INTERNATIONALIZATION ACTIVITIES AT

Smartare Elektroniksystem

ELECTRONIC COMPONENTS & SYSTEMS

Activities related to strengthen Swedish participation in Int'l (EU funded) consortium projects

THORBJÖRN "TOBY" EBEFORS, PHD

DEPUTY PROGRAM MANAGER

www.smartareelektroniksystem.se

2022 MISSION

STRENGSTHEN SWEDISH ECS COMPANIES PARTICIPATION IN INT'L (EU FUNDED) PROJECTS

PROMOTE ECS PROJECTS TO GO INTERNATIONAL

COLLABORATED WITH OUR SISTER ORGANIZATIONS WITHIN THE ECSEL/KDT MIRROR GROUP NETWORK

International ECS Network

- **ECSEL Italy -> *KDT Italy* 2022 ??**
- **ECSEL Austria**
- **Photonics Finland**
- **Business Sweden – Semiconductor by Sweden Alliance**

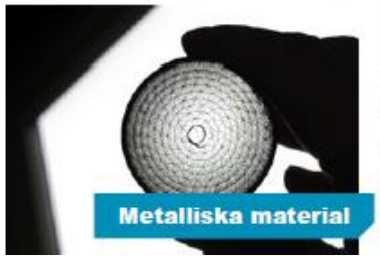
More info and registration at:
https://marketing.business-sweden.se/acton/media/28818/semiconductors-by-sweden-alliance

Outline

- What is a strategic innovation programme
- How we work in Sweden for the growing electronics sector
- Support from idea to product in emerging technologies

  – focus 7 HUBs like organic and printed electronics
- Project and Swedish ECS Company examples from Nat’l portfolio
  - Under development – ECS collaboration tool
  - New ideas for Int’l (EU / SWE-ITA) collaboration

Strategic Innovation Programmes



VINNOVA

Energimyndigheten

FORMAS

STRATEGISKA INNOVATIONS-PROGRAM

Strategic Innovation Programmes

Strategic innovation areas

With support from

VINNOVA Sweden's Innovation Agency

Swedish Energy Agency

FORMAS

Strategic innovation programmes

- Cooperation Industry – public sector – Academia (PPP)
- Strategic research and innovation agendas
- Strategic innovation programme

