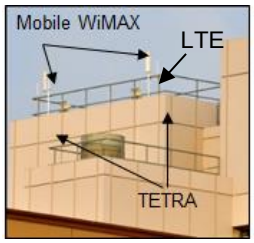
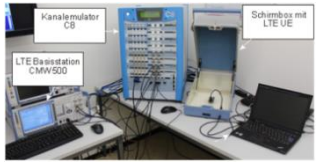
TU Dortmund's ComNets Institute (CNI) in a nutshell

- **Team of 20+ full-time researchers** and 30 students (75 % third party funded)
- Research focus: **highly reliable wireless networks for Cyber Physical Systems** (MAC-App) in energy, transport and production/logistics

Bundesministerium für Bildung und Forschung
Bundesministerium für Wirtschaft und Technologie
DFG
Ministerium für Innovation, Wissenschaft und Forschung des Landes Nordrhein-Westfalen
EUROPÄISCHE UNION
Europäischer Fonds für Regionale Entwicklung

- **Model-driven** research methodology:
  - **Interdisciplinary, cross-layer** system modelling and **multi-scale system simulation**
  - **Sophisticated Lab** (2G-4G network emulators, wireless channel emulators, SDR, SDN) and **Outdoor Testing Site** with research licenses at 400MHz to 2,6 GHz





- On-going contributions to **standardization** (IETF, ISO/IEC) and **open source** projects (Omnet)
- Since 2008: 7 Int'l „Best Paper" Awards
- Award-winning **spin-off** comnovo (SME)

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Head of institute and contact:
Prof. Dr.-Ing. Christian Wietfeld, christian.wietfeld@tu-dortmund.de, www.cni.tu-dortmund.de

CNI‘s EU experience and 5G focus

EU projects track record:

- Involved in EU wireless system research since 20 years
- On-going FP7 projects: **E-Dash** (ICT-Transport), **AIRBEAM** (Security), **SmartC2Net** (ICT-Energy), **SecinCore** (ICT-Security)

Focus Areas in ICT-14 (based on evolution of most recent work):

- **Holistic network architectures** *(Area P8)*

  B. Dusza, C. Ide, L.Cheng and C. Wietfeld, "CoPoMo: A Context-Aware Power Consumption Model for LTE User Equipment", **Transactions on Emerging Telecomunication Technologies** (ETT), vol. 24(6):615-632, Wiley, 2013 (*Chief Editor‘s best paper of issue choice*)

- ***Resource-aware massive Machine-Type Communication*** *(Area P3):*

  Wietfeld, C., Ide, C. and Dusza, B., "Resource Efficient Mobile Communications for Crowd-Sensing", accepted for presentation at 51st ACM/EDAC/IEEE **Design Automation Conference (DAC)**, San Fransisco, USA, June 2014.

- ***Real-time constraints of virtualized / software define networks*** *(Area P14):*

  N. Dorsch, B. Jablkowski, H. Georg, O. Spinczyk and C. Wietfeld, Analysis of Communication Networks for Smart Substations Using a Virtualized Execution Platform, accepted for presentation at **IEEE ICC**, Sydney, Australia, Jun. 2014

- ***Service continuity in heterogenous networks*** *(Area P11)*

  Tran, T., Kuhnert, M., Wietfeld, C., "Cloud Voice Service as Over-the-Top Solution for Seamless Voice Call Continuity in a Heterogeneous Network Environment", **ELSEVIER Journ. Network** and Computer Applications (JNCA), Volume 41, May 2014.

Example proposed CNI contribution to ICT-14 research: *Taking a holistic view on resource-efficiency in 5G*

- Example challenge: Optimizing the energy consumption of the network infrastructure has (negative) impact on energy consumption of devices
- Based on the evolution our stochastic **Context-Aware Power Consumption Model *CoPoMo***, we can quantify the cross-system effects for future 5G systems
- This enables a **holistic view on resource-efficiency and Quality of Service/Experience** for end users and battery powered wireless sensors

1000x lower power consumption of **5G infrastructure** ⟷ *Competing goals* ⟷ **1000x more lifetime** of battery-enabled **5G devices**?

Example **resource trade-offs based on CoPoMo**