Semiconductor Technologies for Smart Cities

A study of the CATRENE Scientific Committee





- Studies performed by the CATRENE SC on a yearly basis have a long tradition
- Studies analyze specific areas of interest to give hints and recommendations for the future work programs and calls
- Studies are published on the CATRENE website and presented in a public workshop
- Topic for 2014:

"Semiconductor Technologies for Smart Cities"





The Team

- Silke Cuno (Fraunhofer FOKUS) Urban Processes
- Guido Dolmans (imec-NL) Production & Logistics
- Tobias Erlbacher (Fraunhofer IISB) Mobility
- Florian Pebay-Peyroula (cea) Security
- Joachim Pelka, Fraunhofer Mikroelektronik (Coordinator)
- Karlheinz Ronge (Fraunhofer IIS) Energy
- Ina Schieferdecker (Fraunhofer FOKUS) ICT
- Andreas Wilde (Fraunhofer IIS) Smart Buildings

... and many, many contributors from industry, Academia & RTOs





Agenda

- 10.30 Welcome (Joachim Pelka)
- 10.35 Introduction and Motivation (Joachim Pelka)
- 10.45 Urban Processes (Silke Cuno)
- 11.05 ICT (Silke Cuno)
- 11.25 Energy (Moritz Loske)
- 11.45 Security (Alain Merle)
- 12.05 Smart House (Andreas Wilde)
- 12.25 Mobility (Tobias Erlbacher)
- 12.45 **Production & Logistic** (Guido Dolmans)
- 13.05 Summary & General Q&As (Joachim Pelka / all)
- 13.25 Closing Remarks (Patrick Cogez)
- 13.30 Lunch





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Introduction & Motivation

Joachim Pelka, Fraunhofer Mikroelektronik





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Why Smart Cities? *Everybody is talking about IoT today*

– IoT is a trend, a buzzword, a hype, …
... but not a use case

- There is a lot of noise around about Smart Cities

• What do you need to make a city smart?

no concrete but

sensors, information processing, networks, ...

– Smart Cities is a good use case for IoT!





Introduction & Motivation: Impact

• City of the Future (Source: Fraunhofer)



... the world is changing fast and entire industries are reinventing themselves in response to complex transitions in social, economic, and environmental arenas.

Increasing urbanization is a key trend and the design of city systems will play an essential role in shaping a sustainable future ...





Introduction & Motivation: Definition



Key Areas to define Smart Cities (min. 5 out of 8)

adopted from: Frost & Sullivan, Icons by Freepik



CATRENE Workshop on Smart Cities (14-04-2015) Dr. Joachim Pelka, Fraunhofer



Introduction & Motivation: Issues

- No unique definition
 What is regarded "smart" in one city may be state of the art in another one
- Technology push vs application pull
 City planners do not know about technology
- Individual approaches and solutions
 Cities and city quarters as testbeds for ideas, technologies and companies.
 77 (!) European cities ranked by TU Vienna





Introduction & Motovation: What makes a city smart?



It's all about information!

adopted from: Frost & Sullivan



CATRENE Workshop on Smart Cities (14-04-2015) Dr. Joachim Pelka, Fraunhofer



Introduction & Motivation: The Challenge



How will Application Pull and Technology Push match at the Application & System Level?



CATRENE Workshop on Smart Cities (14-04-2015) Dr. Joachim Pelka, Fraunhofer



Introduction & Motivation: The Challenge

- Get an Overview on the topic
- Investigate Needs & Requirements with respect to the European semiconductor business (on a more abstract level)

 - Identify & Prioritize the most relevant topics for further investigation





Introduction & Motivation: Areas of Interest



- Urban Processes
- ICT
- Safety & Security
- Energy
- Building
- Mobility & Transport
- Production and Logistics





Introduction & Motivation: Visions & Stories



- Urban Processes Sensors allow monitoring of urban processes and provide the necessary data for simulation / planning
- ICT information is needed everywhere. A new public information infrastructure will become essential like those for water and energy
- Safety & Security Secure handling of information requires reliable Authentication, Authorization, and Accounting
- Energy supply is guaranteed at all levels: from production to autarkic sensor systems
- Buildings are becoming smart, situation aware and energy efficient building blocks of Smart Cities
- Mobility & Transport has to solve the traffic challenges of megacities
- Production and Logistics will find new ways to have production within cities and will minimize transport of goods





Introduction & Motivation: *Methodology*

- Future Key Products
- Technological Requirements
- Roadmap
- Strategic Research & Economic Impact



