



ERICSSON

MOBILE BROADBAND, TVWS & FUTURE OF SPECTRUM MANAGEMENT

SHIV BAKHSHI, PH.D.

VICE PRESIDENT, GROUP FUNCTION TECHNOLOGY, ERICSSON

WHITE SPACES & DYNAMIC SPECTRUM ACCESS

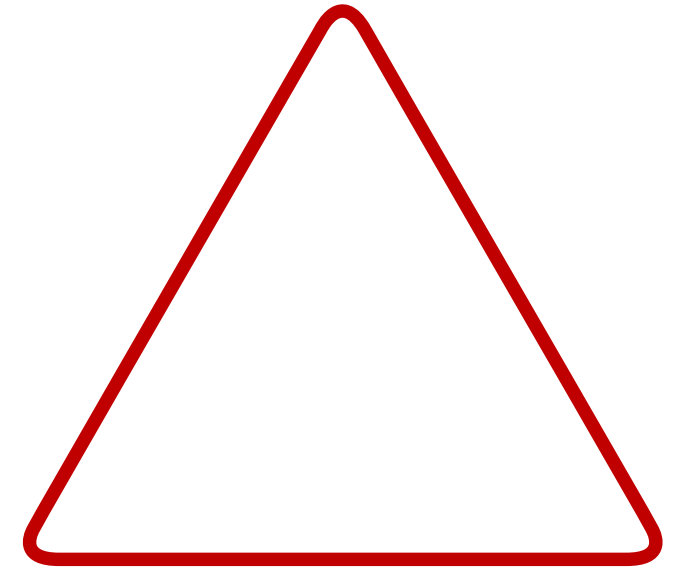
GSR14, BAHRAIN, JUNE2, 2014



POINT OF DEPARTURE



Technology



Policy

Markets

Markets do not fall like manna from the heavens.
They are created by legal precepts and institutional structures of a given country

WHAT THE TVWS DEBATE IS ABOUT



FUTURE OF SPECTRUM MANAGEMENT



**HOW SHOULD SOCIETY DEAL
WITH A CRITICAL RESOURCE LIKE
PRIME SPECTRUM?**

THE CENTRAL QUESTION



SHOULD A CRITICAL SOCIAL RESOURCE
LIKE PRIME SPECTRUM BE MANAGED THROUGH
DELIBERATIVE POLICYMAKING PROCESS,
OR SHOULD IT BE LEFT TO
THE WHIMS AND VAGARIES OF THE MARKETPLACE?

TWO DIFFERENT PERSPECTIVES



TVWS PROPONENTS:

Prime spectrum in the 470 MHz – 694/8 MHz range (that will become available with the imminent Digital Switch Over) be assigned license-exempt status and made available to all and sundry for free

MOBILE INDUSTRY:

This prime spectrum, with its excellent propagation characteristics, is best used to serve public policy goals of inclusive growth through Mobile Broadband, and best under a licensed spectrum regime

STATE VS. MARKET



State vs. Market is *not* an either/or issue

The point is to find the right balance, through light-touch regulation

Licensing allows the State to guide the Market in socially desirable directions by attaching policy conditions and obligations (like geographical and population coverage, for instance)

THE OTHER BENEFIT OF LICENSING



Un-licensed spectrum regime will fail
to inspire investor confidence
and so fail to attract capital *and know-how*
necessary to exploit spectrum for public good.

PATCHWORK QUILTS & PROCESSES



Should Patchwork Quilts
be made by cutting
broadcloths?
Or with left over scraps
of fabric?

Is there a spectrum crunch in Africa? If not, why not deliberate and get things right?

