

arkossa

CONNECTING ENERGY

Experience from Spanish Smart Metering Rollout using PLC technologies

History

- 28 Millions Smart Meters
- Prime and Meters & More Protocols
- 96% Smart Meters Installed
- Masive Rollout since 2012
- + 400 Small Utilities (1 Million Metering Points)



Smart Meters in Spain

- Iberdrola leading the technical specifications
- 80% Smart Meters installed in 5 Years (2012-2016)
- Almost 98% Finished for 2018
- Ecosystem based on Price Level
- 10 Meters Vendors (Just 5 for Data Concentrators)
- 92 Meter Hardware Models
- 5 Companions Versions (1.4 to 1.8)
- +250 Firmware Versions for DLMS Layer
- +80 Firmware Versions for PLC (Prime 1.3.6)



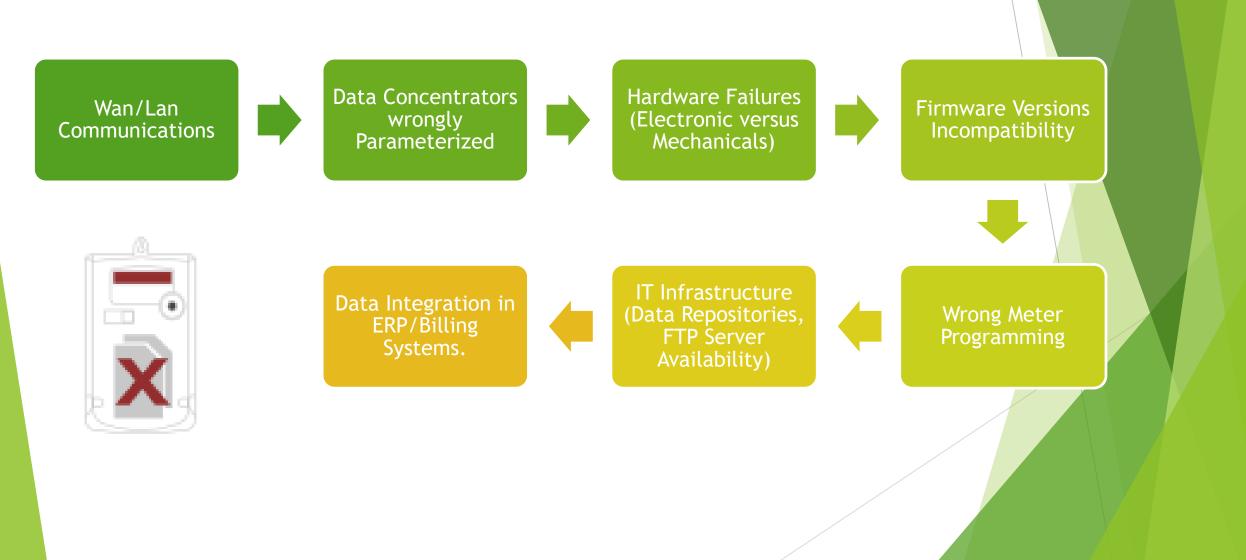
Customer Expectations

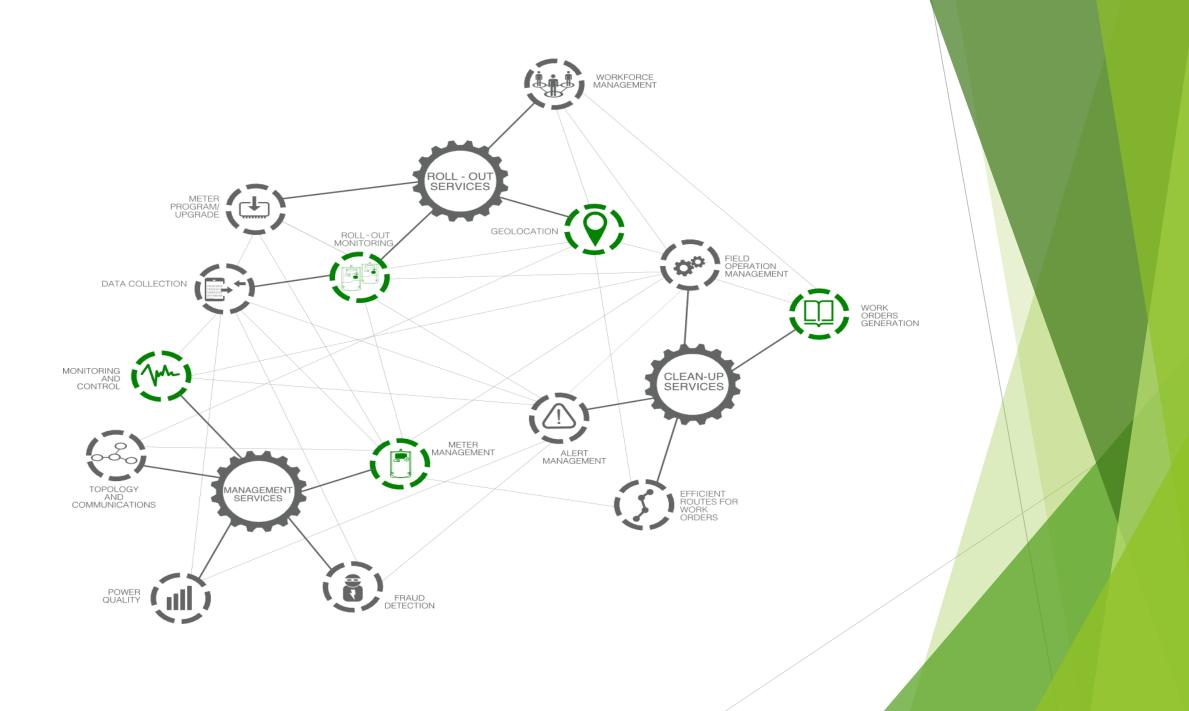
- Plug & Play Technology.
- Online System
- Multiple Vendors and Full Compatibility
- No Network Maintenance (Communnication Level)
- Meter Replacement Project
- Use the Same Non Skilled Staff for Field Services
