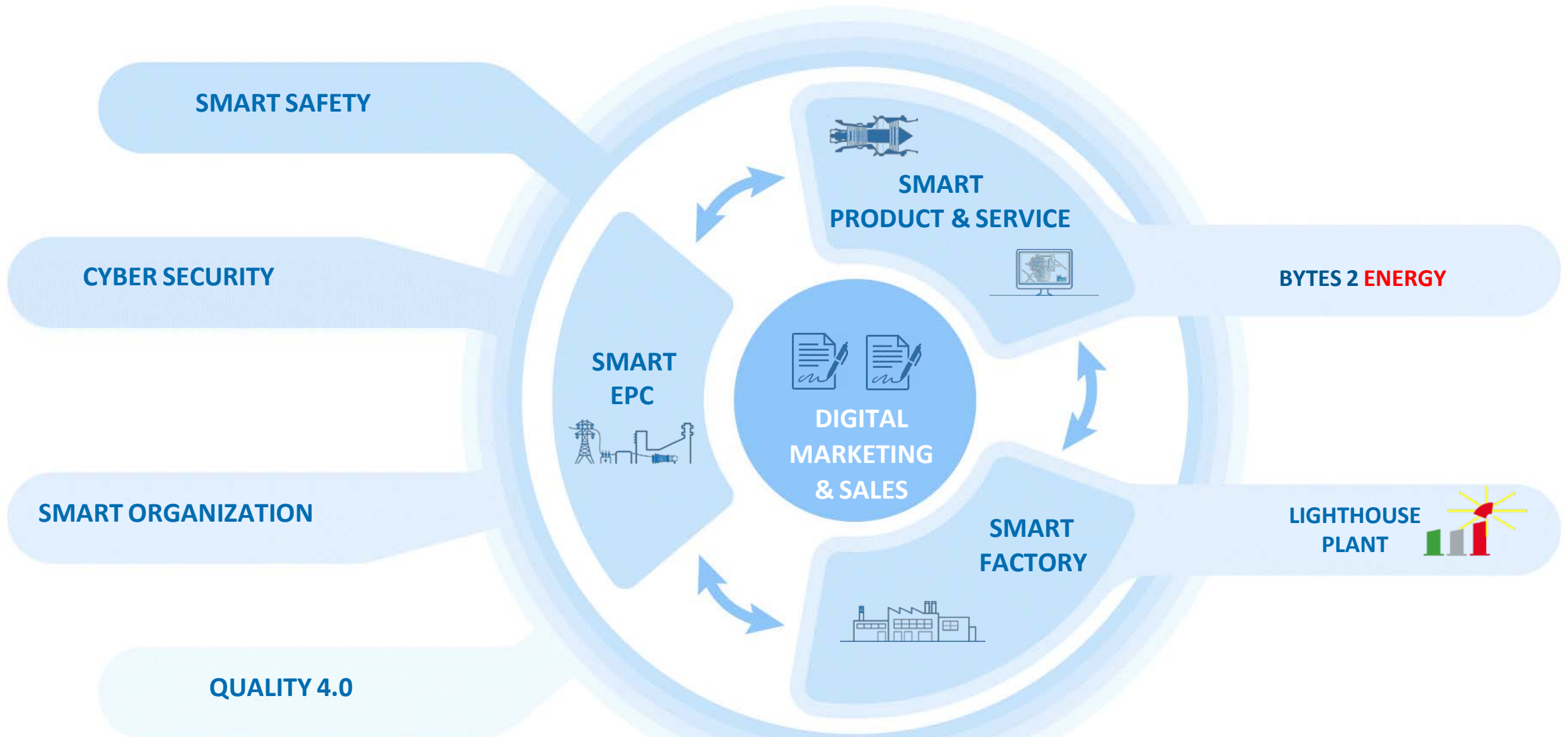




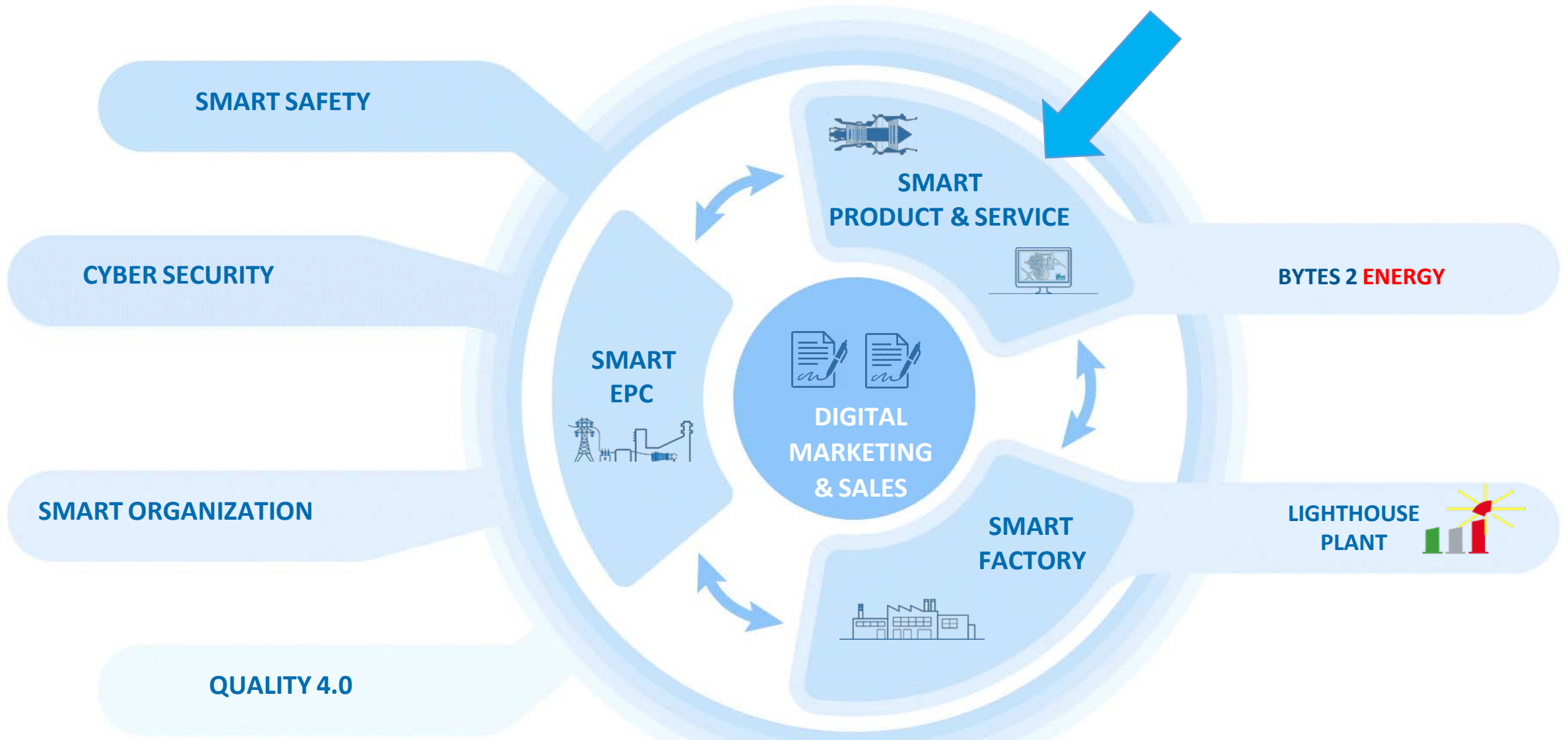
**Il Capitale Umano al centro della
Trasformazione Digitale di
Ansaldo Energia**

