



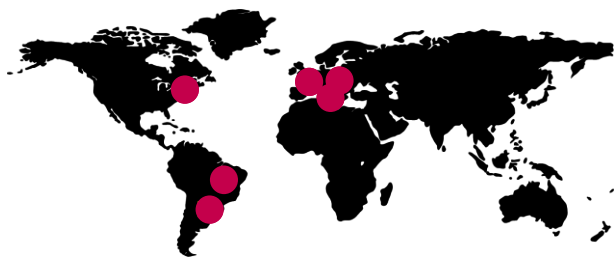
**Terni, FINESCE EU Project Open Day
9 March 2015**



Engineering & ASM Terni:
a win-win collaboration model
for sustaining Research and
Innovation

*Massimo Bertoncini
Director of EU R&D projects*

GROUP / HIGHLIGHTS



A global player
Business integration
Consulting
Outsourcing
Products and solutions

- (Wilmington)
USA
- (São Paulo / Rio de Janeiro / Recife
Belo Horizonte / Curitiba)
BRAZIL
- (Buenos Aires)
ARGENTINA
- (Brussels)
BELGIUM
- (Belgrade)
REPUBLIC OF SERBIA

about 7,300
Professionals

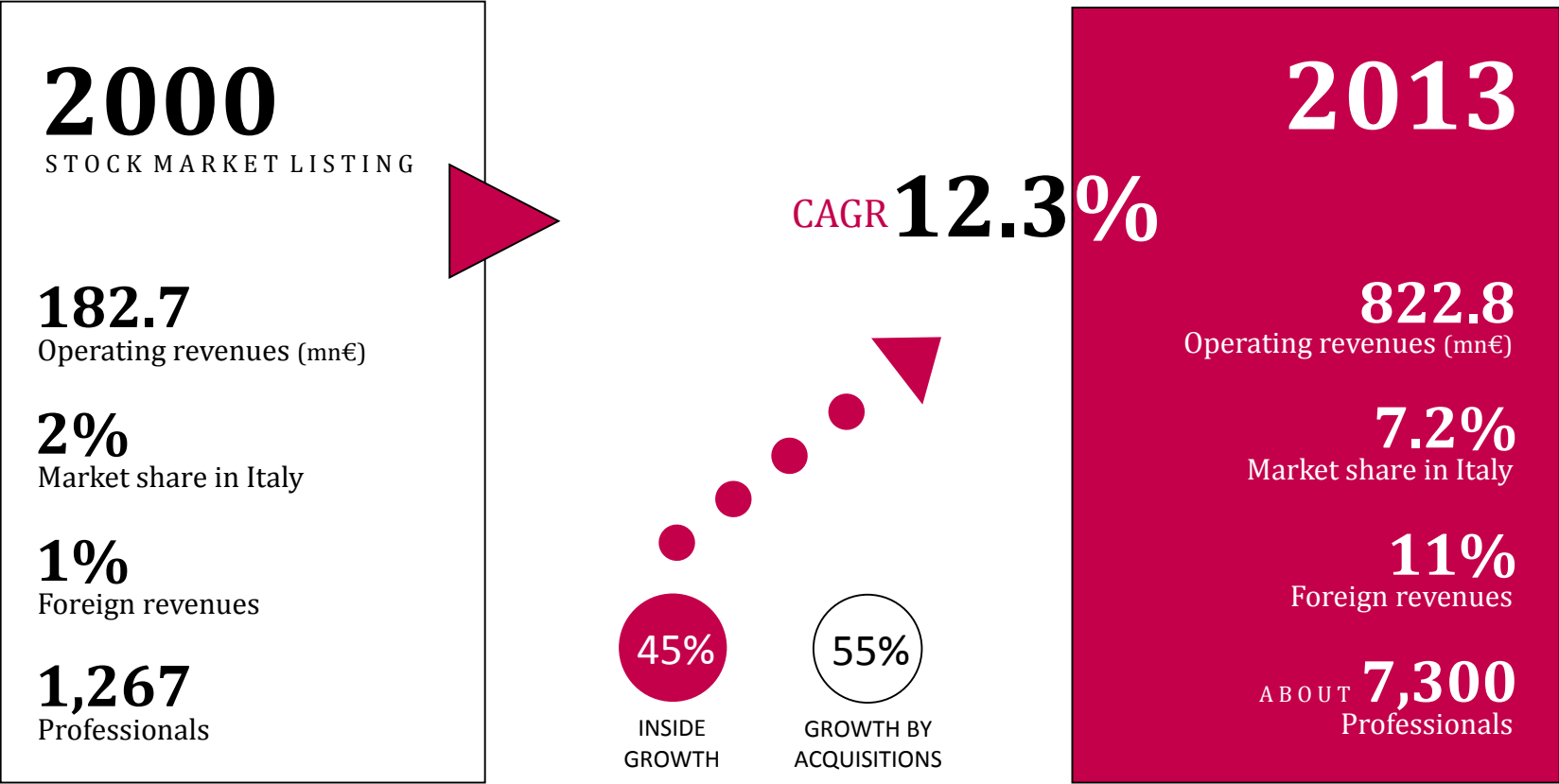
1,000
Large accounts

7.2%
Market share in Italy

822.8 mn€
Operating revenues



GROUP / STORY OF A GROWTH



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Thanks to an accurate scouting approach, Engineering has constantly integrated assets and people in order to broaden the spectrum of owned solutions and reach a wider potential customers portfolio.

