



Caribbean Telecoms: 5G and the Internet of Thing

Willemstad, Curacao

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The Voice of 5G and LTE for the Americas

5G Americas is an industry trade organization composed of leading telecommunications service providers and manufacturers. The organization's mission is to advocate for and foster the advancement and full capabilities of LTE wireless technology and its evolution beyond to 5G, throughout the ecosystem's networks, services, applications and wirelessly connected devices in the Americas. 5G Americas is invested in developing a connected wireless community while leading 5G development for all the Americas.

MEMBERS



WHITE PAPERS

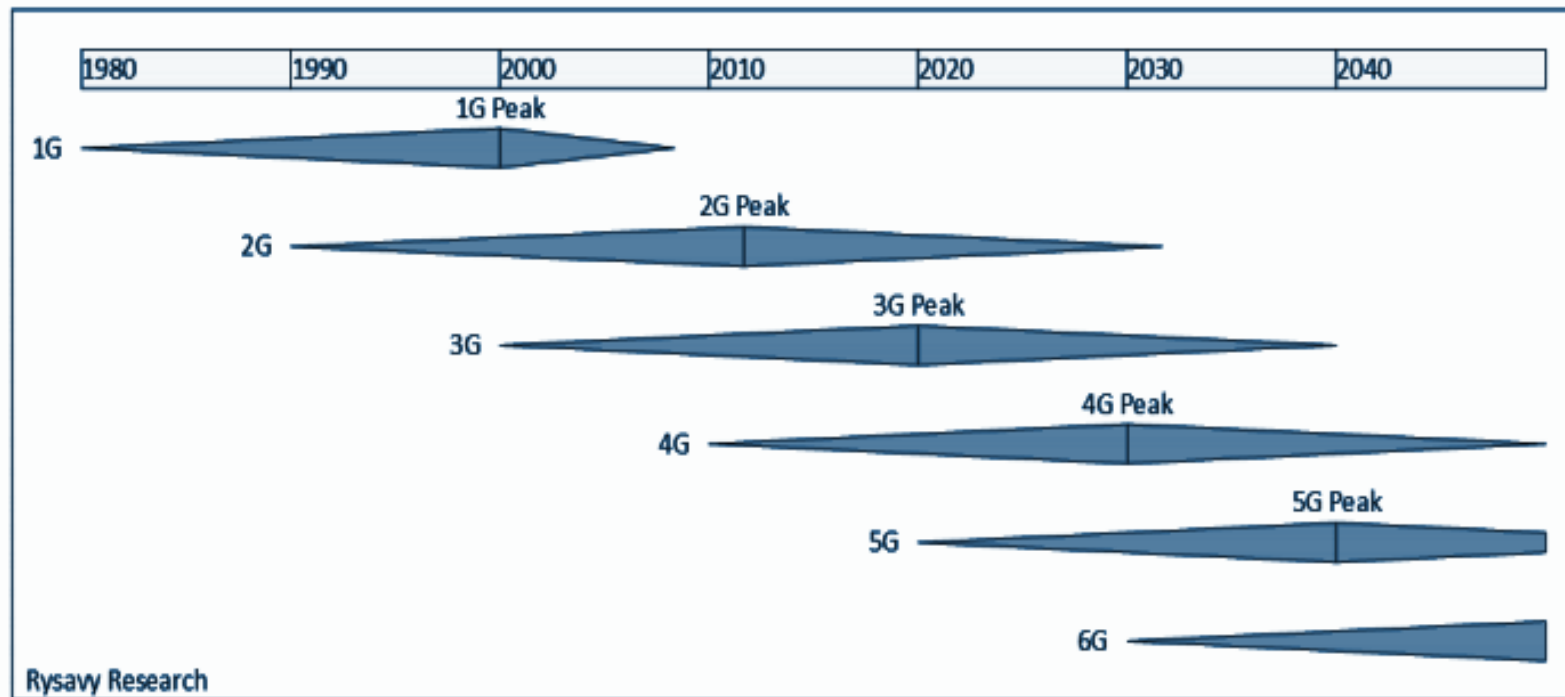


- ▶ Digital Adoption in Latin America: The Role of Infrastructure Deployment and Other Policies in the Region
- ▶ Cellular Technologies Enabling the Internet of Things
- ▶ LTE Aggregation and Unlicensed Spectrum
- ▶ 5G Technology Evolution Recommendations



