



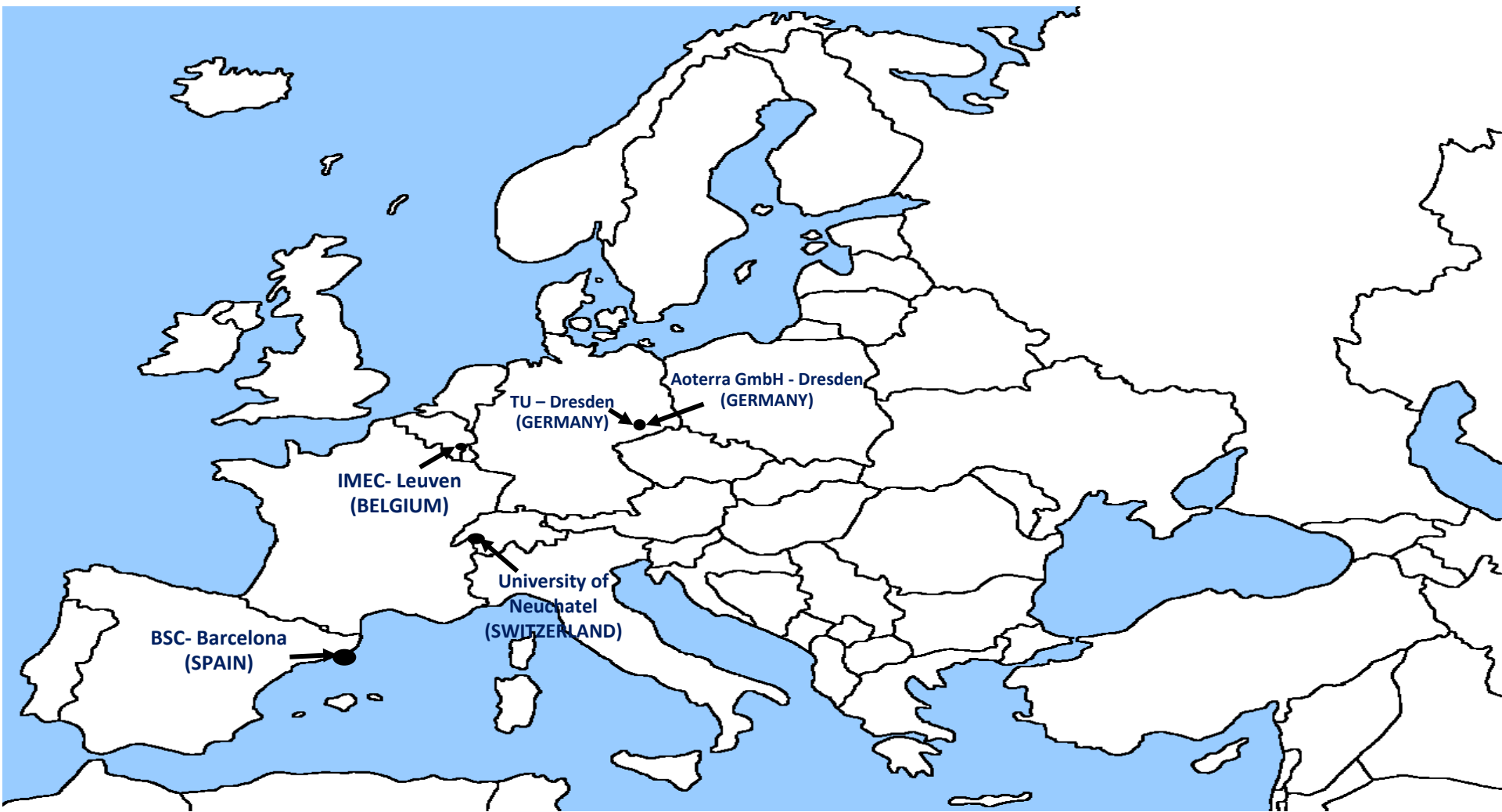
ParaDIME

(Parallel Distributed Infrastructure for Minimization of Energy)

