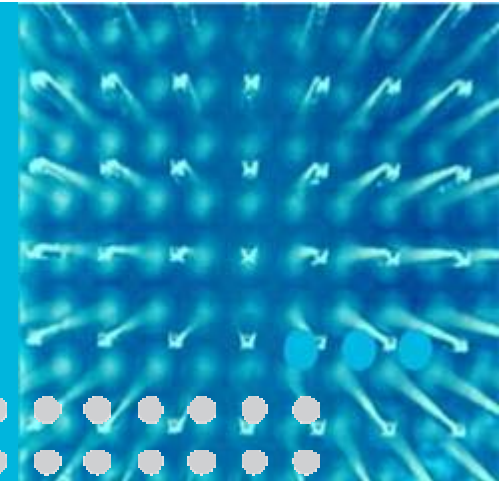


FI PPP

Necessity for Experimentation

(in the continuity of the presentation delivered during the FIRE Week on 01.07.09 in Lulea)



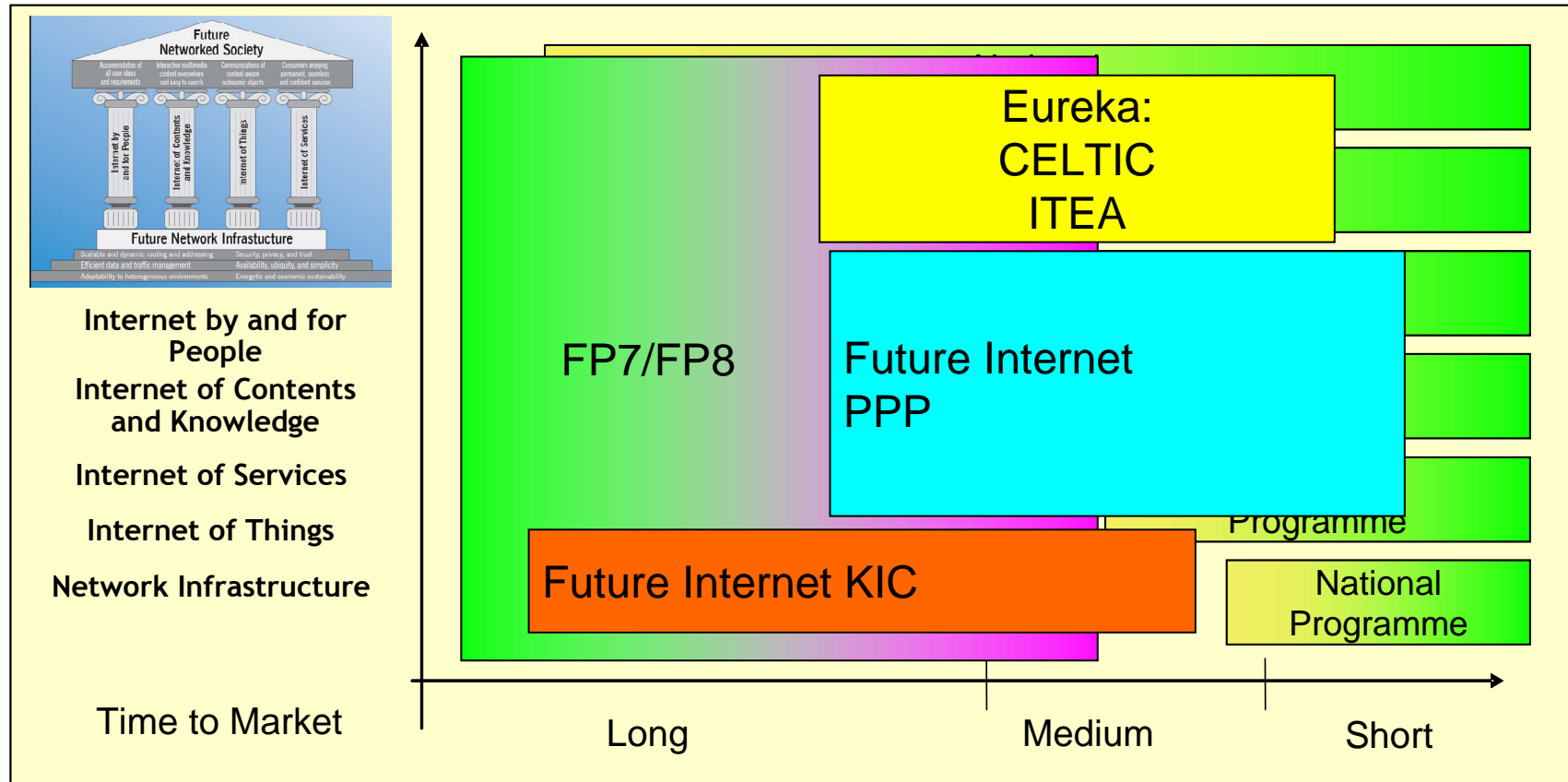
Dr. Didier Bourse

23.11.09 - Stockholm FIA - Kista

FI PPP Initiative

Context & Status (1/7)

Future Internet PPP - Global Perspective



FI PPP Initiative

Context & Status (2/7)

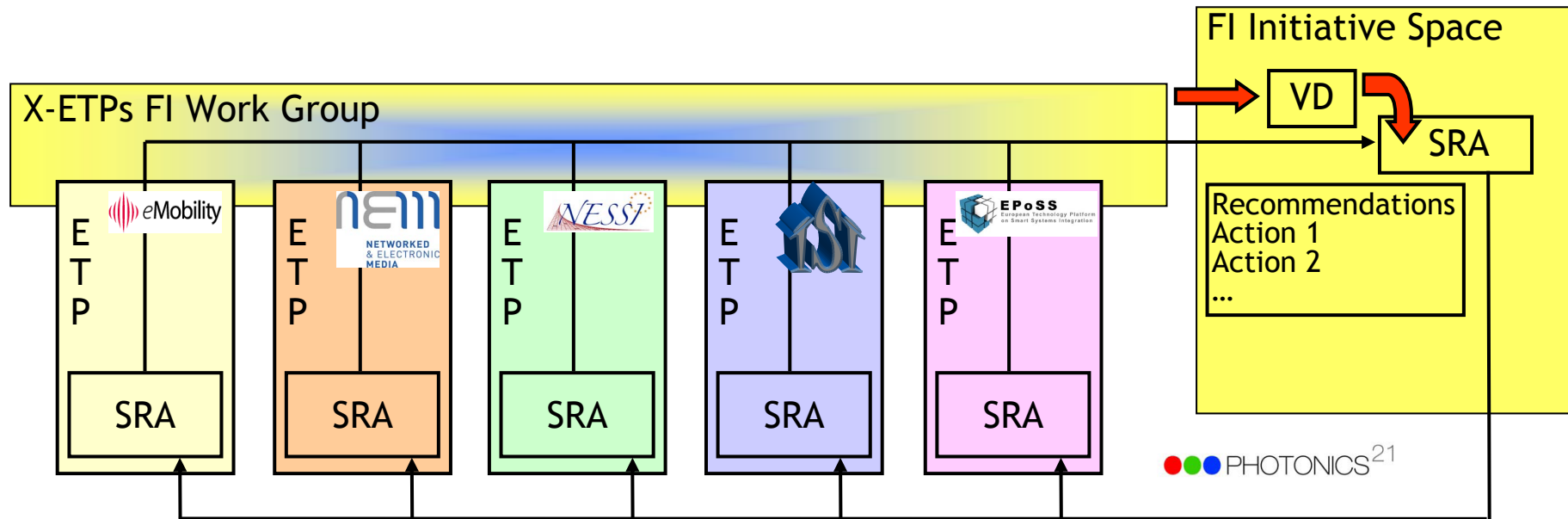
Future Internet PPP - Ambitions

- To **secure EU interests** and **establish its role** in the Future Internet domain
- A **multidisciplinary approach**, where **massively distributed services and applications are run over large scale internet infrastructures** is the only means to deal with the **increasing complexity of intertwined application and service requirements**
- **Only strong coordinated and decisive action** can enable the establishment of such a multidisciplinary approach at the EU level
- Form a **Public Private Partnership (PPP)** that will enable **faster progress** and **exploit synergies** in a way that is not possible with current Instruments
 - Target **short-medium terms impacts**
 - **Accelerate industry developments** and **enable the pitch** (and derisking) of specific developments that are today at lower priorities for EU industry
 - Contribute to **close the gap between technology and applications**
 - Contribute to **close the EU innovation and competitiveness gap**
 - **Complement the longer term research** of the FP