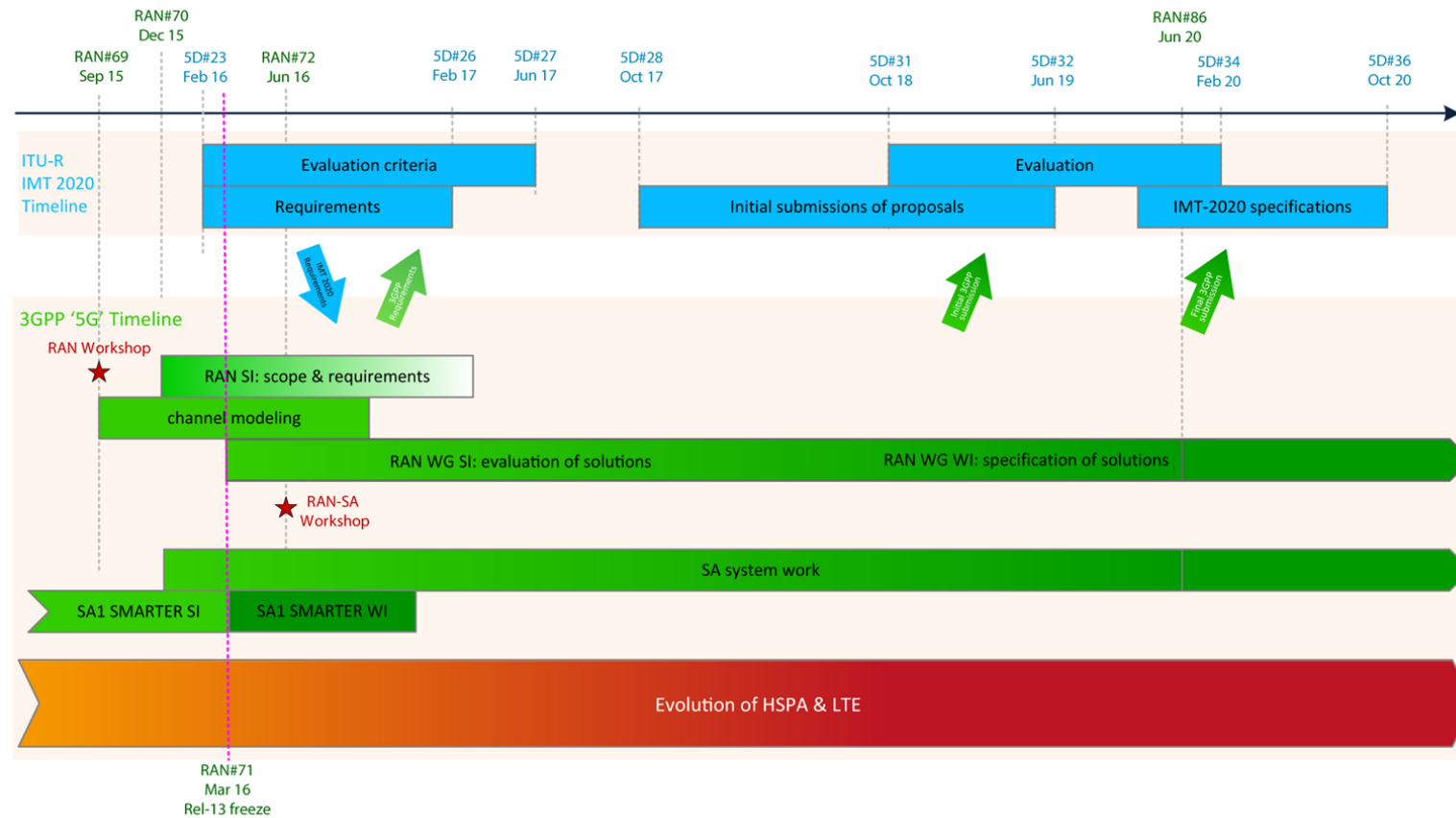
<http://www.5gamericas.org/es/resources/white-papers/>

MOBILE EVOLUTION



Source: http://www.4gamericas.org/files/9214/3991/2167/4G_Americas_Rysavy_Research_LTE_and_5G_Innovation_white_paper.pdf

ROUTE TO IMT-2020



Source: http://www.4gamericas.org/files/8914/3576/4557/4G_Americas_Mobile_Broadband_Evolution_Toward_5G-Rel-12_Rel-13_June_2015x.pdf

MORE ABOUT 5G



- 2G, 3G, 4G y 5G are commercial names, not technological definitions
 - IMT-2000, IMT-Advanced & IMT-2020
- Telecoms industry will still be discussing requirements for IMT-2020 when 1st non-standardized 5G network is launched...
 - 3G and 4G Déjà vu
- It's a capacity game, requirements:
 - Spectrum
 - Fiber Optic
 - International Traffic Gateways
- Need to look at 5G as an ecosystem