**Luca Manuelli
Chief Digital Officer**

La roadmap della Trasformazione Digitale di Ansaldo Energia

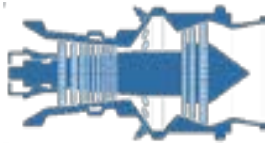


ANSALDO ENERGIA Digital Transformation



SMART PRODUCT & SERVICE

BYTES 2 ENERGY



**IoT PRODUCT
DEVELOPMENT
& PREDICTIVE
MAINTENANCE**

1

DESIGN

*Turbines and Plants
Customization*

2

MANUFACTURE

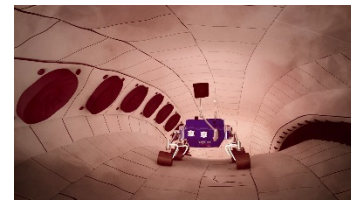
3

EPC

4

SERVICE

*Turbines and Plants
monitored
and managed*



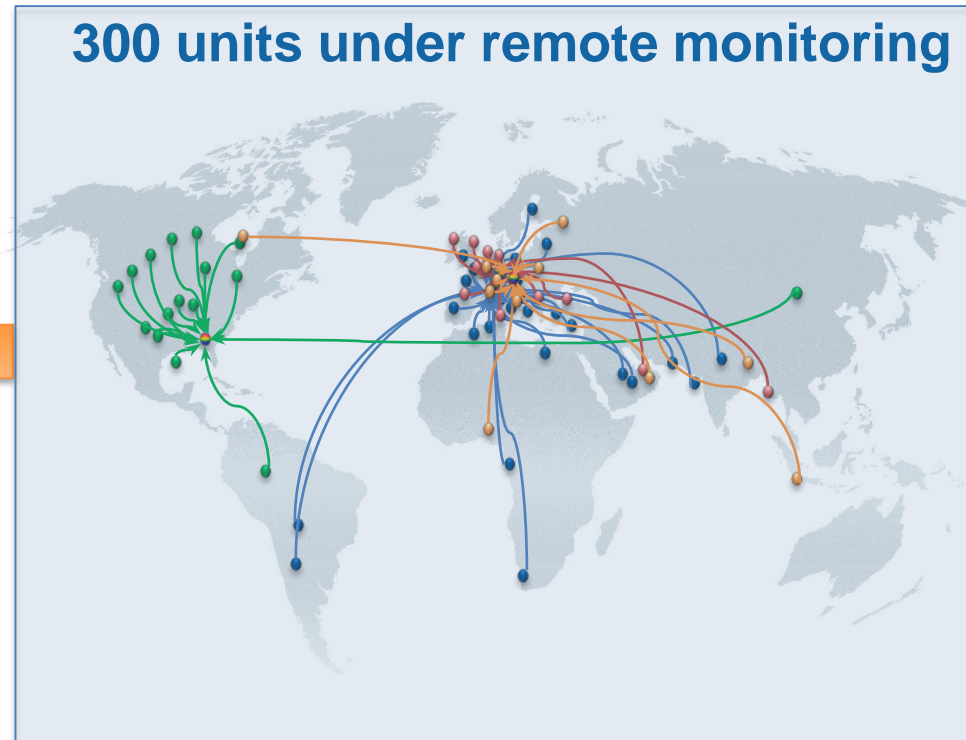
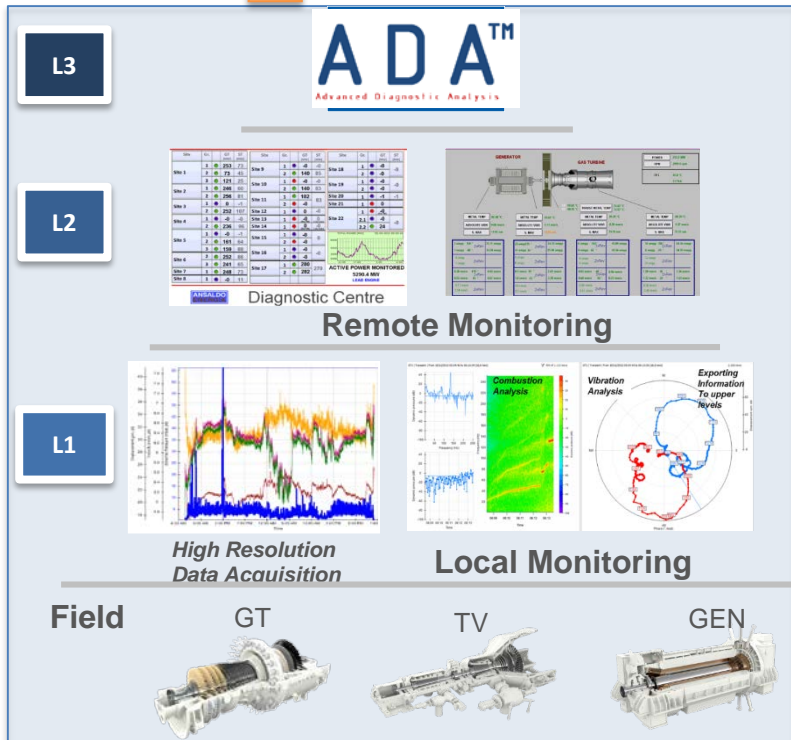
**ROBOTICS
SMART INSPECTION**

