



IEC 61850 Global London

15th October 2019

New industrialized Substation Automation System

Project goals



Why use an SCT tool for the Engineering?

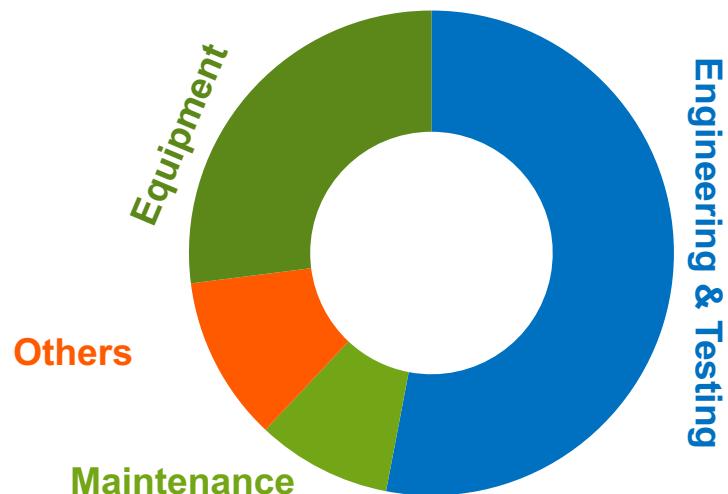
Industrialization



...Traditional
approach

Why a industrialized SAS?

Investment in Substations
will increase dramatically



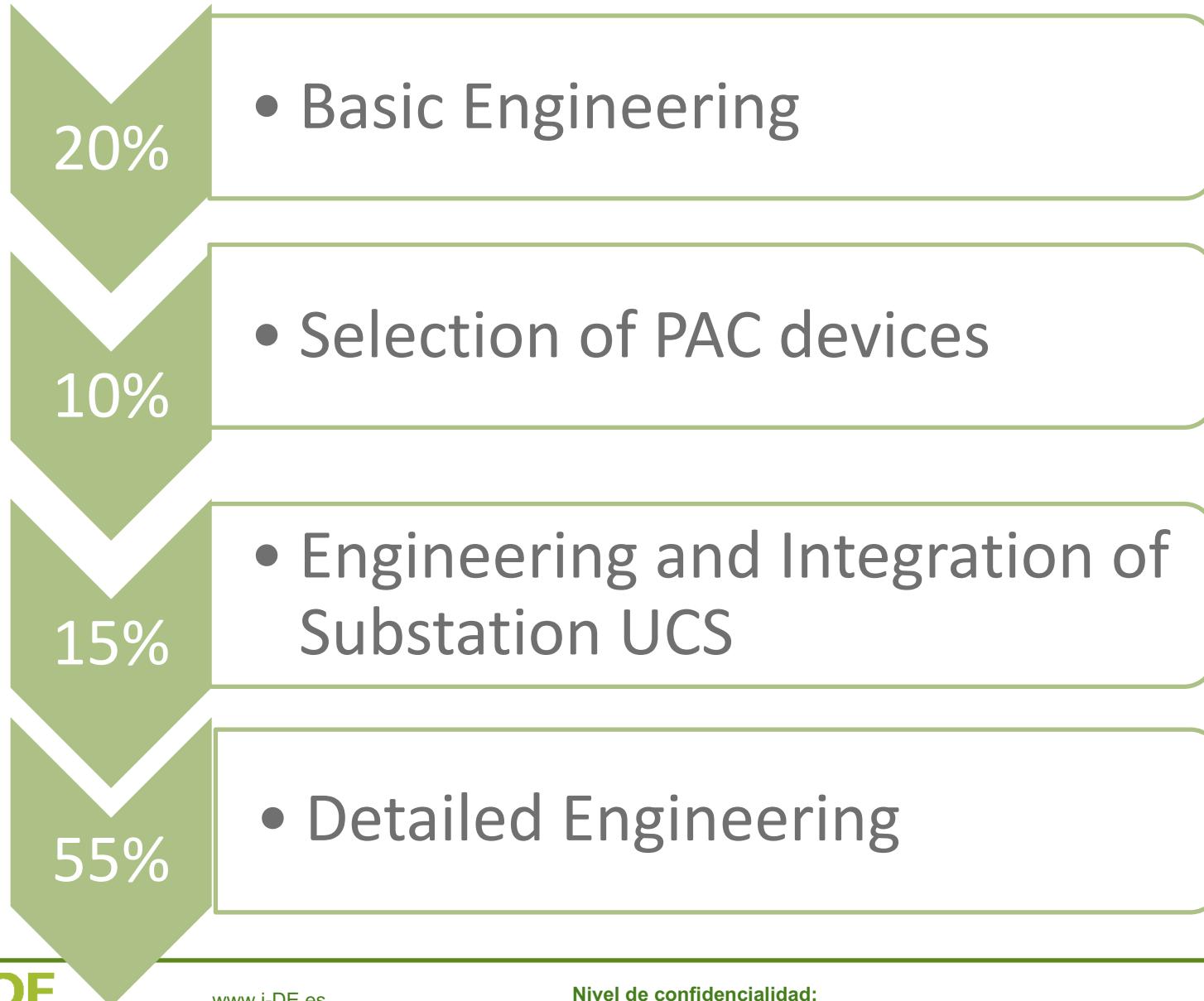
PAC SYSTEM LIFECYCLE COSTS (*Iberdrola Distribución, 2014*)

