

## Smart Energy: a use case pilot of FI-WARE

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Everything gets connected & smart, not just phones

# 10 Hot Consumer Trends

## 1. APPS CHANGE SOCIETY

City life will be transformed by 2016



## 6. ONLINE BENEFITS OUTWEIGH CONCERNS

People minimize risk by being more cautious online



## 2. YOUR BODY IS THE NEW P@55W\*RD

Users prefer fingerprints to passwords



## 3. THE QUANTIFIED SELF

40% want to log their physical activities



## 8. MAKING MY DATA VISIBLE

48% use apps to check their data consumption



## 4. INTERNET EXPECTED EVERYWHERE

Quality of experience when using internet is falling behind that of voice



## 9. SENSORS IN DAILY PLACES

60% believe sensors will be commonplace by the end of 2016



FUTURE INTERNET SMART UTILITY SERVICES

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## 5. SMARTPHONES REDUCE THE DIGITAL DIVIDE

The smartphone is the primary internet device in India and Indonesia

## 10. PLAY, PAUSE, RESUME ELSEWHERE

The rise of streaming services allows people to view content on the move



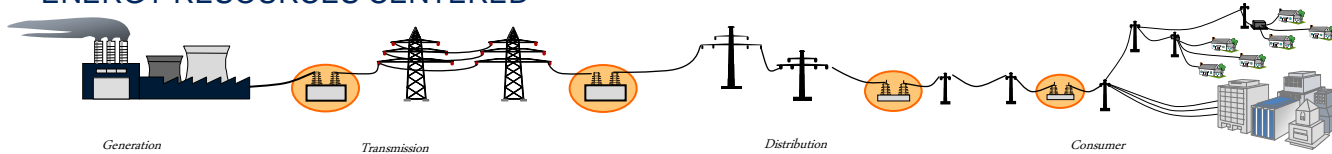
# GRID transformation

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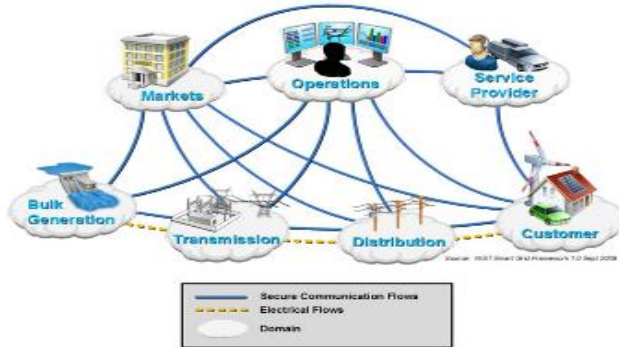
TODAY

ENERGY RESOURCES CENTERED



ONE ENERGY FLOW, ONE INFORMATION FLOW

EXPECTED DISTRIBUTED AND PARTICIPATIVE MARKET



- Distributed generation and consumption
- More focus on customer concerns; quality, security of supply
- New market participants, pro-sumers, aggregators, mobility service operators, etc
- New management models; transparency and non discriminatory access.
- New products and services.

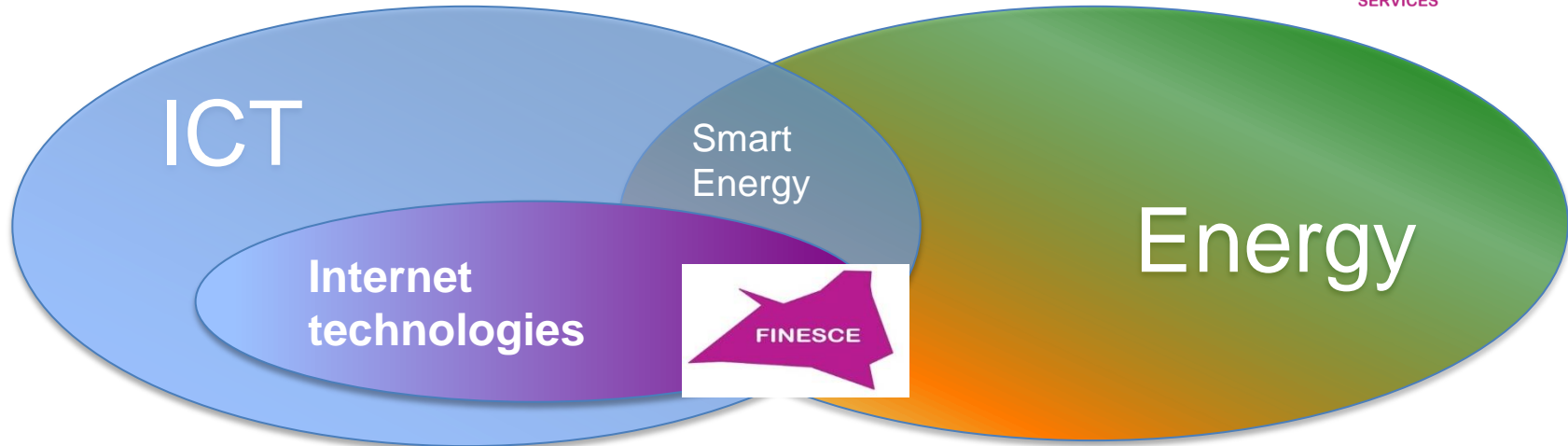
Source: NIST Smart Grid Framework 1.0 Sept 2009

