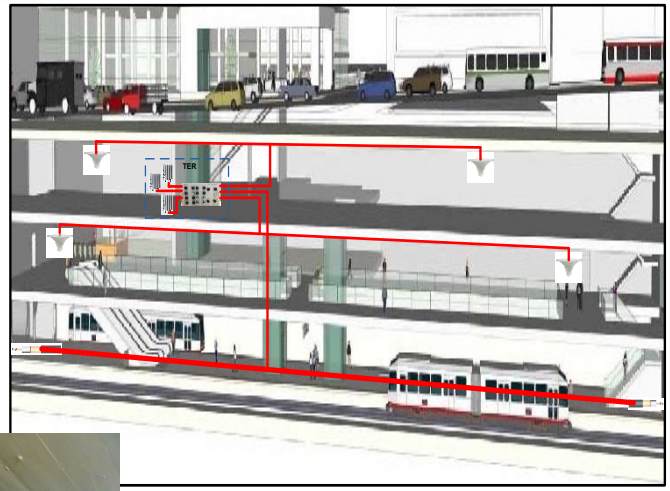
How to Regulate: RAO, Contract (Approved + Published)

Price Regulation Method: FRAND Negotiated Rate

Telecom Infra in Thailand: Regulations

5. Integrated Radio Distribution Network (IRDN)





Telecom Infra in Thailand: Regulations

5. Integrated Radio Distribution Network (IRDN)

Name of Regulation: NBTC Notification Re: Access & Interconnection B.E. 2556 (2013)

What Service to Regulate: Access Service

Who to Regulate: Bangkok Expressway and Metro PCL. (BEM)

Who buys the Service: Mobile Network Operator

How to Regulate: RAO, Contract (Approved + Published)

Price Regulation Method: FRAND Negotiated Rate

Telecom Infra in Thailand: Issues/Challenges

- **Pole**
  - Mostly electricity poles; NBTC to grant right of way
  - Overloading poles problem
- **Duct**
  - Government's policy to move overhead cables underground
  - Huge investment cost (much higher cost than installing cables on poles)
  - Only a few telecom operators are granted permission to build ducts for underground cable move and set the price relatively high – NBTC price regulation is underway

Telecom Infra in Thailand: Issues/Challenges

- **Tower**
  - Usually built for own use
  - AIS-DTAC deal to share telecom towers
  - Infrastructure Fund: DIF – NBTC regulatory policy is underway
- **Dark Fiber**
  - Price issue of dark fiber provided by Electricity Authority
  - Infrastructure Fund: JASIF – NBTC regulatory policy is underway
  - Government's policy to move overhead cables underground
- **IRDN**
  - Single Operator providing IRDN service

Role of Infra-Sharing in Thailand 4.0

- 5G technology is a critical component of a digital transformation strategy and infra-sharing is a key to deploying 5G network
- Effective duct access regulation needs to be in place to further strengthen the fiber backbone

Thank You

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