



PANGOS Advisory · Vila Clementino, São Paulo — Brasil

Executive Capability Statement

Market entry, regulatory strategy and technical advisory for utilities, critical infrastructure and digital communications in Brazil and Latin America

STRATEGY · REGULATION · EXECUTION

Why PANGOS Advisory Exists

A utility's communications decision outlives three governments and two technology generations. The network specified today will still be carrying protection signals in 2055.

International technology companies enter Latin America with excellent products and proven deployments elsewhere. Many still fail to convert that into business. The obstacle is almost never the technology.

It is that regulated infrastructure markets do not behave like the markets these companies already know.

- **Procurement.** Not a purchase, but a thirty-year commitment — evaluated by engineers who will be held accountable for it long after the salesperson has moved on.
- **Regulation.** Not paperwork. Spectrum allocation and homologation determine which architectures are even possible, before a commercial conversation can begin.
- **Reference sites.** Not marketing. A utility will not deploy what a peer utility has not already operated successfully.

Companies that succeed in consumer, enterprise or fintech markets across Latin America routinely fail here. The local knowledge that works in those sectors does not extend to regulated infrastructure. Distributors and tax advisors do not solve spectrum. Country managers do not solve teleprotection latency.

PANGOS Advisory reduces the time, cost and risk of entering and growing in Latin America's critical infrastructure markets — by combining the engineering credibility utilities require, the regulatory access markets demand, and four decades of building these businesses from a standing start. The same capability runs in reverse: PANGOS Advisory also helps companies from Latin America, including Brazil, expand into international markets.

The Evidence

Four decades of building markets, running production across them, and negotiating the agreements that hold them together.

30+ COUNTRIES — MARKET ENTRY DELIVERED	44 UTILITY GROUPS ENGAGED	\$200M+ UTILITY CONTRACTS QUOTED & MANAGED	15× REGIONAL REVENUE GROWTH
5 COUNTRIES — PLANTS UNDER MANAGEMENT	40+ YEARS IN THE SECTOR	IEEE LIFE SENIOR MEMBER	802.16 WIMAX STANDARDS CONTRIBUTOR

Four capabilities, one career

The same discipline runs through every company, in every decade — clear the regulation, build the channel, earn the utility relationships, align the technology with market reality. It is the rule that makes the work succeed, and it repeats. Raychem. Madeco. Huber+Suhner. L-3 Communications. Extricom. Proxim. Sub10 Systems. 4RF. Ubiik Mimomax.

- **Market creation.** A company with a strong product and no foothold in Latin America, Southern Europe or the Caribbean. Within a few years: a regulatory pathway, a channel of local partners, and a book of utility or carrier customers where none existed before.
- **Manufacturing and trade.** Commercial responsibility across manufacturing plants in five countries at Madeco, through the restructuring that followed Mercosul. Brazilian production established and exported across Latin America at Huber+Suhner. US and New Zealand production exported into Southern Europe and the Americas at 4RF and L-3.
- **Global framework agreements.** Negotiated and activated with Telefónica, Telecom Italia and Telmex at L-3; with Iberdrola, ENEL, EDP, Naturgy, Grupo Suez and Siemens at 4RF. Frameworks that clear procurement, engineering, and legal at the parent level, then activate country-by-country.
- **Regulatory access.** Homologation and spectrum pathways cleared across multiple jurisdictions, in every decade of this career — most recently in an engagement with Ubiik Mimomax across Latin America and the Caribbean, including direct participation in Brazilian proceedings that supported a favorable outcome for utility private-network spectrum.

At 4RF, a regional operation generating \$250,000 a year became a \$4 million business over ten years — while the team shrank from three full-time engineers to two part-time, replaced by an in-country partner network.

Who We Help

Three types of organization, with three different questions.