Industrializing SAS

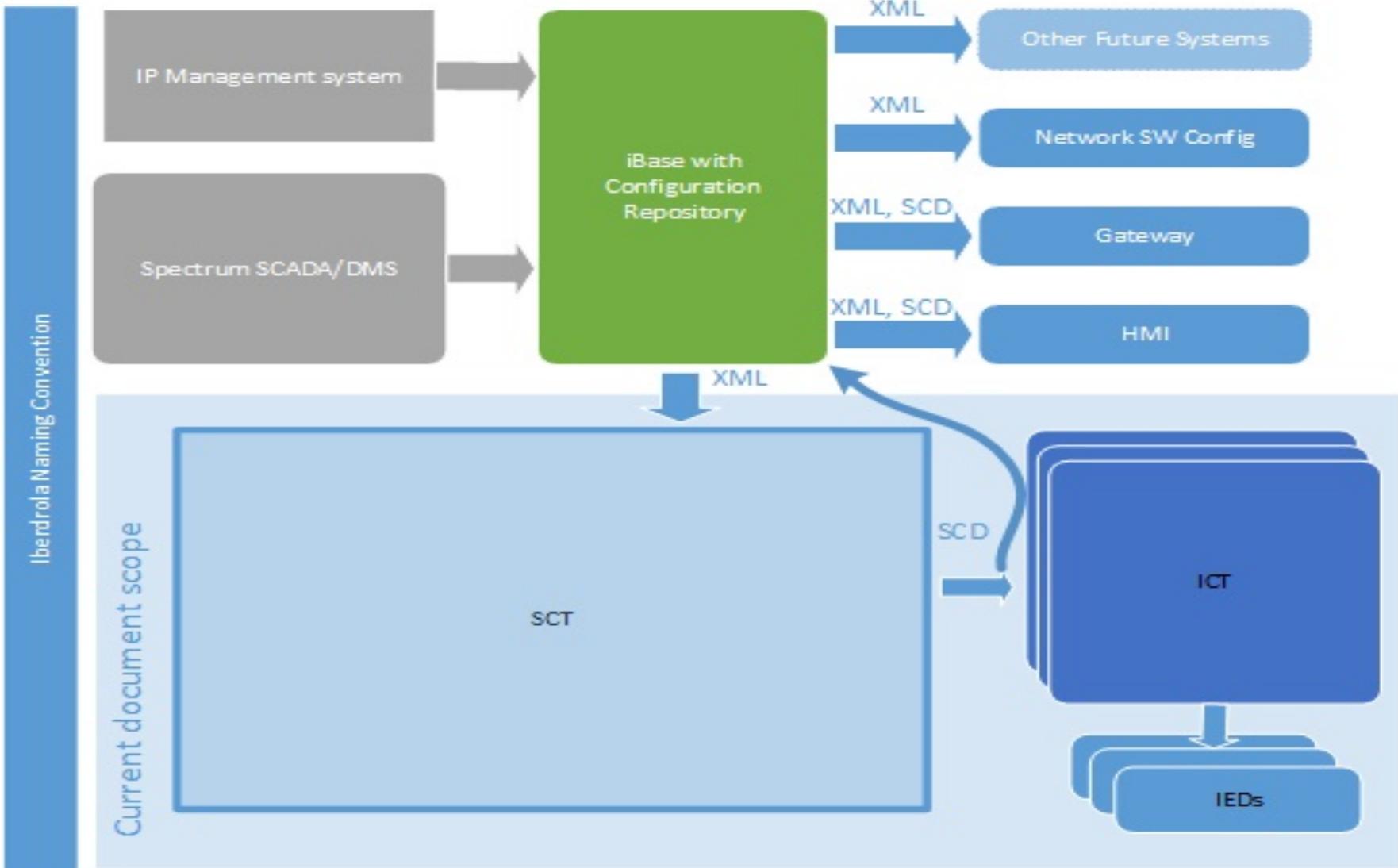
- Increased productivity, reliability & predictability
- Lower engineering and testing costs → efficiencies
- Delivering investments on time and budget