BI-DIRECTIONAL ENERGY FLOW, "N" INFORMATION FLOWS

# The Future Internet for Smart Energy

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**Future Internet of Energy: organizing..**

▪ **Enabling innovation based on internet interfaces in the energy sector**

- (volatile) distributed energy production
- (flexible) consumers and prosumers
- electric vehicles (as consumers and storage)

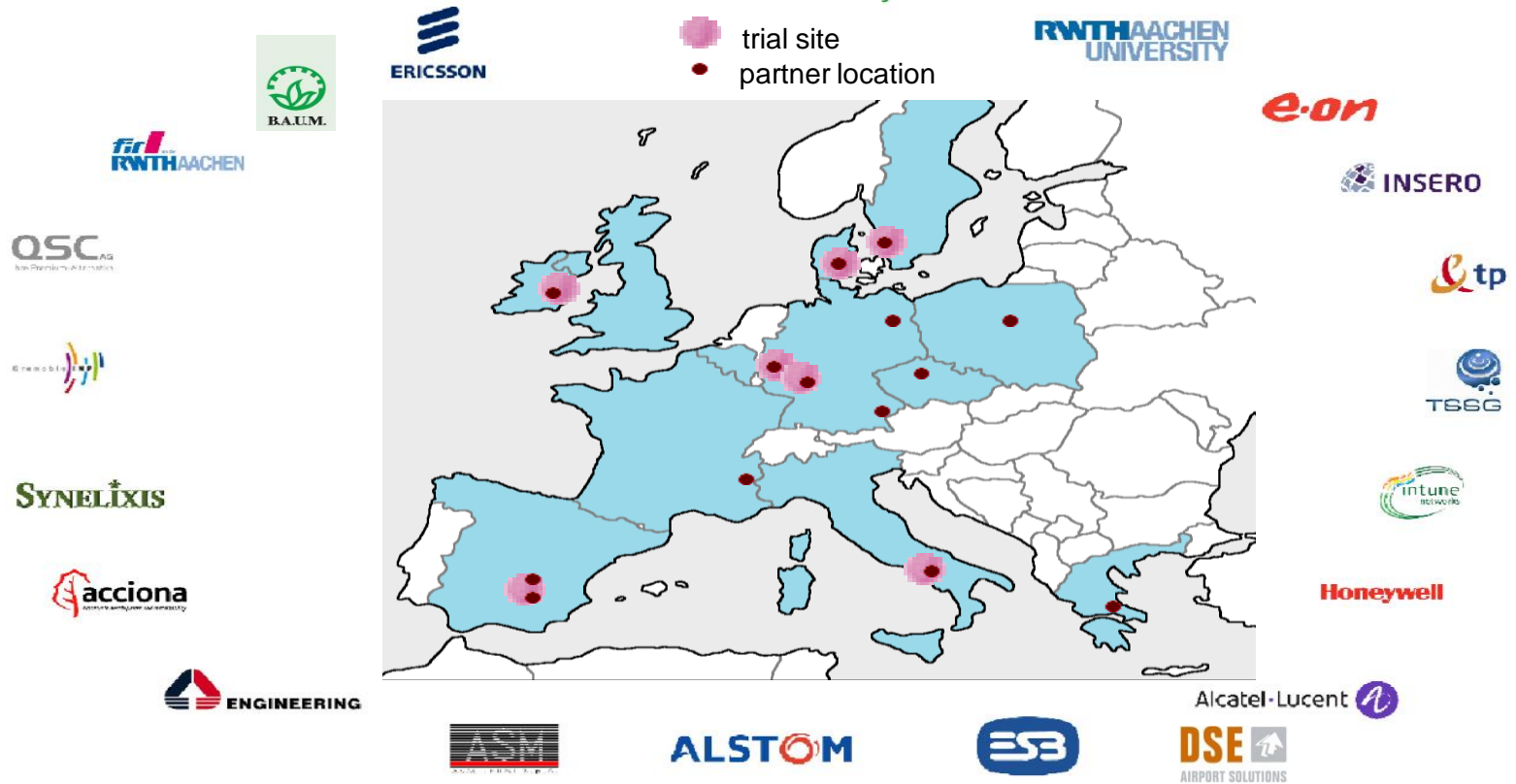
**Benefits of using the future internet and GE approach:**