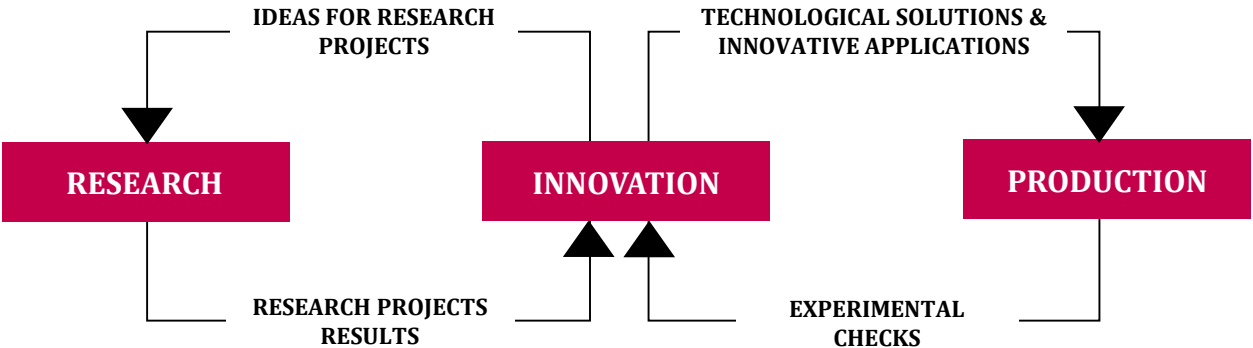
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+25
mn€/year

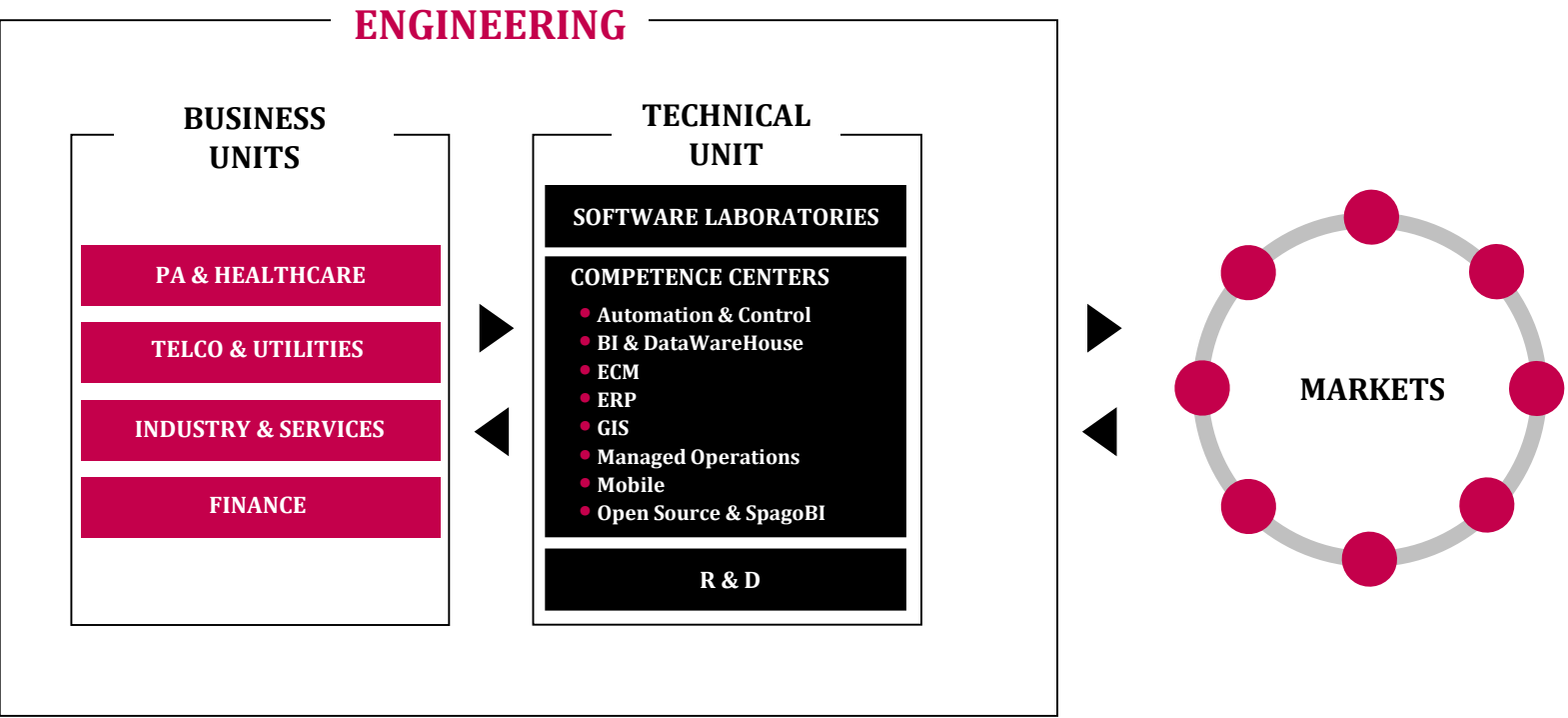
INVESTMENTS
in INNOVATION



Participation in European research programs and creation of a network of collaborations