**APPLICABLE FOR NEW
SUBSTATIONS,
EXTENSIONS AND
REFURBISHMENTS**

Breakdown of Protection and Control Engineering



Does our engineering process follow the standard? Is the SSD sufficient input to the SCT tool?



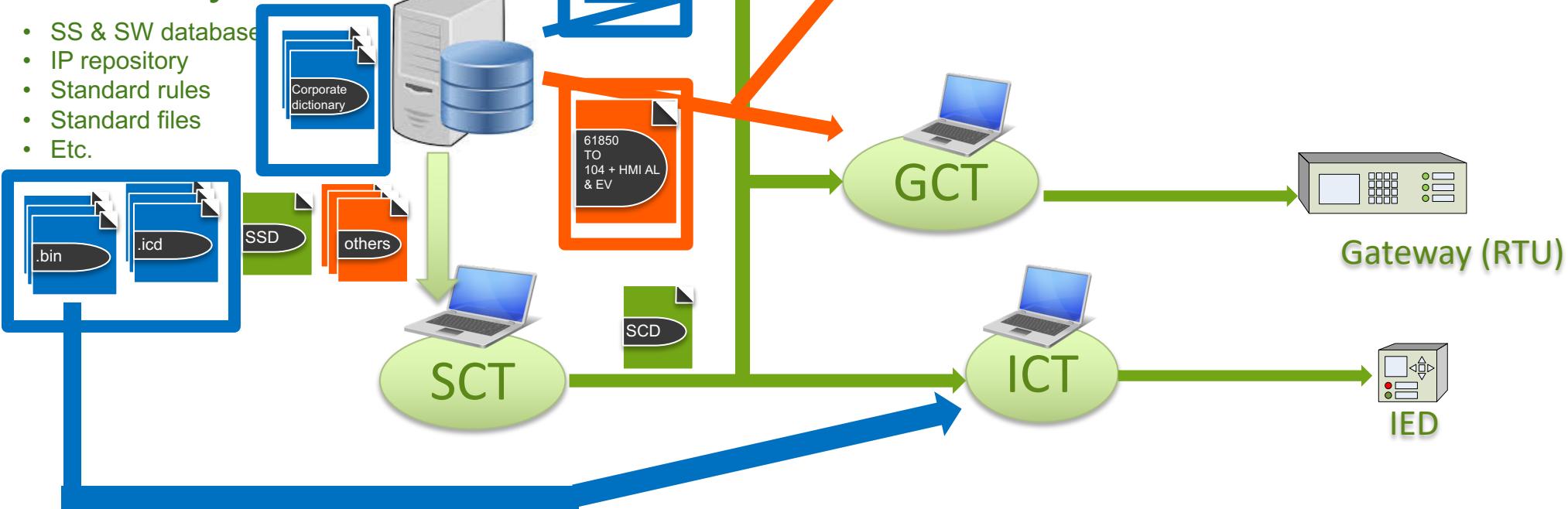
Engineering process

SPECTRUM



Central systems

- SS & SW database
- IP repository
- Standard rules
- Standard files
- Etc.



Project scope

Central Systems

ST Central Units

SCU

IED

Switchgear

Control Center (Spectrum)



