



EMBRAER GROUP

SOLID

SUSTAINABLE

STRATEGIC

5G in Brazil ... the Way Ahead

Space + Terrestrial - the 5G Journey

Nov 9th 2021

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OUTLINE

- ATECH
- 5G Auction Notice
- Backhaul Scenario
- Satellite Opportunity Scenario



ATECH

■ STRATEGIC DEFENSE COMPANY

- Law number 12.598 (Ministry of Defense);
- Absorption and domain of Technological Complex Systems;
- Strategic Partners;
- Integrator for national technological projects of high significance;
- Development and Management of technological solutions for Critical Systems;
- Conception and Integration of strategic programs.

SDP – Strategic Defense Products

SAGITARIO

DACOM

H-XBR

SIGMA

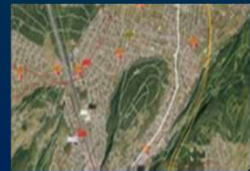
SPA-GE

SOpM

SPA-C2



ATECH



C2 | C4iSR



ATM



INSTRUMENTATION
& CONTROL



SIMULATION



EMBEDDED
SYSTEMS



ASSET
MANAGEMENT
AND LOGISTICS



CYBER
DEFENSE



IoT

Specify

Conceive

Develop

Manage

Integrate

An **Embraer Group Company**, with unique expertise in **system engineering** and technologies of **situational awareness** and **support to decision-making**.

Complete domain of the system life cycle, with proved competence **in world-class technology solutions**.

Delivery of innovative solutions that transform processes, technologies and integration of systems into **intelligence, efficiency** and **optimization**.

5G Auction Notice

- Lots distributed over four frequency groups

Frequency	Lot Group	Lot Types
700 MHz	A (National)	A1
2,3 GHz	E, F (Regional)	E1, E3, E4, E5, E6, E7, E8 F1, F3, F5, F6, F7, F8
3,5 GHz	B, D (National)	B1, B2, B3 D33, D34, D35
	C (Regional)	C2, C4, C5, C6, C7, C8
26 GHz	I (National)	I6
	G, H, J (Regional)	G1, G2, G3, G4, G5 H19, H25, H31, H37, H38, H39, H40, H41, H42 J20, J26, J32, J33

5G Auction Notice

■ Auction Winners

Company/Consortium	Auctioned off lot
Algar Telecom	C8, F8, H37, H38, H39, H40, H41
Brisanet	C4, C5, E4
Claro (América Móvil)	B1, D33, E1, E3, E5, E6, E8, G1, G2
Cloud2U	C7
Consórcio 5G Sul	C6
Flylink	H42
Neko	J32
Sercomtel	C2
TIM (Telecom Italia Mobile)	B3, D34, F6, F7, H19, H25, H31, I6, J20, J26, J33
Vivo (Telefonica)	B2, D35, E7, F1, F3, F5, G3, G4, G5
Winity II	A1

5G Auction Notice

- Some Obligations
 - Block A

Due Date	Dec 31 2023	Dec 31 2024	Dec 31 2025	Dec 31 2026	Dec 31 2027	Dec 31 2028	Dec 31 2029
Aim Counties Annex XII	40%	70%	100%	X	X	X	X
Aim Counties Annex XVII	X	X	X	100%	X	X	X
Aim Roads Annex XIII	10%	20%	50%	70%	90%	100%	X
Aim Roads Annex XVII	X	X	X	X	X	X	100%

- 4G Technology
- 35.784 km of roads and 625 counties
- No mention about the backhaul technology

5G Auction Notice

- Some Obligations
 - Blocks E and F

Due Date	Dec 31 2023	Dec 31 2024	Dec 31 2025	Dec 31 2026	Dec 31 2027	Dec 31 2028	Dec 31 2029
Aim Counties Annex XVI	40%	100%	X	X	X	X	X
Aim Localities Annex XVII	10%	20%	40%	60%	80%	100%	X
Aim Localities Annex XIX	X	X	X	X	X	X	100%

- 4G Technology
- Counties and localities with less than 30.000 inhabitant.
- No mention about the backhaul technology

5G Auction Notice

- Some Obligations
 - Blocks B, C and D

Due Date	Dec 31 2023	Dec 31 2024	Dec 31 2025	Dec 31 2026
Aim Counties Annex XV	40%	70%	100%	X
Aim Localities Annex XVIII	X	X	X	100%

