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**Competition and Infrastructure
Sharing**

By

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- Introduction
- Definition and scope of Infrastructure sharing
- Trends
- Benefits and Challenges
- Principals and remedies
- ITU activities in this area
- Conclusion

Introduction

Every part of a telecoms network is now shareable

- Increasing competition, along with investments in ever-changing technology, has been pushing telecom operators towards new ways of maintaining margins.

Five dimensions of infrastructure sharing

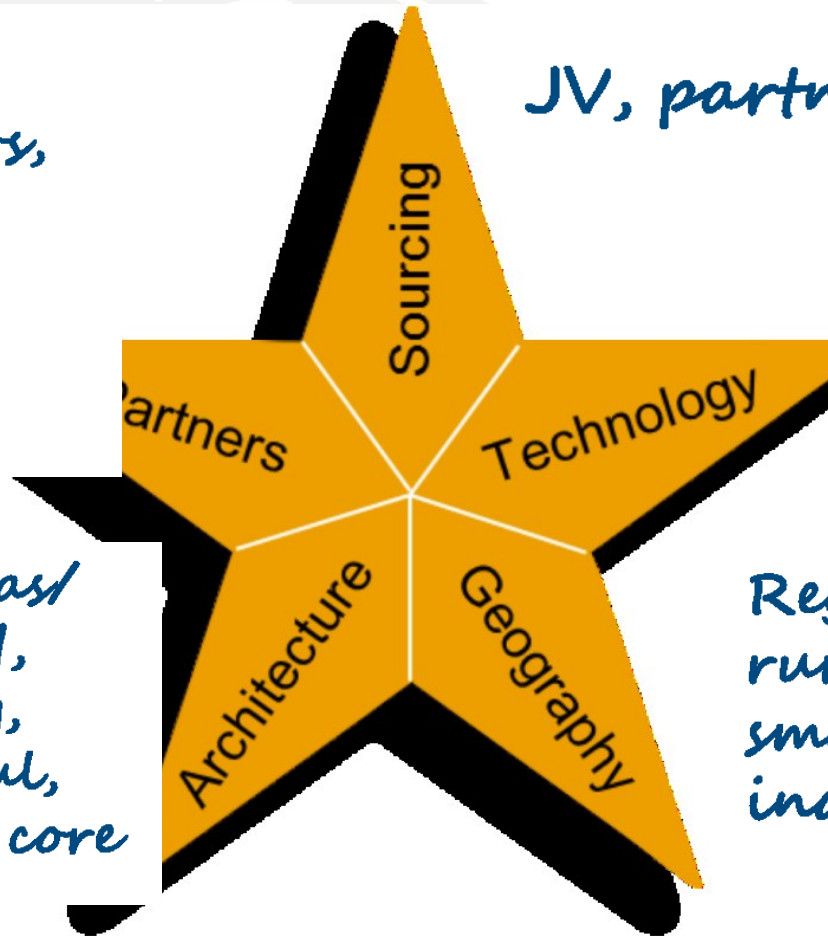
MNOs, TowerCos,
fixed/cable
operators,
utilities,
broadcasters

Passive, antennas/
feeders, MORAN,
MOCN, roaming,
MVNO, backhaul,
LLU, backbone, core

JV, partners, MSPs

2G, 3G, 4G,
WiFi, xDSL,
DOCSIS

Regional, urban,
rural, remote,
small cells (incl.
indoor)