SMART SERVICE: PREDICTIVE DIAGNOSTIC / RM&D



On line - Diagnostics
Operation Condition
and actual performance
Evaluation

Corrective
Maintenance
Troubleshooting

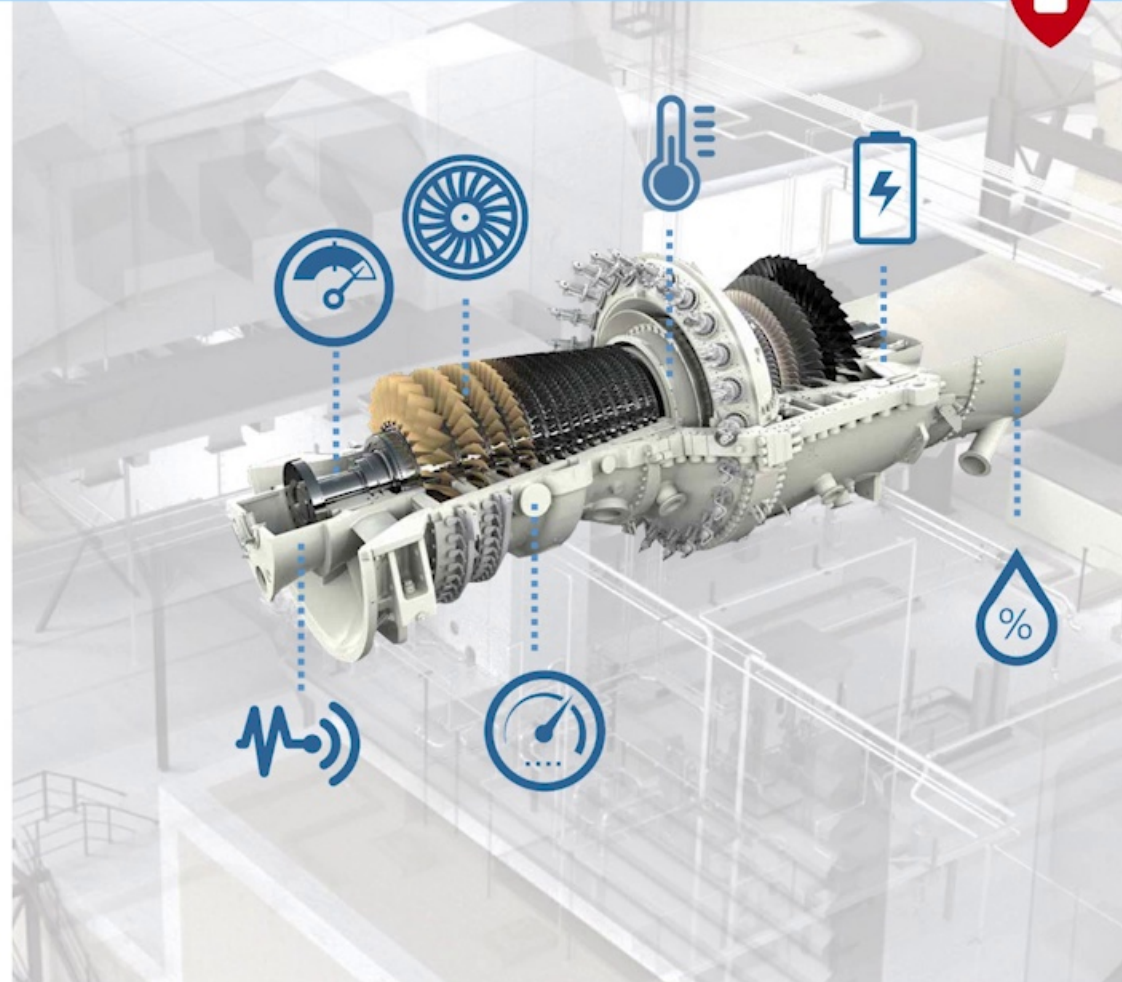


SMART SERVICE: PREDICTIVE MAINTENANCE

PREDICTIVE MAINTENANCE - TURBINE



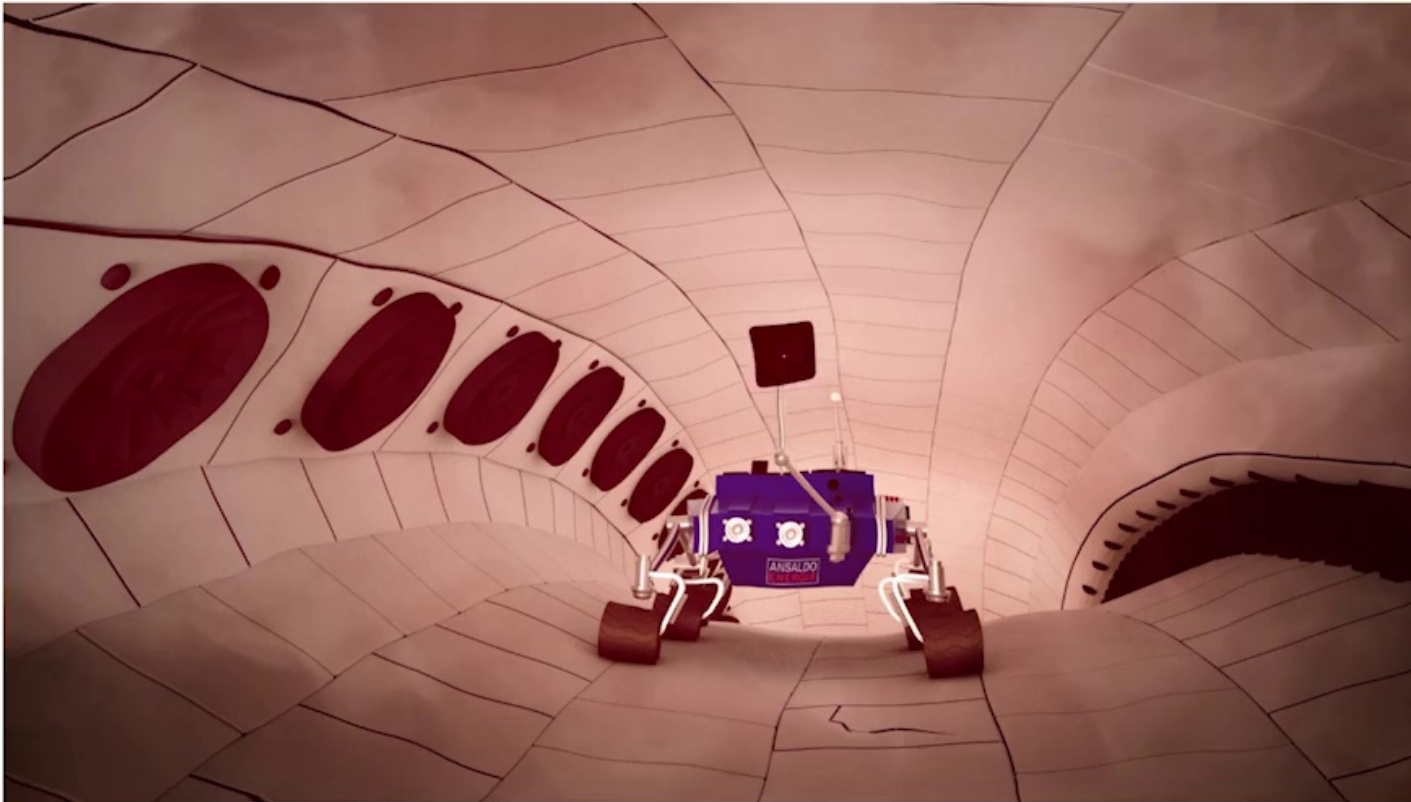
SENSOR BIG DATA



SMART SERVICE: ROBOTICS INSPECTION

SMART SERVICE - ROBOT

ROBOTIC VEHICLE FOR INSPECTION OF GAS TURBINE CERAMIC TILES



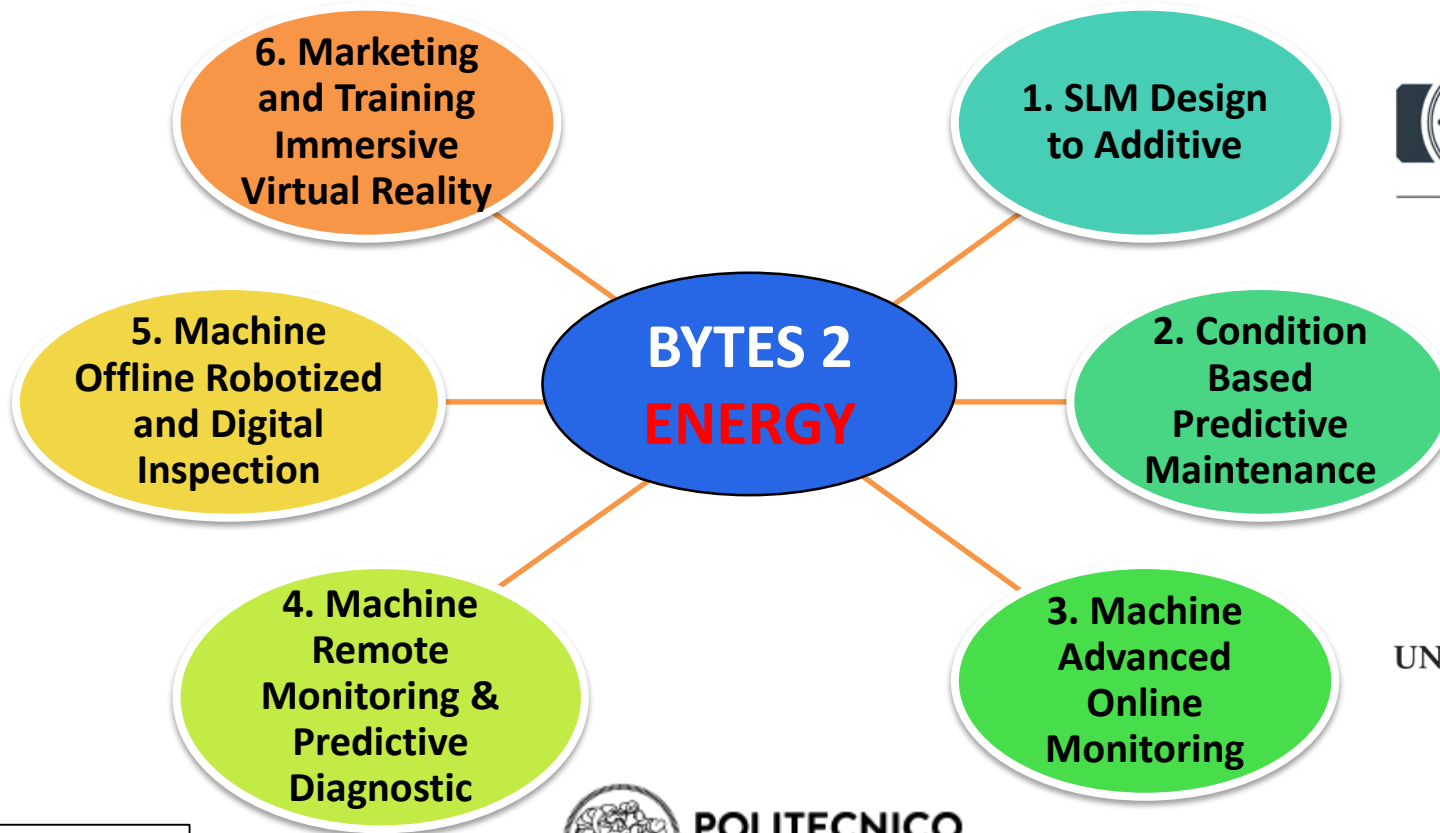
OPERATING SAFELY AT
HIGH TEMPERATURES

TIME SAVING

MICRO DAMAGES
EARLY DETECTION

DIGITAL ARCHIVE
OF THE INSPECTION

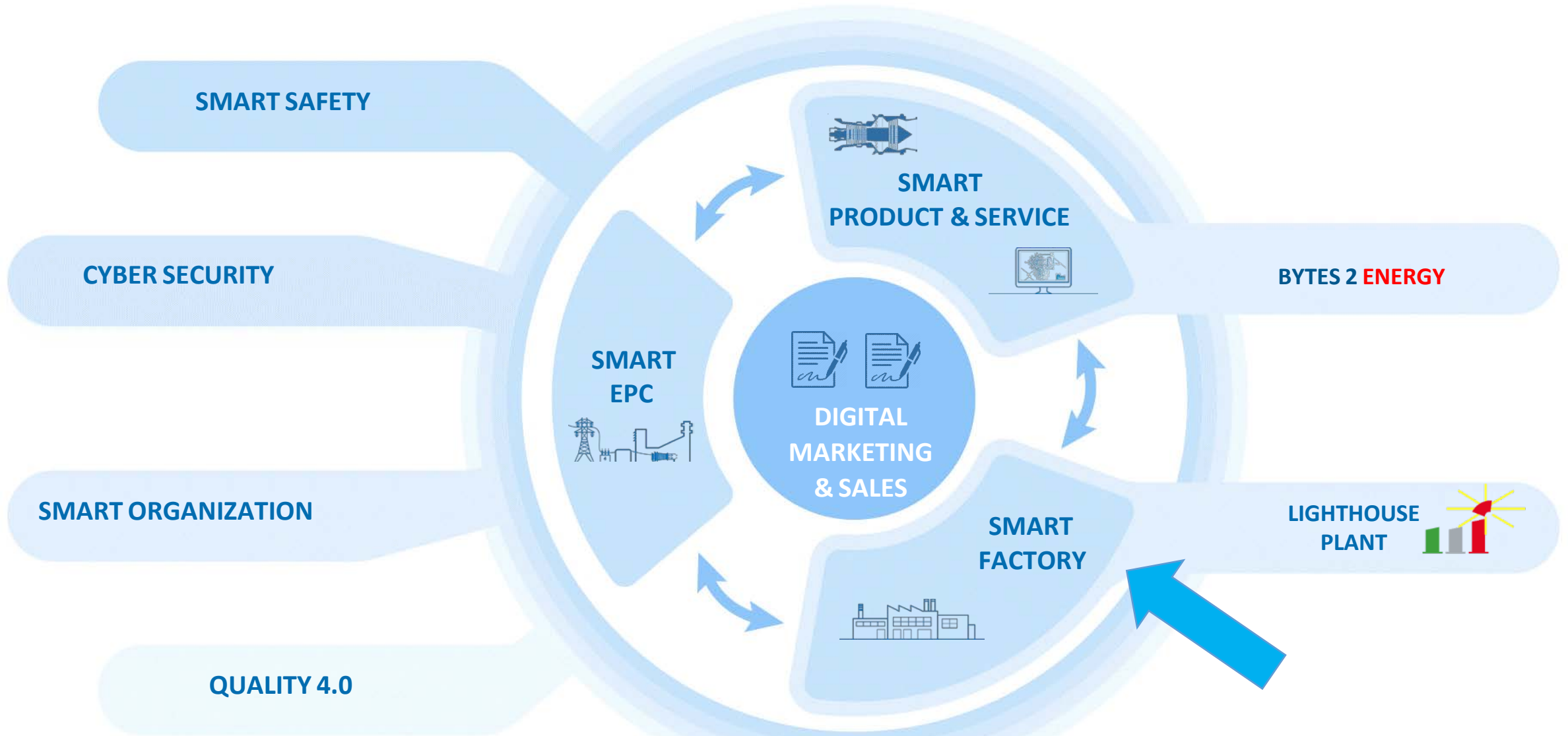
SMART PRODUCT & SERVICE



AGENDA DIGITALE Funding MISE:
 DM 15 ottobre 2014 e DM 24 luglio 2015
 Duration : 36 months (2018-2020)
 Total Investment: 12.5M€