Complete
DSO

Assess
social
needs

Allocate,
assign
spectrum

AGENDA



- MOBILE BROADBAND AS CRITICAL INFRASTRUCTURE
- EXAMINING SOME TVWS PROPOSITIONS
- PARTING THOUGHTS



MOBILE BROADBAND AS CRITICAL INFRASTRUCTURE

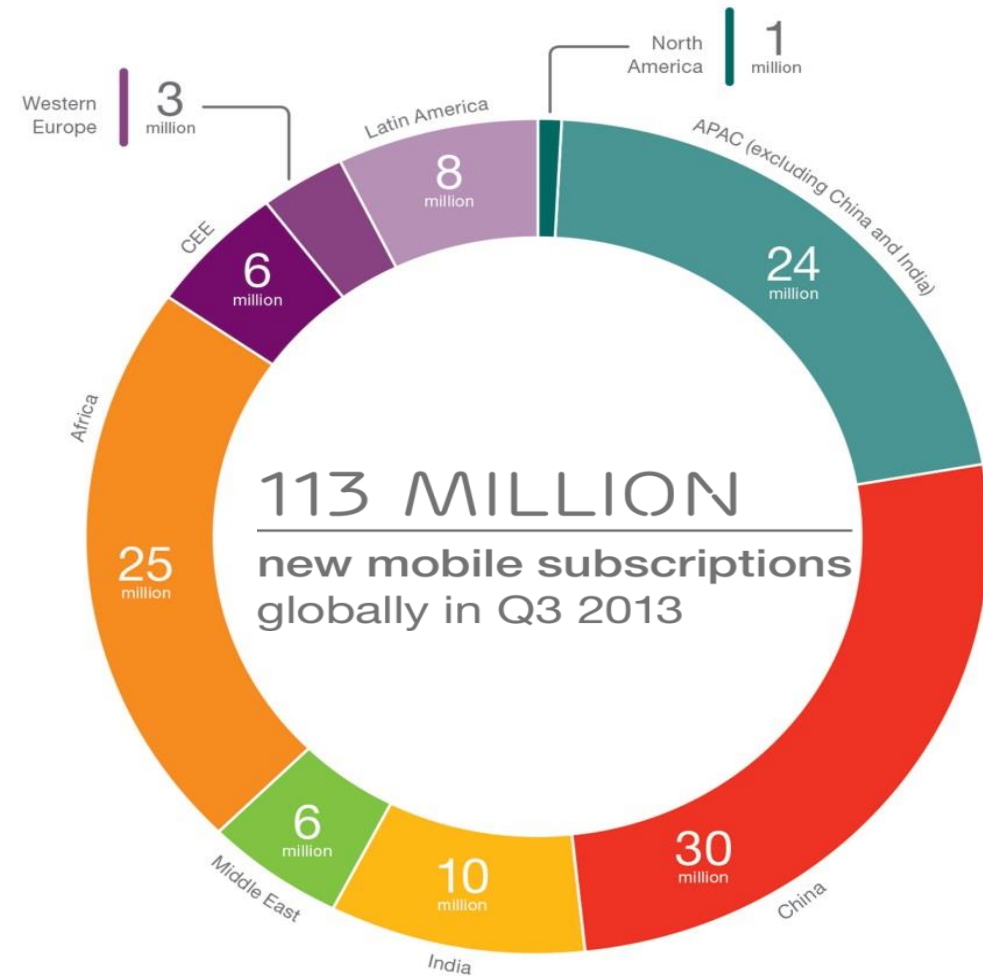
MOBILE SUBSCRIPTION GROWTH



- 6.6 B subscriptions in Q3 2013
- 113 M net additions in Q3 2013

6.6 BILLION
mobile subscriptions
globally in Q3 2013

Note: Number of subscribers around 4.5 B



Source: Ericsson (November 2013)

