

NEREID

ICT-CSA: Micro- and Nano-Electronics Technologies
NanoElectronics Roadmap for Europe: Identification and Dissemination
Grant Agreement n° 685559

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Landscape and General Approach

KICK-OFF meeting

Berlin, Nov. 30 – Dec. 1, 2015



Outline

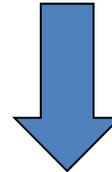
- Why a new roadmap
- Nereid Structure
- Approach and Methodology
- WP presentations: WP Leaders
- Methodology of General Workshops Kayak 10m
- Discussion
- Next steps

Why a new roadmap?

Traditional approach, based on linear scaling (Moore's Law) no longer covers variety of applications



- New technologies, new physical effects
- New, unforeseeable markets
- No single Figure of Merit



- Need a new road mapping methodology



The evolution of ITRS

▶ Focus

- From computers to communications and networked applications;
- From “Scaling and associated technologies” to “Enabling technologies”;
- Older partners withdrawing, new partners in.

▶ Organization

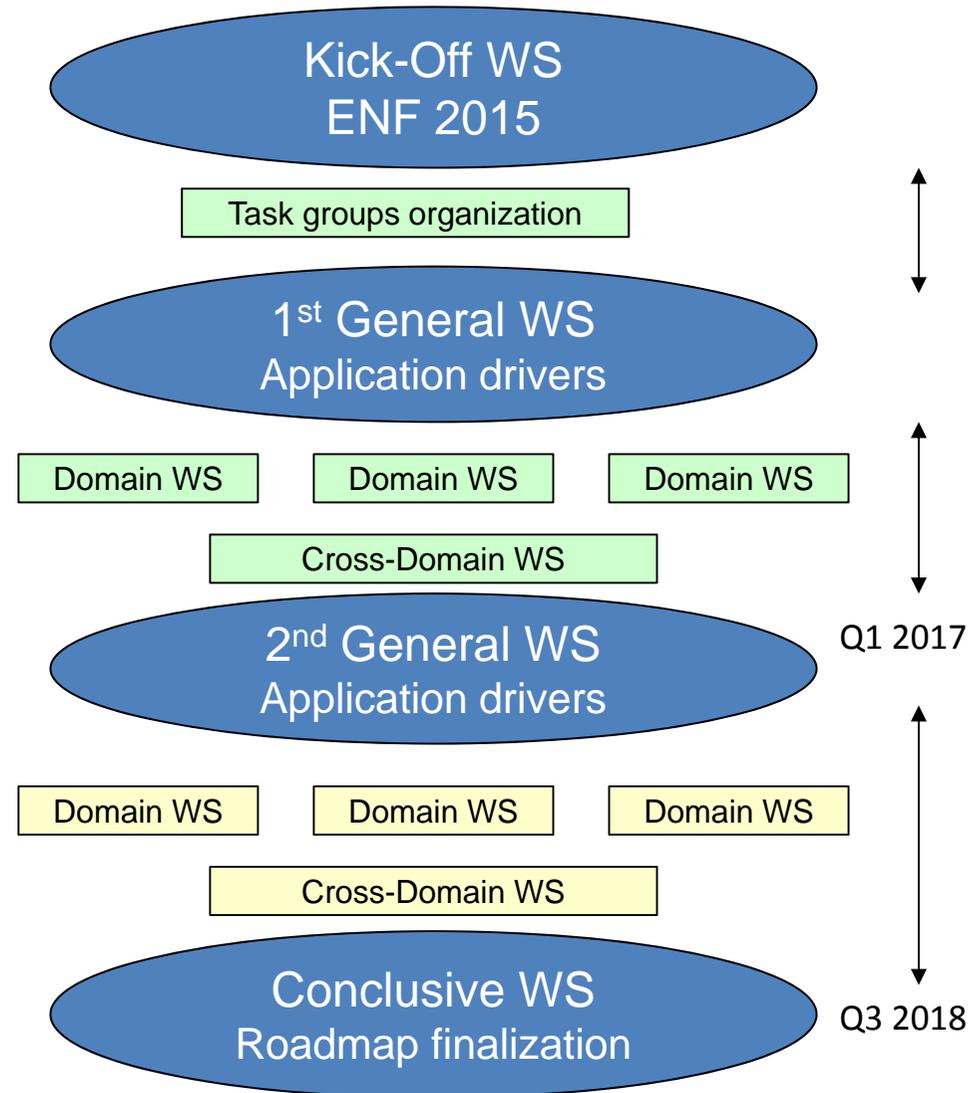
- From 17 “Technology Working Groups (TWG)”
- To 7 “Focus Teams”
 - Function-oriented
 - Matrix organization where TWG are competence centers

NEREID structure

- Aiming at large participation of experts from European academic and industrial institutions
- Limited number of formal partners, all academic, with a clear responsibility for coordinating specific topics.
- Industry participates by providing experts with travel cost refund and “co-leaders” for most Work Packages and Tasks.
- Industry participation through AENEAS industrial association (unfunded) representing European Technology Platform Nanoelectronics.
- Experts chosen from leading European academia and industry mostly **outside** partners.