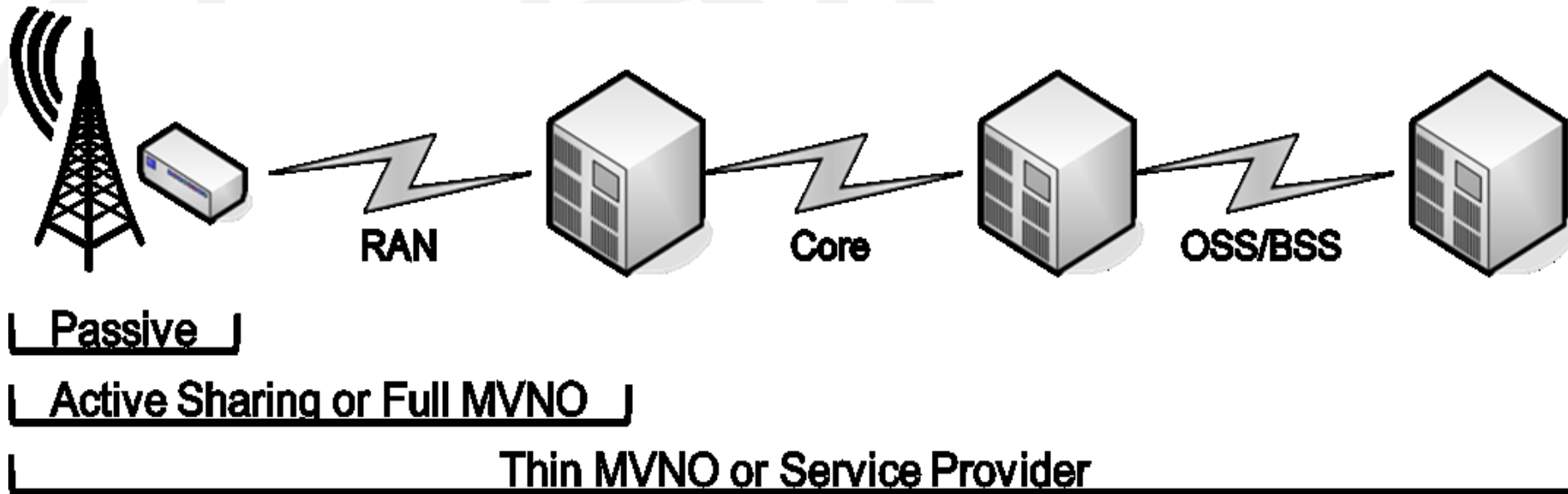


Source; Coleageconsulting

Architecture Sharing

- Architectural dimension is the one that most people use to describe infrastructure sharing.
 1. Passive sharing: the sharing of non-electronic infrastructure such as sites, towers, poles, ducts, trays, shelters, equipment rooms, power, HVAC, security, etc.
 2. Active sharing: the sharing of active (i.e., electronic) infrastructure in the access or core network.