ANSALDO ENERGIA Digital Transformation





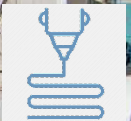
Il Lighthouse Plant di Ansaldo Energia, il primo del Piano Industria 4.0



IOT



BIG DATA

HORIZONTAL
VERTICAL
INTEGRATIONADDITIVE
MANUFACTURING

- Piano triennale di R&S Industriale basato sull'applicazione delle principali Tecnologie Digitali del Piano Impresa 4.0
- Copre l'intero Processo Manifatturiero gestito attraverso i due Siti Produttivi di Genova (Campi e Cornigliano)
- Prevede un Investimento complessivo di 14M€, con un contributo a fondo perduto da parte del MISE (20%) e della Regione Liguria (5%), oltre agli altri incentivi indirizzati dal Piano Impresa 4.0 (Iper e Super-Ammortamento)

AUGMENTED
REALITYVIRTUAL
REALITY

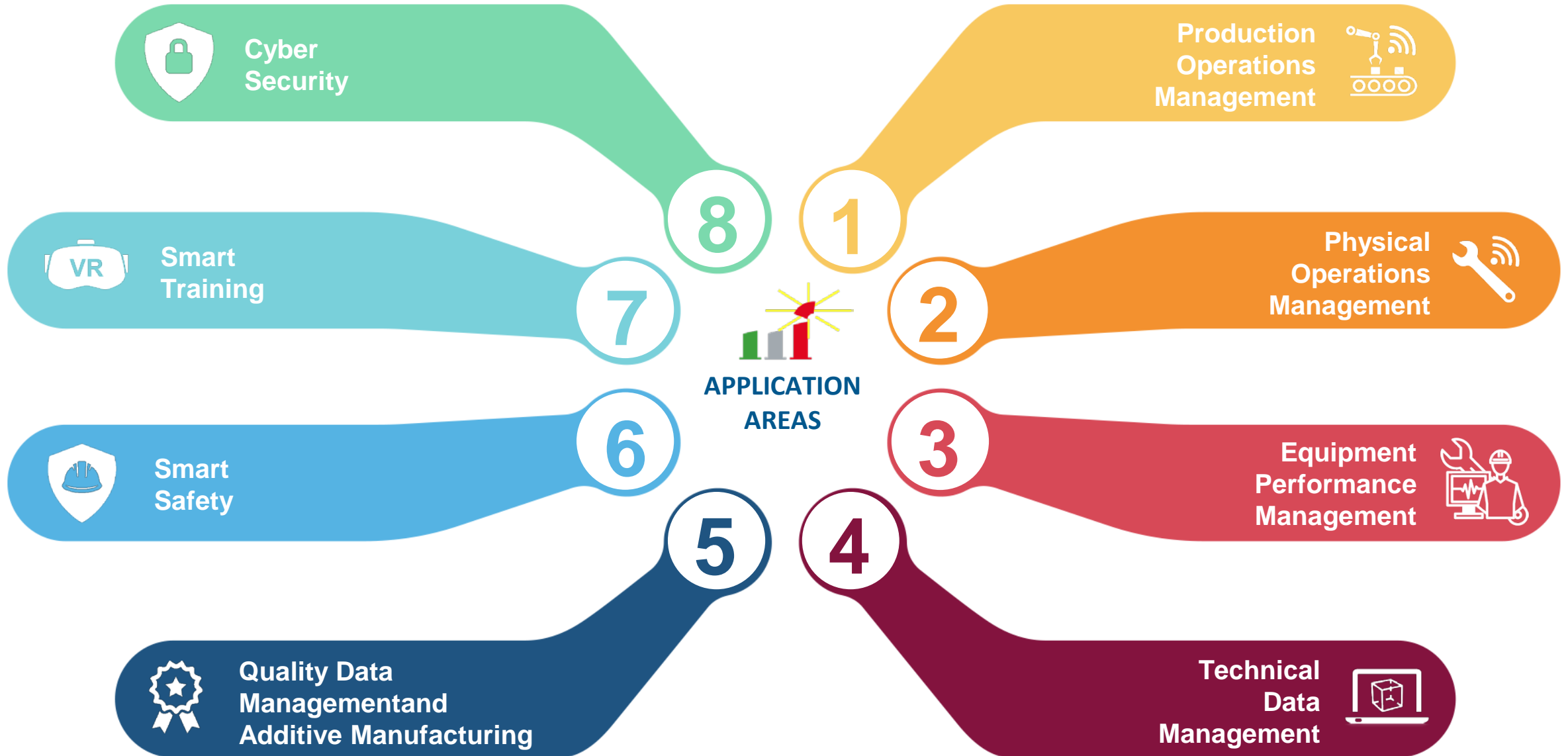
SIMULATION



CLOUD



ANSALDO ENERGIA Lighthouse Plant



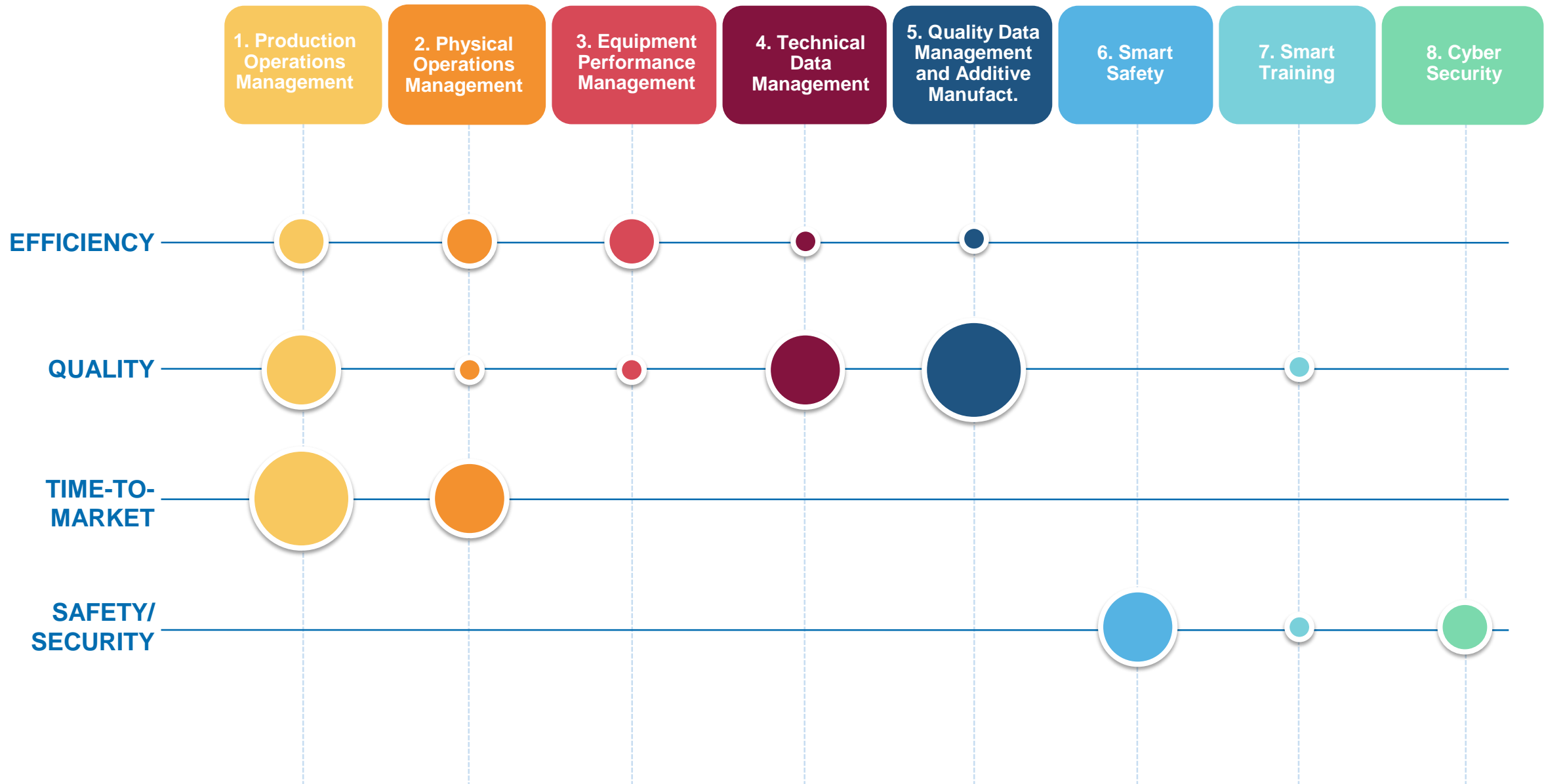


4.0 Technologies by Application Area

	1. Production Operations Management	2. Physical Operations Management	3. Equipment Performance Management	4. Technical Data Management	5. Quality Data Management and Additive Manufact.	6. Smart Safety	7. Smart Training	8. Cyber Security
BIG DATA			✓		✓			✓
IIOT CONNECTIVITY	✓	✓	✓			✓		✓
AUGMENTED REALITY			✓	✓			✓	
SIMULATION	✓		✓	✓			✓	
ADDITIVE MANUFACTURING					✓			
HORIZONTAL & VERTICAL INTEGRATION	✓			✓	✓			
CLOUD	✓	✓	✓	✓	✓		✓	✓