GROUP / MARKET APPROACH



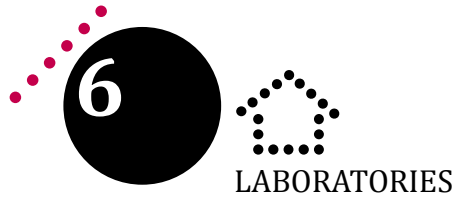


BUSINESS MODEL

Engineering aims at creating tangible value across the software and services value chain by meeting the needs of the actual and potential customers, playing along with them to define, plan and execute an efficient IT strategy.

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projects software platforms *SOLUTIONS* services
IT Infrastructures SYSTEMS outsourcing
technology application management systems integration



R&D PROJECTS

SEARCH

SINTESYS, CUBRIK, PHAROS,
CHORUS+, I-SEARCH

CLOUD COMPUTING

VENUS-C, VISION Cloud,
OCEAN, ARTIST, CLIPS

FUTURE INTERNET

FI-WARE, TEFIS, OUTSMART,
SEQUOIA, FINSNEY, SOFI

E-LEARNING

Aristotele, ERINA+

MANUFACTURING

BIVEE, MSEE

ENERGY & SMART CITY

INGRID, GEYSER, FINESCE

NETWORKING

AgrEvolution

OPEN SOURCE

MARKOS, QualiPSO

E-GOV

SMARTiP

E-HEALTH

I-DONT-FALL,
EMBALANCE,
PATHWAY

RESEARCH/ ETP PARTICIPATION



FUTURE
INTERNET
PPP



ENG RESEARCH & INNOVATION/ OUR PARTNER NETWORK

ITALIAN UNIVERSITY		FOREIGN UNIVERSITY		RESEARCH CENTER		ICT COMPANY		END USER	
POLITECNICO DI MILANO	POLITECNICO DI TORINO	LONDON SCHOOL OF ECONOMICS	AALTO UNIV. HELSINKI	FRAUNHOFER	INRIA	SAP	GOOGLE	MALMÖ CITY SWEDEN	FUJISAWA CITY JAPAN
UNIV. GENOVA	UNIV. TRENTO	QUEEN MARY UNIV. LONDON	KIEL UNIV.	CERN	ERCIM	MICROSOFT	IBM	ASM TERNI	MANCHESTER CITY, UK
UNIV. ROMA III	UNIV. PISA	UNIV. STUTTGARD	TECH. UNIV. DELFT	ESA-ESRIN	CNR	SIEMENS	TELECOM ITALIA	COMUNE DI VENEZIA	COMUNE DI BOLOGNA
UNIV. ROMA TOR VERGATA	UNIV. ROMA LA SAPIENZA	CITY UNIV. LONDON	UNIV. POLITECNICA BARCELONA	FOND. BRUNO KESSLER	TECNALIA	TELEFONICA	ATOS	MINISTERO DELL' INTERNO	FAO
UNIV. NAPOLI FEDERICO II	UNIV. PALERMO	UNIV. LUXEMBOURG	UNIV. OF THE AEGEAN	EURESCOM	CREATE-NET	ALCATEL-LUCENT BELL	THALES	FONDAZIONE SANTA LUCIA	UNIV. HOSPITAL NORTH NORWAY
UNIV. FIRENZE	UNIV. VENEZIA	UNIV. POLITECNICA BARCELONA	UNIV. SAN PAOLO	ICCS	TRENTORISE	NOKIA	ORANGE	POLICIA MUNICIPAL MADRID	ROMANIAN BORDER POLICE
SCUOLA SUP. SANT' ANNA	UNIV. MILANO BICOCCA	BEIHANG UNIV. CHINA	KEIO UNIV. JAPAN	ISPRA	IMINDS	ALMAVIVA	ERICSSON	EU NETWORK OF LIVING LABS	ACC. NAZ. SANTA CECILIA
UNIV. BOLZANO	UNIV. BOLOGNA	UNIV. CANTABRIA	TECH. UNIV. ZURICH	WIT	SINTEF				
UNIV. INSUBRIA	UNIV. PADOVA	UNIV. REY JUAN CARLOS	UNIV. DUISBURG-ESSEN	CERTH	DFKI				
UNIV. BENEVENTO	UNIV. COSENZA	TECH. UNIV. BERLIN	TECH. UNIV. SOUTH CHINA	VTT	IT INNOVATION				
UNIV. LECCE	UNIV. CATANIA	NATIONAL TECH. UNIV. ATHENS	EDINBURGH NAPIER UNIV.						
POLITECNICO DI BARI	UNIV. MESSINA								



Participation in European research programs and creation of a network of collaborations

ENG & ASM TERNI / WIN-WIN COLLABORATION in R&D PROJECTS

Win-win collaboration in the last five years (from 2011 onward) through:

- Co-participation to European projects
- Mutual exchange of innovative ideas and know how
- Shared strategic visions for smart city deployment
- Mutual benefits for both collaborating parties



- Seamless access to specialized know how for smart energy grids, water, waste, mobility -> smart city
- Availability of usage of limited shares of smart city resource supply infrastructures (smart electricity grid, including power network and field equipment, water network, data centers...) as **field lab** where to validate innovative technologies and platform
- Towards a **Smart City Living Lab**, aimed at
 - promoting human-centered and participatory smart city service deployment and governance
 - making it available a field lab for anticipated technology validation and pre-deployment

ENG & ASM TERNI / ASM MAIN BENEFITS

- Capitalizing on ENG experience and EU portfolio network while lowering entry barriers for EU Research & Innovation projects participation
- Lower city-level investment to deploy cost-effective smart energy city solutions (due to partial cost reimbursement by EU)
- Making use of the innovative platforms and solutions after the end of European project with a view to provide durable benefits to the citizenships
- Attracting new investments from institutions and private companies interested to build and deploy smart city services on the top of the deployed layer (es. Phase 3 of Future Internet PPP services could be deployed over the top of the FINESCE platform)

ENG & ASM TERNI / CO-PARTICIPATION IN EU R&D PROJECTS on SMART ENERGY GRIDS

- FINESCE

- FP7 FI-PPP
- 2012-2015



- GEYSER

- FP7 SMART CITY
- 3 YEARS Duration
- 2013-2016)



- NOBEL GRID

- H2020
- 4 years duration (2015-2018)
- kicked off in January 2015



- ELSA

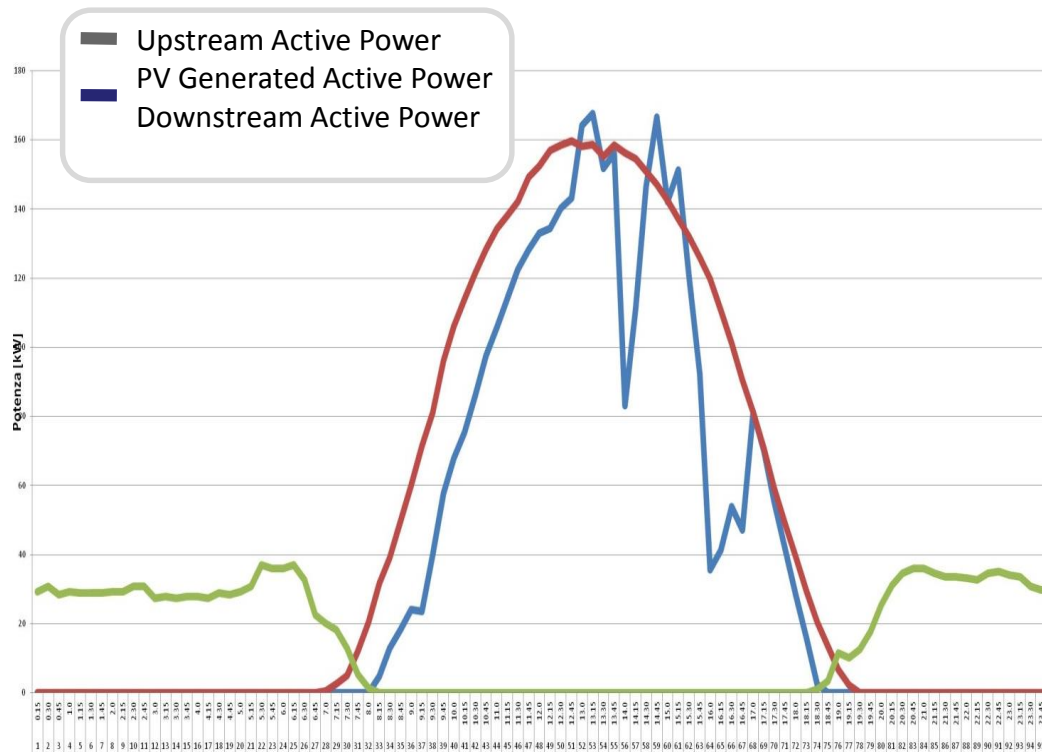
- H2020
- 3 years duration (2015-2017)
- kickoff in April 2015



FINESCE/ FUTURE INTERNET SMART UTILITY SERVICES

- NEAR REAL TIME OPTIMAL MANAGEMENT OF AGGREGATED DEMAND FLEXIBILITY TO INTEGRATE LARGE SHARE OF FLUCTUATING RESs
- FINESCE is an on-going European R&D project, funded within the Public-Private partnership on Future Internet, aimed at demonstrating how Future Internet platform and technologies could enable in a more effective way increasing flexibility to the Future Smart Energy System, which will deal with the challenge of integrating rising shares of stochastic RESs
- Near Real time management of aggregated demand flexibility allows energy stakeholders, either DSOs either suppliers to trade and acquire the necessary flexibility from the energy consumers (commercial, industrial, aggregators of residential demand) for ensuring the network stability and providing demand-supply balance within a scenario of large penetration of intermittent RESs
- Major outcome: Energy marketplace application on the top of FI-WARE platform for both DSOs and retailers aimed to the effective integration of intermittent renewable energy sources in Smart Grids via demand-response and real time energy marketplace