- **Shorter time to market!**
- Easy access for new partners
- scalability of applications
- lower costs for application development

# FINESCE Partners and Trial Sites

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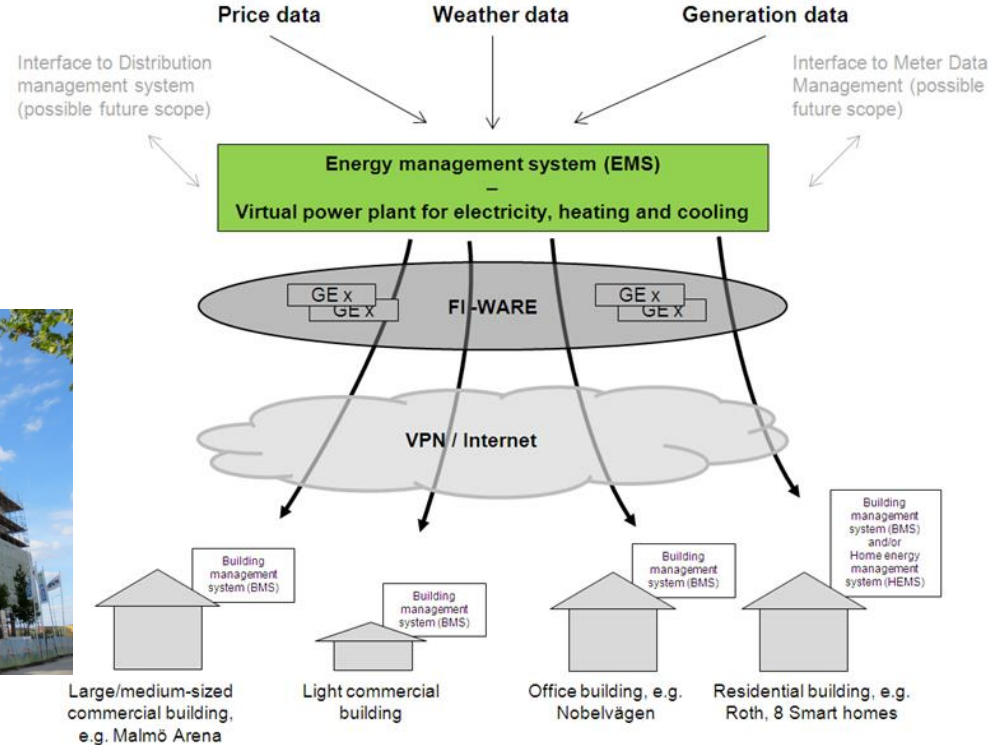


# Trial 1: FI Providing Sustainable Smart City Energy (Malmö, Sweden)

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- Using Future Internet as an enabler for innovation and opening of closed systems
- Demonstrate optimization of supply and demand across different energy carriers, such as electricity, heat and cooling



# Trial 2 – Smart Region Horsens, Denmark & Madrid

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## Two trial sites/streams of activities

1. Trial site Horsens: Energy management in a community of 20 single family houses in a village
2. Trial site Madrid: Energy management in a commercial office building



## WP 2 objectives

- Enable value added services through an open FI based platform with FINESCE APIs, offering rich data on energy needs and consumption patterns.
- Promote energy efficiency via incentives from the energy market place and dynamic tariffs.