Mobile Network Infrastructure sharing



Source: Coleago Consulting

Fixed Infrastructure network sharing



Passive sharing: ducts, poles, cables

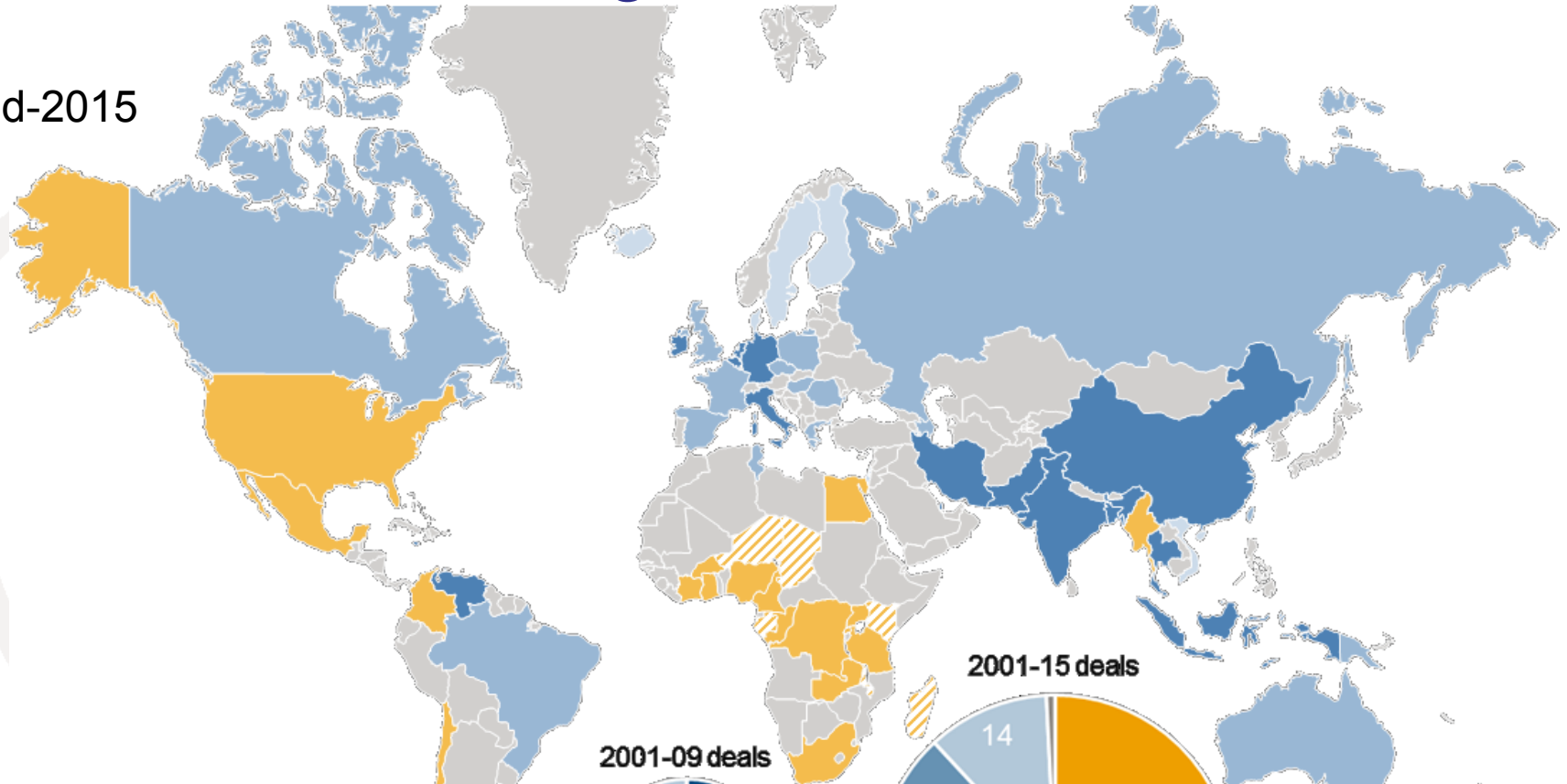
Active sharing: LLU or Bitstream

Transport

Source: Coleago Consulting

76 MNO sharing deals, 46 TowerCo deals

End-2015



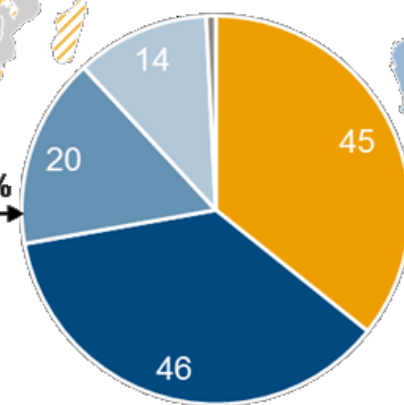
- Open Access
- Active (MOCN)
- Active (MORAN)
- Passive
- TowerCo