BY 2019

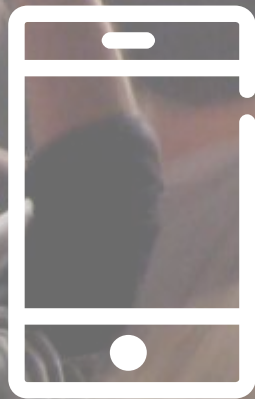
X10

Data traffic
driven by video



750 M

PCs and tablets



5.6 BN

Smartphone
subscriptions



8.0 BN

Mobile broadband
subscriptions



9.3 BN

Mobile subscriptions

POPULATION COVERAGE



- WCDMA/HSPA estimated to cover ~90% of world population by 2019

145

HSPA 42 Mbps networks are commercially launched in 75 countries

>65%

of the world's population will be covered by LTE in 2019

274

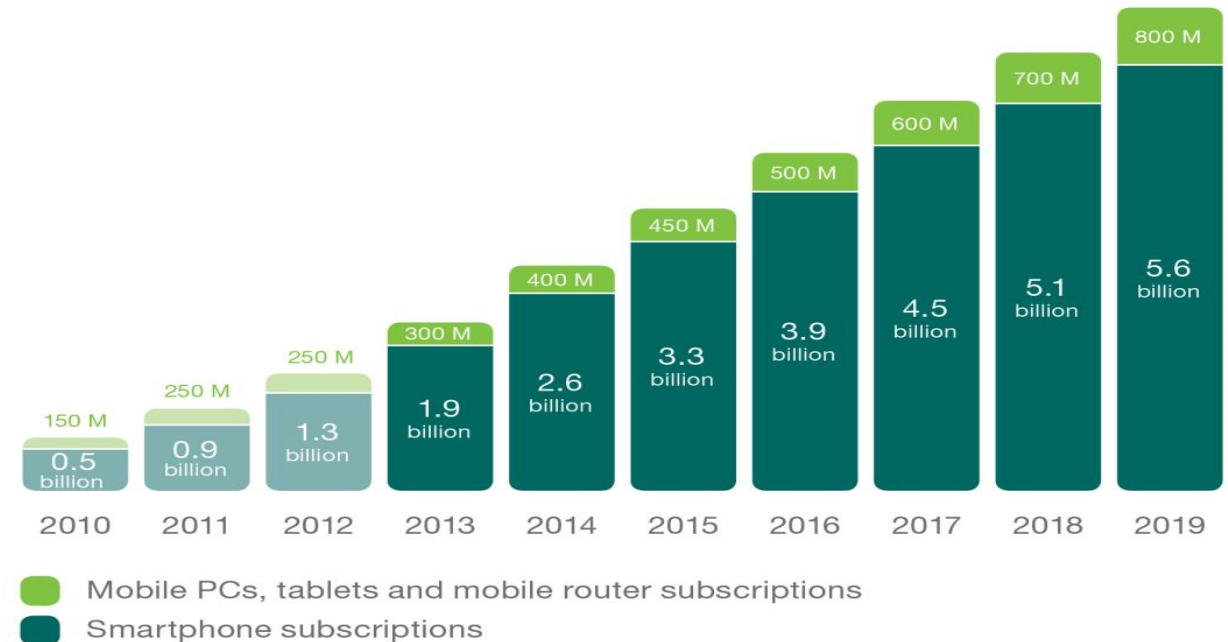
LTE networks launched in 101 countries

5.6 BILLION SMARTPHONE SUBSCRIPTIONS END 2019



- 5.6 B smartphone subscriptions by the end of 2019
- 55% of phones sold during Q3, 2013 were smartphones
- By 2019 the average smartphone subscription will use 2.2GB of data per month

Smartphones, mobile PCs, tablets and mobile routers with cellular connection



Source: Ericsson (November 2013)

WHY THESE NUMBERS MATTER



JOBS

**Because all kinds of societal goals
– political, economic, developmental –
are intrinsically tied to the growth of
Mobile Broadband**