THE 5G ECOSYSTEM

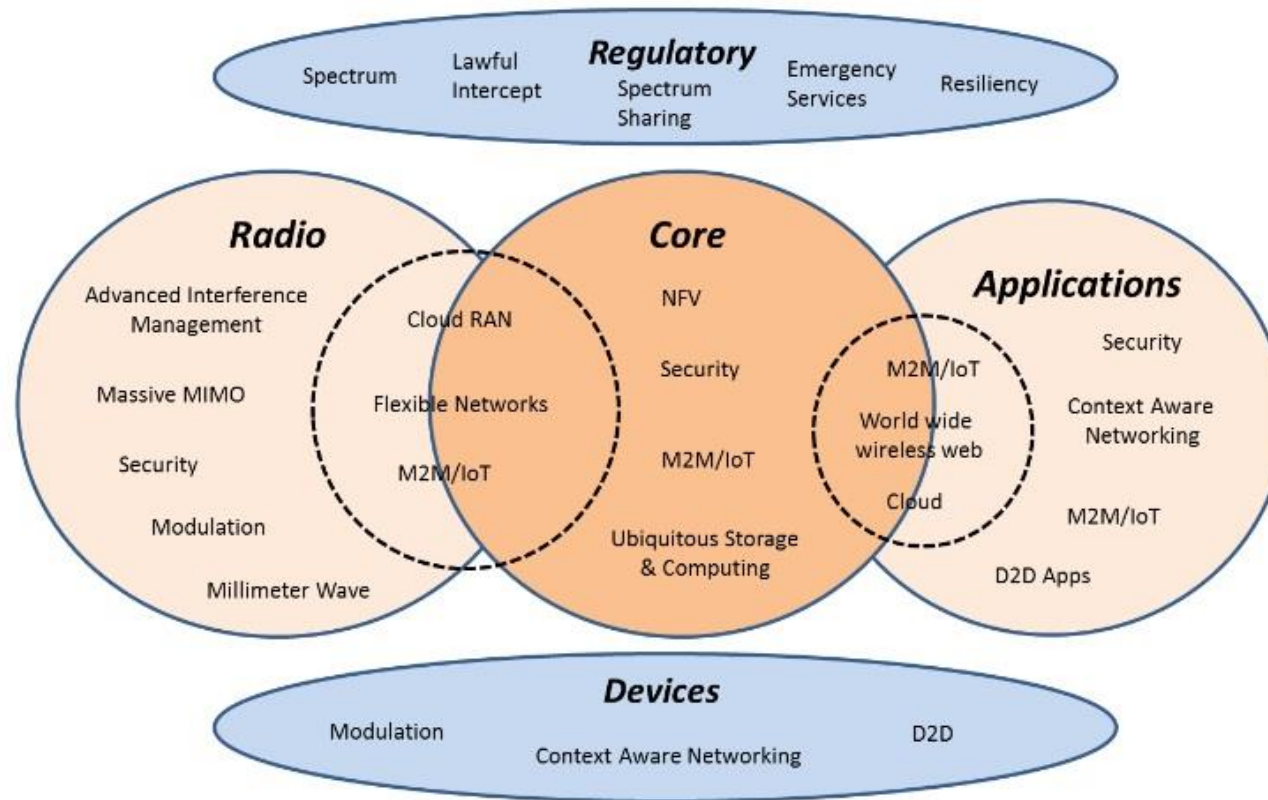


Figure 2. A Preliminary View of an End-to-End 5G Ecosystem.