- ▶ IT Infrastructure will support the Project.

Reality

- No Technology Transfer
- Utilities without Non Skilled Staff for Field Services
- Non Properly Tools for Network Maintenance & Operations
- Meter Vendors acting mainly as Meter Providers
- Lack of support for Field Services
- Penalties for Non Readings on Smart Meters.
- IT infrastructure not flexible and Scalable

Non PLC Problems





Arkossa's Solutions



arkossa

CONNECTING ENERGY

- Solution Provider
 - Consultancy Services
 - Training Provider
 - Project Management
- Hardware Solutions
 - Design Tools for Non Skilled People (Spectrum Analyzers, Meter Software APPS)
 - Design of Filters, Repeaters and Signal Amplifiers.
- Software Solutions
 - Big Data for Analysis For Network Operations
 - Flexible Data Integration

Arkossa's Solutions

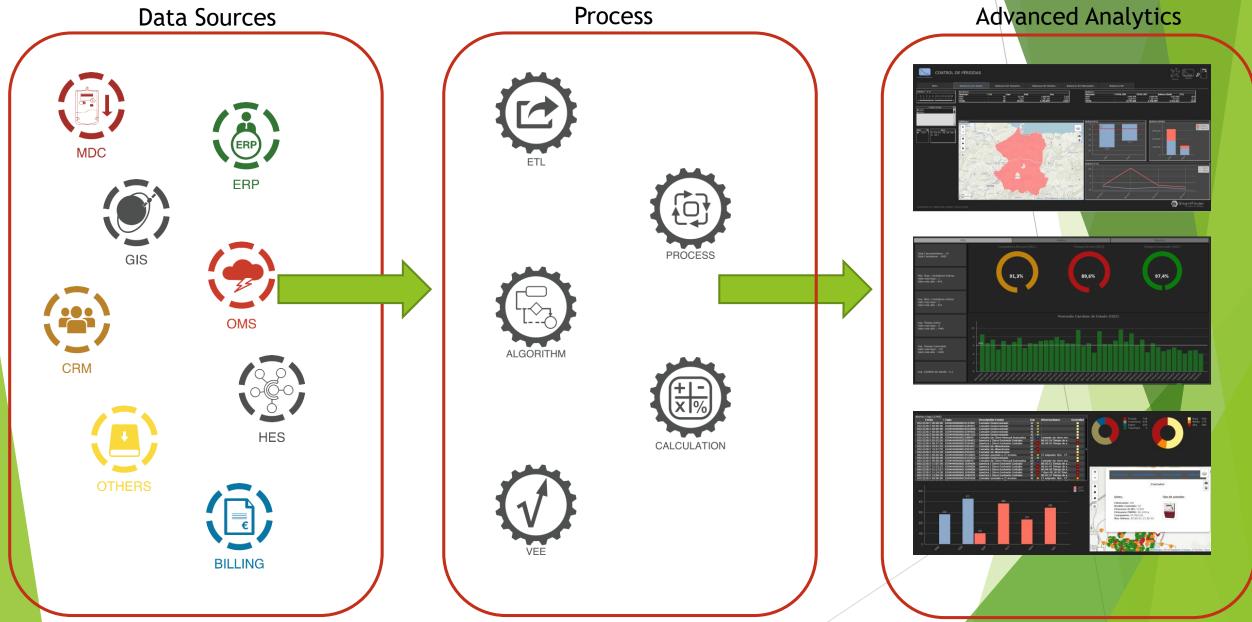
Using Arkossa's tools and Services, give to utilities enough capabilities for daily operations.