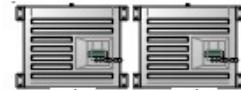
Remote users

Central management systems

Local console (HMI)



Firewall
Gateway (RTU)



SUBSTATION IEC61850 ETHERNET LOCAL AREA NETWORK

IEDs

Measurement Units

Bay Control Units

P+C Relays

Protection Relays & Disturbance recorders

Teleprotection Units

To Remote Stations

Remote Access Firewall



SAS configuration process

STANDARDIZATION

Bay type & IED type definition

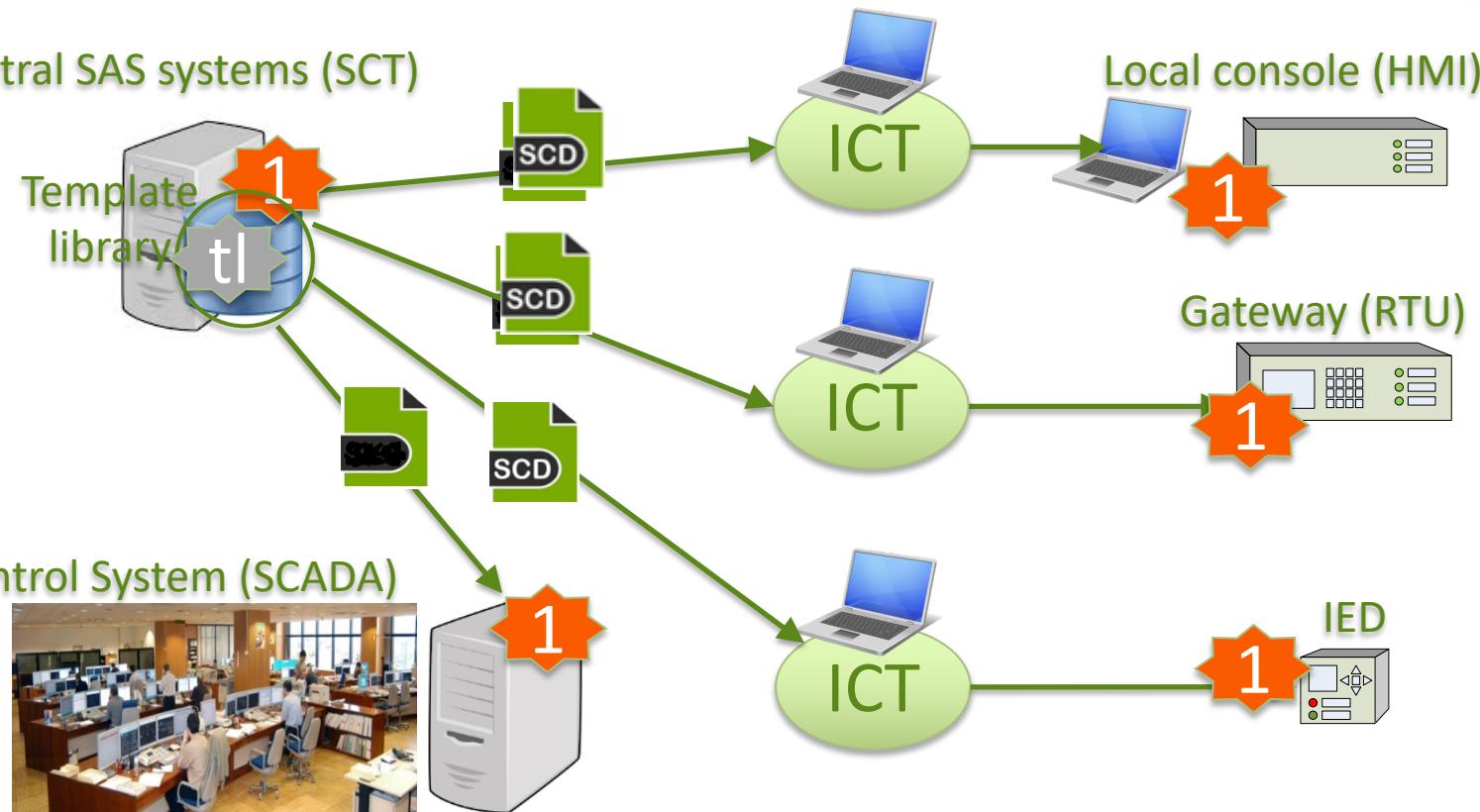
QUALIFICATION (supplier)