SES Founded in 2014:
+ ~70 companies, total 107 organisations

SVENSK ELEKTRONIK

SWEDISH ICT ACREO

swerea swedish research

PhotonicSweden

CHALMERS

LULEÅ TEKNISKA UNIVERSITET

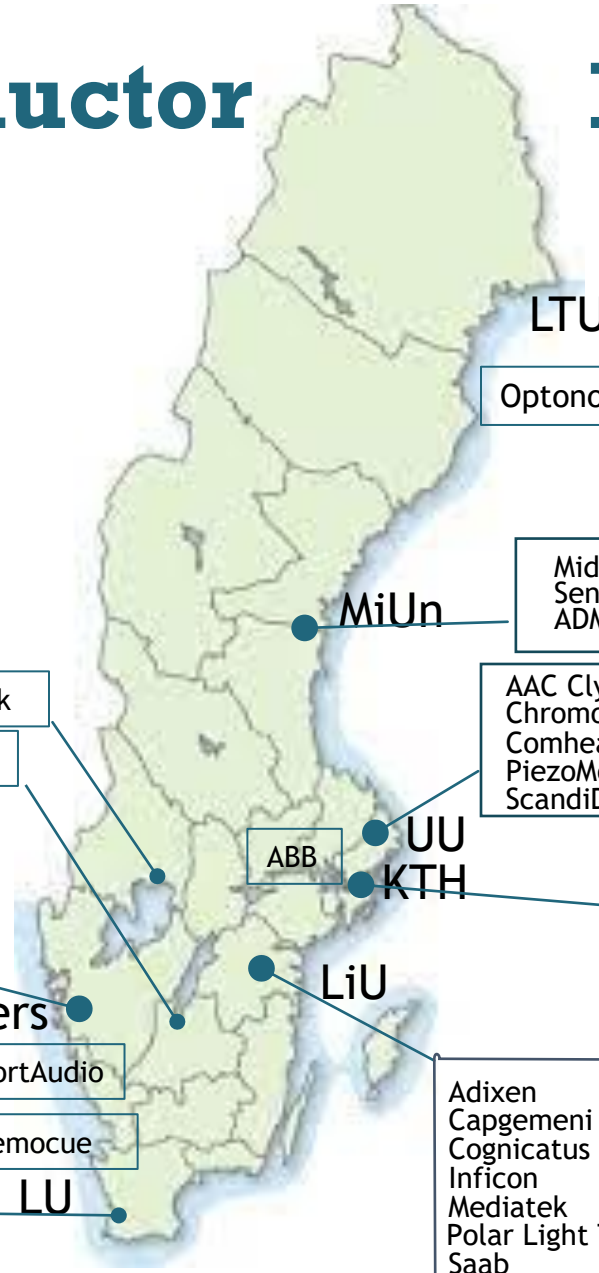
KTH

+ adding 350 new organisations (Large Corps and SME and ROTs) through-out 2014-2021 calls


Forming ~580 SWE ECS project proposals 2014-21
SMARTAREELEKTRONIKSYSTEM.SE

Swedish Semiconductor Landscape 2021

What we have found.
106 companies



LTU
D-Flow technology
Optonova

MiUn
MidDec
Senseair
ADMSdesign

ShortLink
Airborne Hydrography

AAC Clyde Space
Chromogenics
Comheat
PiezoMotor
ScandiDos
ScandiNova

ABB
UU
KTH

Emerson
Fingerprint Cards
Gaisler
Gapwaves
Gotmic
Insplorion
Low noise factory
Qamqom
RTI
Ruag
Semcon
SiTek
Smoltek
Zero point technology

II-VI (Ascatron, Finisar)
Ascillion
Aerocrine (Circassia)
Asensor Technology
BitSimNOW
Blixt
Cobham
Cree
DBMRF
Ericsson

Entangly
ETA Devices
Excillum
Exeger
Exploric
Hübner (Cobolt)
Imsys
Infinion
IRnova
Jon DeTech
Kiselkarbid i Stockholm
Mercene Labs
Midsummer
Mycronic

Myvox
NanOsc
Nocilis materials
NoleTech
NXP (Catena)
Optonova
Prismatic
Sensic
Silicon Witchery
Silex
Sivers Semiconductors
Tobii
TranSic (ON semi)
Xcounter

LiU

Chalmers

ComfortAudio

Hemocue

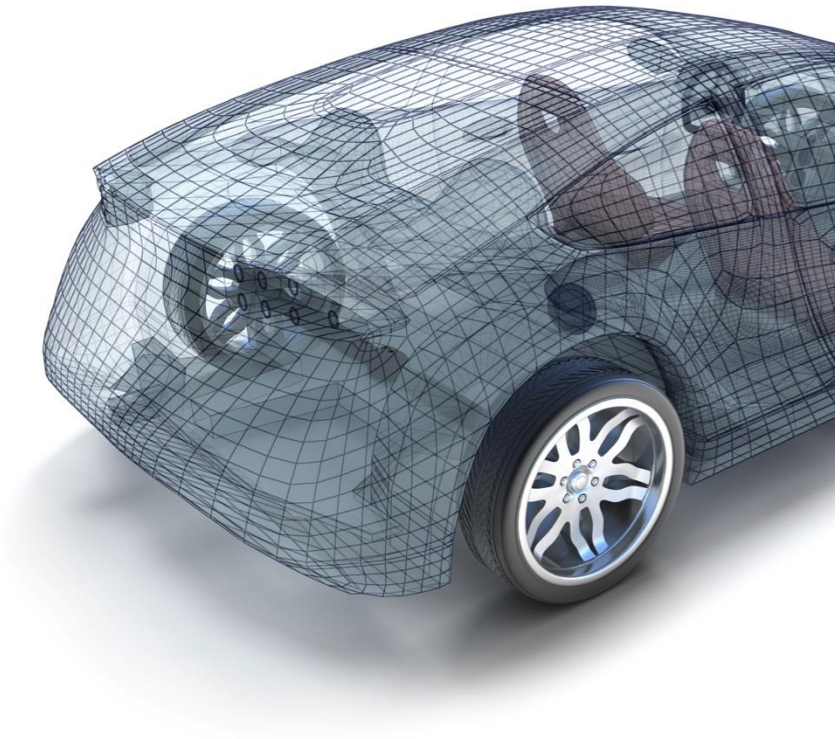
LU

Acconeer
AlixLabs
ARM Sweden
Axis
Beamwave
Epiluvac
Epinovatech
GLO / Nanosys
Hexagem
Imagination Technologies
Mikrodust
Nordamps
Obducat
Synopsys
Xenergic

Adixen
Capgemeni
Cognicatus
Inficon
Mediatek
Polar Light Tech.
Saab
SGA
Sick IVP
ST SiliconCarbide (Norstel)
SweGaN
Syncore
Teledyne
Veoneer

VISION and challenges

”by 2025 Swedish electronic systems enable a world-class Swedish industry ”.