CARIBBEAN MARKETS

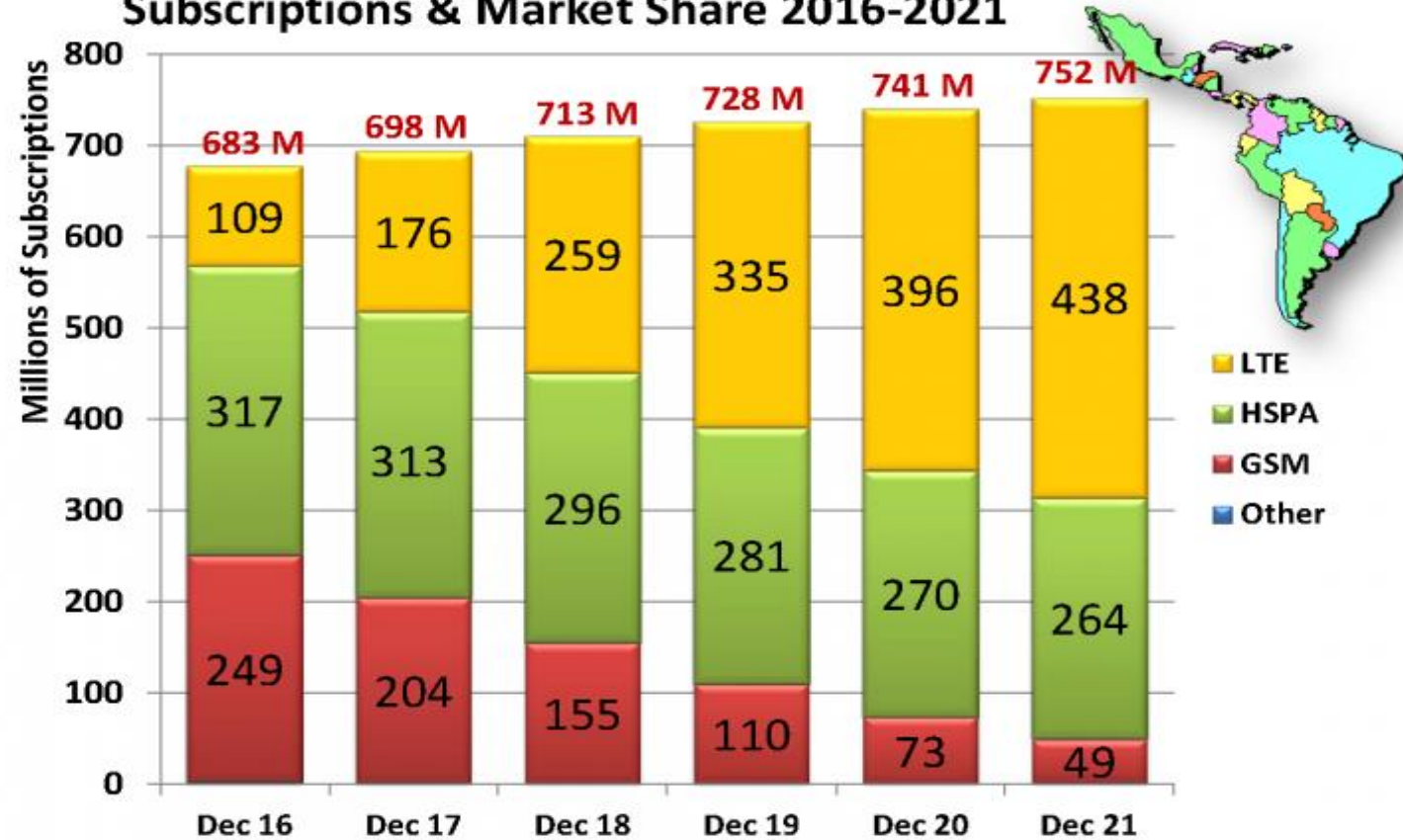


Anguilla	Dominica	Saint Barthélemy
Antigua & Barbuda	Dominican Republic	Saint Kitts and Nevis
Aruba	French Guiana	Saint Lucia
Bahamas	Grenada	Saint Martin
Barbados	Guadeloupe	Saint Vincent and the Grenadines
Belize	Guyana	Sint Maarten
Bermuda	Haiti	Suriname
Bonaire, Sint Eustatius and Saba	Jamaica	Trinidad and Tobago
Cayman Islands	Martinique	Turks and Caicos Islands
Cuba	Montserrat	Virgin Islands, British
Curaçao	Puerto Rico	Virgin Islands, U.S.

CALA MOBILE LINES 2016 – 2020



Latin America & Caribbean Technology Forecast Subscriptions & Market Share 2016-2021