Expected Benefits by Application Area





Lighthouse Plant extension to other AE Group Key Process



Smart EPC



Smart Factory

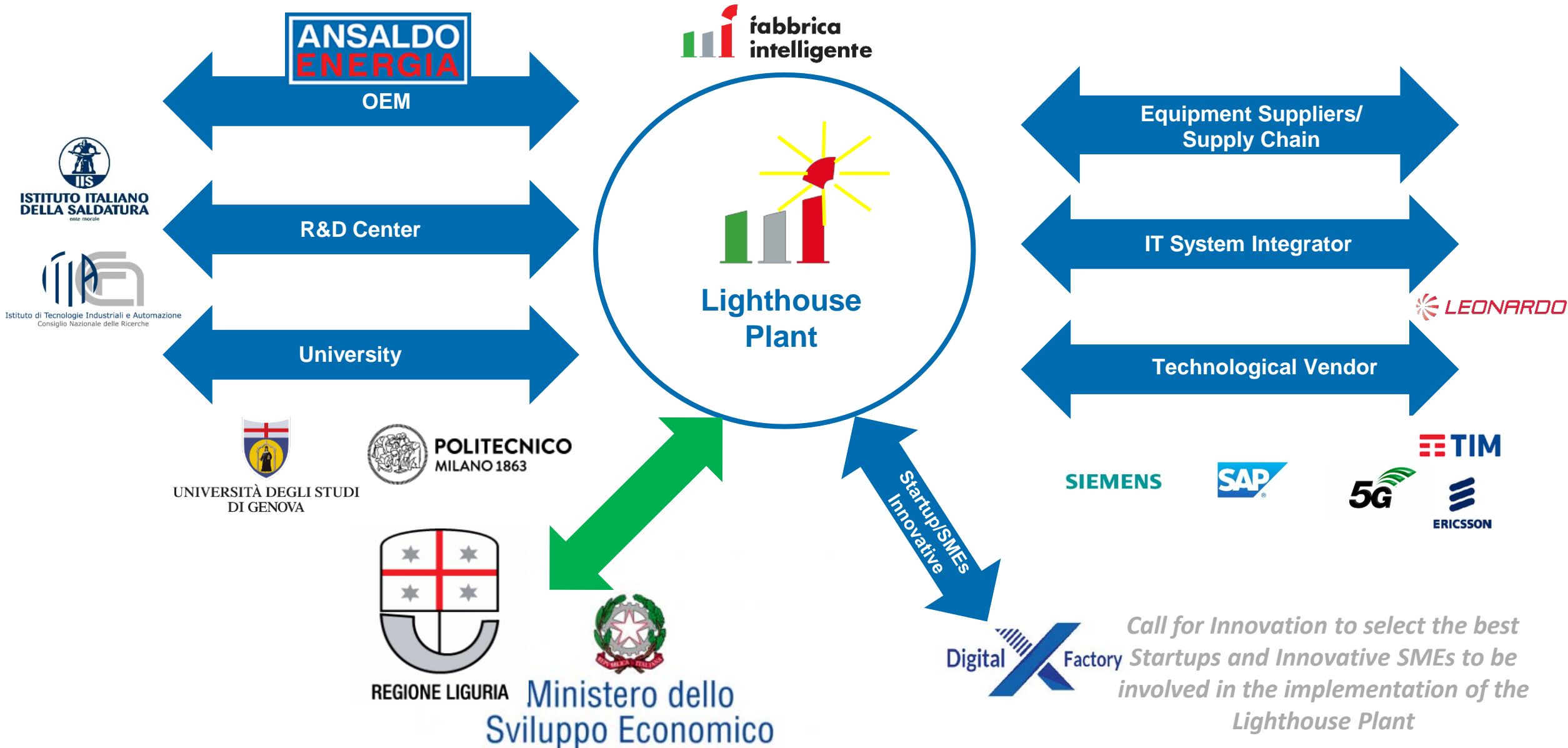


Smart Product & Service

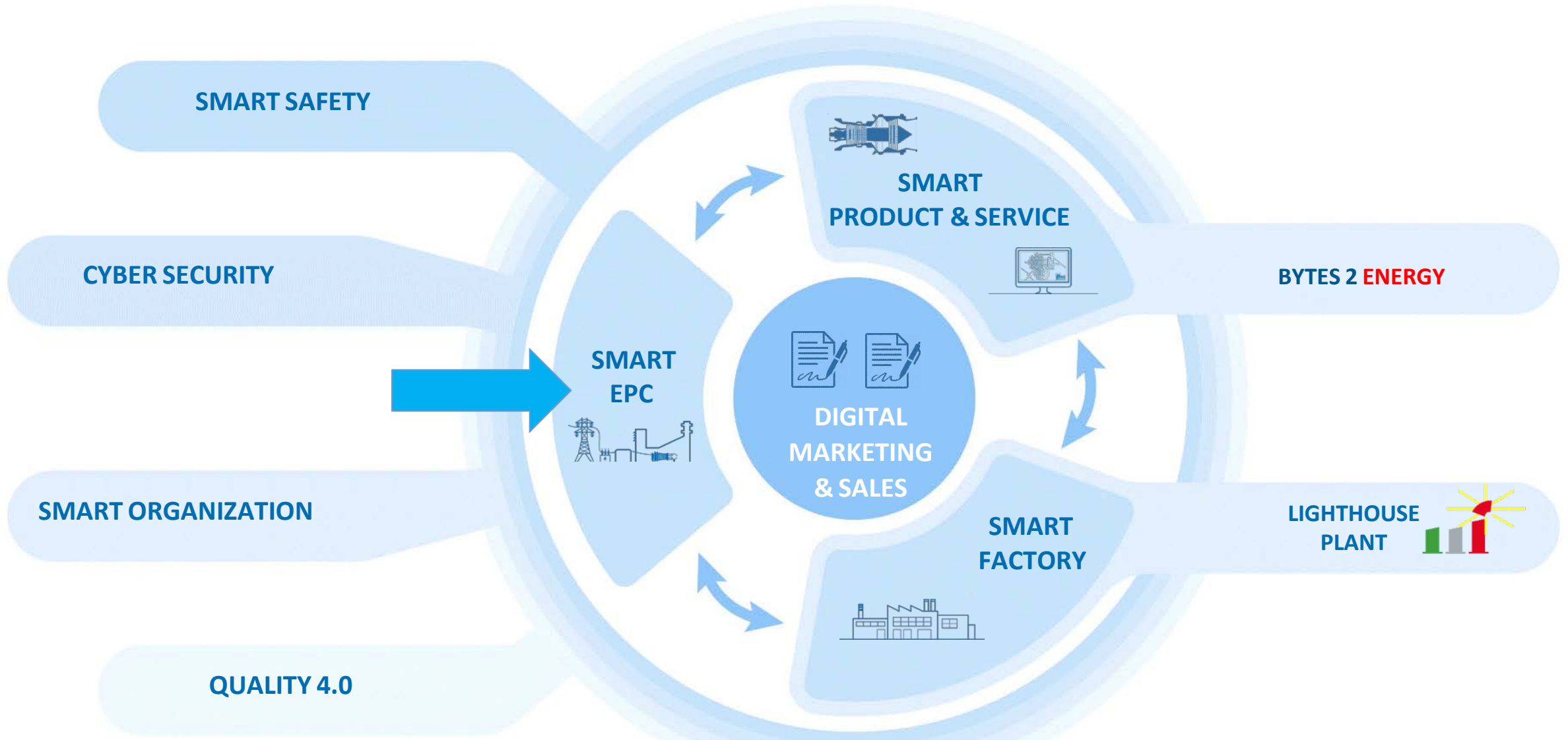
	Big Data	IOT	Augmented Reality	Simulation	Additive Manuf.	Cloud		Big Data	IOT	Augmented Reality	Simulation	Additive Manuf.	Cloud
Production Operations Management		✓							✓				
Equipment Performance Management								✓	✓		✓		✓
Technical Data Management			✓							✓			
Quality Data Management	✓					✓		✓					✓
Additive Manufacturing												✓	
Smart Safety		✓							✓				
Smart Training			✓	✓						✓	✓		
Cyber Security	✓					✓		✓					✓