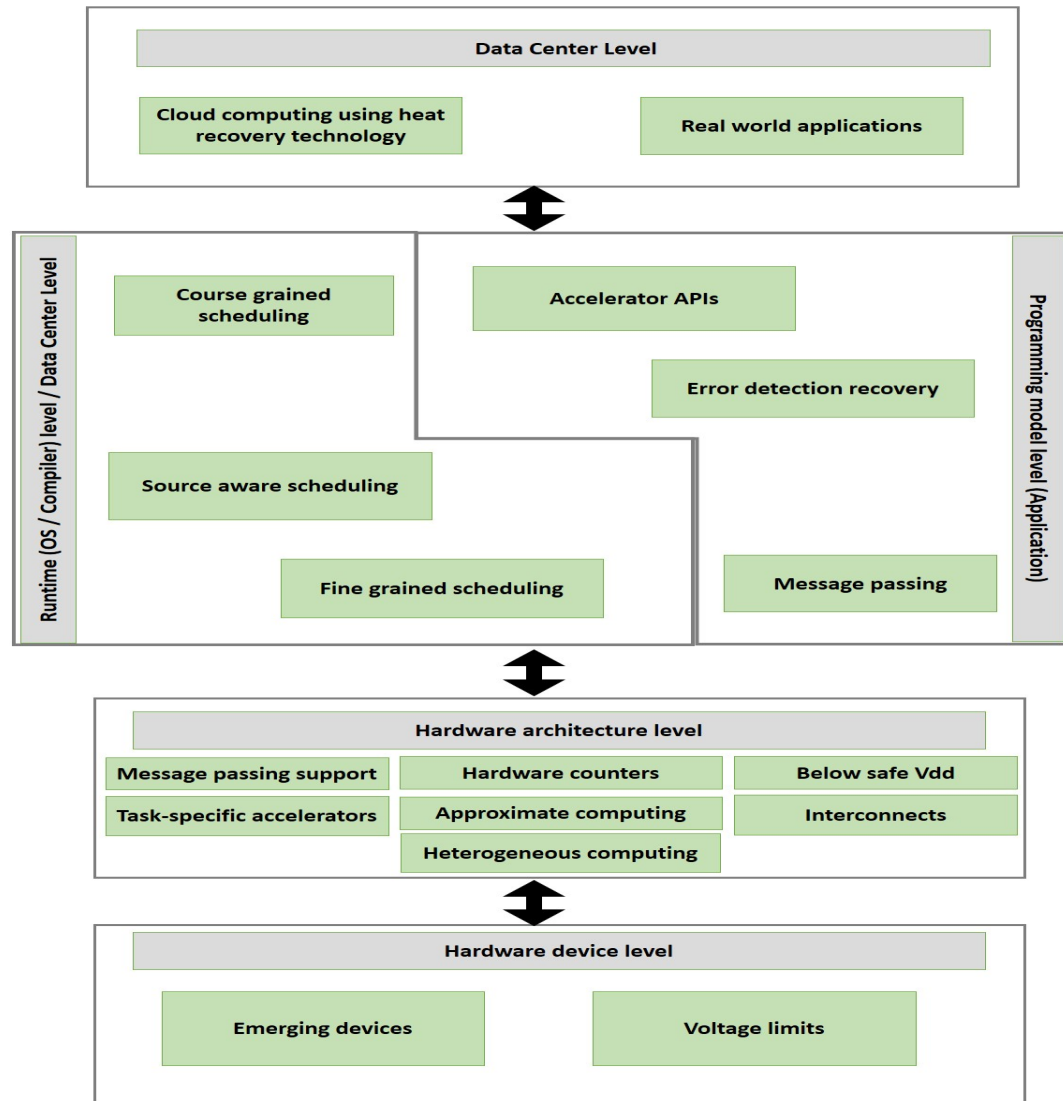
ICT-Energy Workshop - Barcelona

This project and the research leading to these results has received funding from the European Community's Seventh Framework Programme [FP7/2007-2013] under grant agreement n° 318693

