

# RELY - Design for Reliability of SoCs for Applications like Transportation, Medical, and Industrial Automation

ECPE Network Meeting  
European Research Projects  
Related to Power Electronics

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Bundesministerium  
für Bildung  
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MINISTÈRE DE L'ÉCONOMIE  
DES FINANCES ET DE L'INDUSTRIE

## CA403 RELY

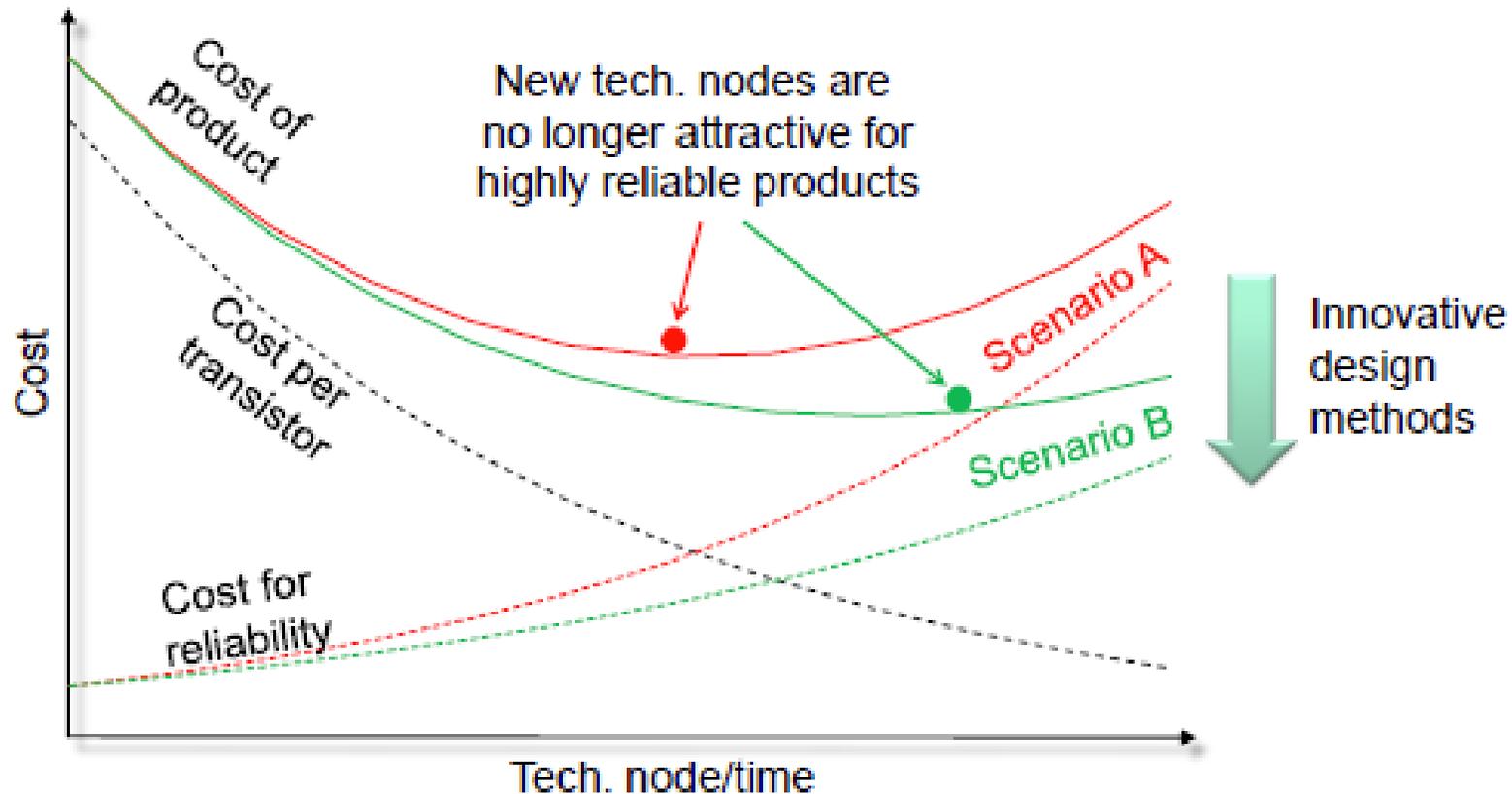


# Motivation - Part 1

Continues CMOS technology shrinking leads to:

- more failures due to higher circuit sensitivity
  - stronger coupling due to smaller distances
  - weaker signals due to lower voltages
- new failure mechanisms, e.g. natural radioactivity (cosmic rays)
- more complexity due to more SoC functions and therefore more failures due to higher device counts (billions instead of millions)