FINESCE/ FUTURE INTERNET SMART UTILITY SERVICES



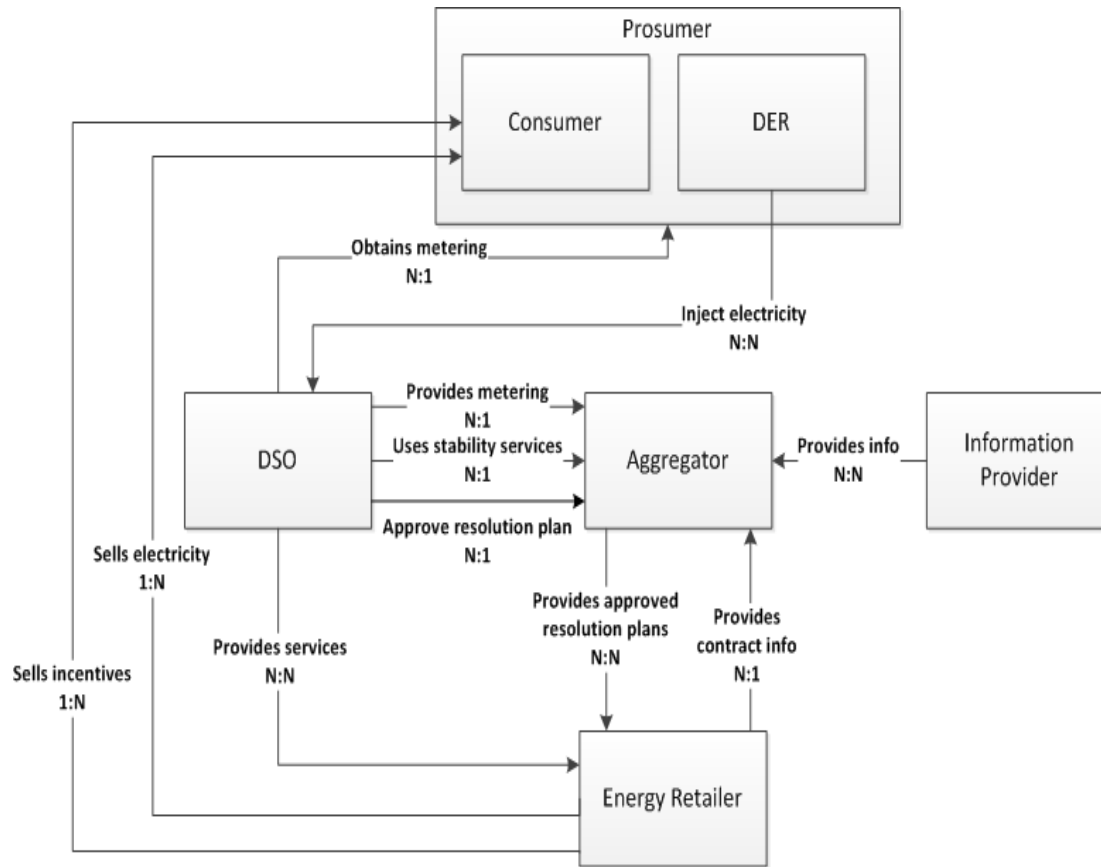
Large shares of stochastic RES (15-30%)

Energy consumption not aligned w.r.t. production from PV plant

➔ Facing network stability problems due to reverse power flows

➔ Energy consumption needs to be shifted in order to maximize usage from local PV plants
(Demand postponement / Demand flexibility to be acquired by energy players in the marketplace)

FINESCE/ FUTURE INTERNET SMART UTILITY SERVICES



Aggregator

- identifies imbalances in power demand and supply
- proposes a control plan to address them