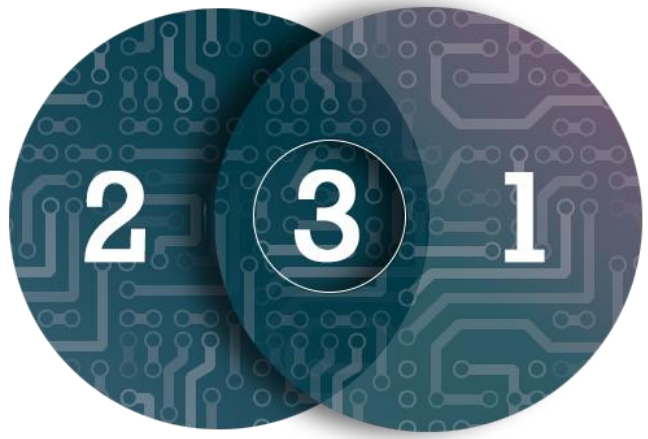


3 challenges

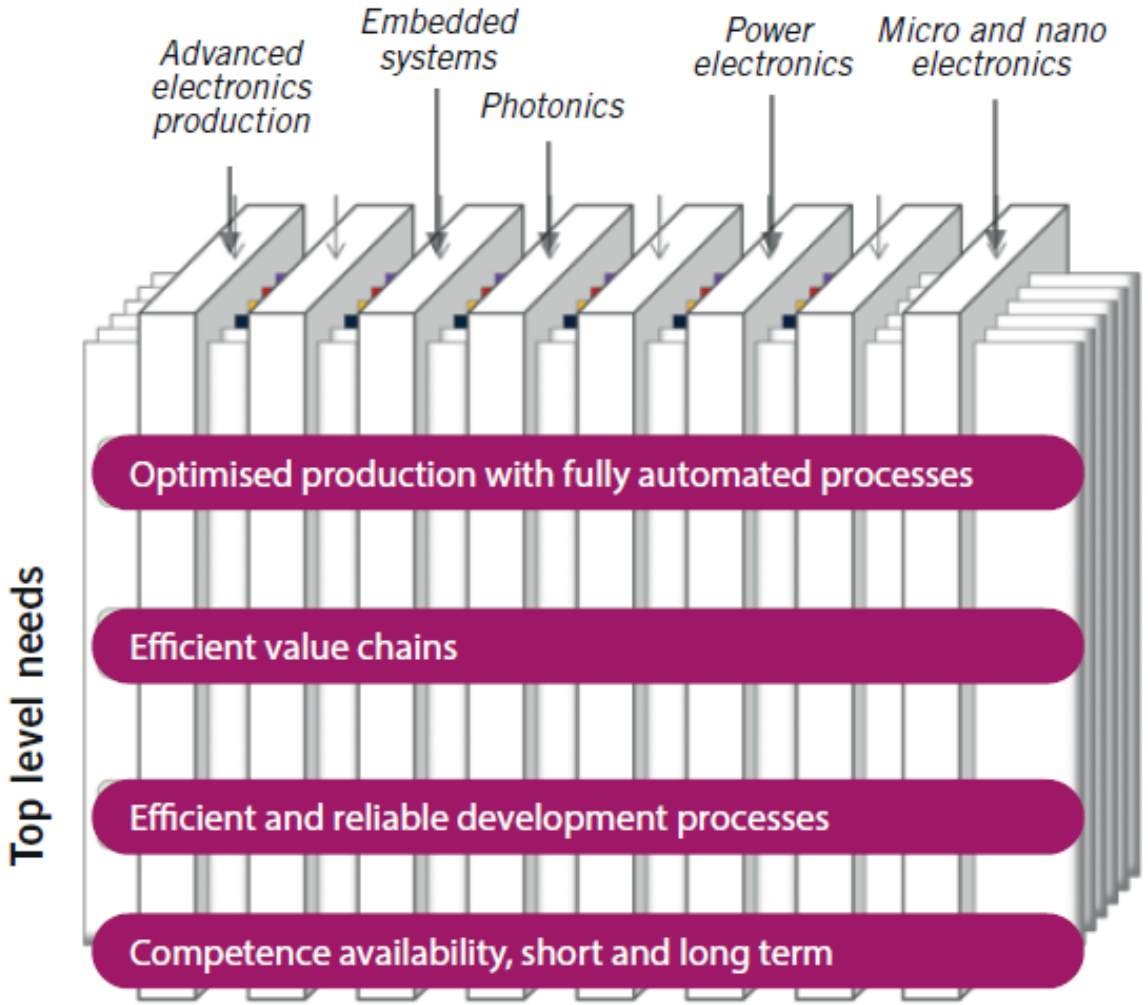
- Increased cooperation and efficiency in the value chains
- Maintained and further developed Swedish excellence
- Secure the provision of skills