# Motivation - Part 2



Reliable Systems on Unreliable Fabrics, Todd Austin et al, IEEE Design & Test of Computers, 2008

# Project Goal

Cost efficient utilization of future technologies for highly reliable SoCs

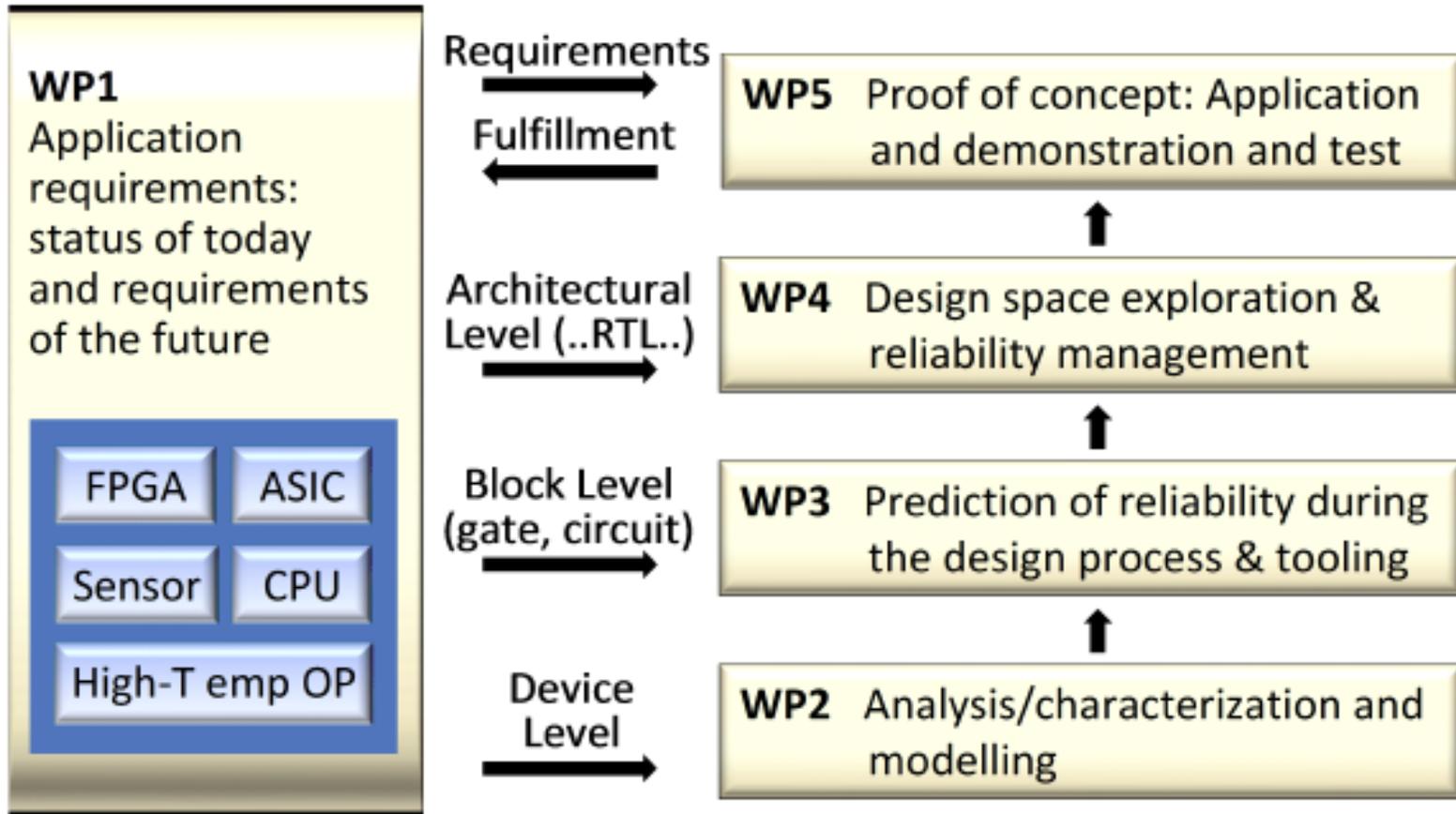
- Focus on design measures
- Predictable reliability at all design phases (abstract models)
- Reliability management during SoC life time
- New SoCs with a new level of functionality and complexity