Key Players

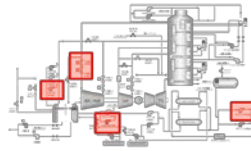


ANSALDO ENERGIA Digital Transformation



SMART EPC

3D SMART EPC
PLATFORM



**SPE (SMART
POWERFUL EYE)
E-COMMISSIONING**

1

DESIGN



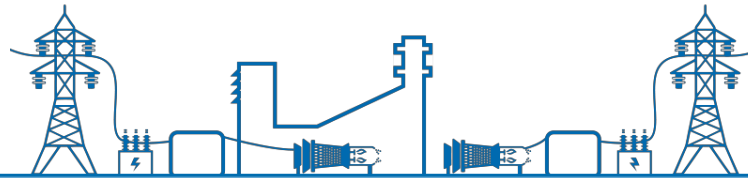
2

MANUFACTURE



3

EPC



Power Plant



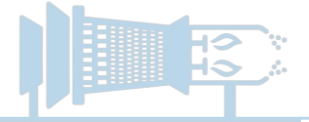
ENGINEERING

PROCUREMENT

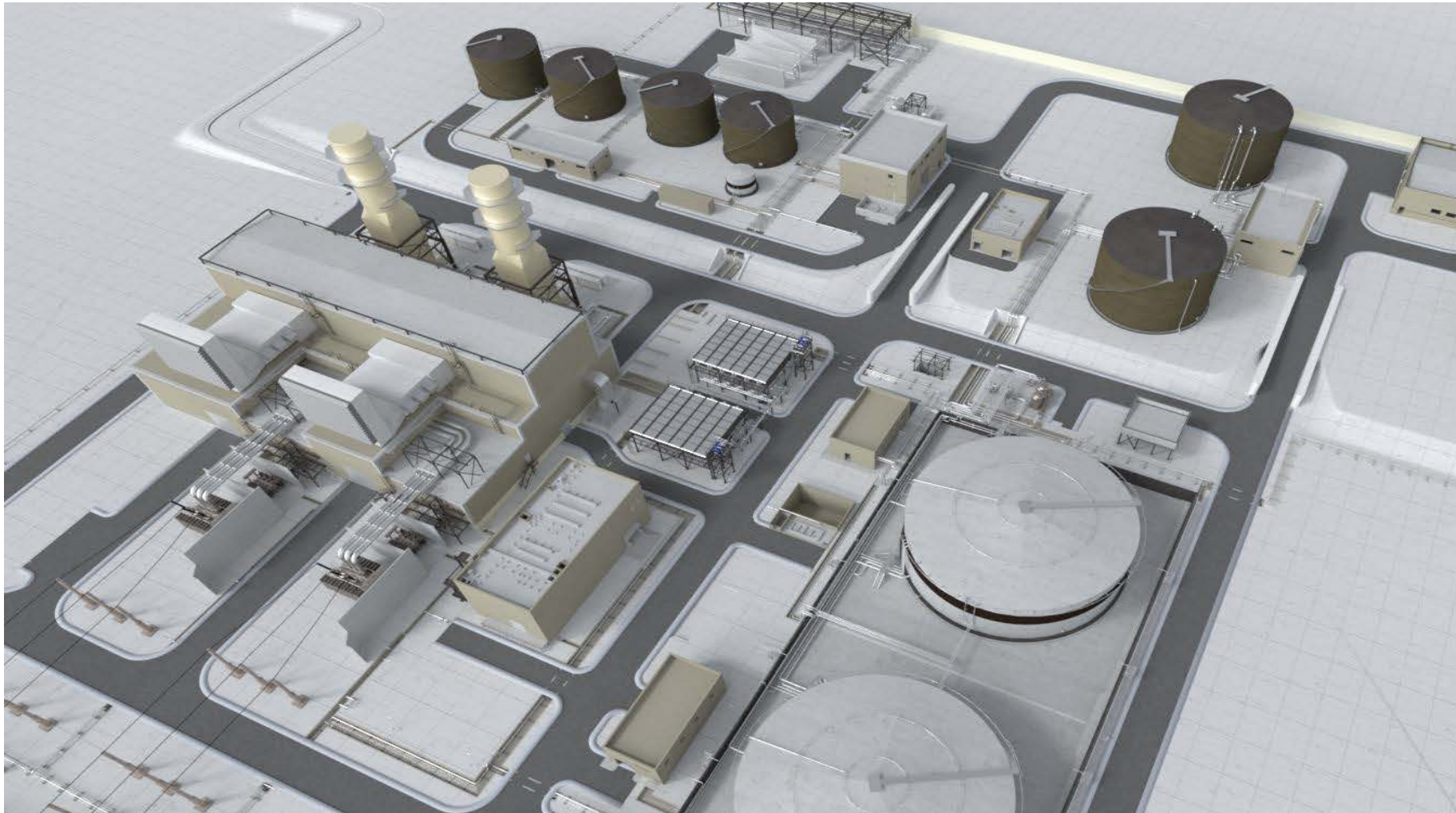
CONSTRUCTION

4

SERVICE



SMART EPC - 3D SMART EPC PLATFORM

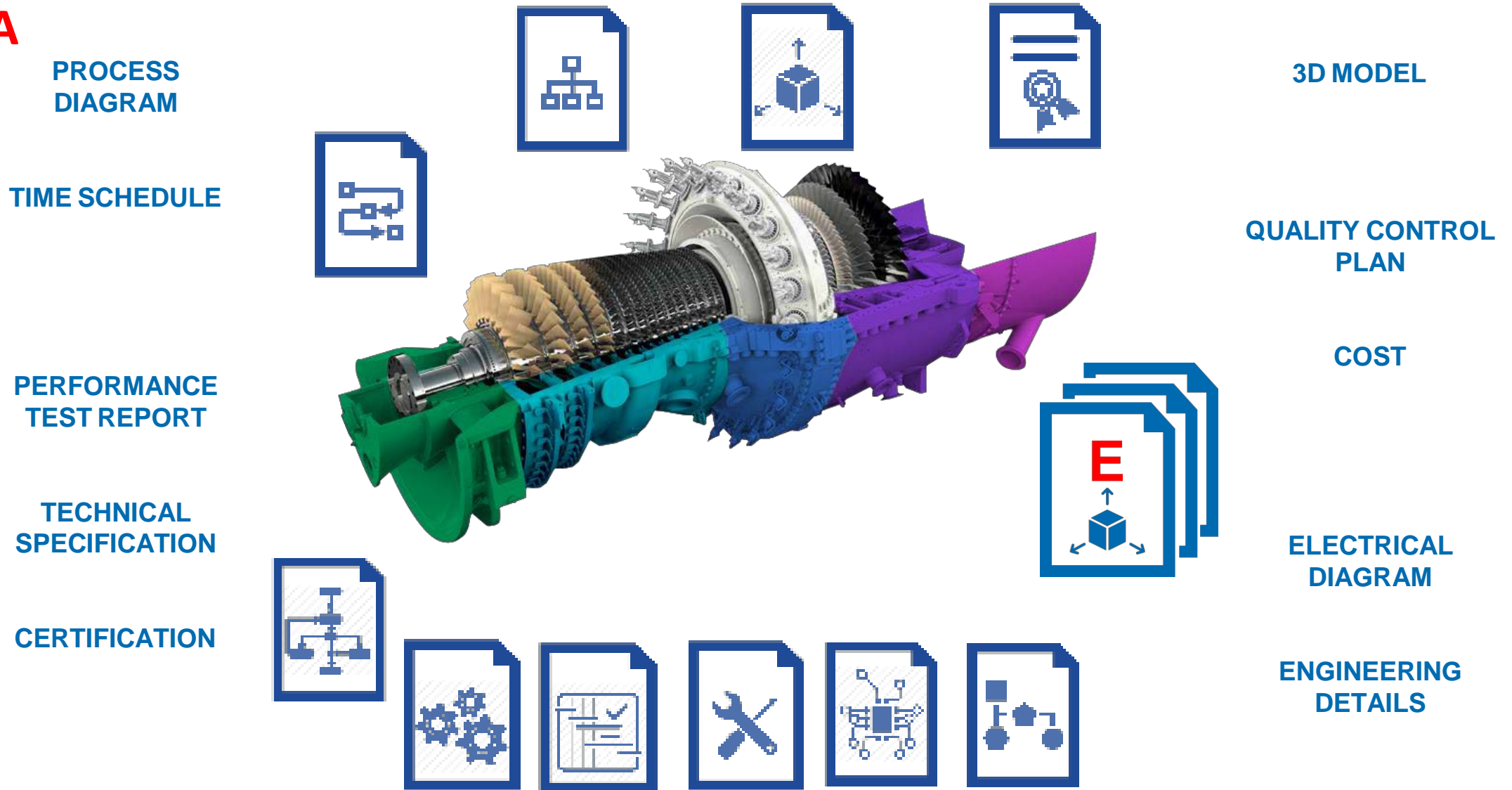


**TURBINE
GENERATOR
STACK
AUXILIARY AIR
INTAKE
STEEL STRUCTURES
PIPING CABLES
BUILDING
COMPONENTS AND
SYSTEM**

**14 - 36 MONTHS
150.000+ HH ENGINEERING
8.000 - 20.000 DOCUMENTS
13.500+ COMPONENTS
3.500 - 5.000 PACKAGES
1.000 - 1.500 SUPPLIES
200+ SUPPLIERS
1.500.000+ HH ASSEMBLY**