DSO

- has the control of distribution grid
- approves resolution plans

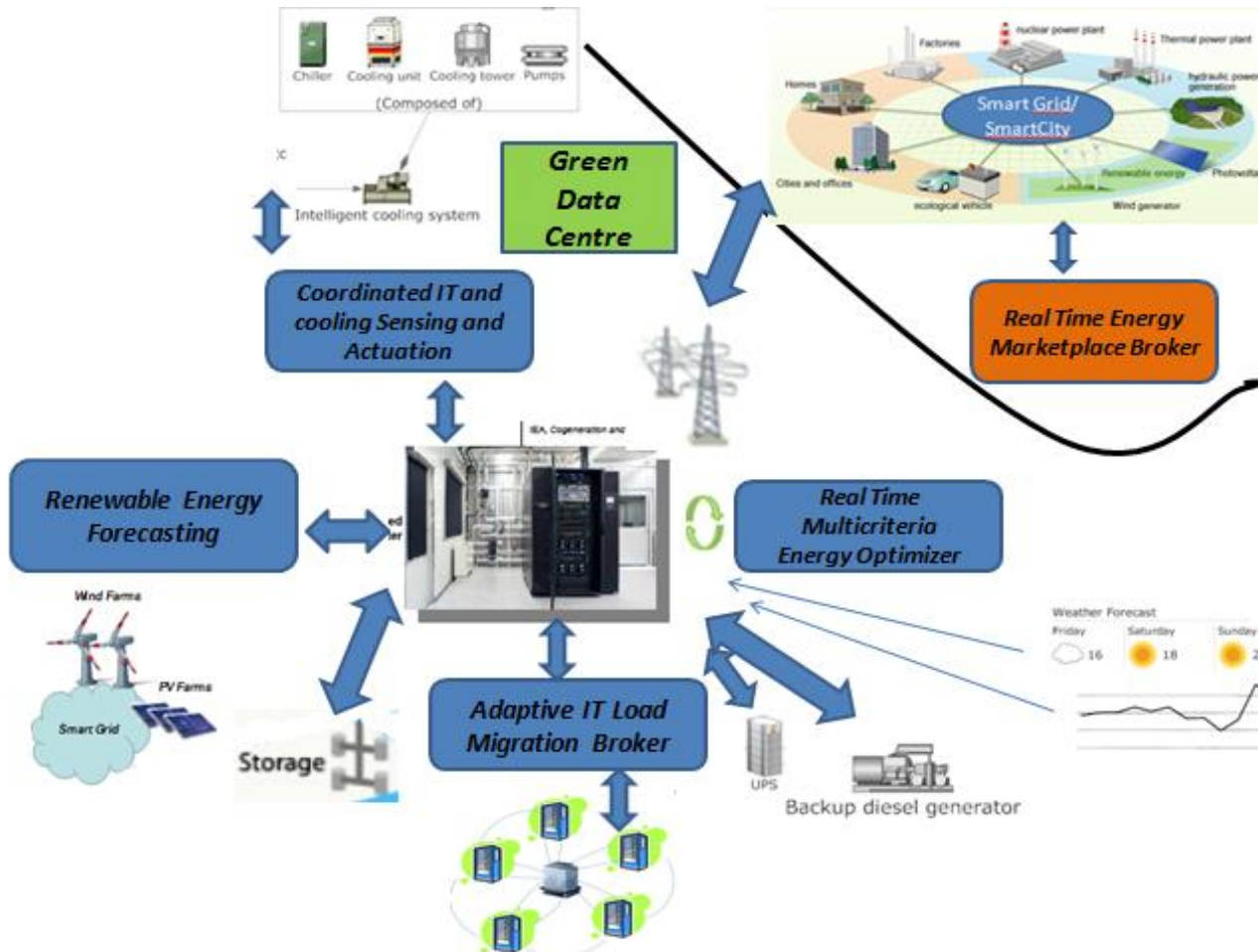
Energy Retailer

- transforms the resolution plans to specific incentives tailored to the consumer

GEYSER/ Green nEtworked data centres as energy proSumerS in smaRt city environments

- OPTIMIZED ENERGY MANAGEMENT IN GREEN NETWORKED DATA CENTERS INTERACTING WITH SMART ENERGY GRIDS IN SMART CITIES
- Urban Data Centers may represent significant energy flexibility buffers for smart energy stakeholders, either distributors either retailers
- GESYSER aims at delivering novel tools and practices which support the optimized operation of data center cloud-based networks when they are integrated with smart energy (either electricity either thermal)grids and smart cities
- GEYSER incorporates an innovative approach which combines local generation capacity with thermal storage and cloud-based IT workload temporal and/or spatial migration to make it available the requested flexibility levels to energy stakeholders (DSO, retailers) via energy marketplaces
- Major outcomes: Conceptual, Technological& Business framework Platform for efficiently designing and operating renewable energy-powered networked Data Centres acting as a flexible energy player within a Smart City /Smart Grid context

GEYSER/ Green nEtworked data centres as energy proSumers in smaRt city environments



