FUTURE INTERNET SMART UTILITY SERVICES

FINESCE

Smart Energy Usage Area in the FI-PPP, Overview and Status Quo

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2013-11-28

SEVENTH FRAMEWORK PROGRAMME

FUTURE INTERNET PPP

FINESCE Objectives

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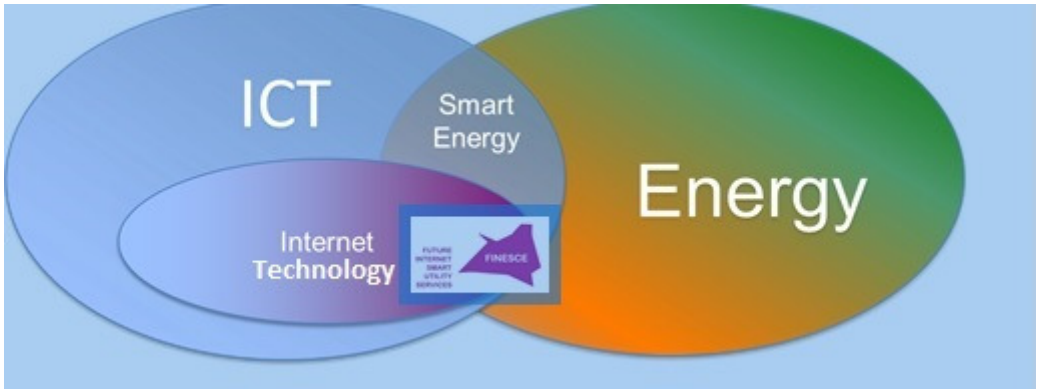
- Team-up the ICT and Energy sectors to demonstrate outstanding European Future Internet technologies enabling sustainable energy management
- Develop novel service layer enhancements encapsulated in the FINESCE API layer



Trial Site: Malmö, Sweden
FI Providing Sustainable Smart City Energy Ecosystem

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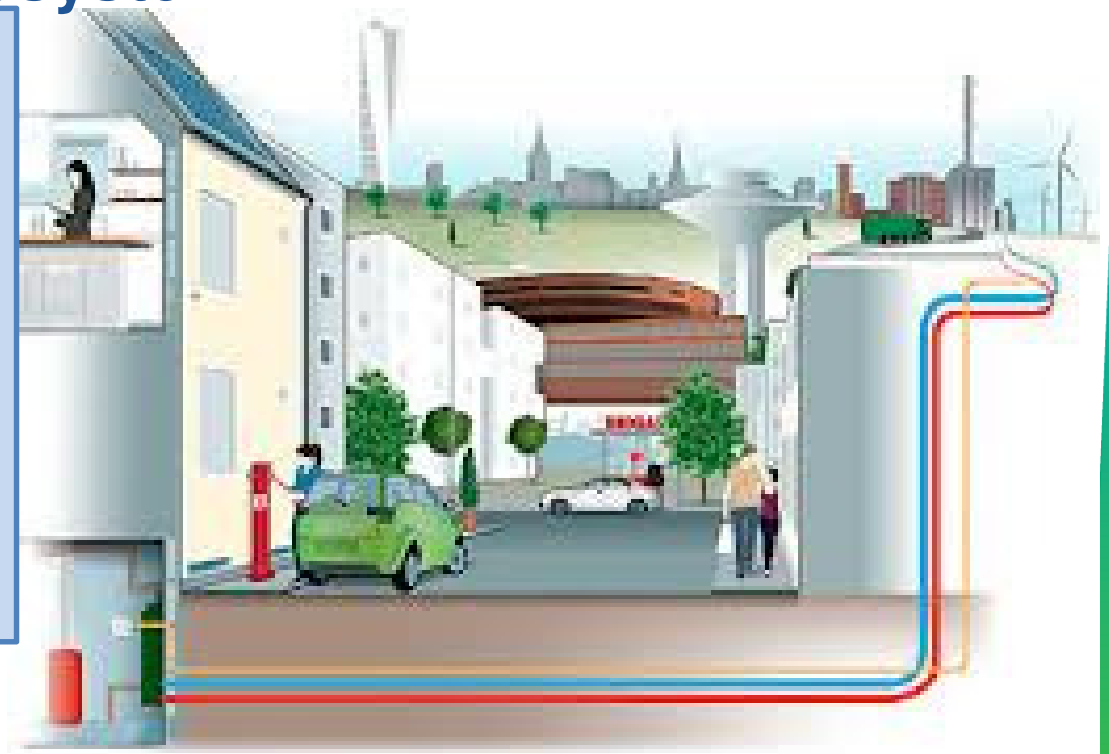
- Demonstrate optimisation of supply and demand across different energy carriers, such as electricity, heat and cooling
- Mix of building types
- Proof of concept of distributed energy management (in the individual buildings and apartments) and centralised portfolio management (overall)