SMART EPC - 3D SMART EPC PLATFORM

BIG DATA



SMART EPC - 3D SMART EPC PLATFORM

ENGINEERING Power Plant Configuration

REQUISITE 1 ○ ● ○ ○ ○

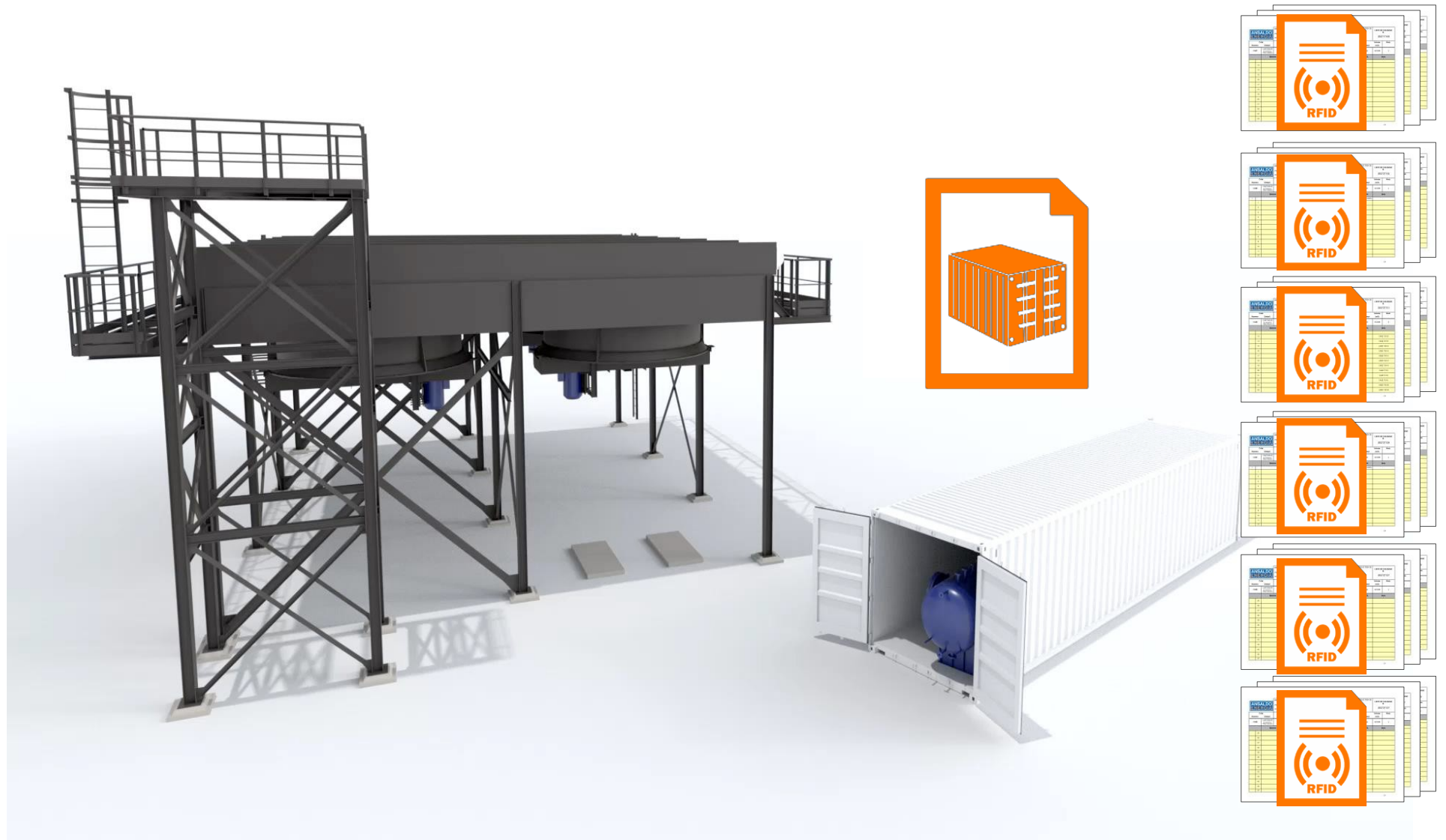
REQUISITE 2 ○ ○ ● ○ ○

REQUISITE 3 ○ ● ○ ○ ○

REQUISITE 4 ○ ○ ● ○ ○

CREATE PLANT

SMART EPC - 3D SMART EPC PLATFORM

**PROCUREMENT
Smart Tracking
(Fin Fan Cooler
Packing List)**

SMART EPC - 3D SMART EPC PLATFORM

PROCUREMENT
Smart Tracking
(End-to-end
Smart Tracking)



**REAL TIME
 TRACKING PACKAGE**

1.000+ SHIPMENTS
3.500 – 5.000 PACKAGES
1.000 – 1.5000 SUPPLIES
200+ SUPPLIERS

SMART EPC - 3D SMART EPC PLATFORM

PROCUREMENT Smart Tracking (Packing List Site Check)



ANSALDO ENERGIA		CONSTRUCTEUR: Ansaldo Energia S.p.A. Via N. Lovati, 8 10152 Genova GE Italia				A L'ORDRE DE LA SOCIÉTÉ ALGERIENNE DE PRODUCTION DE L'ÉLECTRICITÉ S.P.E. - S.P.A.			LISTE DE COLBARE N° 053727127		
Numero	Entail	Code	Unité	Stockage	Artes	Position Arête	Longueur	Largueur	Hauteur	Volume (m3)	Note
1008	CONTREPLAQUE SÉCURITÉ	0200	1000	1000	1000	2000	1000	200	200	400000	3
Numero	Q.té	Unité	Description	Pos. de Dessin	Dimension mm	WBS_PCL	Note				
10	1	PCS	COLONNE HÉRISSÉE 1000	1000	1000						
11	1	PCS	COLONNE HÉRISSÉE 1000	1000	1000						
12	4	PCS	DISQUE ANCIENNE COLONNE	1000	1000						
13	4	PCS	COMPACTEUR ANCIENNE COLONNE	1000	1000						
14	4	PCS	COMPACTEUR ANCIENNE COLONNE	1000	1000						
15	1	PCS	Échelle 1000 mm	1000	1000						
16	3	PCS	PROTECTOR HÉRISSÉE 1000	1000	1000						
17	6	PCS	PROTECTOR HÉRISSÉE 1000	1000	1000						
18	2	PCS	PROTECTOR HÉRISSÉE 1000	1000	1000						
19	2	PCS	PROTECTOR HÉRISSÉE 1000	1000	1000						
20	1	PCS	PROTECTOR HÉRISSÉE 1000	1000	1000						
21	1	PCS	PROTECTOR HÉRISSÉE 1000	1000	1000						

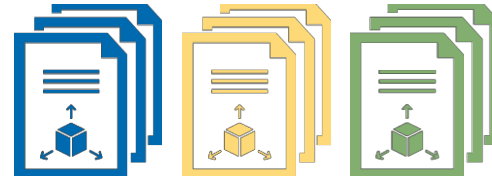
SMART EPC - 3D SMART EPC PLATFORM

CONSTRUCTION

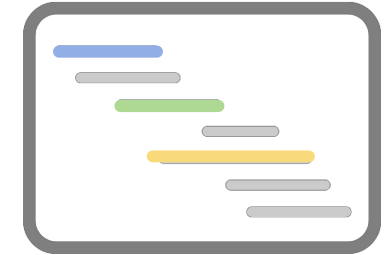
WAREHOUSE



DOCUMENTATION



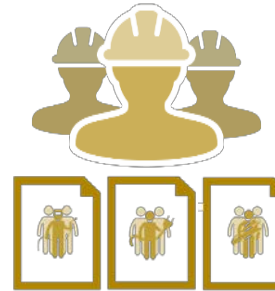
PLANNING



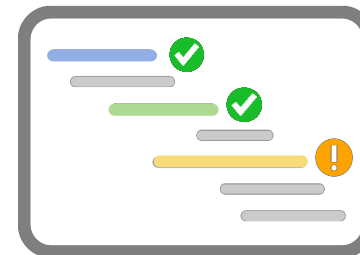
+

+

TEAMS

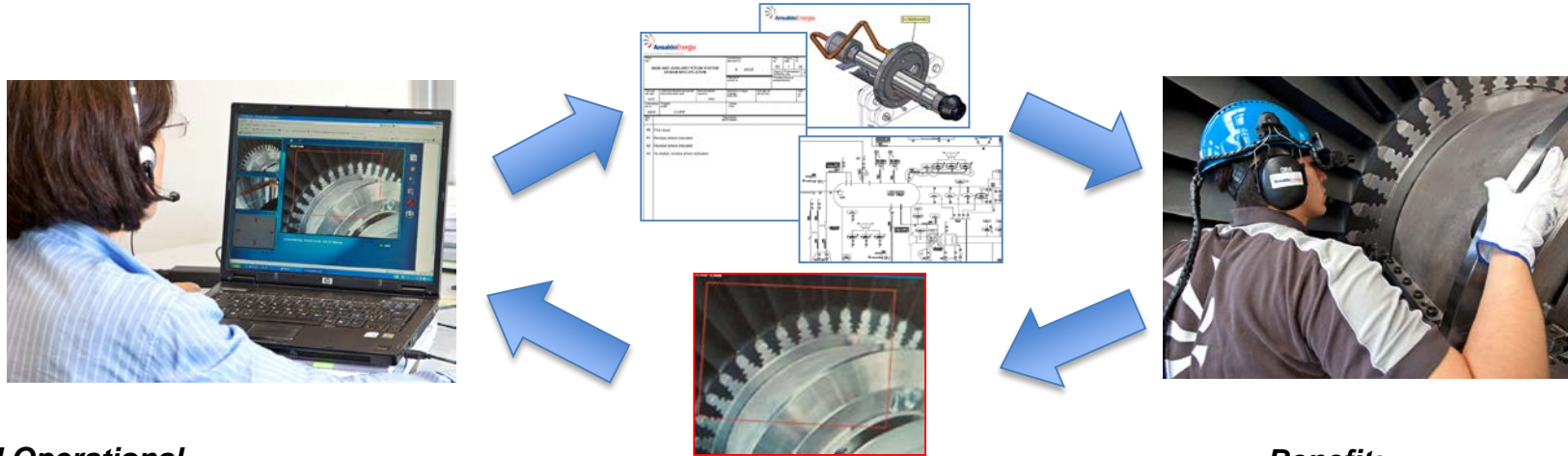


MONITORING



1.500.000 HH ASSEMBLY
20 – 40.000 M3 CONCRETE
1500-5000 TONS STEEL STRUCTURE
400 – 800 KM CABLES
500 – 1.300 TON PIPING

SPE (SMART POWERFUL EYE) E-COMMISSIONING



Field Operational Support:

- Installation
- Commissioning
- Supervising
- Work progress overview
- Troubleshooting e fault-finding
- Maintenance
- Customer Support

SPE



Benefit:

- Supporting Field activities from HQ
- Answer time reduction
- Ansaldo people on field reduction
- Link between different experts in different sites
- One expert can support different sites
- Plant: best availability



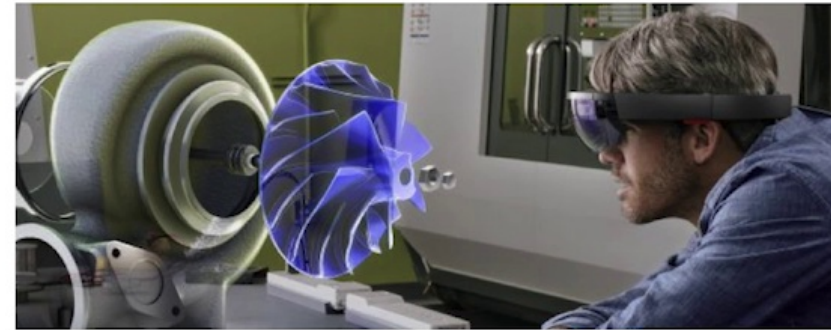
UPGRADE SPE

SPE (SMART POWERFUL EYE) E-COMMISSIONING

AUGMENTED REALITY FOR REMOTE COMMISSIONING

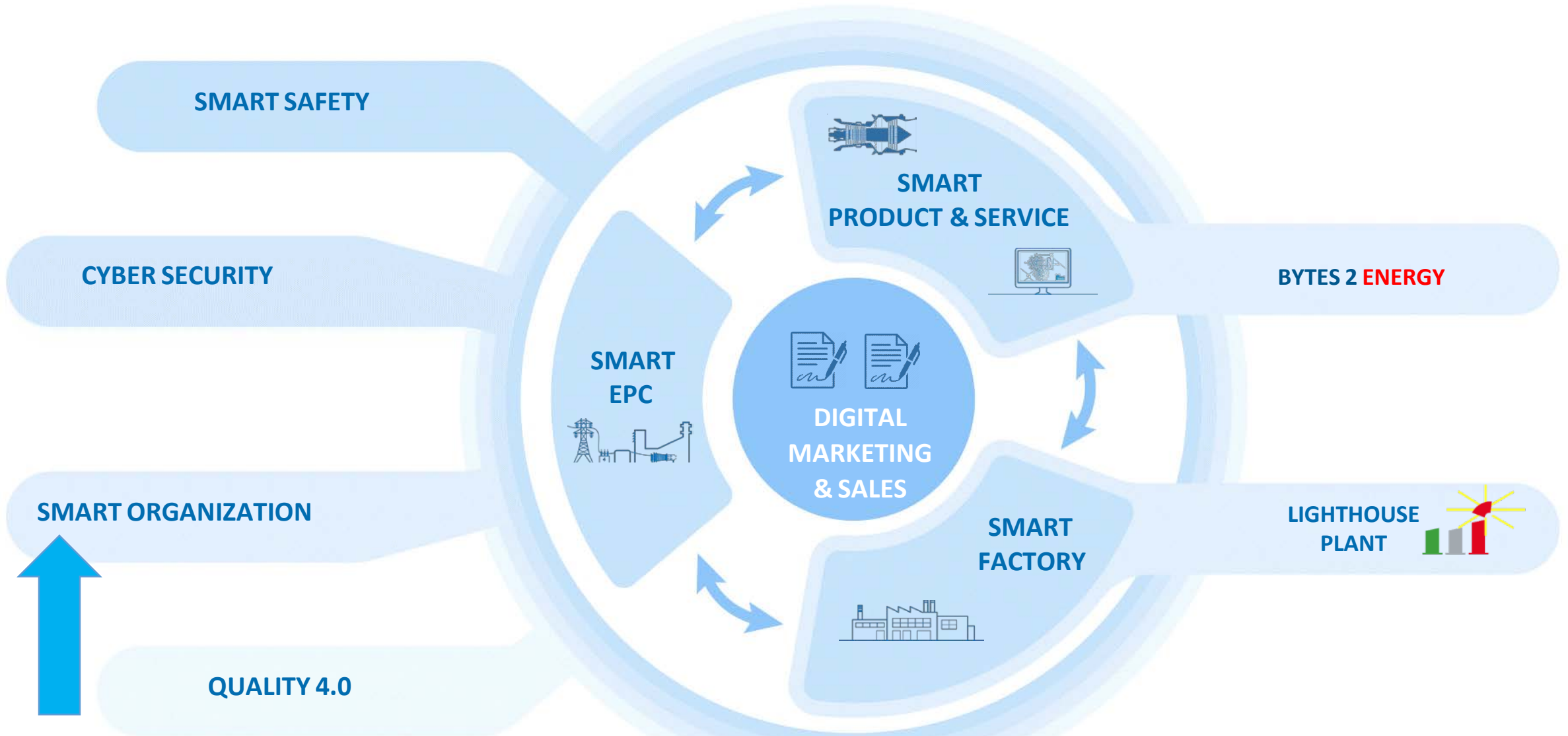


NEW TECHNOLOGIES, NEW POSSIBILITIES (Mixed Reality)

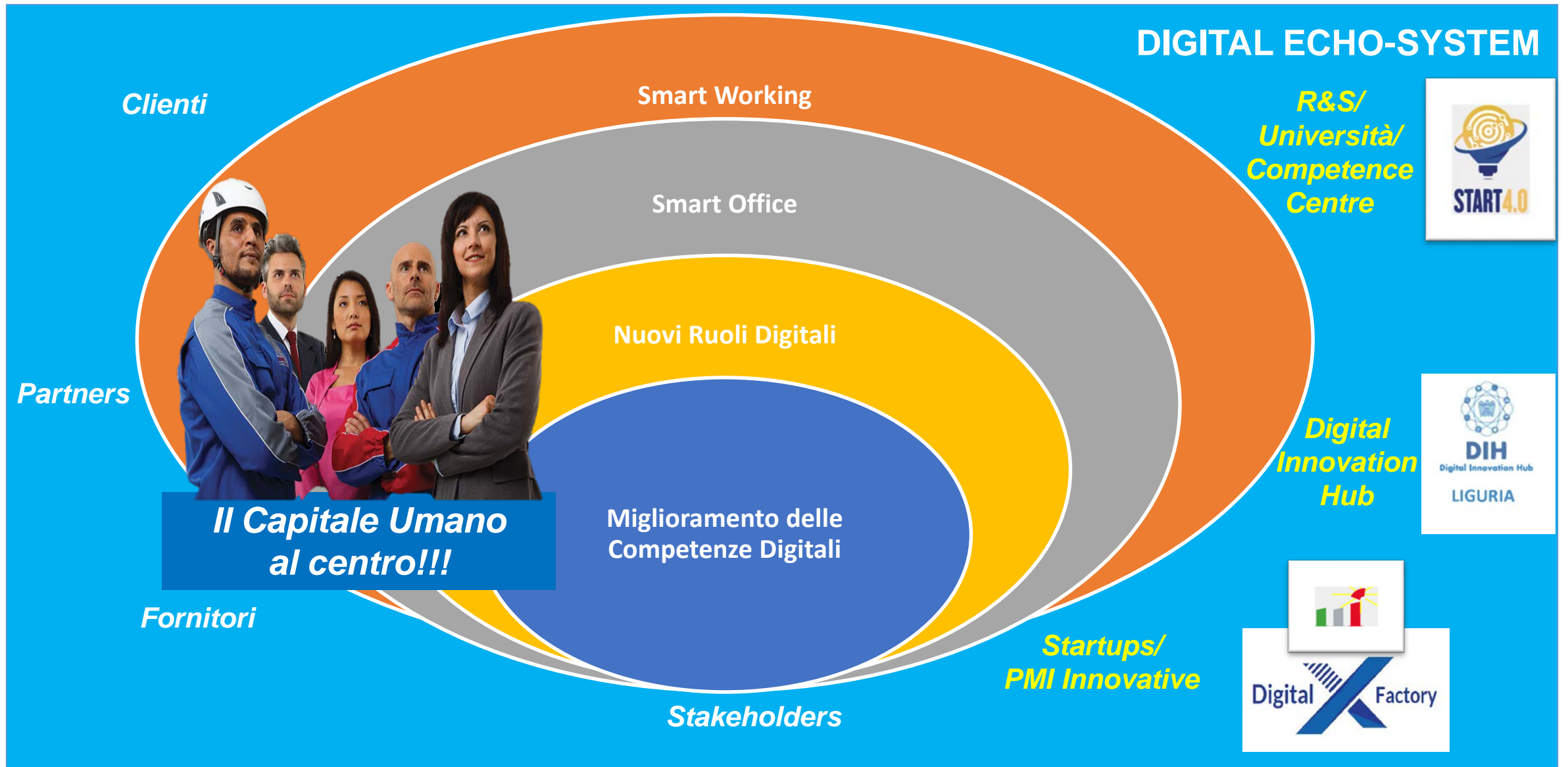


BENEFITS
POOLING OF QUALIFIED COMPETENCES
REAL-TIME COOPERATION IN DIFFERENT LOCATIONS
TIME RESPONSE SHORTENING
EASIER REAL-TIME ACCESS TO PLANT OR EQUIPMENT DATA
VIRTUAL TUTORIALS AND TRAININGS

ANSALDO ENERGIA Digital Transformation



Il Capitale Umano al centro della Trasformazione Digitale di Ansaldo Energia





GRAZIE

**Il Capitale Umano al centro della
Trasformazione Digitale di
Ansaldo Energia**

**Luca Manuelli
Chief Digital Officer**