Technology Companies <i>How do we enter this market?</i> – Telecom and radio vendors – Grid and metering technology providers – Industrial IoT and OT suppliers – Manufacturers weighing import vs. local production	Utilities & Operators <i>Will this decision still hold in 2055?</i> – Communications roadmap and architecture – Modernization strategy for the installed base – Independent technology evaluation – Spectrum and regulatory positioning	Investors & Acquirers <i>Does the thesis survive contact?</i> – Technical due diligence – Market validation and sizing – Regulatory exposure assessment – Competitive landscape review
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Common to all three: a decision that depends on how regulation, engineering and market behavior interact — and a cost of getting it wrong measured in years, not quarters. Increasingly, a fourth: regional companies asking how to take proven capability into international markets.

What PANGOS Advisory Does

Six practices. Each addresses a barrier that stops good technology from reaching the field.

1. Regulatory Market Entry & Homologation

The barrier most vendors hit first, and the one they are least equipped to clear. Spectrum policy, certification pathways, ANATEL frameworks, and direct engagement in proceedings that shape utility private-network deployment.

2. Channel & Partner Ecosystem Development

VAR and system-integrator networks built and governed from zero — across 30+ countries at 4RF, and from scratch at Sub10, Extricom, Proxim and Huber+Suhner. Training programmes, certification paths and partner economics included.

3. Utility & Critical-Infrastructure Access

Long-term relationships with utilities and regulators across Latin America and Southern Europe; representation before UTCAL, CIGRE and CIRED. Positioning against real use cases: SCADA and automation, smart metering, distribution automation, mission-critical teleprotection.

4. Independent Technical Advisory

Vendor-neutral evaluation of architectures, technologies, business cases and investment opportunities. Private LTE/5G, LPWAN, 450 MHz, IEC 61850, deterministic communications, resilient network design. The objective is the right architecture, not a preferred product.

5. Manufacturing, Trade & Footprint Strategy

Whether to import, assemble or manufacture in-region — and what that decision costs. Multi-country production footprints, Mercosul and cross-border trade flows, tariff and local-content exposure, and the certification consequences of each route. Built on plants managed across five countries and Brazilian production exported region-wide.

6. Executive Education & Knowledge Transfer

Keynotes, executive briefings and technical workshops for leadership teams, engineering organizations and industry associations — at DISTRIBUTECH, UTC and UTCAL forums, IEEE working groups, CIGRE, CIRED and Capacity LATAM.

Where PANGOS Changes the Outcome

Three situations that recur, and what changes.

“We have a strong product. How do we enter Brazil?”

TYPICAL STARTING POSITION

No homologation pathway identified
 No utility relationships
 Regulatory timeline unknown
 One distributor assumed to cover the region
 Positioning built for a different market

AFTER ENGAGEMENT

Certification route mapped and underway
 Named utility contacts and live discussions
 Regulatory calendar and dependencies understood
 Country-by-country channel structure
 Positioning built around utility use cases

“We need confidence before we invest.”

Independent technical and market due diligence for investors and acquirers: architecture assessment, competitive landscape, regulatory exposure, realistic adoption timelines, and a vendor-neutral read on whether the technology thesis holds in the markets it claims.

“Our architecture decision has to last twenty years.”

Utility-side advisory on communications architecture: what to retain, what to integrate, what to replace, and how to specify platforms so the radio generation can turn over without disturbing the operational systems above it. Assessed on condition, criticality, risk and integrability — the framing regulators and asset-management colleagues already use.

Thought Leadership

PANGOS Advisory publishes independent, vendor-neutral technical work. It is how clients can assess the thinking before they commission it.

A Modular Communications Architecture for Critical Infrastructure

The foundation white paper. A layered architecture in which functional classes are matched to the bearers that suit them, legacy networks are integrated rather than islanded, and deterministic protection traffic is kept structurally separate from statistical layers.

Deterministic Communications as an Enabler of Modern Protection Coordination

The engineering case beneath the architecture. Protection coordination in increasingly dynamic power systems: IEC 61850, teleprotection, bounded worst-case latency, renewable integration. Why no statistical bearer satisfies determinism, however it is marketed.

Modernizing Without Forklifts · proposed for the UTC Journal

Utility telecom teams are rarely asked whether to modernize — they are asked what to do about the network they already have. Whether a legacy network is retained, integrated or succeeded is an asset-management decision driven by condition, risk and performance, not by equipment age or a vendor's roadmap. Aligned with recent CIGRE work on the regulatory treatment of ageing transmission and distribution assets.