for applications like transportation, medical and industrial automation

# Project Overview

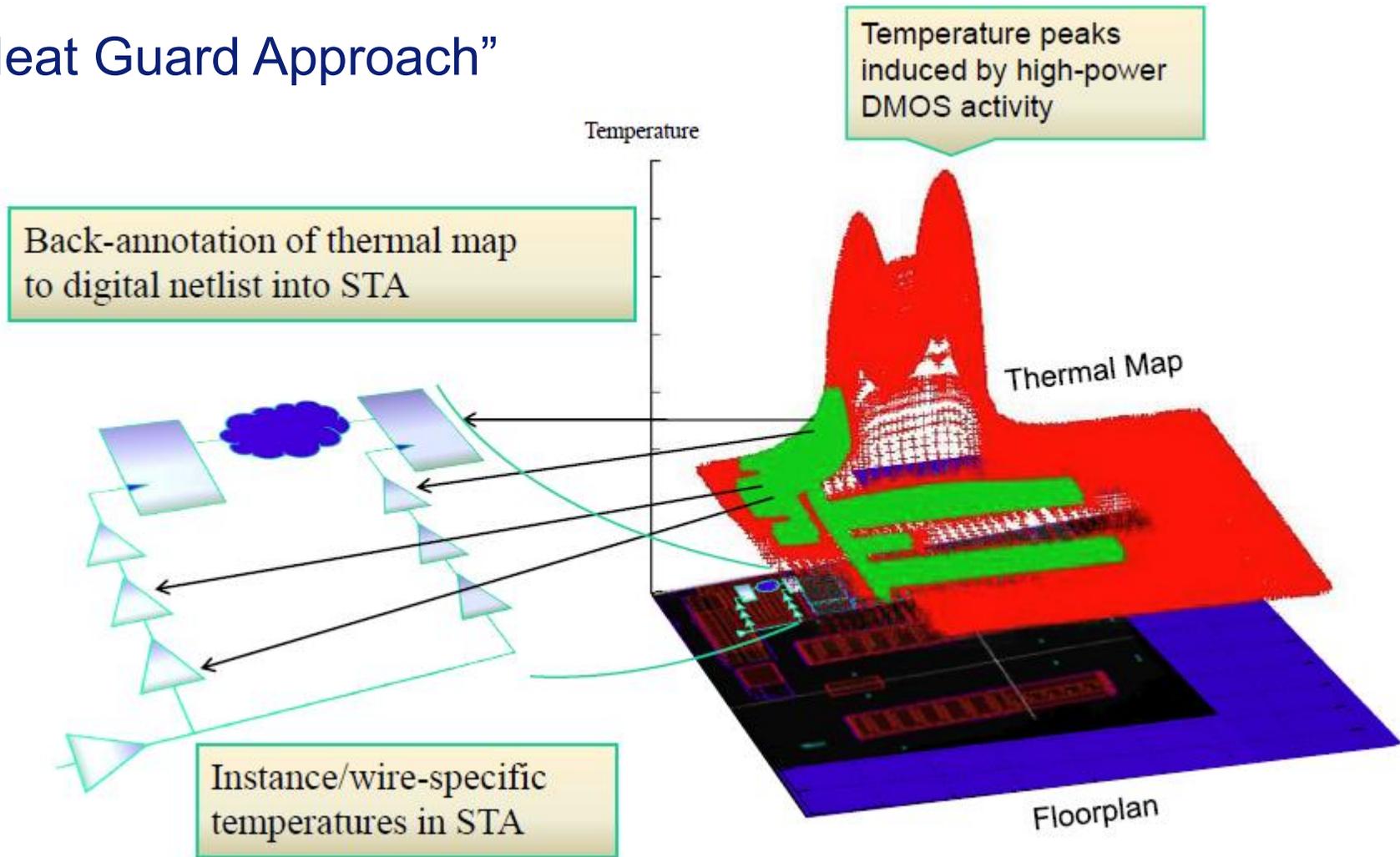
<b>Project Duration:</b>	1.5.2011 – 30.4.2014
<b>Effort:</b>	178 PY
<b>Project lead:</b>	Infineon Technologies AG
<b>Funded Nations:</b>	France, Germany
<b>Without funding:</b>	The Netherlands, Romania
<b>Industrial Partners:</b>	ATMEL, EADS F, EADS G, Infineon G, Infineon R, MunEDA, ST, X-FAB
<b>Academic Partners:</b>	CEA-LIST, Fraunhofer EAS, Fraunhofer IISB, ITTP, TUD, TUM LTE, TUM LIS, UHB ITEM
<b>Subcontractors:</b>	Abound Logic, Leibniz University of Hannover, OFFIS, TUM EDA

# Project Structure



# Example on Innovative Design Methods

## “Heat Guard Approach”



# Further Innovative Design Methods in RELY

- Reliability management utilizing health monitors
- Automatic identification and replacement of system critical elements
- Modeling on high abstraction levels