IED template generation

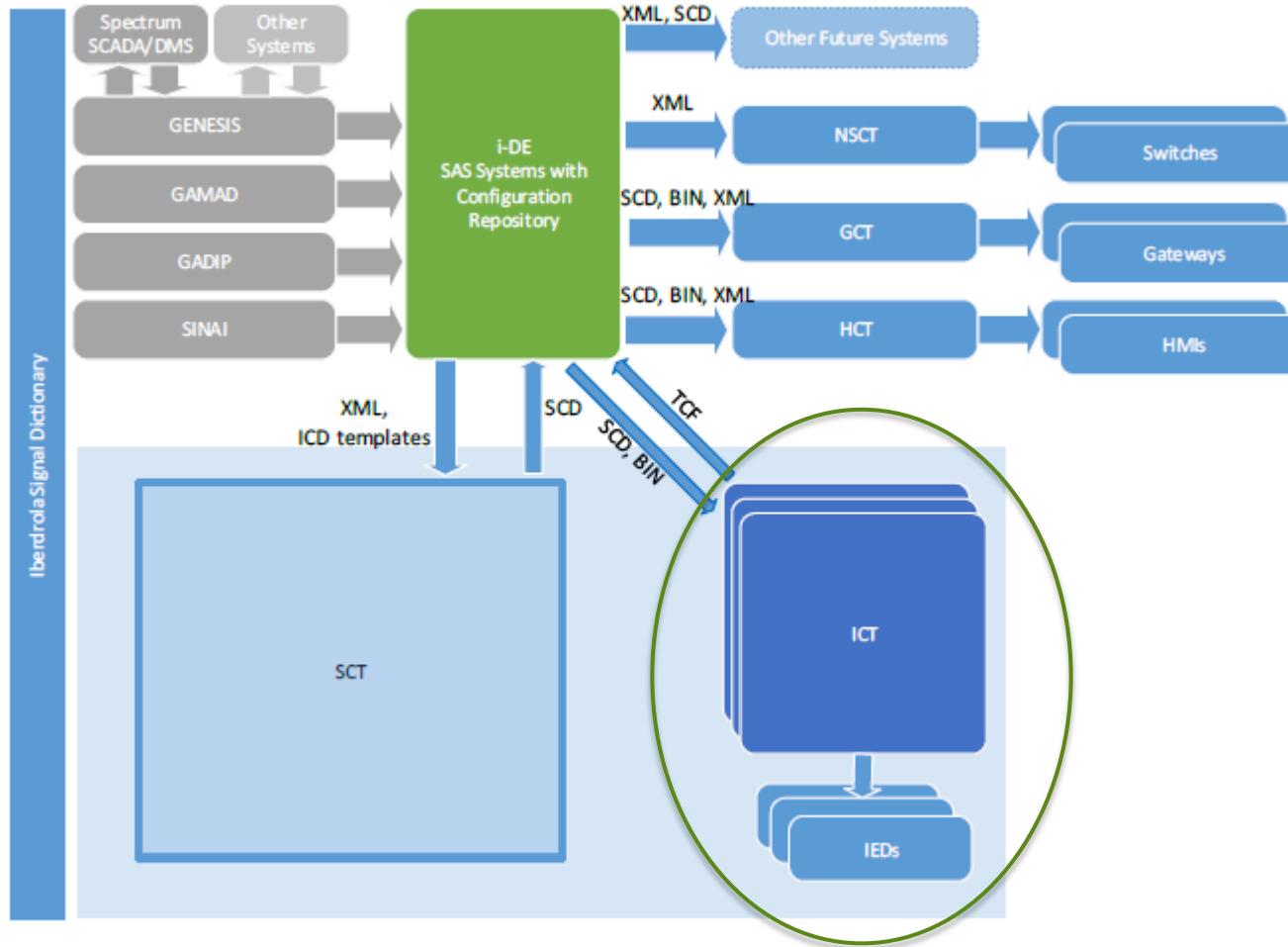
ONE-CLICK CONFIG.