ParaDIME Consortium

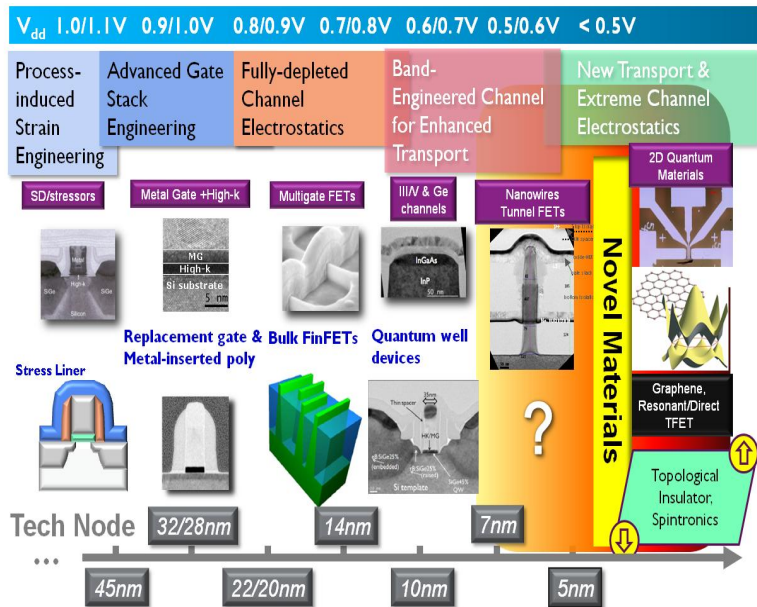


The ParaDIME Stack

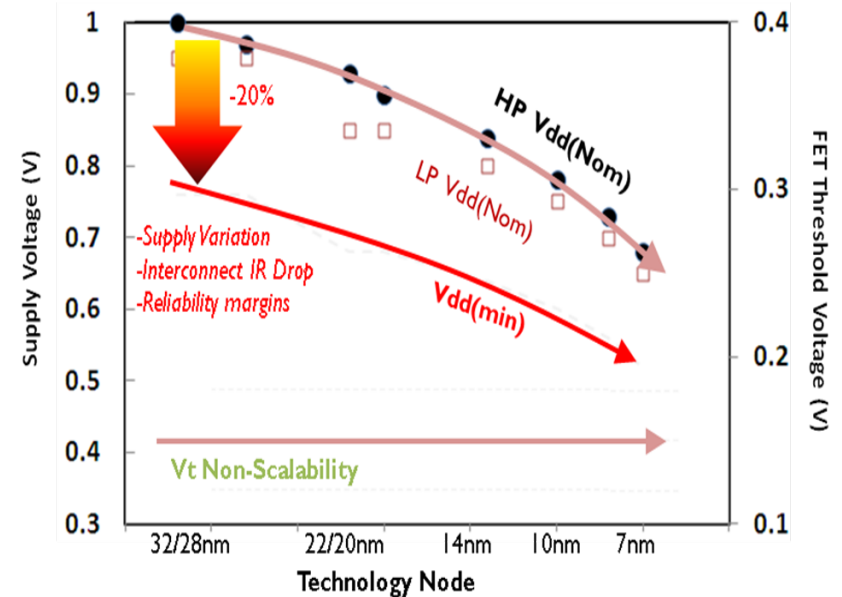


IMEC's Contribution

Emerging devices



Voltage limit



BSC's Contribution – Hardware Level

- **Energy-Efficient Message Passing**
 - Message passing microarchitecture
 - Message passing accelerator
 - Fast task switch
 - Task passing
- **Operation Below Safe V_{dd} .**
 - Automatic HW lowering of V_{dd}
 - SW-guided (low-power annotation)
 - Errors
- **Approximate Computing.**
 - Reduced error detection / correction
 - Reduced precision FP / Narrow integers
- **Heterogeneous Computing.**
 - Architectural level
 - Device level.

- Fine grain scheduling
 - Schedule threads and processes
- Course grain scheduling
 - Peak load
- Source aware scheduling
 - Carbon footprint (Supply sources : renewable over non renewable)

University of Neuchatel's Contribution (Programming model)

- Message passing
 - Actor Model
- Error detection/recovery
 - Duplication of transactional memory model
- Accelerator API
 - Task specific interface similar to OpenGL
- Applications
 - Future energy aware benchmark

Aoterra's Contribution (Data Center Level)

- Green & cloud computing
 - Renewable and non renewable cost
- Real world application
 - Batch execution



PARA
DIME

ParaDIME

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THANK YOU

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