- With our Big Data Software tools:
 - PLC Readings Performance.
 - PLC Network Problems.
 - Detailed Analysis for Metering Points.
 - Work Orders Optimization.
- With our mobility tools:
 - Work Orders for field Services.
 - Software for Meter Management on Field.
- With our hardware tools:
 - PLC Signal Analyzer (NOISE)
 - Noise Localizator (Smart Box)
 - Filters & Repeaters
- With our Training Services:

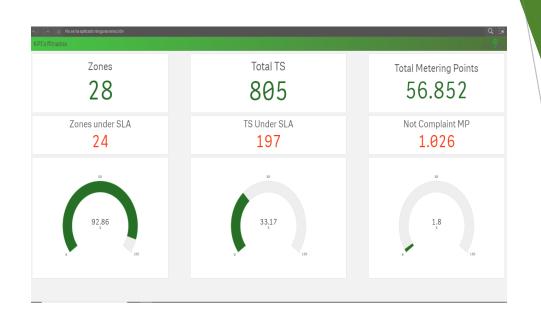
Trained Staff with skills for Noise Detection, Signal Analysis using our different tools (Noise, SmartBox, Arkoworker).

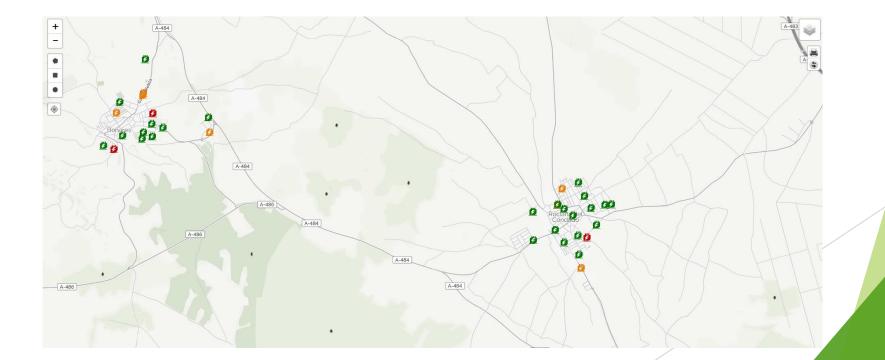


SMART FINDER



Analytics Tools





Analytics Tools



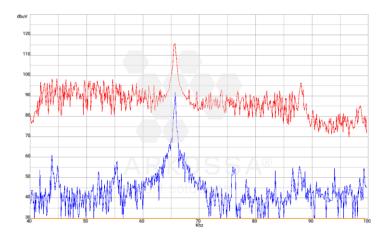
Field Services



							Order Date 26			18		
TS Pere el Gran							SubOrder: 4					
Adress			Location		S.L.A.1	Order 1	Order Type		Estado	final		
C Corro,326				345		Clean-l	Clean-Up		Finishe	ed		
Metering Point			Meter Numb	er	Meter Numb	er Replaced	d Not Match Metering		ring Poir	nt		
ES0113000056283707VJ0F			LGZ003183	3000								
Meter Seal Module Seal		Seal	Cabinet Seal		Meter Seal Ne	w Module	Module Seal New		Cabinet Seal New			
Observations												
3 Phase Meter with High Level of Noise affecting the PLC Band.												
Module Picture					Meter Picture							
						•						
PLC Signal Before Intervention					PLC Signal After Intervention							
Materials												
PLC Filter			Number				umber		Illation K	it		
BF 4	U	381	702494-A	381	102495-A	38170249	A-OI	No				