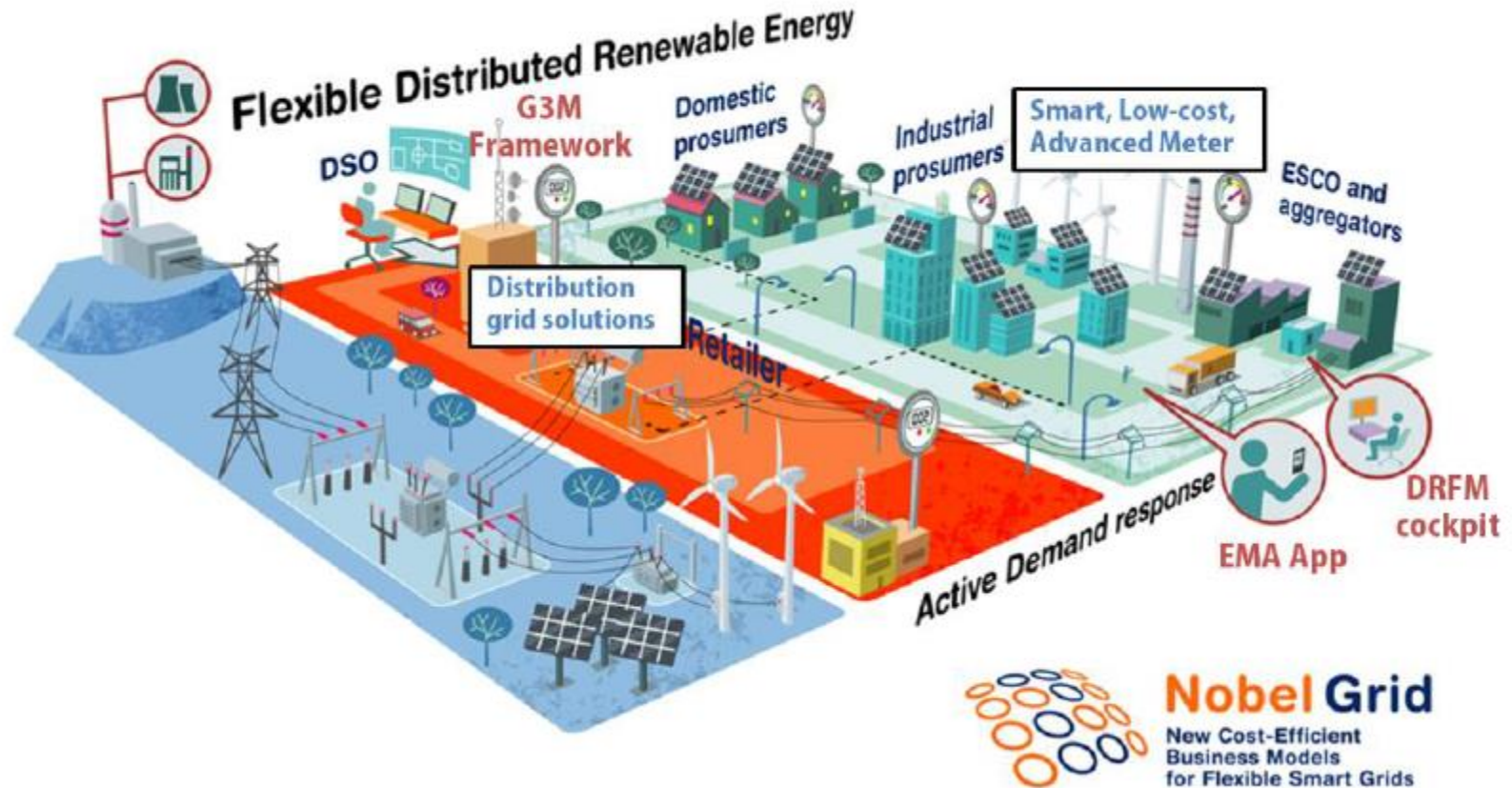
GEYSER/ Green nEtworked data centres as energy proSumerS in smaRt city environments

- Data Centers are often operated in uncoordinated way and their energy efficiency has been so far addressed in an isolated way
- GEYSER rationale: integration of data centers into smart energy grids to provide energy networks with flexibility required to face supplementary operational challenges for the integration of fluctuating RES sources
- GEYSER has been developing and implementing a novel concept for local balancing marketplaces in which electricity distributors (DSOs) will be able to procure the necessary flexibility to deal with unexpected operational challenges due to intermittent RESs in near real time (data centers offering ancillary services to DSOs)
- GEYSER has been investigating how to realize the intelligent integration of energy-efficient networked urban data centers – substantially powered by renewable energy – with energy infrastructures (i.e. smart power grids and district heating) within the Smart City context
- The GEYSER vision is to enable a holistic concept of the energy-efficient data center, the one which will be located in Smart City environments, powered as much as possible by renewable energy sources and flexibly managing IT workload
- This will be done by trading-off energy (i.e. power and/or heat) exchanges with smart city infrastructures against workload exchanges with other Data Centers in its network

NOBEL GRID/ **New Cost-Efficient Business Models for Flexible Smart Grids**

- **PREDICTIVE ANALYTICS SERVICES FOR OPTIMIZED DEMAND RESPONSE ENABLED BY SCALABLE MONITORING AND COMPUTING INFRASTRUCTURE**
- NOBEL GRID will develop, deploy and evaluate advanced **tools, ICT services and suitable business models** enabling **active consumers' involvement** and demand response models aimed at effectively integrate larger shares of intermittent RESs. **distributed renewable energy production.**
- NOBEL GRID will be aimed at demonstrating how and to a what extent latest ICT advancements in **big data predictive analytics and scalable monitoring** may enable real time cost-effective demand response solutions with a view to **improve medium and low voltage electricity distribution networks stability and continuity of supply, within a scenario of large share of fluctuating RESs**
- **Innovative solutions to lower the cost of the development and deployment of smart metering systems** will be provided with a view to develop and test a new **Smart Low-cost Advanced Meter (SLAM)**, which focus will not only be on providing the usual meter capabilities at lower costs – reducing component costs by removing for instance unnecessary displays - but also in addressing specifically the needs of the prosumers with regards to data analysis and services
- A Follow up of the FINESCE use case will be made available with one more order of magnitude with regard end users and predictive analytics service prioritization