2001-09 deals



+260%

2001-15 deals



JVs between
MNOs

TowerCo sale &
lease-backs

Trends

Consolidation

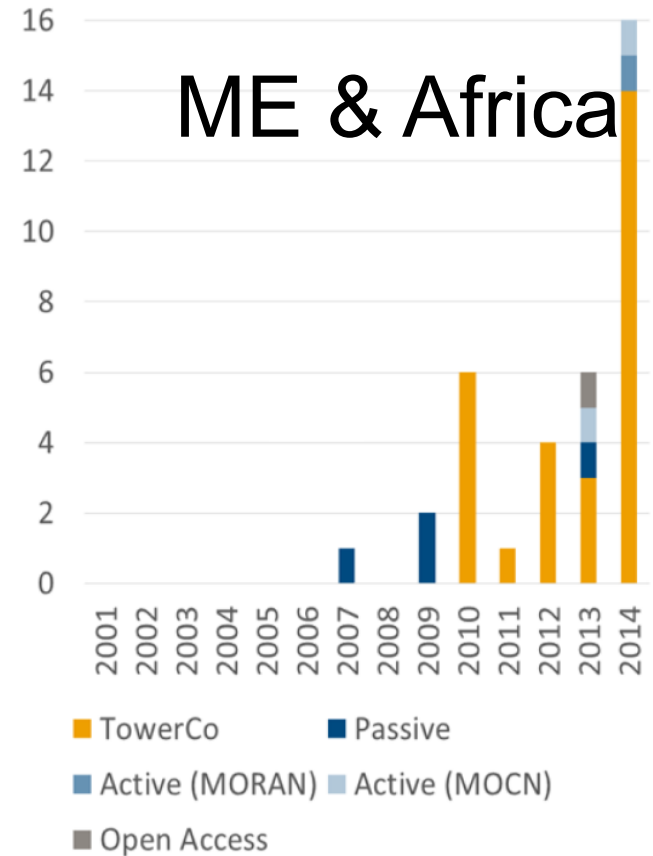
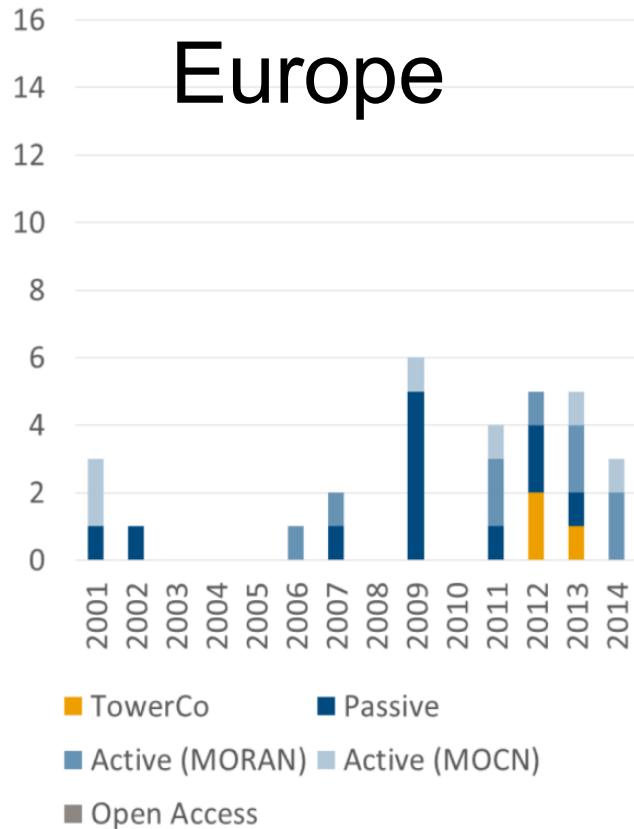
Virtualisation?

- 40% of towers had been sold to 3rd party in Africa by 2014
- Cost saving range from 25% -40%
- Open-access national broadband networks – Australia, Tanzania,