EDUCATION



TRANSPORTATION



PUBLIC SAFETY



POLLUTION



HEALTH



ENERGY



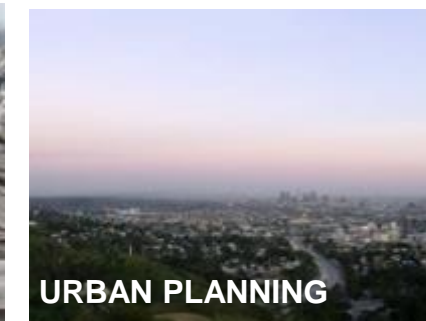
FOOD AND AGRICULTURE



GREEN ASPECTS



DIGITAL DIVIDE



URBAN PLANNING



E-GOVERNANCE

MBB AS CRITICAL INFRASTRUCTURE

The background of the slide is a dark, textured grey. It is filled with vibrant, multi-colored paint splashes in shades of red, blue, green, yellow, and purple. Overlaid on these splashes are several stylized, translucent human figures in various dynamic poses, appearing to be in motion or dancing. At the bottom of the image, there are several glass jars or bottles, some of which are glowing with bright light, suggesting a source of energy or creativity.

UNLEASHES
DIGITAL VITALITIES
OF PEOPLES,
BUSINESSES & SOCIETIES

ON GOING THE DISTANCE

Two black silhouettes of people walking towards the right on a rocky, uneven surface. Each person is carrying a briefcase. The person on the left is slightly ahead of the person on the right.

**THE COST OF COORDINATION
IS SOMETIMES PAID
IN THE CURRENCY OF TIME.**

BUT IT IS WORTH THE INVESTMENT

**IF YOU WANT TO GO FAST, GO ALONE.
IF YOU WANT TO GO FAR, GO TOGETHER.**

- AFRICAN PROVERB

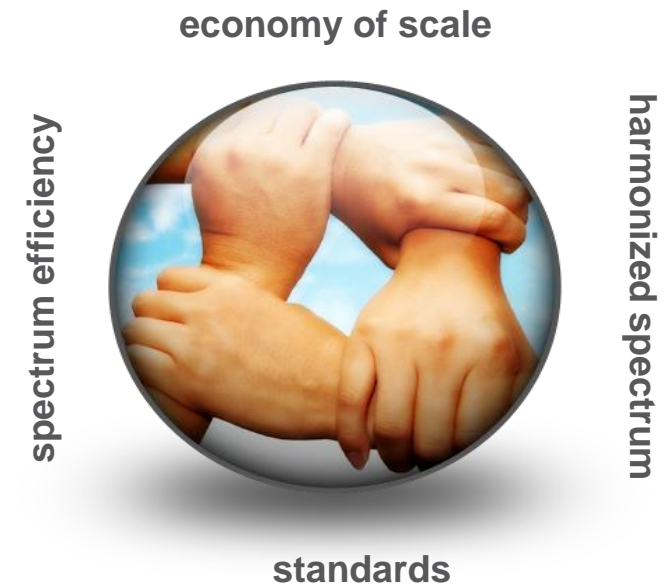
SPECTRUM HARMONIZATION, LICENSING & STANDARDIZATION: BENEFITS



Identification of common frequency bands at the international level for IMT – spectrum harmonization – and subsequent licensing of spectrum and standardization activity are key to meeting national policy goals.

Principal benefits of these activities are:

- Economies of scale, lowering cost of coverage of marginalized, low-population density areas
- Efficient use of spectrum for wide area coverage,
- Cross-border operation and coordination,
- Regional and Global roaming capabilities
- Simplifying design of equipment, focusing R&D investments,
- Ensuring Interoperability for choice, convenience
- Providing long-term investment assurance for manufacturers, network operators, others



Providing affordable broadband services and applications for all



EXAMINING SOME TVWS PROPOSITIONS

WHITE SPACES

- ‘White Spaces’ in telecom refer to unused or underused spectrum – often *intentionally*, as in the case of guard bands
- White spaces can be found both in terms of time and space
- White spaces as guard bands serve to mitigate against radio interference