Three groups form electronic related industry in Sweden (figures from 2017)

- **Group 1** – 3 650 companies making electronics
  - Manufacturers, consultants, material/component suppliers and distributors
  - SILEX, Mycronic, ENICS, Semcon Caran and Arrow
- **Group 2** – 7 850 companies with electronics in products
  - Elekta, ABB and Scania, Volvo
- **Group 3** – 15 300 companies with electronics in production/operations
  - E.g. LifeScience, process industry, mining
  - AstraZeneca, Vattenfall and LKAB



Strategic Research and Development ECS areas in Sweden



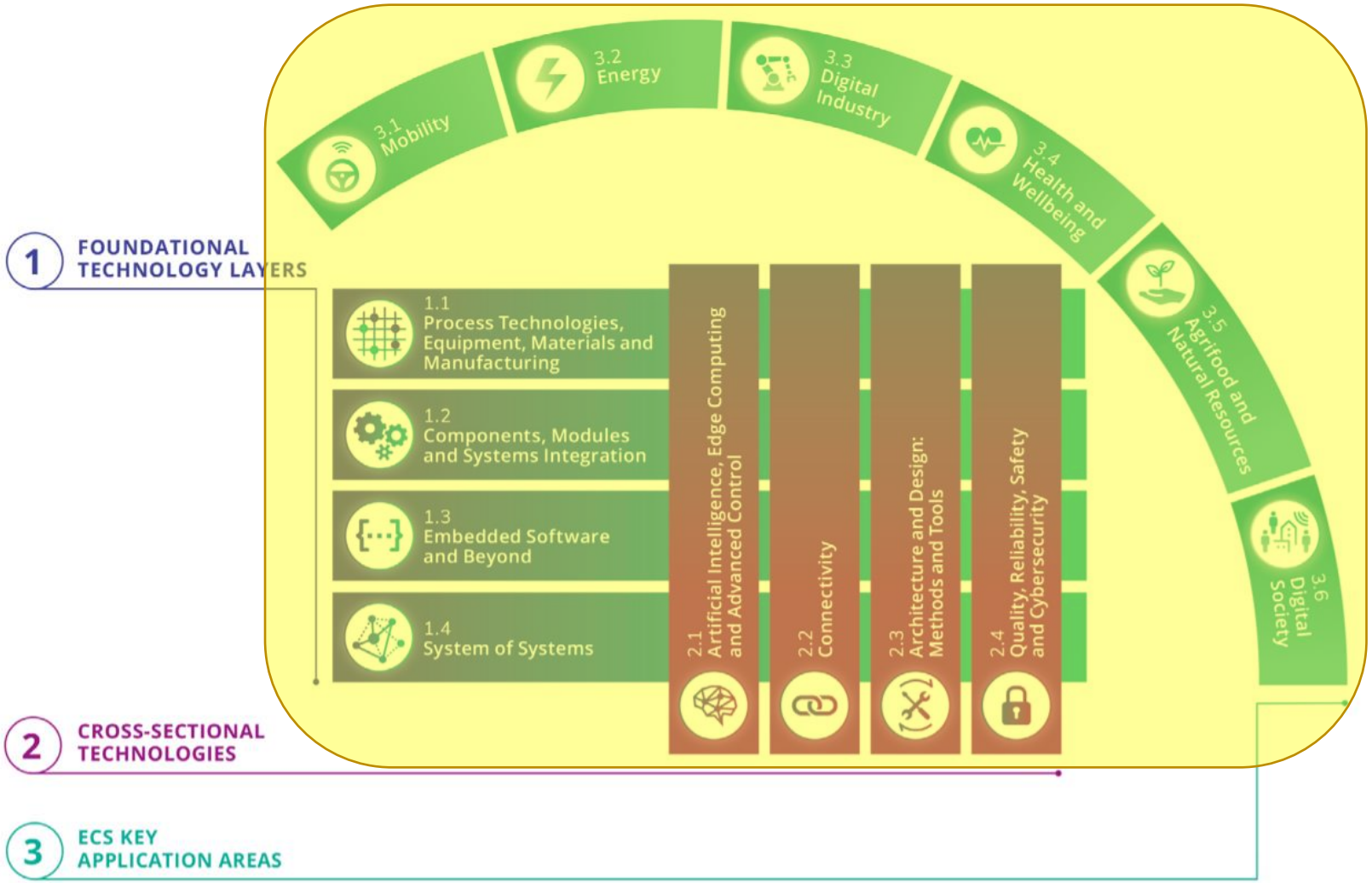
Industrially interesting/emerging technologies