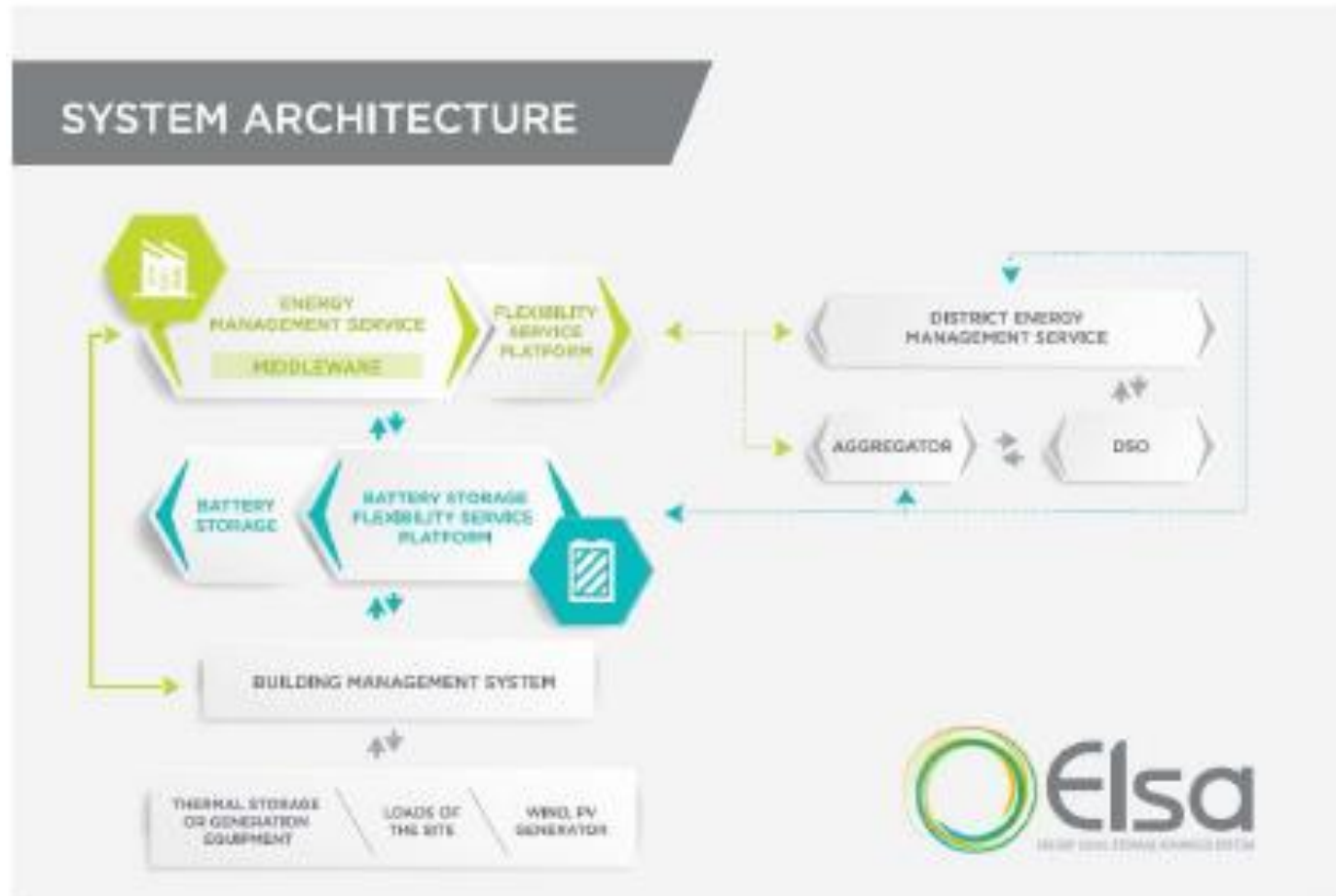
NOBEL GRID/ New Cost-Efficient Business Models for Flexible Smart Grids



ELSA/ ENERGY LOCAL STORAGE ADVANCED SYSTEM

- OPTIMIZED MANAGEMENT AND COORDINATION OF DECENTRALIZED ENERGY STORAGE (2ND LIFE EV LI-ION BATTERIES, THERMAL STORAGE AND DEMAND RESPONSE) FOR LOCAL GRID STABILIZATION
- ELSA project will demonstrate an innovative yet economically-viable **hybrid multi-source small/local energy storage-as-a-service concept** centered on **low-cost second-life batteries**, aimed at supporting building and district managers in **local energy management optimization**, and power grid distributors in enhanced DSO network operations
- Few commercial decentralized storage systems do exist today due to technology immaturity, high CAPEX and lack of viable business models
- ELSA aims at combining and optimally manage decentralized physical storage facilities (Li-Ion 2nd life batteries, CHP, thermal storage devices/heaters) with virtual storage systems (demand response for both electrical and thermal loads, flexible generation) through an effective ICT-based energy management system (EMS)
- Further evolution of FINESCE demand-response aggregation, by adding substation-level storage to aggregated demand response/load flexibilization to alleviate local grid congestion
- Synergies among ENERGY AND TRANSPORT/MOBILITY infrastructures with a view to achieve holistic smart city energy efficiency

ELSA/ ENERGY LOCAL STORAGE ADVANCED SYSTEM



Thanks for your attention!
Questions?



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