& TVWS



- TVWS is NOT a technology, but spectral resource.
- In context of current policy debate, it is code for ‘regime change’ – getting prime spectrum in 470 MHz – 698 MHz band to be assigned a “license-exempt status”
- It lacks a technology roadmap, not to mention a robust eco-system



TECHNOLOGY BEHIND TVWS

The technology behind TVWS is 802.11a/f
– a WiFi derivative

And WiFi, as we all recognize,
is a celebration of the success
of fixed-line infrastructure

EXAMINING TVWS PROPOSITIONS



- There is “No Opportunity Cost” to broadcasters.
Specious argument since the opportunity cost is to society.
- TVWS will liberate underutilized spectrum.
There are better ways: Licensed or Authorized Shared Access, for instance

LIBERATING SPECTRUM

LICENSED SHARED ACCESS AS A POLICY TOOL



Licensed Dedicated



Mainstream approach for MBB
350 MHz now, need 1500-2000 MHz

- Efficient for large area and population coverage
 - Predictable quality of service
 - Reliable at high load at all times
- Affordability, Economies of scale, High valuations

Licensed / Authorized Shared

Complementary for MBB
Targeted opportunities (3.5GHz, AWS3)

- Fast unlocking of mobile spectrum
- Either-or usage between incumbent and licensee
 - Predictable quality of service
- Protects incumbent, lends investment security

Unlicensed Spectrum

Dedicated to Wi-Fi
>500 MHz today

- Efficient for indoor / controlled environments and short ranges, typically indoor
 - Unpredictable quality of service
- Reliable at low load, unreliable at high load

EXAMINING TVWS PROPOSITIONS



- There is “No Opportunity Cost” to broadcasters.
Specious argument since the opportunity cost is to society.
- TVWS will liberate underutilized spectrum.
There are better ways: Licensed or Authorized Shared Access, for instance
- New, innovative business models under unlicensed spectrum regime will help bridge the digital divide quickly and efficiently
Self interest will drive players to cherry-pick and thwart policy goals of inclusion.
Licensing preferred, since allows policymakers to attach policy obligations.
- White Space databases & spectrum analysis tools available now for DS Access
No conclusive studies presented in the ITU process WP 5A or 5D. Databases controlled by private actors may usurp and undermine mandate of policymakers