e·on

E.ON Energy Research Center

Trial Site: Denmark, Spain
FI for End Users of Energy Ecosystems

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Trial overview

- 25 single family houses stream in Horsens, Denmark
- Commercial Acciona office building stream in Madrid, Spain

Objective

Enable services through FI based platform and FINESCE API offering rich data on energy needs and consumption patterns.
Promote energy efficiency via incentives and dynamic tariffs

INSERO acciona Infraestructuras DSE AIRPORT SOLUTIONS E.ON Energy Research Center

Trial Site: Germany (Cologne/Aachen)
FI Developing the B2B Energy Ecosystem

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Objectives

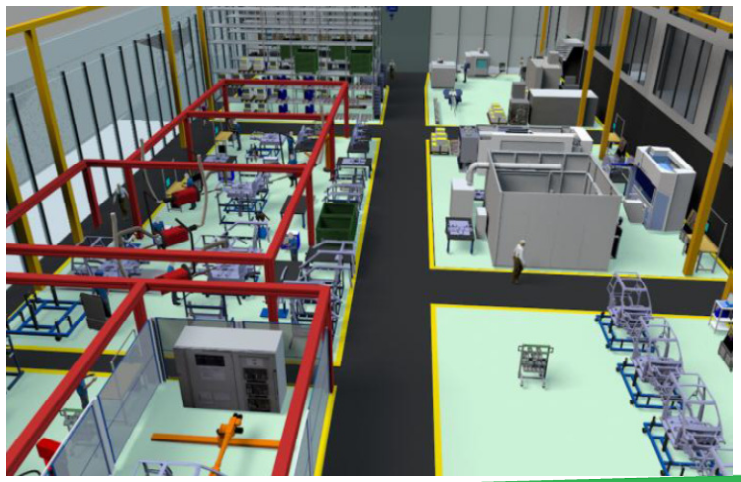
- Proof of concept of Cross-border virtual power plant (NRW – Belgium)
- Energy management in a smart factory using monitoring and demand side response (flexible electricity tariffs)

Scope

Trial installation in Belgium and Germany

~10 Renewable energy sources

1 Demand Site



QSC AG

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Trial Site: Italy
FI Building the Energy Marketplace

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Objectives

- New MV/LV Market mechanisms for enacting Demand Response
- Minimising reverse power flow and power losses in Terni Trial Site

Scope

Trial installation in Terni (Italy)
- 2 Photovoltaic Plants
- 19 Customers

ENGINEERING SYNELIXIS ASM ASM Terni S.p.A. Grenoble INP

Trial Site: Ireland
Future Internet in Electricity in Action

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Objectives:

- eCar batteries as interruptible loads to balance the power grid
- Substation communications for power management