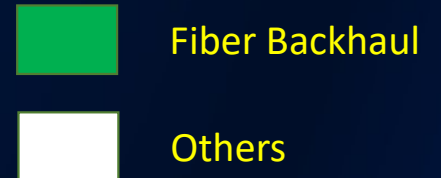
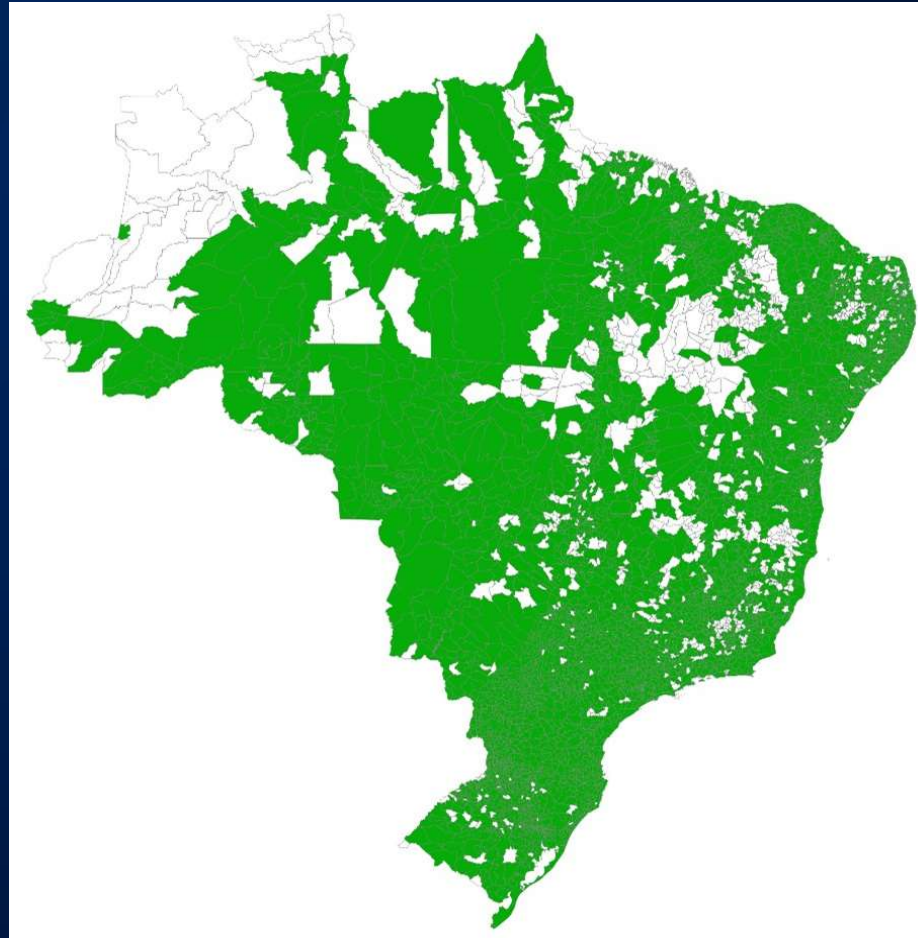
- Transport network
 - ✓ 1 Gbps – Less than 20.000 inhabitant
 - ✓ 10 Gbps – More than 20.000 inhabitant

5G Auction Notice

- Some Obligations
 - Blocks B and D

Due Date	Jul 31 2022	Jul 31 2023	Jul 31 2024	Jul 31 2025	Jul 31 2026	Jul 31 2027	Jul 31 2028	Jul 31 2029
Aim Capitals Annex XIV-A	100%	100%	100%	X	X	X	X	X
Aim Cities Annex XIV-A	X	X	X	P > 500000	P > 200000	P > 100000	50% (P > 30000)	100% (P > 30000)
Aim Localities Annex XIX	X	X	X	X	X	X	X	100%

Backhaul Scenario



Backhaul Scenario

AMAZON

Area: 5.200.000 km²



32 EUROPE COUNTRIES

Area: 5.200.000 km²

Satellite Opportunity Scenario



- In regions with difficulties for terrestrial links
 - Satellite can enable the flow from regions of difficult access to the wired backbone.
- Deadlines for service availability
 - The winners that foresee that the terrestrial transport network will not be ready to attend the Auction Notice date requirements could setup a “Plan B” with satellite backhaul.





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