Source:  September 2016

CARIBBEAN MOBILE LINES



**Pop.
(Millions)**

43.9

**Mobile subscribers
(Millions, estimated end 2015)**

35.2

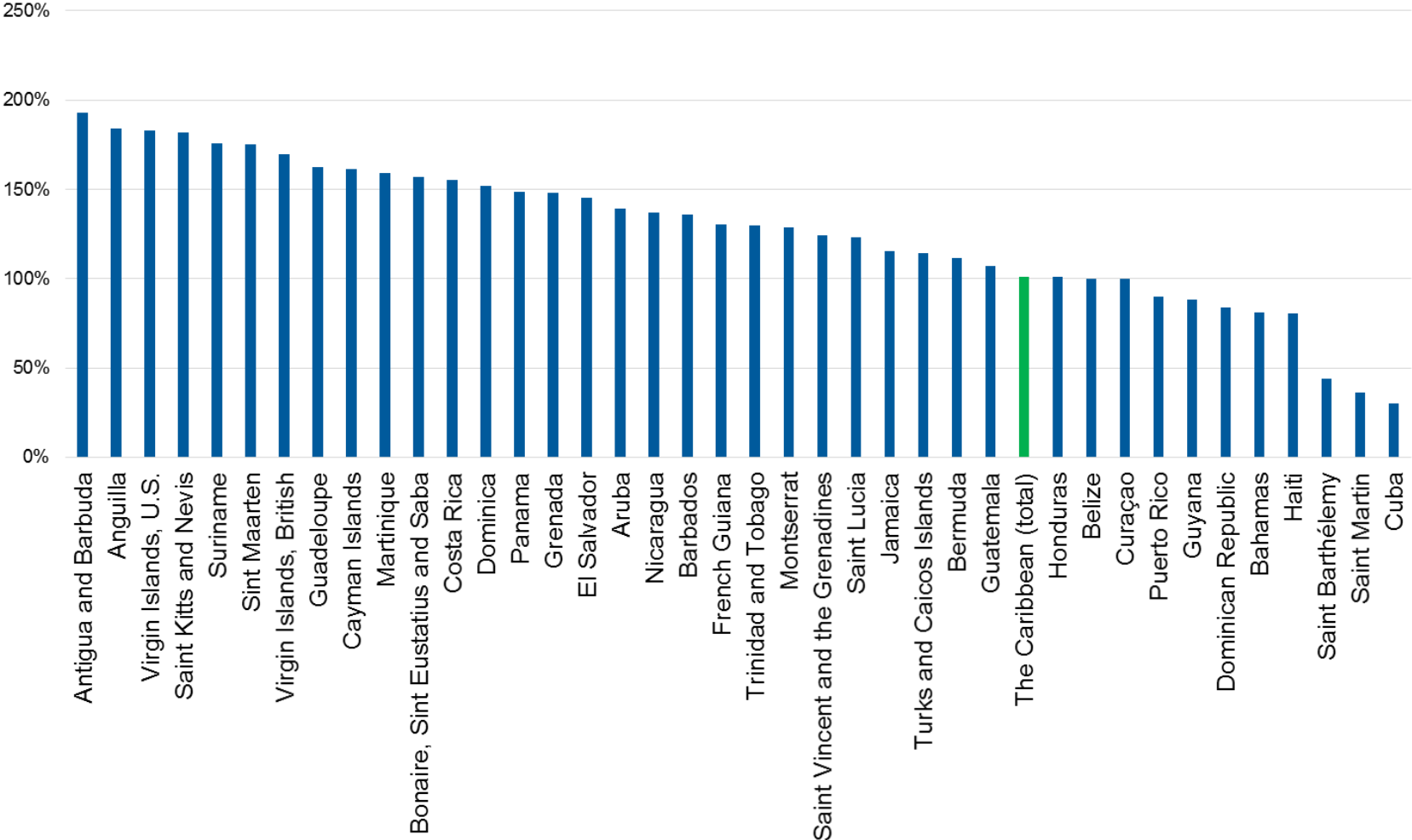
Mobile Penetration

80.1%

33 Markets

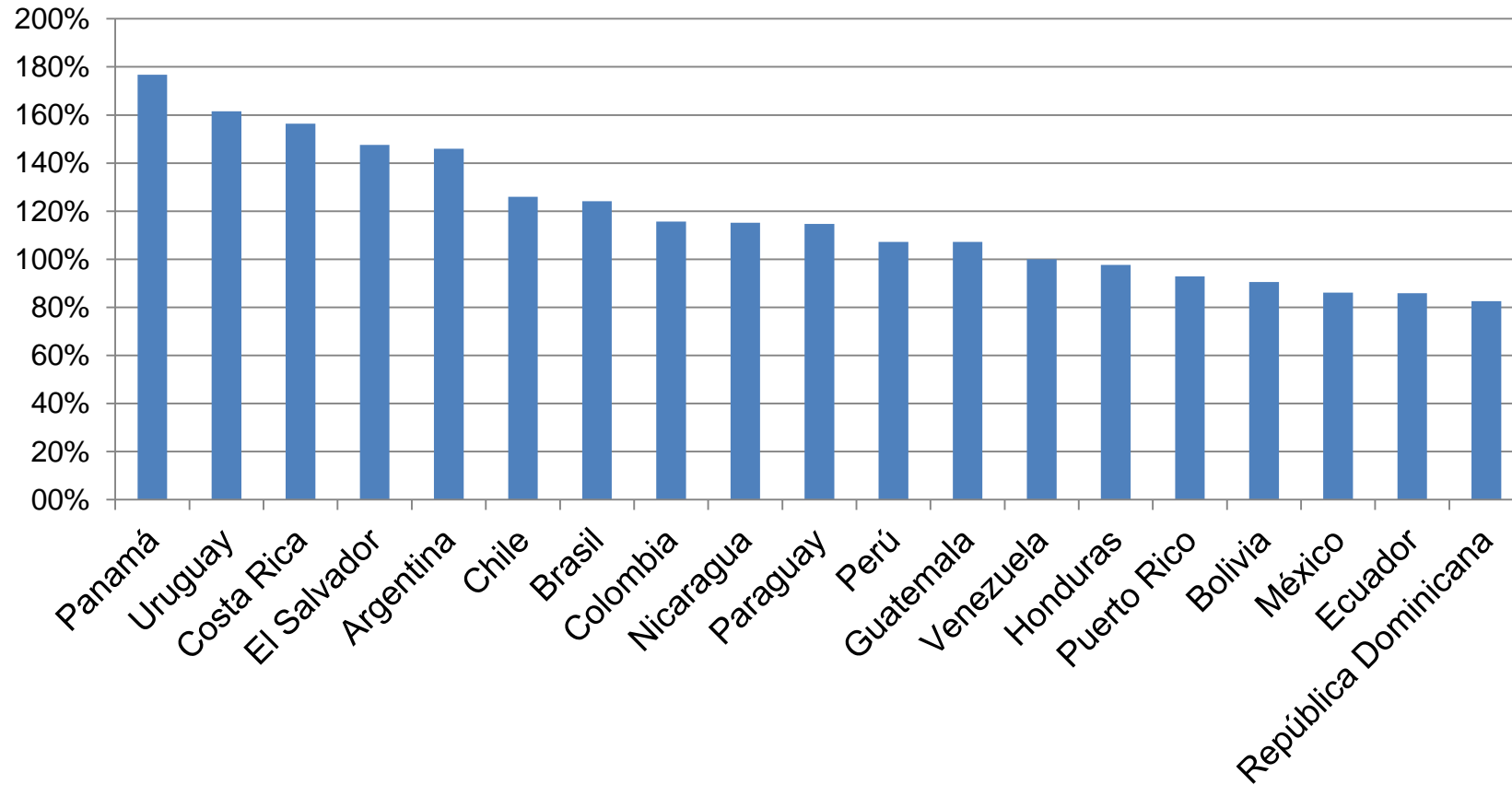
85 Operators

MOBILE PENETRATION CARIBBEAN



Source: ITU, Operators, Regulators, WEF, World Bank

MOBILE PENETRATION LATAM



IoT / M2M DRIVERS CALA



IoT/M2M market in Latin America and the Caribbean is incipient, although it is starting to be seen by mobile operators as a new source of revenue and opportunities

STRENGTHS	WEAKNESS
<ul style="list-style-type: none">• Mobile service expansion• 4G LTE market growth• Well-established operators	<ul style="list-style-type: none">• Regulatory updating• Digital gap• Frequency spectrum assignment• Little qualified corporate sales teams
OPPORTUNITIES	THREATS
<ul style="list-style-type: none">• Users inclined to adopting new technologies• Governmental support to smart cities• Support to technological star-up initiatives• Globally inserted industries• Opening towards mobile virtual network operators• Spectrum reuse	<ul style="list-style-type: none">• Regional economic scenario• Equipment importation barriers• Tax pressure