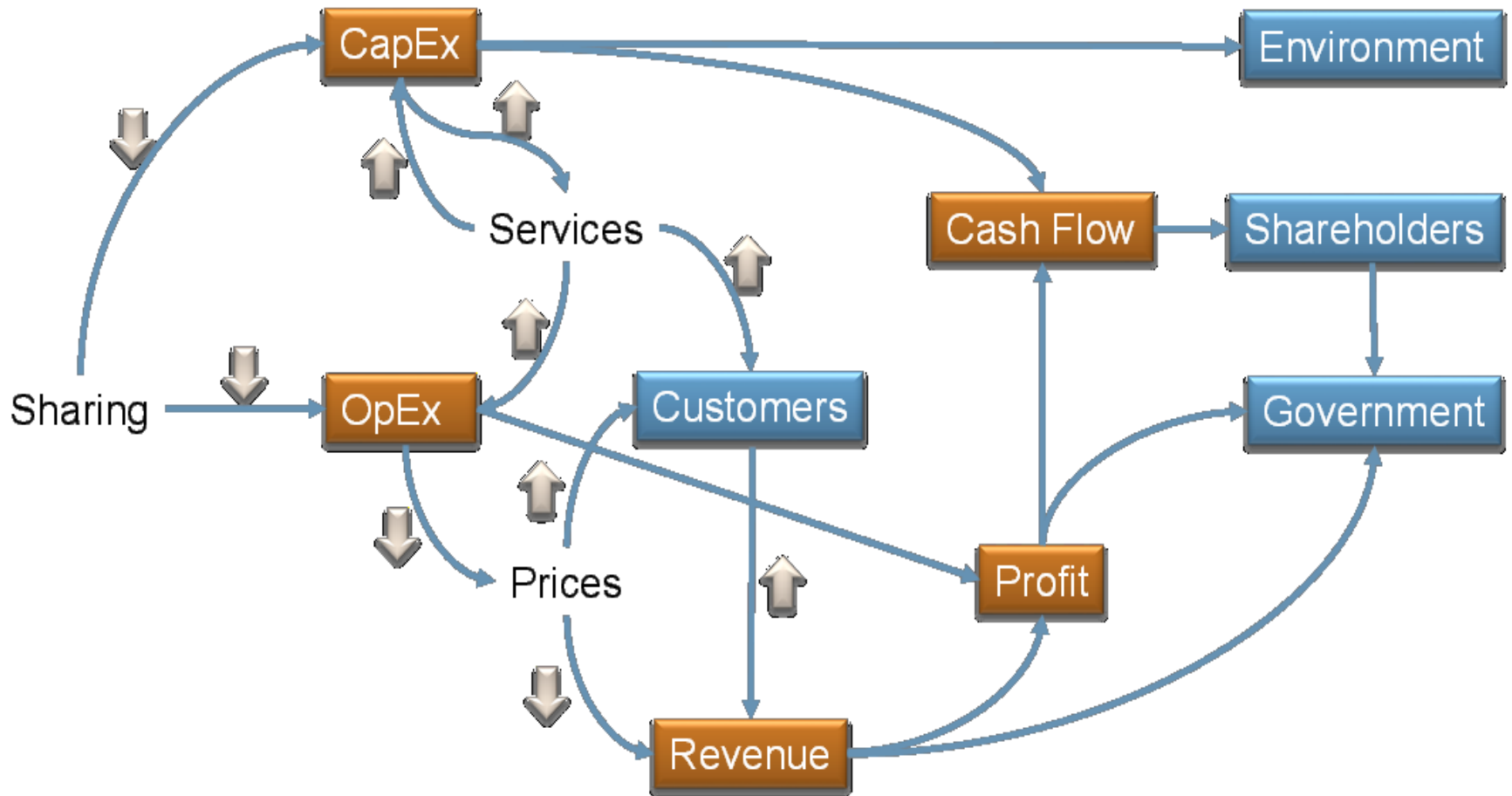
Trends- Virtualization

- Multi-MNO rural infrastructure sharing- expansion of 3G and 4G
- Network Functions Virtualisation (NFV) and Software-Defined Networking (SDN)
- Spectrum sharing-14 spectrum sharing (MOCN) joint ventures between MNOs. MOCN deals are likely to increase but NRAs will still be under considerable pressure to release more spectrum. Some NRAs such as the FCC in the USA and Ofcom in the UK are evaluating advanced spectrum sharing using “lightly licensed” or unlicensed spectrum

Mobile sharing regional differences



Direct and Indirect benefits of network infrastructure sharing



Source: Coleago Consulting

Challenges/Risks- Sharing Parties

Risk	Description
Partner conflict	Distrust, lack of respect or arguments between the partners
Change of ownership	Ownership of one party changes (cf Australia, Ireland and UK)
Proprietary information leakage	Proprietary strategic information is passed to competitor (accidently or on purpose)
Technical incompatibilities	Typically arising from the legacy active equipment
Legacy networks, systems or contracts	Legacy networks, systems or contracts complicate or hinder network sharing leading to a reduction in sharing benefits
Poor customer experience	Breakdown in end-to-end customer experience management
Over-estimation of benefits	Often happens where one or both of the parties lack experience of sharing