# Trial 3 - cross-border Virtual Utility

## Motivations

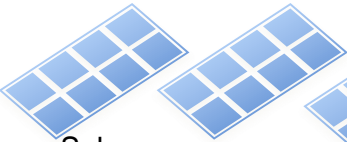
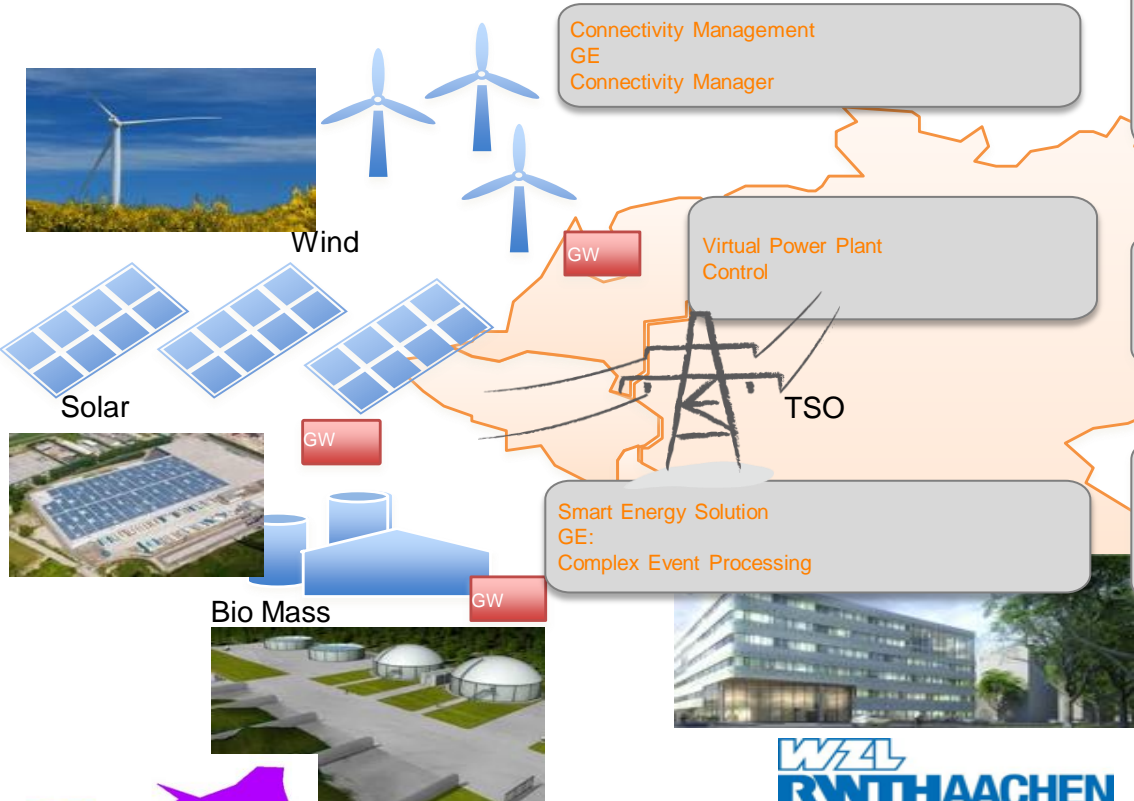
- Combine renewable Energy production with Demand Site Management to a Virtual Utility
- Combine different volatile energy production to guaranteed CO2 free certified energy

## Objective

- Increase the part of renewable Energy of the consumption of electrical Energy

## Scope

- Trial installation in Belgium and Germany
- ~10 Renewable energy sources
- ~1 Demand Site

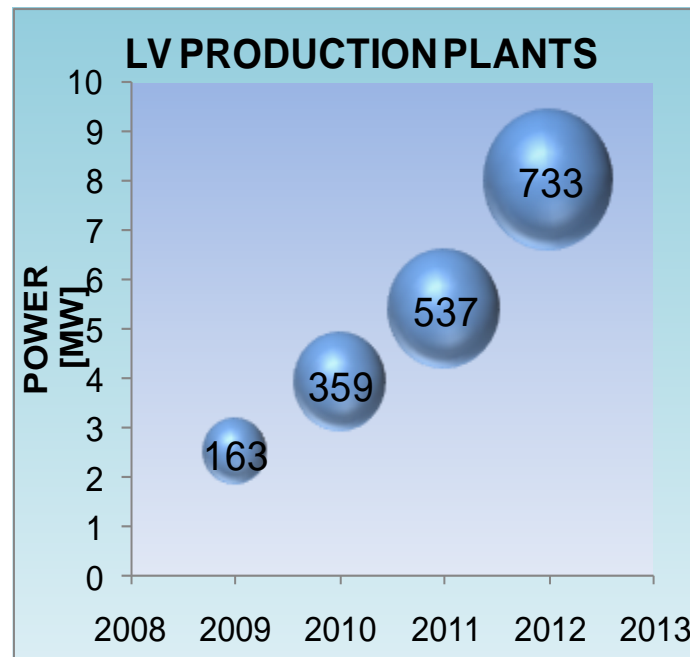


## Trial 4 – FI Building the Energy Marketplace in Terni, Italy

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- Trial site: Terni (Italy)