IoT / M2M GLOBAL GROWTH

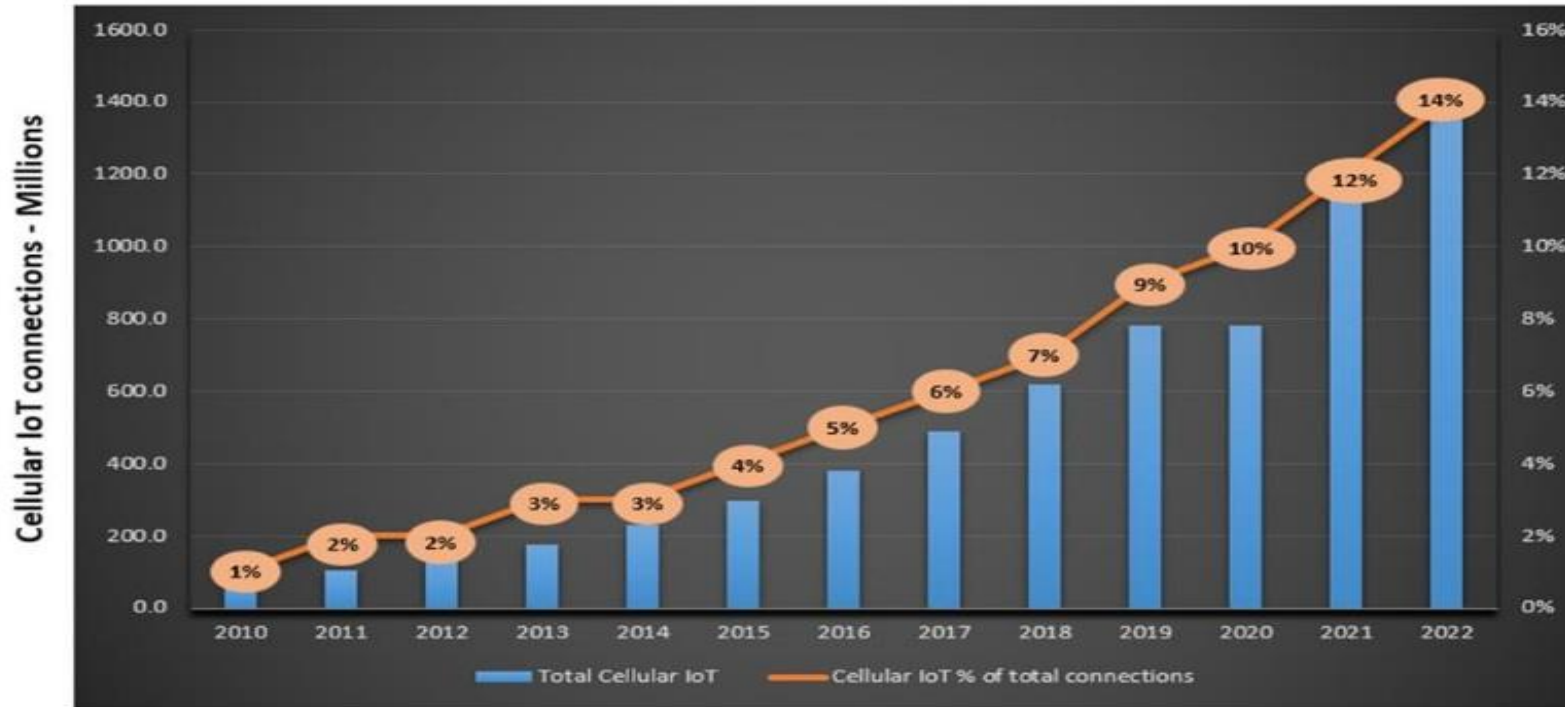


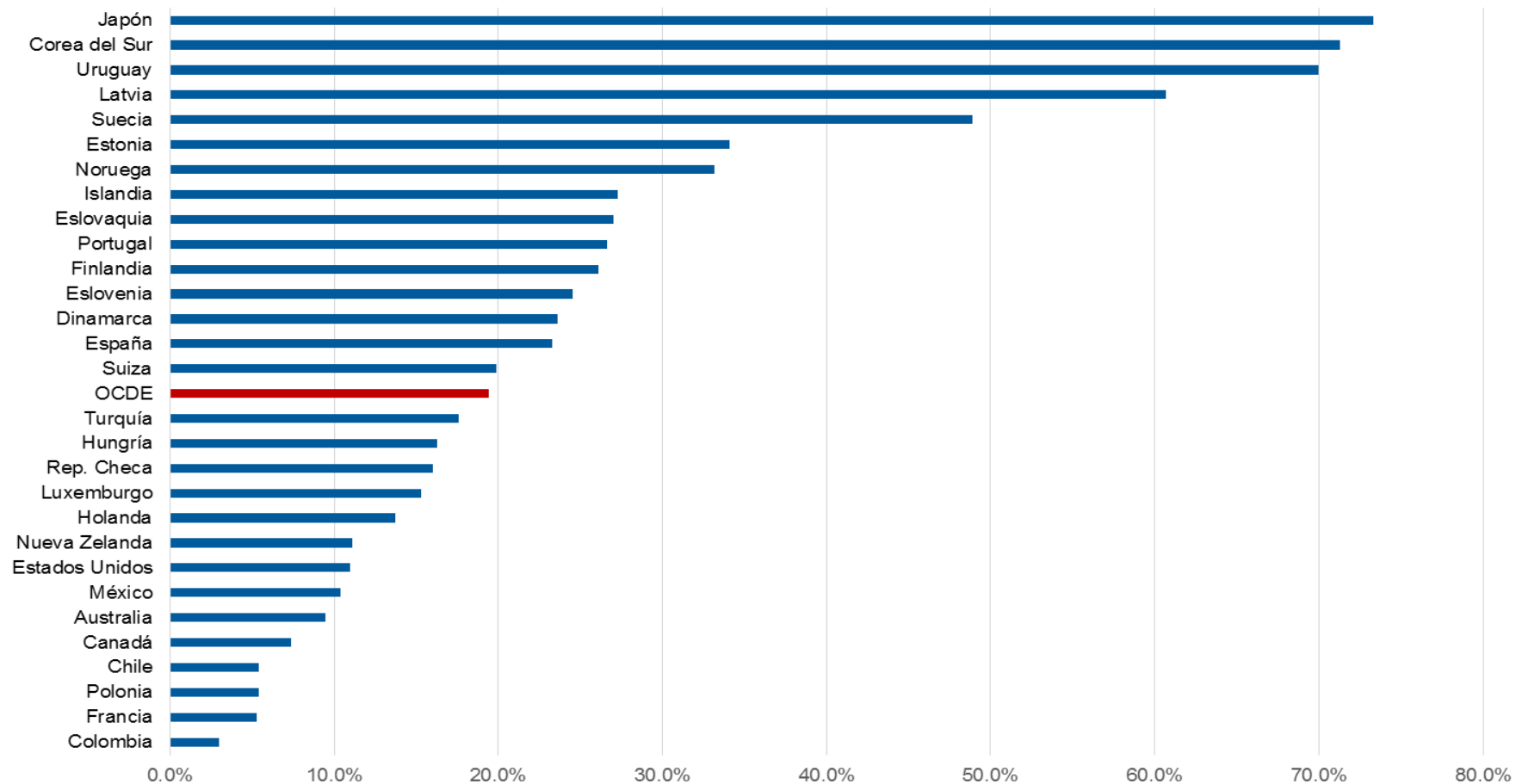
Figure 2.4. Growth of Cellular IoT Connections and Cellular IoT