Challenges/Risks- NRA

Risk	Description
Delays	Process to request or negotiate sharing is delayed by one party
Refusal	Sharing is refused by one party on unsubstantiated grounds
Discrimination	Terms and conditions offered vary according to the requesting party
High prices	Prices for sharing include unreasonable profits
Disputes	Frequent disputes place an unnecessary burden on the NRA

	Challenge cited in the SADC Region
1	Fragmented regulatory frameworks, responsibilities are within different Acts; not necessarily under jurisdiction of the ICT Ministry,
2	Deliberate delays by an infrastructure owner in responding to requests and negotiating
3	Lack of infrastructure sharing pricing models
4	Discriminatory and variances in pricing depending on identity of the entity requesting access to infrastructure
5	Lack of guidelines or regulations on co-location
6	Limited availability of backbone infrastructure
7	Duplication of infrastructure where sharing could have been feasible
8	Refusal to share infrastructure
9	Restrictive terms and conditions in infrastructure sharing agreements
10	Inadequate capacity within regulators to address disputes and complaints
11	Existing design elements of infrastructure place limitations of the feasibility of sharing with other providers
12	Impact of infrastructure sharing on investment in deployment of new infrastructure
13	Lack of coordination across industry sectors with implementation of new infrastructure
14	Loss of competition
15	Collusion or proprietary information leakage
16	Lack of financial incentives to share in marginal areas
17	Infrastructure owner is able to charge high prices due to local monopoly of suitable infrastructure

SADC Infrastructure sharing Guideline

- The main objective of the SADC Infrastructure Sharing Guidelines project is to allow for **regional harmonisation** to achieve a conducive to infrastructure sharing that promotes competition, incentives to roll out [services] to underserved areas and benefits consumers in terms of price efficiency and improved quality of services
- ITU support to CRASA Secretariat delivered by David Buist-Coleago consulting 2016



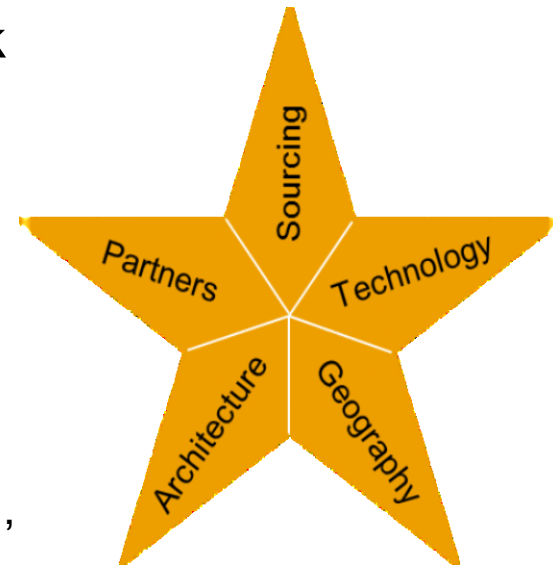
Principles → Remedies

- | | |
|----|---|
| P1 | Regulatory framework should address all aspects of infrastructure sharing and apply to all sector participants |
| P2 | All types of sharing should be permitted so long as competition is not adversely affected |
| P3 | All sector participants have the right to request to share infrastructure that has been mandated for sharing |
| P4 | All sector participants when requested are obliged to negotiate sharing of their (mandated) infrastructure |
| P5 | Operators designated as having SMP in a passive or active infrastructure market are required to publish a reference offer approved by the NRA |
| P6 | Commercial terms for infrastructure sharing should be transparent, fair/economic and non-discriminatory |
| P7 | Standard approval process for new infrastructure should be timely, effective and encourage infrastructure sharing |
| P8 | Standard dispute resolution process should be cross-sector, documented, timely and effective |
| P9 | Infrastructure sharing regulatory framework takes into account the national broadband plan, USF policy and future technology development |