FI PPP Initiative

Context & Status (3/7)

Future Internet PPP - X-ETPs FI Basis



Recommendations

- Identify achievable business models based on the current ecosystem and based on disruptions brought by the Future Internet developments
- Develop a dynamic roadmap for the key research challenges to be tackled, and establish a road map ensuring the take-up of the research results
- Explore different R&D evolutionary and disruptive approaches, covering classical, clean-slate, and experimentally-driven
- Further develop the cross-domain research fertilization covered by the set of projects working together in the Future Internet Assembly
- Provide the financial resources allowing for the strengthening of the industrial/public partnerships in R&D
- Develop appropriate multi-disciplinary teaching and life-long training programs to ensure sustainable knowledge and skills acquisition facilitating innovation
- Develop the an integrated and structured approach between National and European R&D programs so as to overcome the current fragmentation of efforts
- Develop and implement the so-called push-pull model: Large investment in R&D accompanied by a solid and homogenous policy of leading edge markets development and public procurements
- Stimulate a pan-European coordinated approach on matters relating to standardization and the single market
- Provide the means to ensure global coordination of concepts and plans for the Future Internet to address industrial perspective
- Raise awareness of all European citizens about the clear and visible benefit of the outcome of the investment in Future Internet development

FI PPP Initiative
Context & Status (4/7)

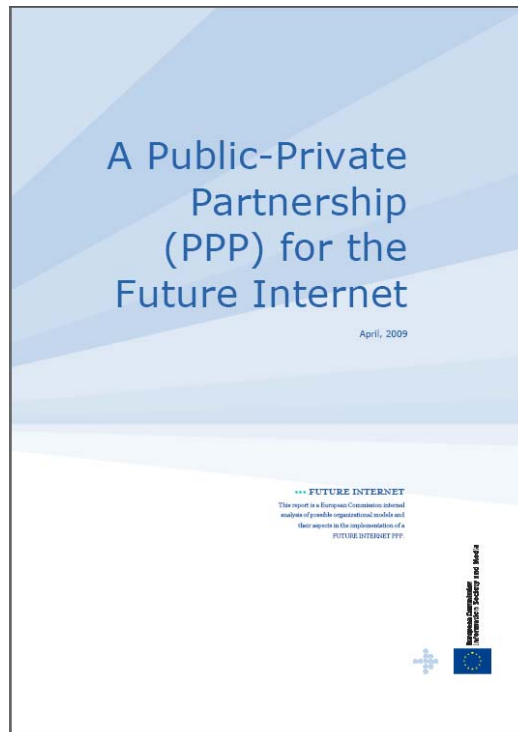
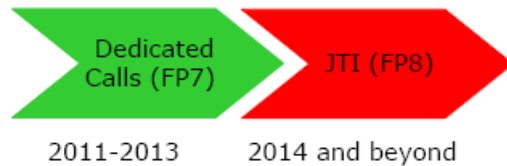
Future Internet PPP - Industrial Core Group (CG)



FI PPP Initiative

Context & Status (5/7)

Future Internet PPP - 2009...



EC Document - April 09

http://ec.europa.eu/information_society/activities/foi/library/index_en.htm



Industry calls for a Public Private Partnership on the Future of the Internet - During the conference David Kennedy, Director of Eurescom and the representative of a group of leading European technology companies, presented their **industry call for action**, notably on the establishment of a public private partnership on Future Internet.