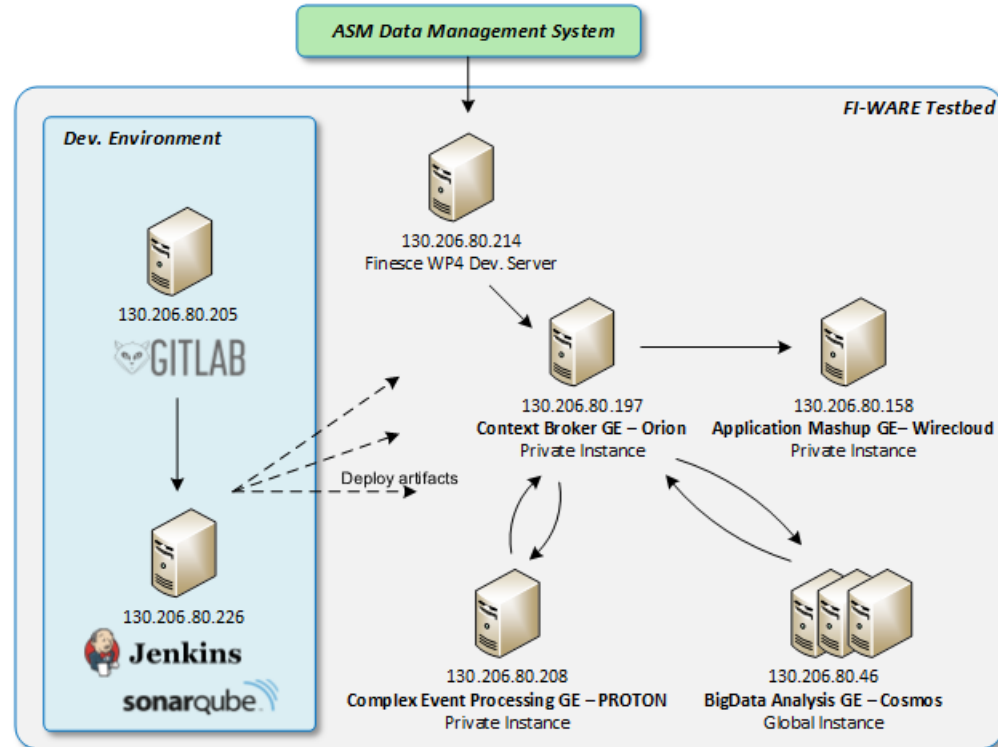


# GE and DSE integration

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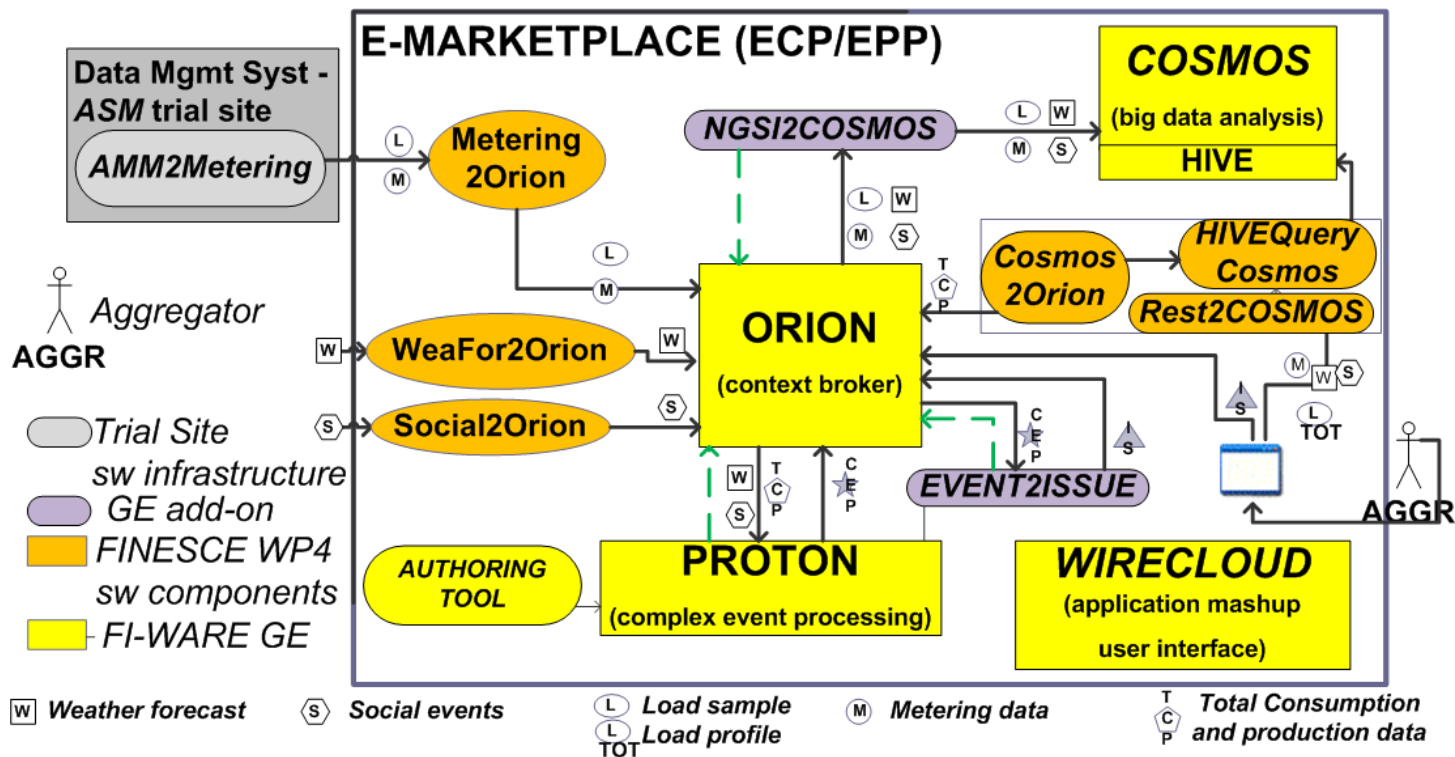
- WP4 trial is actively using the cloud facilities offered by the FI-WARE Testbed
- FI-WARE Generic Enablers used “as-a-service”