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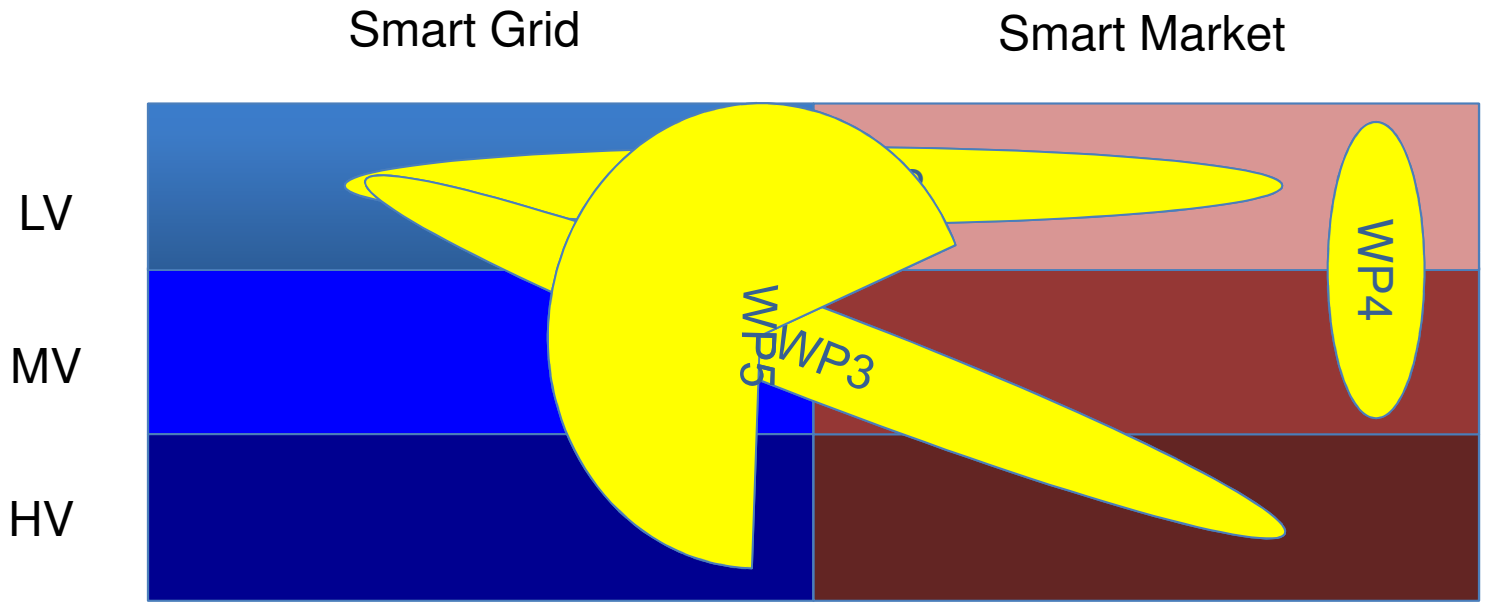
FINESCE Vision and Strategy



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FINESCE Component-based Architecture

- FINESCE has 5 vertical Work Packages developing independent field trials of different aspects of using FI in the Smart Energy domain.
- The broad scope of the trials means that a top-down architectural approach cannot be applied.
- FINESCE uses a bottom-up approach
- each trial's architecture uses the components suitable for its needs
- each trial develops API services which are consolidated into a common unified FINESCE API layer