[EC FI Newsletter N°6 - 18.06.09](#) and <http://www.future-internet.eu/>

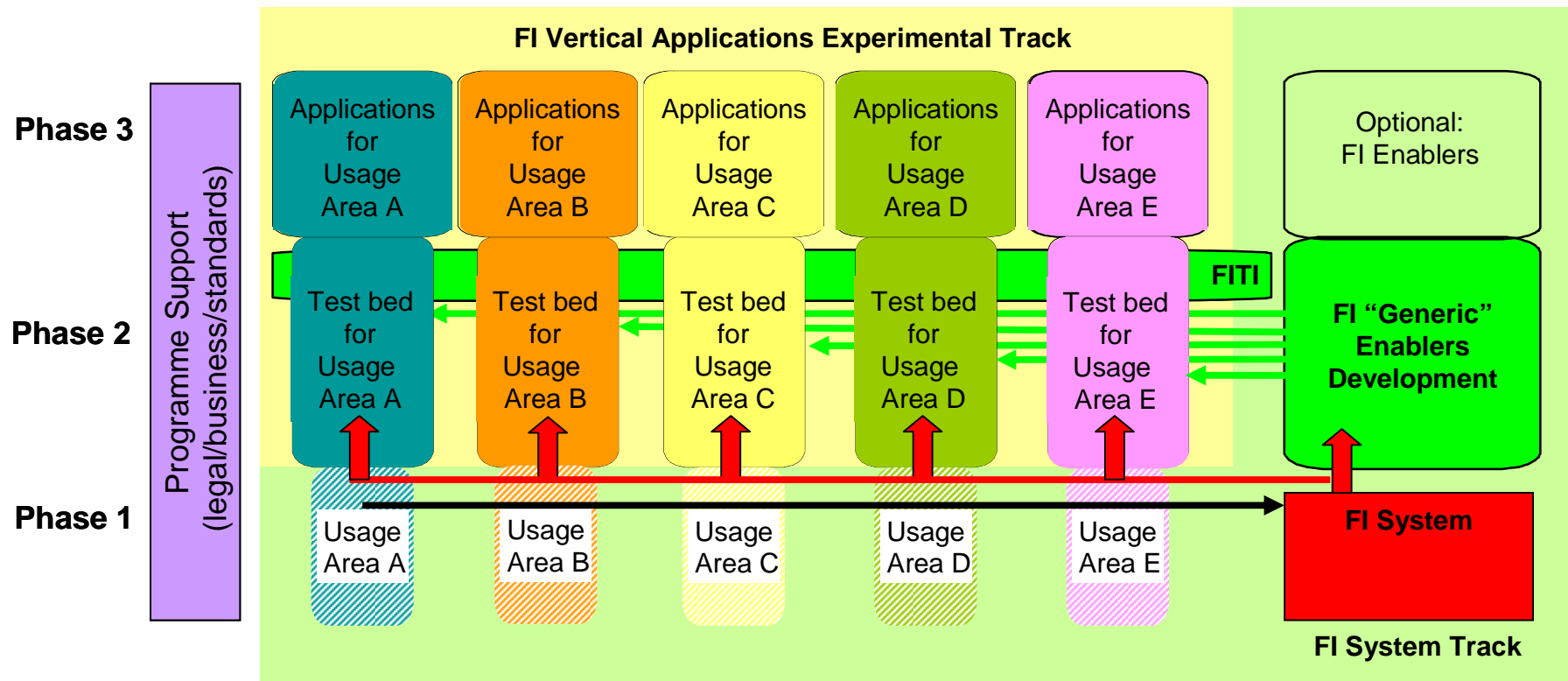


http://ec.europa.eu/information_society/activities/foi/library/fi-communication_en.pdf

FI PPP Initiative

Context & Status (6/7)