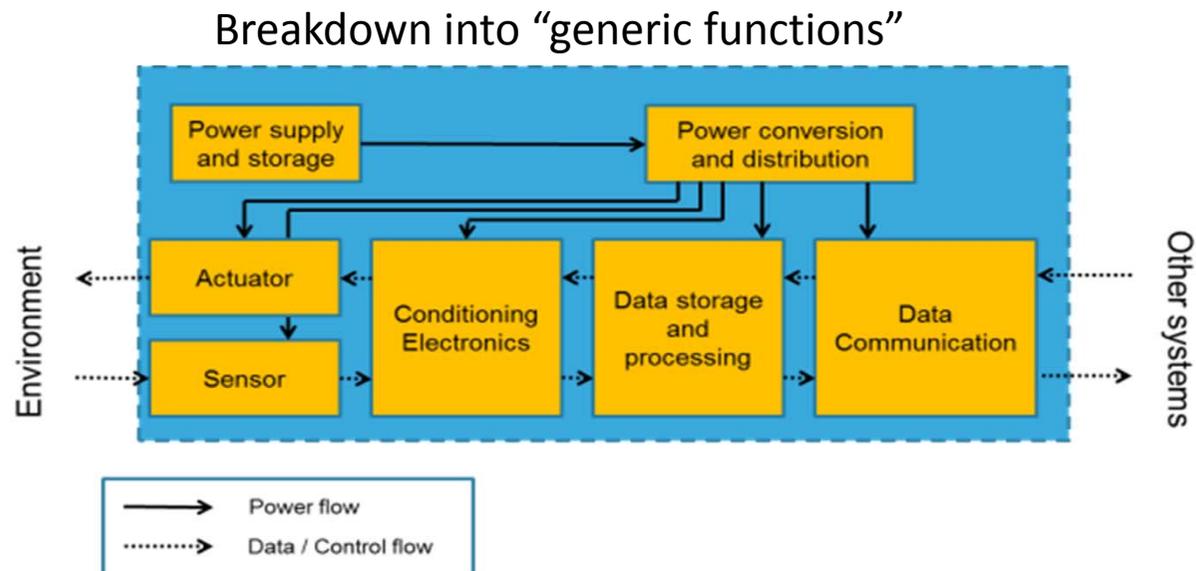
Planned Approach

- Methodology based on ITRS 2.0, but focusing on European Nanoelectronics and Application industry.
- An open initiative with a large part of budget for Workshop and participation of external experts.
- Large selection of experts from different European organizations (including ENI2 and ENIAC SCC)
- Starting from Application WS with key users, and template definition.
- Major general workshops for roadmap coordination – exchange with application domains, and minor technical, topic-specific meetings.
- One Work Package for coordination with other roadmap initiatives (ITRS...)



Proposed Methodology

- Identify the “Applications” that will be the focus of the roadmap
- Find out functions which are generic across applications
- Describe the state of the art and the vision (the needs)
- Create the roadmaps by translating the needs into the major technology areas (devices, interconnect, materials.....) and associated targets



General Workshops

Overall Action Plan	Kick-off	WS1	WS2	Final WS
Main objective	Launch operations	General workshop	General workshop	Shape up
Duration (days)	1	2	2	2
Contents	1 People presentations 2 Methodology presentation <i>(deviations from linear extrapolation, double unknown.../examples)</i>	Knowledge sharing sessions	Knowledge sharing sessions	1 Reframing structure / Contents 2 Set priorities 3 Put everything together by focusing on convergence 4 Roadmap finalization (with tech. domains)
Participants	About 30 experts Mainly project partners, Some applications experts Facilitators	Around 50 people Technology and key application experts Partners' experts Facilitators	Around 50 people Technology and key application experts Partners' experts Facilitators	Mainly semiconductor technology experts
Results	1 Agreement on process 2 Engaging participants	Representative Directions: identify technologies, Generic Functions & Performance indicators	Confirm/Amend directions: Technologies, Generic Functions & Performance indicators	1 Performance indicators evolution for the Generic Functions 2 Roadmap synchronization
Workshop Follow-up activity	1 Decide how to consider applicative themes 2 Select Key Applications & Tech. Referents	1 Filter out what's missing and key 2 Work towards common language	1 Enhance main results lines 2. Finalize common language 3 Collate everything	1 Write down deliverable 2 Dissemination actions

Prerequisite for success

- Involvement the right experts on key technology and application domains
- Preliminary list: 140 names

Black and White: how things could go wrong

- Select the « wrong » experts
 - Only invite « politicians »
 - Restrict invitations to senior/high-level people
 - Invite not knowledgeable people
- Make participation difficult
 - Charge high fee for attending
 - Lack of communication
 - Organize meetings overlapping with other important events for the targeted audience
 - Organize meetings in impossible-to-reach places

White

- Priority task: Establish a list of targeted experts
 - Covering the entire value chain
 - From materials and equipments to systems
 - Criteria for choice : open-mindedness, competency, team spirit
 - Right balance of decision makers and experts able to feed them with good inputs

Convince experts to participate

- Define and advertize NEREID goals and expected impact
 - Be open regarding process, meeting structure, agenda
 - Welcome inputs, make roadmap a dynamic document
 - Support communication before / during / after meetings
 - Using modern tools : forum, blogs...
 - Share data and subsequent analysis
 - Manage confidentiality
 - Support expert financially to attend meetings
- Include in the meetings agenda an activity of common language building

Convince companies/institutions to let experts participate

- Show that technology developments in Europe are possible and required
- Regular reporting on progress