Central SAS systems (SCT)



Central system developments



Great development effort: data integration, process automation

Requirement overview

ICT	Goose Engineering	Command line	Integrity check	Total configuration file
	IP comparison	Configuration comparison	Remote FW upgrade	No memory – external repository
IED	Flexible product naming	Protection functionalities	Analog/counter functionalities	Control functionalities
	Mechanical& electrical req. ROADMAP	IEC 61850 services	Log management (syslog)	File management (secure)

Maintenance & refurbishment



MAINTENANCE

Use original SCD file without changes



DOES NOT REQUIRE RECONFIGURATION OF OTHER DEVICES

REFURBISHMENT

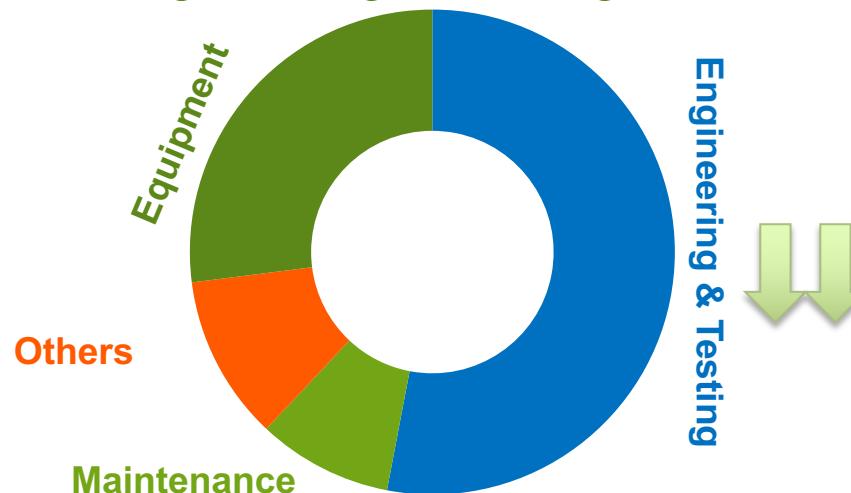
By voltage levels / modules to maximize industrialization
Separated HMI&Gateway (not shared for legacy protocols)