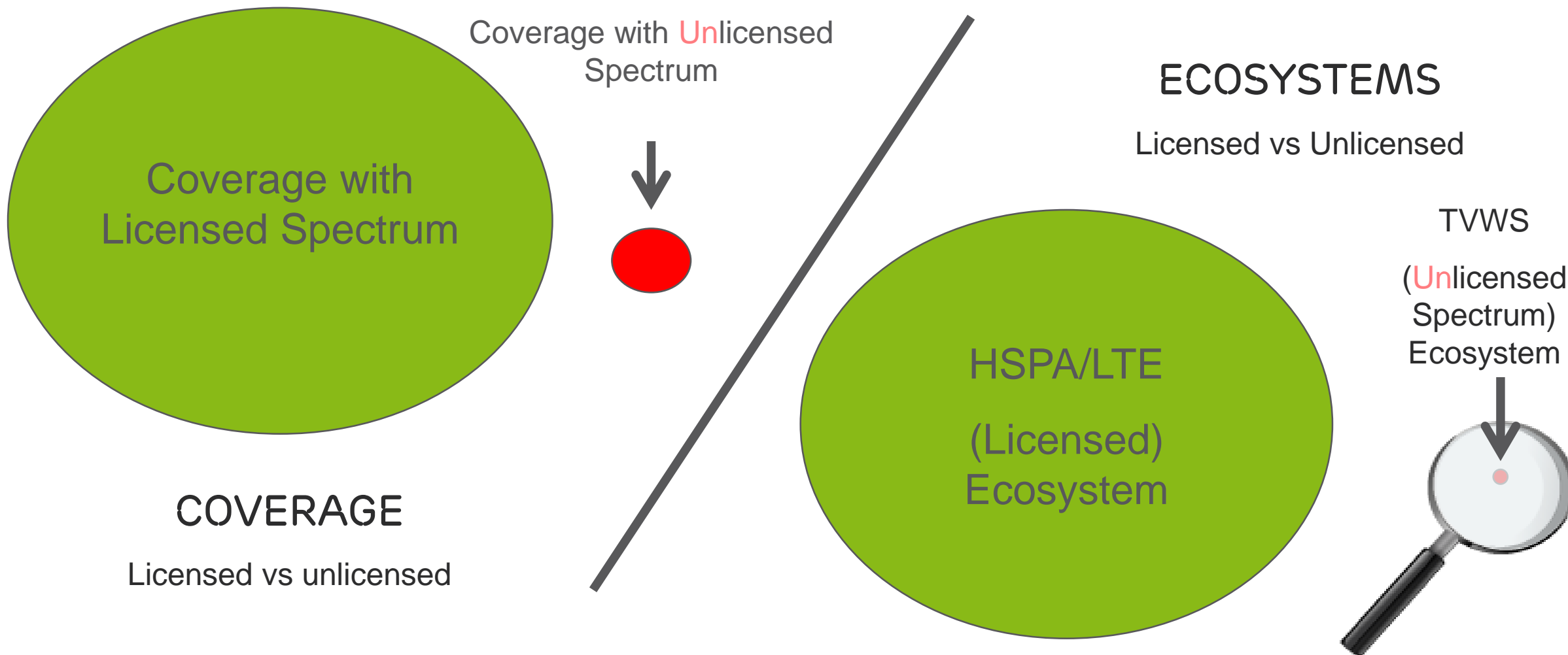
EXAMINING TVWS PROPOSITIONS/2



- Unlicensed spectrum regime, sans auction costs, will make services affordable.
Shoddy thinking since it conflates licensing with auctions. Spectrum may be licensed through 'beauty contest,' revenue sharing model, etc.
- License-exempt spectrum regime would unleash positive forces in society.
License-exempt spectrum regime would deny emerging market mobile users benefits of the economies of scale and scope inherent in a robust eco-system.

COVERAGE AND ECOSYSTEM

LICENSED VS. UNLICENSED SPECTRUM



EXAMINING TVWS PROPOSITIONS/3



- Unlicensed spectrum regime, sans auction costs, will make services affordable.
Shoddy thinking since it conflates licensing with auctions. Spectrum may be licensed through 'beauty contest,' revenue sharing model, etc.
- License-exempt spectrum regime would unleash positive forces in society.
License-exempt spectrum regime would deny emerging market mobile users benefits of the economies of scale and scope inherent in a robust eco-system
- TVWS will provide instant access and bridge the Digital Divide.
Bridging the Digital Divide is not merely about access. It's also about connectivity. Backhaul is critical. TVWS approach is *technologically* inefficient as a system.

MOBILE INDUSTRY POSITIONS



- Licensed vs. Unlicensed spectrum is a false dichotomy. Wireless *does* need a mix of both.



- Not against exploiting White Spaces, but do not support the idea in sub-1GHz spectrum. (Sub 1GHz should be licensed, dedicated)



- Not against unlicensed spectrum, but again do not support the idea in sub-1GHz spectrum. (We support unlicensed in 2.4GHz, 5GHz.)