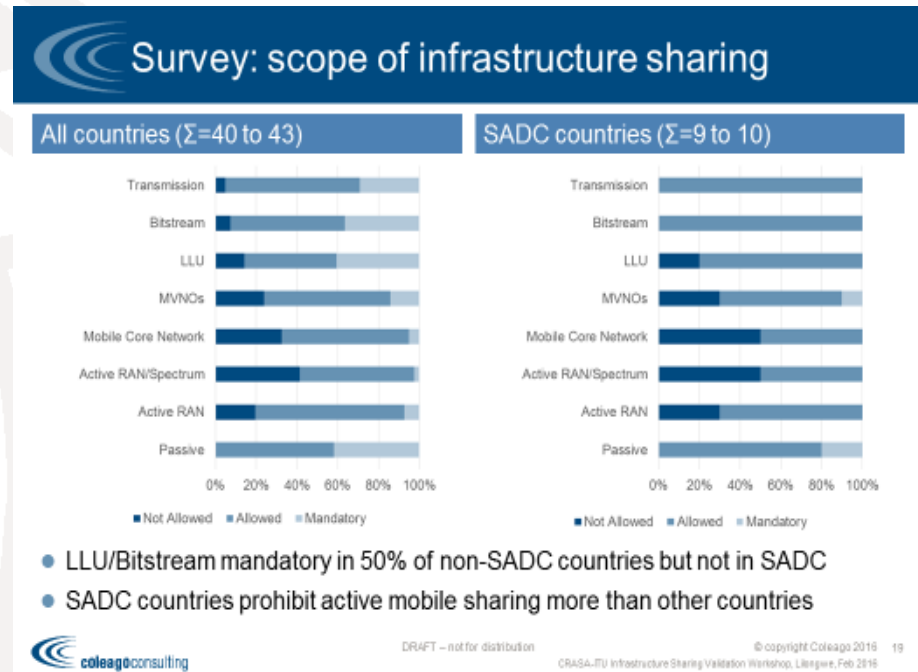
P1: Regulatory framework addresses all aspects of infrastructure sharing and applies to all participants

- Many existing regulatory frameworks fail to address all aspects of sharing, e.g., passive-only or mobile-only
- Use the “five dimensions of sharing” to check that the regulatory framework addresses all “technologies”, “geography”, “architectures” and “partners”
- Communications NRA may lack necessary authority:
 - Broadcasting NRA is separate in Mauritius, Zambia and Zimbabwe
 - NRA may not be able to apply legislation or regulation to companies from other sectors (e.g., utilities or transportation)
- Establish cross-sector governance, processes, standards and systems
- Examples: Brazil, EU, Portugal



P2: All types of sharing are permitted so long as competition is not adversely affected

- Use the “five dimensions of sharing” to check that the regulatory framework addresses all “technologies” and “architectures”
- Regulatory framework should provide guidance on the types of sharing agreements that will require NRA and competition authority approval, along with the process and indicative timetable
- NRA and competition authority should provide clear guidance on the types of sharing agreements that will need clearance along with the process and indicative timetable
- Examples: EU, Malaysia



P3: Right to request to share infrastructure mandated for sharing

- The NRA must identify the types of infrastructure that are mandatory to share and the licensees to whom it applies; typically this includes:
 - Passive radio and fixed communications network infrastructure including that owned by third-party infrastructure owners
 - Active radio communications networks by MVNOS and for the purpose of international roaming; note that these may be covered by other legislation, regulation or licensing
 - Any infrastructure where the owner has been designated as having SMP (see P5)
- Examples: Australia, Canada, EU, Malaysia, Portugal

P4: Obligation to negotiate sharing of (mandated) infrastructure

- All sector participants when requested are obliged to negotiate sharing of their (mandated) infrastructure:
 - Within reasonable timeframes
 - Subject to technical/commercial feasibility
 - Unless agreed otherwise by the NRA
- Regulatory framework should define:
 - The process and time limits
 - Guidelines on how to determine technical/commercial feasibility
 - Model offer(s) to set a minimum reasonable standard for agreements and thereby reduce the likelihood of disputes
- Examples: Australia, Canada, EU, Malaysia, Portugal

P5: Reference offers to be published by operators designated as having SMP

- NRA:
 - Defines the markets
 - Undertakes a market review to determine whether an operator has SMP
 - Reviews SMP designation at end of (x-years') period; for example, Hong Kong, Romania, USA have deregulated LLU at a later date due to increased competition
- Operator with SMP must publish a reference offer approved by the NRA within a specified period of time
- Regulatory framework should define:
 - The process and time limits
 - Guideline on how pricing should be set (see P6)
- Examples: Brazil, EU