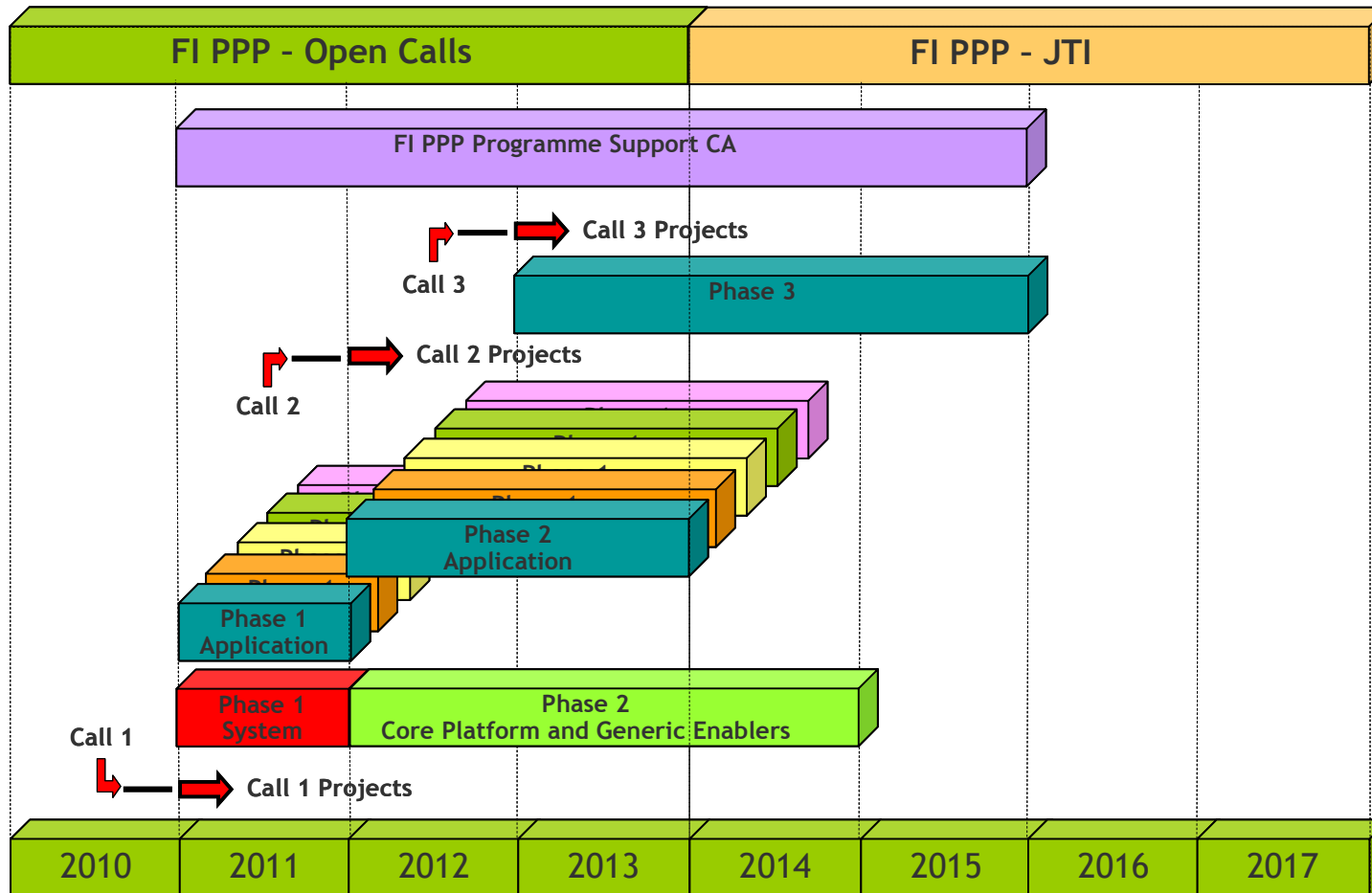
Future Internet PPP - CG Draft Programme Structuring



FI PPP Initiative

Context & Status (7/7)

Future Internet PPP - CG Draft Programme Planning



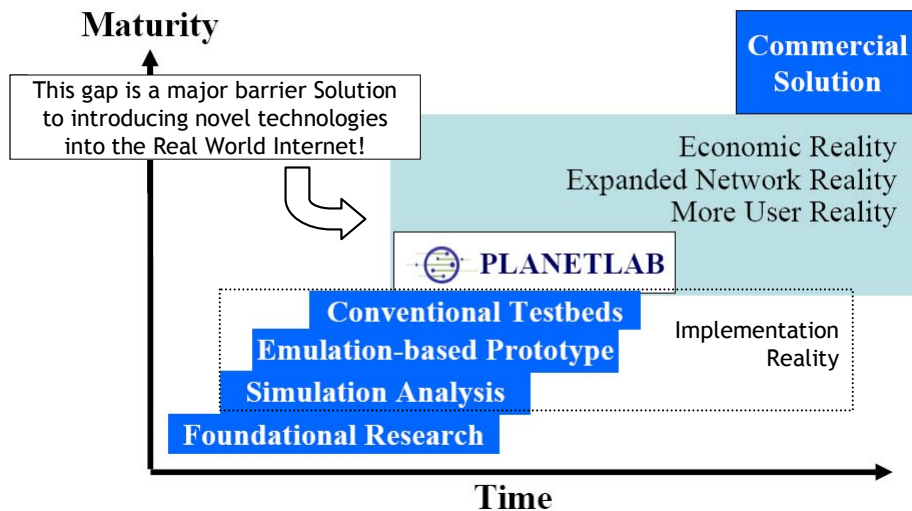
FI PPP Initiative

Experimentation (1/5)

Future Internet PPP - Prototyping and Validation

- FI PPP includes specific focus on prototyping, validation, piloting, trials
-> **Currently under definition**
- “Experimentation gap”

Much more to do to close the gap...