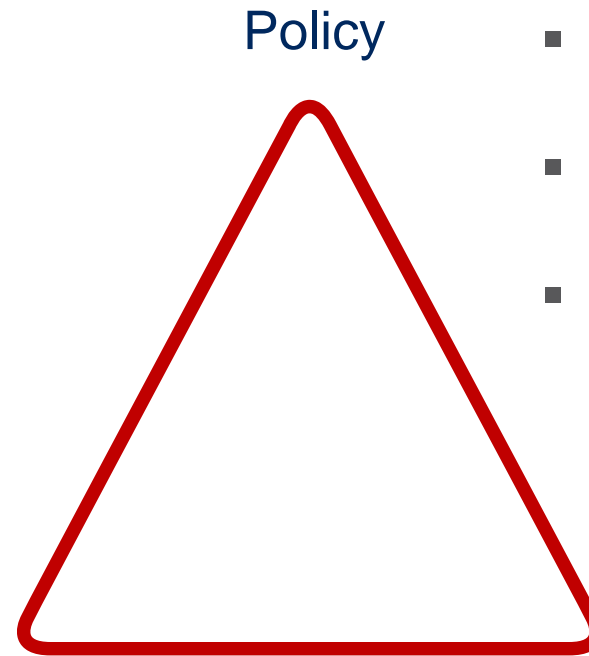


- Under-utilized spectrum *should be* 'liberated' and put to social use. But Licensed or Authorized Shared Access (LSA/ASA) is way to go.



- Making prime spectrum license-exempt serves neither the goals of efficiency (technology) nor equity (social policy, inclusiveness).

EXAMINING TVWS ARGUMENTS/FINAL



Policy

- Unlicensed spectrum: No opportunity for articulating policy conditions
- Databases controlled by market players could disintermediate policymakers
- Licensing spectrum does not necessarily require auctions. Or big money.

Technology

- LTE and 802.11x: OFDM, yes, but higher, control layers are issue.
- Access & connectivity
- Unclear backhaul solutions

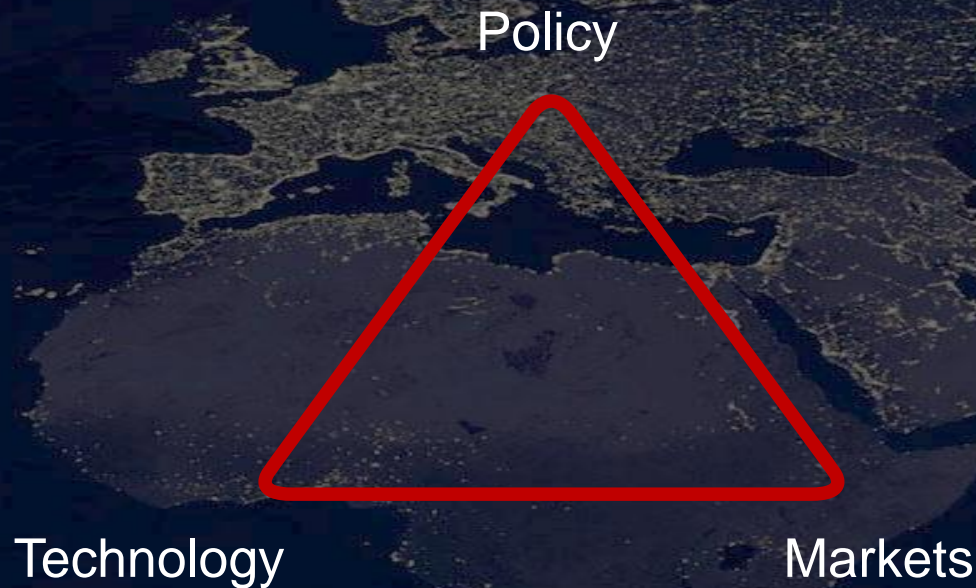
Markets

- May lack the scale of Financial and intellectual investment of MBB
- Ecosystem, and scale
- Spectrum Squatters



PARTING THOUGHTS

PARTING THOUGHTS



- Policymakers should **SEIZE** current MBB opportunity on 700-800-900MHz now
- Policymakers should exercise regulatory **FORBEARANCE** on sub-700 UHF spectrum till after the DSO (& when they can assess spectrum, and social needs)
- Must recognize importance of **LICENSED, HARMONIZED** spectrum regime in enabling scale, scope, robust ecosystems
- **LEVERAGE** spectrum judiciously to unleash Africa's digital potential



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