Benefits, Planning & Conclusions

Benefits

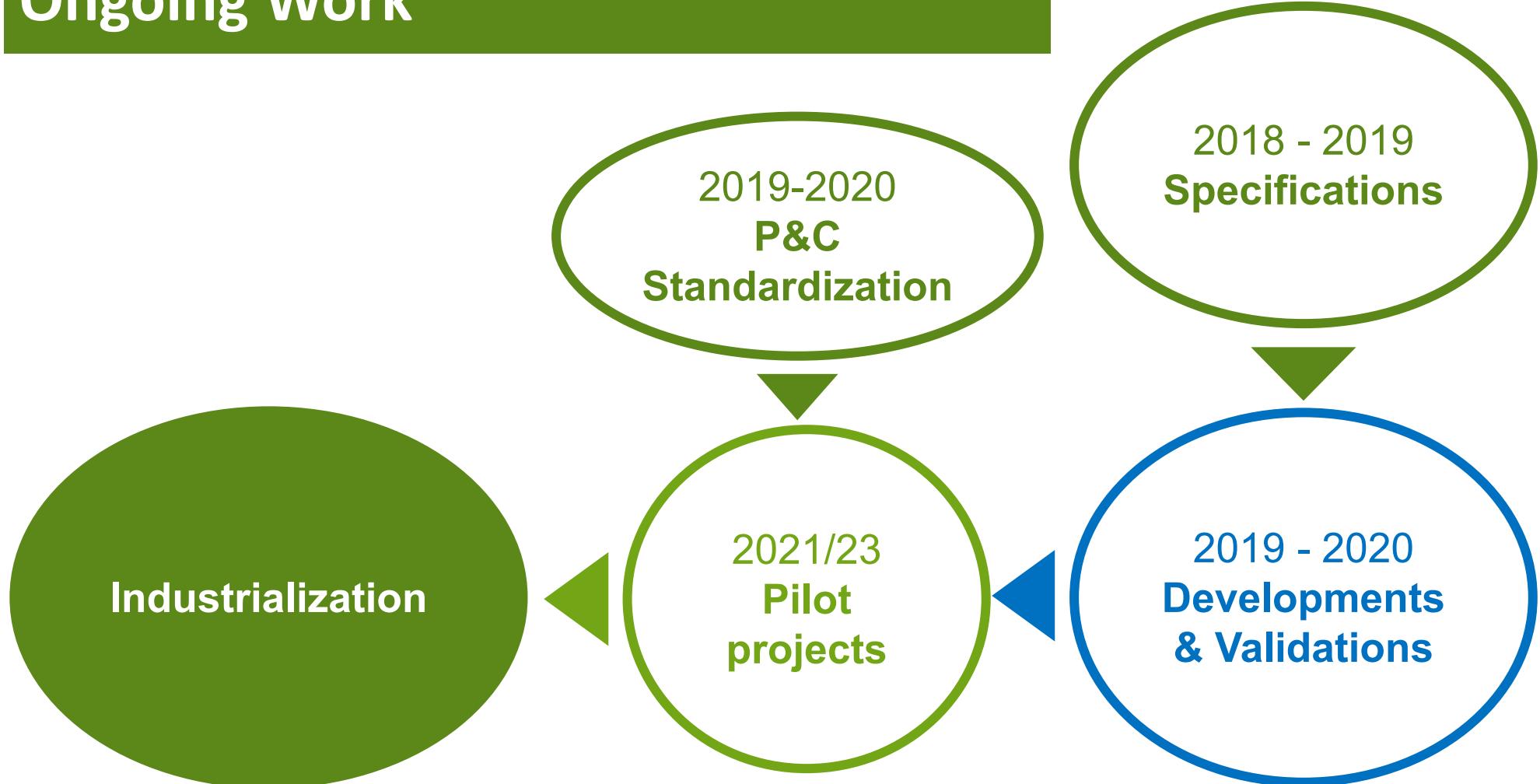
- Dramatic decrease in engineering & Testing costs.



PAC SYSTEM LIFECYCLE COSTS (Iberdrola i-DE, 2014)

- Much easier renewal of electronic devices (different asset life cycles).
- Optimized maintenance processes (remote access, monitoring & support).
- More simple solutions for the user, managed by more generalist departments.
- Could be applied Exportable to other utilities

Ongoing Work



Standardization to pull industrialization & automation

Creation of efficiencies

One data origin → data quality

Simplification & automation →
↓errors, tests, costs, time↓

Good approach for other parties / to be extended inside Iberdrola