PlanetLab - Marc E. Fiuczynsk - Princeton University
FIRE Week - 10.09.08 - Paris
(Combination of Gap / Gap Decrease / More to do...)

Analysis/discussions on what will be experimented through (different goals and methodologies)

1. “Classical” prototyping
2. Trials on existing networks and “real” Internet (e.g. through NOs networks)
3. “FIRE” experimental facilities (e.g. FOT approach)
4. Pilots (e.g. in connection to Smart Cities)

Reflecting presenter views

FI PPP Initiative

Experimentation (2/5)

“ FIRE-like ” Experimentation - Facts (Highlights)

- **Derisk prototypes concepts/modules** that require trials in real-life conditions that can not be reproduced in confined environments
- **Access to hundred of machines physically distributed** across the world and available on public Internet **to host applications for testing in real-life environment**
 - Consider delays, latency, real-life network traffic, variable bandwidth, realistic robustness, large scale, failure modes...
- **Build by experiment distributed systems and network protocols**
- **Evaluate performance of infrastructures and services**
- **Validate mechanisms for interworking and verification of interoperability**
- **Experiment and co-create with real-users** and real-life environment. Important role of **User Driven Innovation (UDI)** in the context of FI
- **Note: “Natural” evolution** for experimentation, all applications evolving toward digital/virtual world (e.g. banking, commerce...)

Reflecting presenter views

FI PPP Initiative

Experimentation (3/5)

Future Internet PPP - Prototyping and Validation - Smart Energy Grid (Highlights)

- Scalability testing
 - Many millions of households (prosumers)
 - Many millions of electric cars
 - 10.000s of smaller and medium power plants (esp. renewables)
- > **Not only a bandwidth problem but also a problem of complexity for control algorithms, management systems and data handling**
- International interworking for
 - Responsiveness in case of an indicated blackout, global blackout prevention
 - Resilience of the whole system, stability management
 - Load / generation pattern prediction in connection with real-time configuration of adaptable balancing groups crossing international boundaries

Reflecting presenter views

FI PPP Initiative

Experimentation (4/5)

“ FIRE-like ” Experimentation - Open Questions (1/2)

- What is the **most appropriate FOT approach** in the context of **short-medium terms Industry impact**?
 - PlanetLab / PlanetLab Europe? OneLab2? G-Lab?...
 - LivingLabs? European Network of LivingLabs (ENoLL)?
 - Federica? (VITAL++? Wisebed?) - GEANT? NREN? DANTE? TERENA?
 - PanLab2?
 - CoreLab? GENI Spiral1?
 - PPPLab?
- Are these **experimentation facilities interoperable** (meta-level) or should the facilities be **considered as standalone** (one facility family per specific objective)?
- **What can Industry not test** on “FIRE-like” experimental facilities as compared to “real” Internet
- How can we take benefit from **EU and National pilots and testbeds**?
- What can be **leveraged from GEANT and DANTE**?

Reflecting presenter views

“ FIRE-like ” Experimentation - Open Questions (2/2)

- Where is the **right balance** between **bottom-up** (availabilities) and **top-down** (use requirements) experimental facilities design/development
 - Who are the “**customers**”/users of the current experimental facilities?
 - Are the **FP7 projects** taking benefit of the experimental facilities?
- Is this possible to guarantee **reproducible and verifiable results** from experimentations?
- Is this **secure enough environment** for experimentations?
- What are the **standardization contributions** expected from the experimental facilities work, towards IETF, ETSI, ITU...?
- What are/will be the **tangible industrial achievements/benefits** from the experimental facilities (e.g. from PII, OneLab2...)?



Specific discussions shall be further progressed in the coming weeks to define the intersections points between the **FI PPP experimentation requirements** and the **FIRE experimental facilities evolution**

Reflecting presenter views