# GE and DSE integration

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## Trial site Ireland

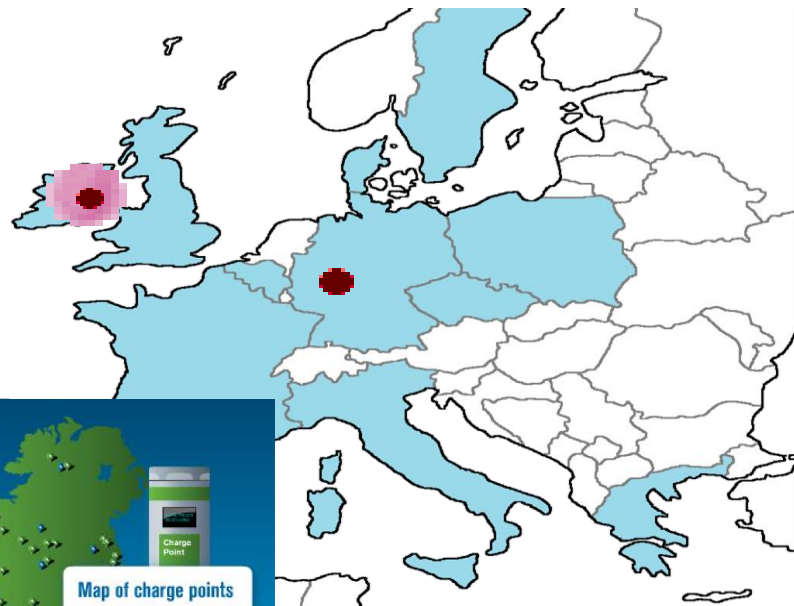
### Future Internet : Electricity in Action

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#### Objectives:

- eCar batteries as interruptible loads to balance the power grid
- Substation communication for power management
- Simulation at RWTH to scale up results