as Percentage of IoT Market – 2010-2022.

CONNECTED LINES w/ IoT / M2M



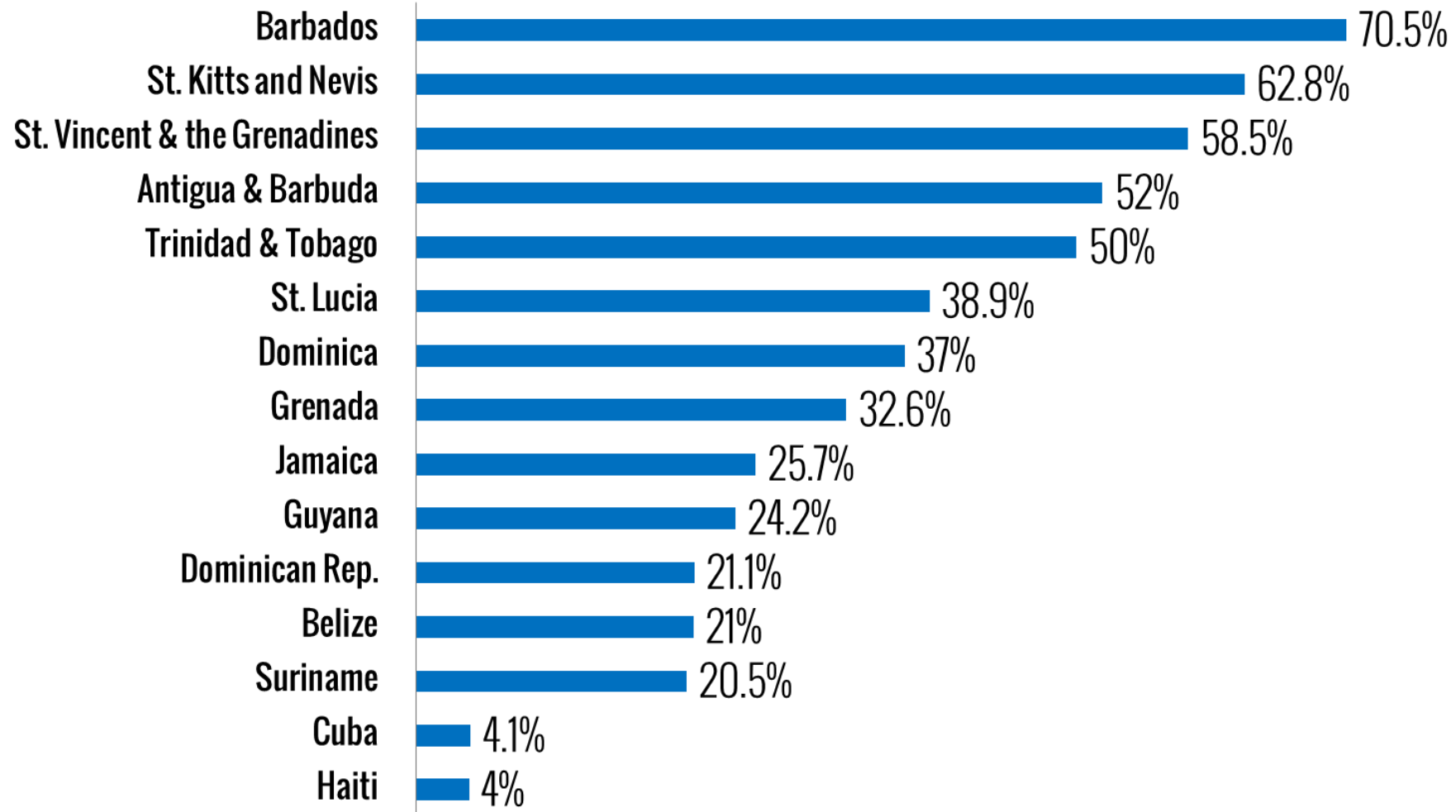
Figure 2.5. IoT Market Growth by Device Type 2015 – 2022.