P6: Commercial terms are transparent, fair/economic and non-discriminatory

- Principle should be embodied in the model offer(s)
- Regulatory framework should include pricing guidelines to reduce the likelihood of disputes and to be used in cases of SMP
Recommended approach (see Task 1e) is either or both of:
 - Benchmarking
 - Long-Range Incremental Cost (LRIC) model with Modern Equivalent Asset (MEA) valuation
- Examples: Bahrain, EU

P7: Standard approval process for new infrastructure

- Process should have the following characteristics:
 - Timely: maximum time limits for each step
 - Effective: all stakeholders should be involved in designing the process to ensure that it is as efficient as possible and is continuously improved
 - Encourage infrastructure sharing:
 - Create a cross-sector GIS to facilitate infrastructure sharing
 - The requester must show that there is no suitable existing infrastructure that can be shared
 - New infrastructure should be designed for sharing, subject to interest from other parties [min. technical standards]
 - Include an environmental impact assessment
 - Examples: Portugal, UK

P8: Standard dispute resolution process

- Check that existing process is applicable to all disputes arising from sharing
- Process should be:
 - Documented
 - Timely: maximum time limits for each step
 - Effective: all stakeholders should be involved in designing the process to ensure that it is as efficient as possible and is continuously improved
- Examples: Brazil, ITU, UK



P9: Take account of the national broadband plan, USF policy and future technology development

- As far as possible, ensure that the infrastructure sharing regulatory framework:
 - Supports the objectives set out in the national broadband plan and the USF policy, e.g., providing broadband to rural areas
 - Is technology-neutral in order to cope with developments such as virtualisation (SDN and NFV), 5G, etc.



Passive sharing pricing models

Country	Scope	Model	Asset Valuation
Canada	Ducts, poles	LRIC	HCA
France	Ducts, poles	FAC	CCA
Germany	Ducts	LRIC	CCA
Portugal	Ducts	?	?
UK	Ducts, poles	LRIC	CCA
USA	Ducts, poles	LRIC/FAC	HCA

FAC: Fully Allocated Cost (top-down)

LRIC: Long-Run Incremental Cost
(bottom-up)

CCA: Current Cost Accounting

HCA: Historical Cost Accounting



Active sharing pricing models

* Used to use LRIC

Country	Scope	Model	Asset Valuation
Australia	LLU	BBM with FAC*	Hybrid HCA/CCA
Canada	LLU	LRIC	HCA
France	LLU	FAC*	CCA
Germany	LLU	LRIC	CCA
Sweden	LLU	LRIC	MEA
UK	LLU	FAC*	Hybrid HCA/CCA
USA	LLU	LRIC	CCA

BBM: Building Block Model

FAC: Fully Allocated Cost

LRIC: Long-Run Incremental Cost

CCA: Current Cost Accounting

HCA: Historical Cost Accounting

MEA: Modern Equivalent Assets

Conclusion

- Infrastructure sharing has proved to be beneficial to the
 - industry players (reduced Capex, opex, increased innovations)
 - Governments (Taxes, universal services) and
 - consumers, (reduced prices, increased innovations and choice); HOWEVER
- Infrastructure sharing if not effectively and efficiently implemented may be disruptive, hinder competition, growth and innovation;
- Focus on creating a conducive policy and regulatory environment that promotes competition & innovation

Regulatory framework checklist

- **Per country**

- Infrastructure sharing policy
- Cross-sector governance
- Cross-sector processes for:
 - Requesting/responding to (mobile and fixed) passive sharing
 - New infrastructure approval
 - Dispute resolution
- Process for evaluating SMP
- Model offer(s)
- Pricing guidelines including use of pricing models
- Pricing model(s)
- Infrastructure sharing database/atlas

- **Regional Level/SADC**

- Dispute knowledgebase (case studies)
- Benchmark knowledgebase
- Common infrastructure sharing database/atlas
- Common pricing model

THANK YOU

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