trial site  
partner location

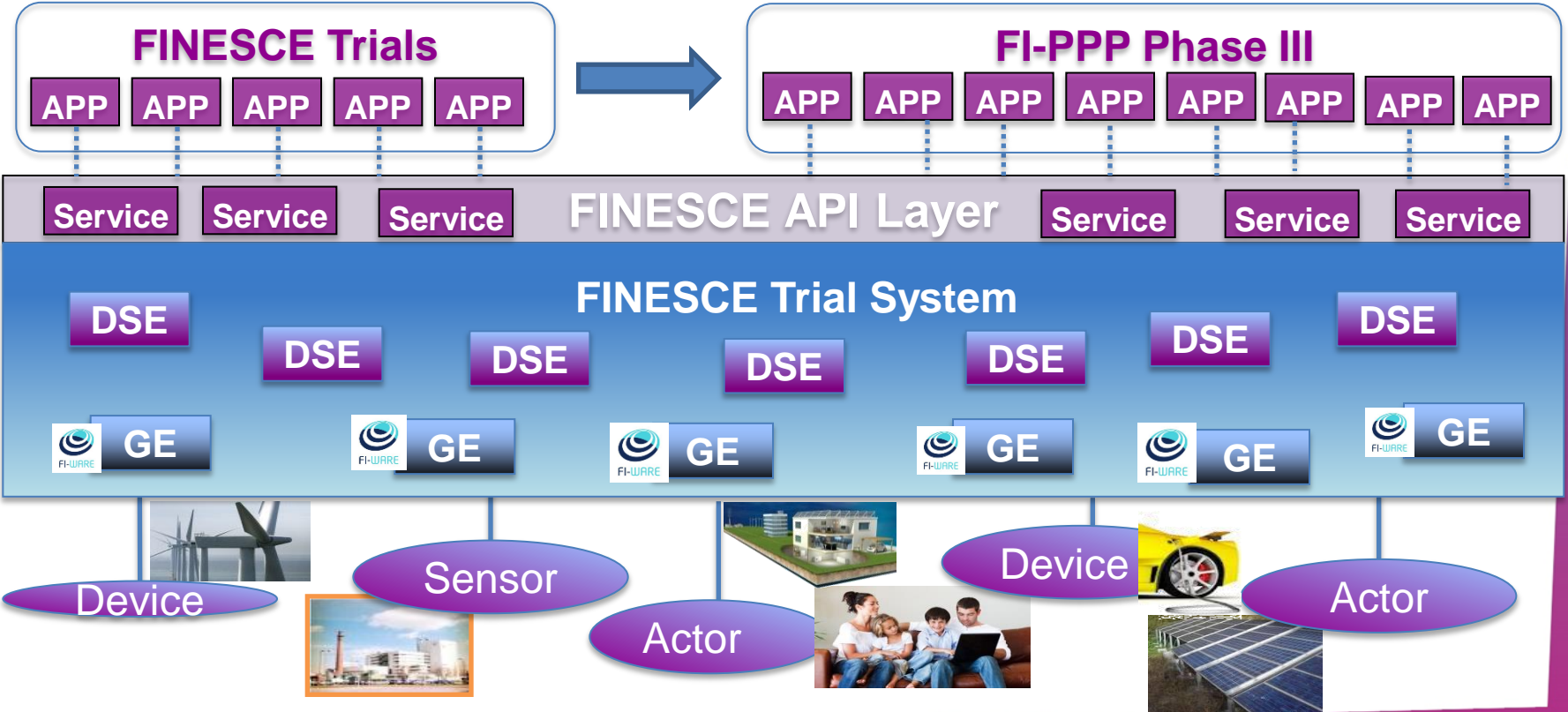


E.ON Energy Research Center



# FINESCE API Layer Offers Services to Apps

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# Instances of GEIs under evaluation, in design or integrated, total for all Trial Sites

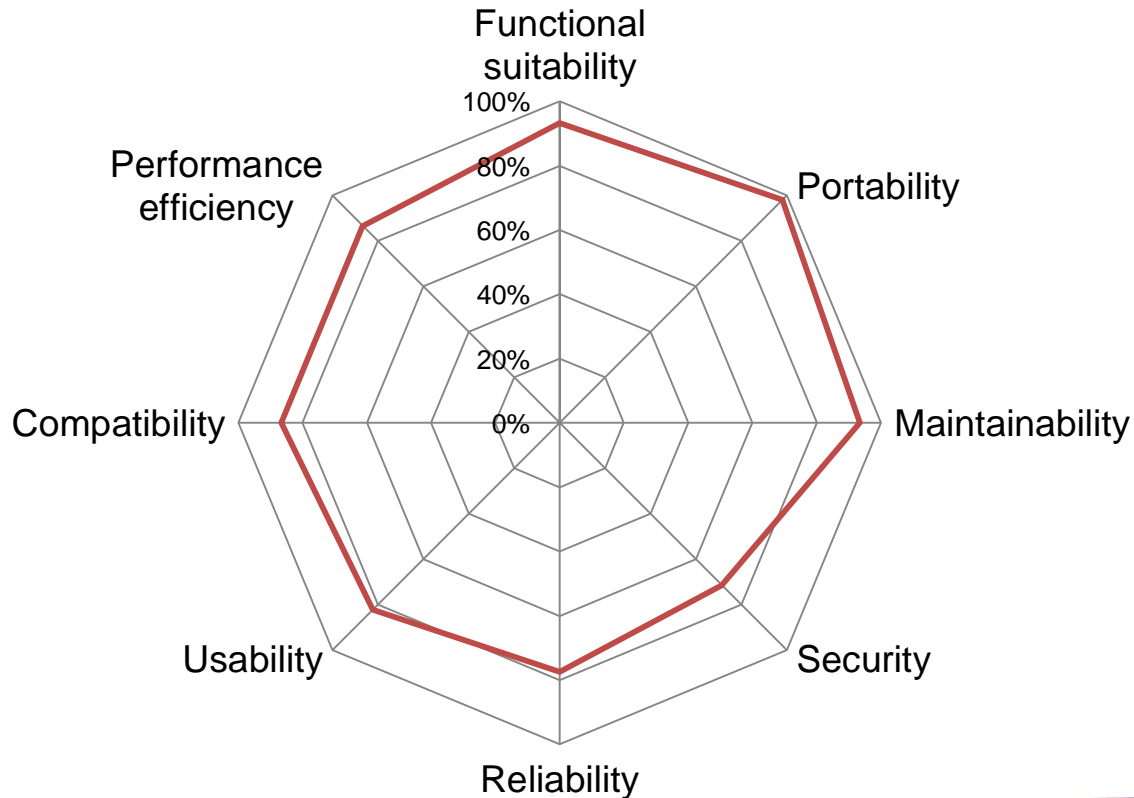
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# GE Evaluation Example: Gateway Data Handling