One Grid, Many Spectrum Paths · proposed for CIGRE ELECTRA

Spectrum policy is national and diverges; propagation physics and grid traffic are universal and do not. Beneath the diversity of national band plans lies a single converging architecture. Spectrum is the long-lived asset; the air interface is not — a network built the other way round has its lifetimes inverted.

Earlier published work includes “Segurança para Field Area Network (FAN),” “Opções de roteamento eficiente para o Field Area Networks,” “Nuove soluzioni di modem radio per Reti Intelligenti,” and technical papers on private LTE and LPWAN architectures for utility SCADA, AMI 2.0 smart water metering for Latin America, and cell-size optimization for utility IoT under 3GPP and 450 MHz Alliance frameworks.

What Others Say

Regulators and industry associations

“Correct professional, sincere, knows the technical aspects, relates well, always with the aim of making things happen, delivering products.”

— **Vinicius Caram, Superintendent, ANATEL (Brazilian Telecommunications Regulator); President, CCP II–CITEL**

“He is one of my references when I think in mission-critical radios.”

— **Agostinho Linhares, PhD, IEEE Senior Member; Executive Director, IPE Digital — formerly ANATEL and Petrobras**

“He possesses a deep understanding of telecommunications technology, including wireless technologies and solutions for utilities network, and has consistently delivered high-quality results.”

— **Ronaldo Santarem, Vice President, UTC América Latina**

International business development

“He was passionate about growing the brand and the value 4RF could offer new customers. Outcome driven, with ‘no stone unturned’, diligent and fun.”

— **Clare Wilson, General Manager – International, New Zealand Trade & Enterprise**

Utilities and critical infrastructure

“Thanks to many years of hard work with successful results, he built up a strong credibility and portfolio with the top customers from LATAM to Europe.”

— **Paolo Torreggiani, Telecom Leader, Hitachi Rail**

“A implementação da infraestrutura de backbone para o maior projeto de smart meter da América Latina demandava uma liderança técnica sólida, cooperação eficiente e um comprometimento excepcional — qualidades que o Marco demonstrou com maestria.”

— **Lucas Romero Freitas, Head of Energy & Infrastructure Strategy — Eletropaulo smart-meter backbone project**

Market creation

“From zero presence of the company he succeeded to establish an infrastructure for sales channels and position the company as one of the leading vendors in this territory.”

— **Gabi Sitton, Extricom**

“Marco's dominance of the Latin culture and mode of doing business in these markets added to his technical professionalism make him the ideal combination for success in complex markets.”

— **Hernán Carrizo, Head of Sales — Communication Networks & Advanced Networks**

How We Engage

The six practices define what PANGOS Advisory delivers. The models below define how a client engages it — the same capability, structured to fit the stage a company is at.

Engagement models

- **Strategic Advisor.** Ongoing executive guidance on market strategy, positioning and expansion.
- **Fractional Business Development Executive.** Regional leadership without a permanent local structure — for companies entering a market before the volume justifies headcount.
- **Independent Technical Advisor.** Vendor-neutral review of architecture, technology and deployment strategy.
- **Due Diligence Expert.** Technical and market assessment for investors, acquirers and boards.
- **Speaker and Workshop Leader.** Keynotes, workshops and executive briefings for leadership and engineering teams.

How we work

Five stages. Every engagement ends with capability inside the client, not dependency on the advisor.

- **Understand.** Market, technology, commercial objectives and internal constraints.
- **Assess.** Regulation, competition, architecture, partner landscape, realistic timelines.
- **Recommend.** A practical strategy sized to the client's actual resources and appetite.
- **Execute.** Partner discussions, regulatory engagement, utility introductions, proposal support.
- **Transfer.** Documentation, briefings and training so the client's own team can carry it forward.

Technology companies rarely fail in Latin America because the technology is inadequate.

They fail when technology, regulation and market reality are never brought into alignment. That alignment is the work.

Marco Milos Pangos

Founder & Principal Advisor · Life Senior Member, IEEE · Member, CIGRE

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