API Layer Offers Services to Apps

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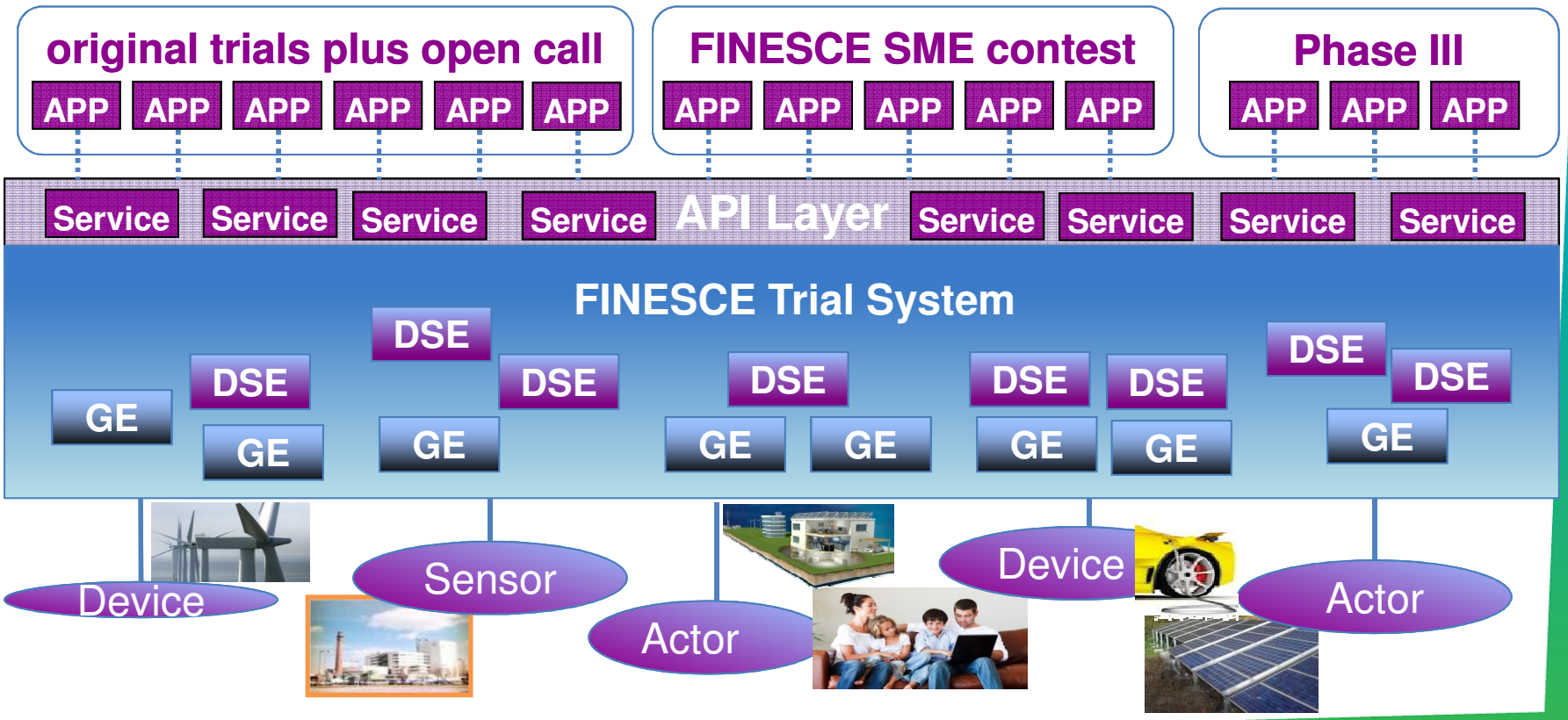

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FINESCE API Objective and Approach

Objective

FINESCE API will allows project participants, research (PPP) projects, Students during talent competitions and SMEs to:

- get remote access to the project trials and infrastructures
- monitor experiments
- Create & validate their 3rd party FI energy applications

FINESCE API provides risk-free recipes for using FI-WARE GEs and FINESCE DSEs in a structured, coherent and business-oriented manner

Approach

- Rely on HTTP/RESTful services (wherever possible)
- Expose FINESCE trials results (both on-line & historical data)
- Expose FINESCE DSE interfaces
- Expose Customized access to GEs, utilised by FINESCE
- Allow normal access to GEs, utilised by FINESCE

GEs Currently Planned to be Used

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FI-WARE Chapter	GE	WP1	WP2 Horsens	WP2 Acciona	WP3 Factorv	WP3 Core.VPP	WP4	WP5
Apps	Mashup				✓		✓	
Cloud	IaaS DCRM					✓	✓	
	Object Storage					✓		
	PaaS					✓	✓	
	SDC						✓	
	IaaS Service Management						✓	
Data/Context Management	Big Data Analysis	✓	✓	✓			✓	
	CEP	✓			✓		✓	✓
	Context Broker	✓	✓	✓	✓		✓	
I2ND	Cloud Edge							✓

FI-WARE Chapter	GE	WP1	WP2 Horsens	WP2 Acciona	WP3 Factory	WP3 Core, VPP	WP4	WP5
IoT	Configuration Manager		✓					
	Gateway Data Handling		✓		✓		✓	✓
	Gateway Device Management		✓		✓			
	Backend Device Management		✓					
	Backend IoT Broker		✓					
	Gateway Protocol Adapter		✓					
Security	Access Control	✓	✓				✓	
	Data Handling			✓		✓	✓	
	DB Anonymizer							✓
	Identity Management		✓				✓	
	Security Monitoring							✓
	Privacy-Preserving Authentication							✓
	Content Based Security							✓

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Next Steps

- Trial design performed
- Open Call (submission deadline 13 Nov.2013)
- Trial Preparation to provide working and tested trial architecture components (to M11, Jan. 2014)
- GE and DSE integration into trials (to M13, Mar. 2014)
- Trial Implementation (starting M10, Dec. 2013)
- Emulation, Simulation (started M8, Oct. 2013)