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The GE Gateway Data Handling showed a very good overall result (83,85%) and greatly supports a fast and scalable integration of energy management in an industrial environment!

- Smart Grids mean new communications networks for utilities
- Existing systems can be developed into solutions addressing many of the requirements for Smart Grids
- GEs shorten development times and offer an excellent platform for experimentation
- Many utilities have little awareness of the opportunities of scale and scope which an IP based network offers them – it opens up a world of innovation to them

# European Conference on the Future Internet (ECFI) in Munich, 17.9.-18.9. 2014

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## Grand opening of FI-PPP phase 3 by Neelie Kroes, Vice President of the European Commission

- Enabling Europe's Digital Industry
- 80 Mio funding available for SMEs
- Meet 16 accelerator projects
- 2 days packed with information, discussions, entertainment and training

Register at

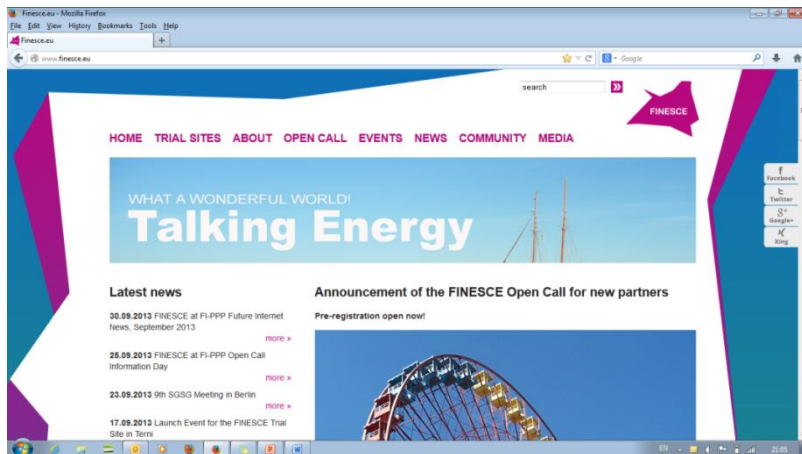
<http://www.ecfi.eu/munich2014/>



# FINESCE – Team up with us!

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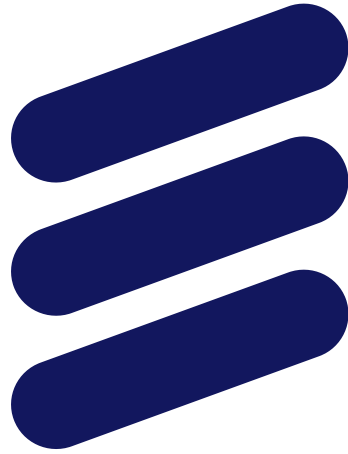
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WWW.FINESCE.EU

- › **FINESCE Trial Open Days – experience our trials 1st hand!**
  - September 20, 2014      Dublin, Ireland (EV charging and Grid trial)
  - December 2, 2014      Horsens, Denmark (Smart Region & homes)
  - February 2015      Terni, Italy (E-marketplace for energy)
  - June 2015      Malmö, Sweden (Smart City area)
- › **FINESCE Innovation Community ([www.finesce.eu](http://www.finesce.eu))**
  - for all interested to follow what we are doing
  - membership is free of charge – just enter your email address on our web site or give us a business card



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