Repeater 3 Number

Location



Back Office Services

Alertas CT Alertas Cups

et 0		lor	
□ 127-C2001 28	□ 2000(1) □ 2007(2) □ 2016(1387 □ 2041(1) □	= ene(4)	(6) abr(17) jun(8) jul(20) aqo(27) sep(45 oct(90 nov(20)
0 127-C2003 219		ene(4) ene(2) end((0) (0)
0 127-02003 215			
	Alertas Cups (13878)	22	Alertas Cups (Grupos) 💫 Alertas Cups (Gravedad)
© 127-C2005 0	Fecha – des evento cups	Cod. Grp Gravedad	
□ 127-C2006 0			Fraude 758
□ 127-C2007 0	16/09/2016 00:00:00 Contador asociado a CT erroneo	11 AI	nventaric 13055
© 127-C2008 100	17/09/2016 00:00:00 Contador asociado a CT erroneo		Somunicacionas 0
© 127-C2009 12			Datos 3 Nivel 1 7
D 127-C2010 34	18/09/2016 00:00:00 Contador asociado a CT erroneo	11 AI	Topología -
0 127-C2011 164	19/09/2016 00:00:00 Contador asociado a CT erroneo	11 AI	Seguricad 0
□ 127-C2013 95		17 AF	
0 127-C2014 9547	19/09/2016 09:34:00 Cierre de la tapa precinto fabricante	13 AF	
0 127-C2014-2 768	19/09/2016 09:47:00 Fin Detección Tensión en bornes salida ante apertura E.Cort	18 AF	
0 127-C2015 17	19/09/2016 00:18:00 Inicio Detección Tensión en bornes salida ante apertura E.C.,	17 AF	
0 127-02013 17	19/09/2016 09:56:00 Fin Deteccion Tension en bornes salida ante apertura E.Cort	18 AF	
0 127-C2010 149	19/09/2016 09:57:00 Inicio Detección Tensión en bornes salida ante apertura E.C.,	17 AF	
	19/09/2016 10:24:00 Fin Detección Tensión en bornes salida ante apertura E.Cort	18 AF	
© 127-C2018 283	19/09/2016 10:24:00 Inicio Detección Tensión en bornes salida ante apertura E.C.,	17 AF	
□ 127-C2019 1 ▼	19/09/2016 10:51:00 En Detección Tensión en bornes salida ante apertura E.Cort	18 AF	
louns O	19/09/2016 10:51:00 Pri Detección Tensión en bornes salida ante apertura E.C	17 AF	Alertas Cups (Avg)
cups Q			ratedo se los Pajaniles
□ ES033000000000010LE1F001 0	19/09/2016 11:11:00 En Detección Tensión en bornes salida ante apertura E.Cort		
□ ES0330000000000020CD2F001 0	20/09/2016 00:00:00 Contador asociado a CT erroneo	11 AI	
© ES03300D0000000021CX0F 0	21/09/2016 00:00:00 Contador asociado a CT erroneo		
© ES033000000000022CB0F 0	21/09/2016 00:00:00 Reverso de Energia	3 AF	
D ES033000000000030CL3F001 0	21/09/2016 09:00:00 Reverso de Energia	3 🗌 AF	
ES03300000000031CC0F 0	21/09/2016 12:00:00 Reverso de Energia	3 🔽 AF	los Pajarilos
ES033000000000032CK0F 0	21/09/2016 17:00:00 Reverso de Energia	3 🚺 AF	
ES0330000000000040KY4F001 0	22/09/2016 00:00:00 Contador asociado a CT erroneo	II AI	
□ ES033000000000041KF0F 0	22/09/2016 15:00:00 Beverso de Eperaia	3 AF	
C ES0330000000000042KPCF 0			
	Alertas Cups (Meses)	2	
ES033000000000050KQ5F001 0			
ES033000000000051KV0F 0	ene	2003	
© ES033000000000052KH0F 0	feb	21.07	
© ES0330000000000061EG0F 0	Tep	2013	
D ES033C0D00000062EM0F 1	mar	2L41	
ES033000000000072ES0F C			
ES03300000000081TR0F C T	abriene		
			5226 Las Traseras
Gravedari Q	nLi ali		
O 1 Baja C A			
O 2 Media 13090	jul jan and a second a second and		
O 3 Alta 3			
0 4 Muy Alta 770 7	acio		
	sep		
Tipo Q.	cc:		
IAF Fraude 758			
2AI Inventario 13055	roy		
3AC Comunicaciones			
4AD Datos			
SAT Topología 62			
GAS Seguridad			300 m
	d 2000 /000 a000 8	8000 1000	1000 it 🕐 🦻 Qilik/Maps_ Map Data @ OpenStreetMap contribut
	L		

Conclusions

- PLC Works!!!
- Well deployed Projects Got an Average 95% of Meter Readings without Field Services
- Readings Performance and PLC Availability are different concepts.
- Utilities needs a new organization structure for Smart Grid Operations and Maintenance.
- Innovation is mandatory

Questions ?

international@arkossa.com