FTTH SHARE



Source: OECD

CARIBBEAN INTERNET HOUSEHOLD PENETRATION



ITU SPECTRUM RECOMMENDATIONS



	Spectrum Requirement RATG 1 (MHz)			Spectrum Requirement RATG 2 (MHz)			Total Spectrum Requirement (MHz)		
	2010	2015	2020	2010	2015	2020	2010	2015	2020
Year	2010	2015	2020	2010	2015	2020	2010	2015	2020
Low POP Density	840	880	440	0	420	900	840	1300	1340
High POP Density	760	800	540	0	500	1420	760	1300	1960

SMART CITIES



The British Standards Institute (BSI) defines smart cities as **‘the effective integration of physical, digital and human systems in the built environment to deliver sustainable, prosperous and inclusive future for its citizens’** (BSI, 2014).

Cisco defines the term as those cities that adopt **‘scalable solutions that take advantage of information and communications technology (ICT) to increase efficiencies, reduce costs, and enhance quality of life’** (Falconer and Mitchell, 2012).

What most smart city definitions have in common is that they consider the **use of smart technologies and data as the means to solve cities’ sustainability challenges** – economic, social and environmental issues. Smart technologies can be classified, broadly, as ICT solutions. They range from expensive hardware solutions such as city control centres, smart grids and autonomous vehicles, through to much lower cost solutions such as smartphone apps, online platforms that crowdsource citizens’ ideas and low-cost environmental sensors. Data is also central to smart cities, in particular the use of big data and open data.

The approaches to smart city initiatives can be classified into two main approaches: ‘top-down’ and ‘bottom-up’ (Centre for Cities, 2014). Top-down approaches focus on **technology, efficiency and master planning**, integrating data from different systems into a central operations centre. Bottom-up approaches focus on **citizens and how they can use innovative technologies, such as social media, mobile applications and open data to create solutions** to issues that matter to them and enable behaviour change.

WEF GLOBAL IT REPORT RANKINGS



	Network Readiness Index (Rank)	Mobile network coverage, % of pop (Rank)	Int'l Internet bandwidth, kb/s per user (Rank)
Barbados	4.6 (34)	100 (1)	52 (53)
Guyana	3.7 (93)	97.1 (92)	10.2 (99)
Haiti	2.5 (137)	NA (NA)	NA (NA)
Jamaica	3.9 (82)	95 (103)	32.3 (67)
Suriname	3.2 (113)	100 (1)	201.6 (12)
Trinidad & Tobago	4 (70)	100 (1)	17.2 (89)
Dominican Republic	3.6 (95)	97.4 (91)	18.9 (85)
Puerto Rico	4.5 (44)	68.4 (134)	136.9 (18)

Source: WEF

WEF GLOBAL IT REPORT RANKINGS



	Importance of ICTs to gov't vision (Rank)	Impact of ICTs on access to basic services (Rank)	Internet access in schools (Rank)
Barbados	3.9 (72)	4.5 (53)	5 (44)
Guyana	4 (58)	4 (75)	4.2 (71)
Haiti	2.6 (137)	2.9 (137)	2.6 (129)
Jamaica	3.6 (92)	3.6 (103)	4 (83)
Suriname	2.9 (128)	3 (133)	2.7 (125)
Trinidad & Tobago	3.6 (88)	3.7 (98)	4.5 (64)
Dominican Republic	3.4 (101)	3.9 (84)	3.5 (104)
Puerto Rico	3.8 (79)	4.6 (48)	4.8 (54)

SUMMARY



- The Caribbean market evolved... voice and SMS no longer the main revenue generators. High speed connectivity enabling access to differentiated content defines the new scenario.
- Increased demand in broadband services – wired and wireless technologies – are driving the regional capacity market.
- Puerto Rico and Dominican Republic leading LTE adoption in Central America, while Cuba's immediate future is not certain.
- Caribbean telecommunications development depends of 3 variables related to capacity: spectrum, fiber optics, and international gateways.

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Questions?