- *Assembly technology and reliability*
- *Sensors*
- *Printed electronics*
- *Antenna, microwave and therahertz systems*

Application priorities

- Telecom
- Automation/production
- Automotive
- Energy
- Life Science
- Military and security

The 180 Swedish ECS projects granted under SES 2014-21
- all over the EU ECS (KDT/Xecs) theme map



SES competence HUBs:

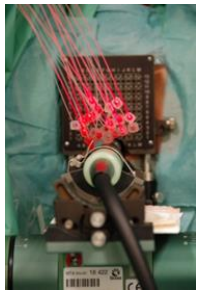
- ✓ Antenna, microwave and THz systems
- ✓ Printed Electronics
- ✓ Photonics
- ✓ Micro- and nano- electronics
- ✓ Embedded systems
- ✓ Advanced electronics production
- ✓ Power electronics
- ✓ Reliability in electronic hardware

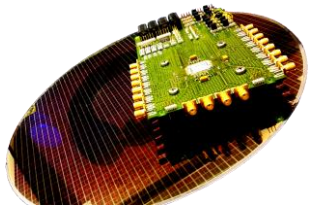
extra HUBs:

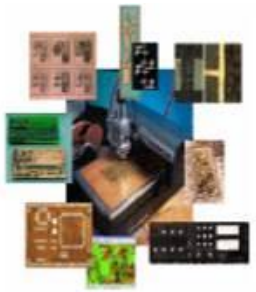
- ✓ Embedded sensor systems for health
- ✓ Integrated Circuits and systems

ECS Competence HUBs in Sweden contact info

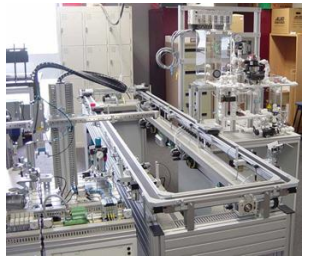
www.smartareelektroniksystem.se/en/efforts/competence/

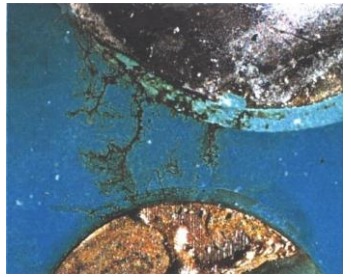






- **Embedded systems**, Luleå University, *ulf.bodin@ltu.se*
  - *Sub-HUB **Embedded sensor systems for health**, Mälardalens Högskola, maria.linden@mdh.se*
- **Photonics**, Photonic Sweden, *lennart@photonicsweden.org*
- **Printed Electronics**, Printed Electronics Arena, RISE, *bjorn.norberg@ri.se*
- **MicroNano Electronics**, Mitt University, christer.frojdh@miun.se
  - *Sub-HUB **Integrated Circuits and systems**, Linköpings University Atila.Alvandpour@liu.se*
- **Power Electronics**, SiC Power Centre at RISE, *Mietek.bakowski@ri.se*
- **Advanced electronics production**, KTH, *johnnyob@kth.se*
- **Reliable electronics hardware**, RISE / Swerea IVF, *per-erik.tegehall@ri.se*
- **Antennas- mm wave- and terahertz systems,** Chalmers *jan.grahn@chalmers.se*





EU Investments in Sweden

Invest. (-> 2019)	H2020	ICT	ICT-Target HEU	Increase H2020 -> HEU	ECSEL (-> 2020)
Total	48 824 M€	5 252 M€			823 M€
Sweden	**1 660 M€** (~ 4,42 B€)	**142 M€** (460 M€)			***17,1 M€***
Share	3,4%	2,7%	~3,5%	*21%*	*2,1%*

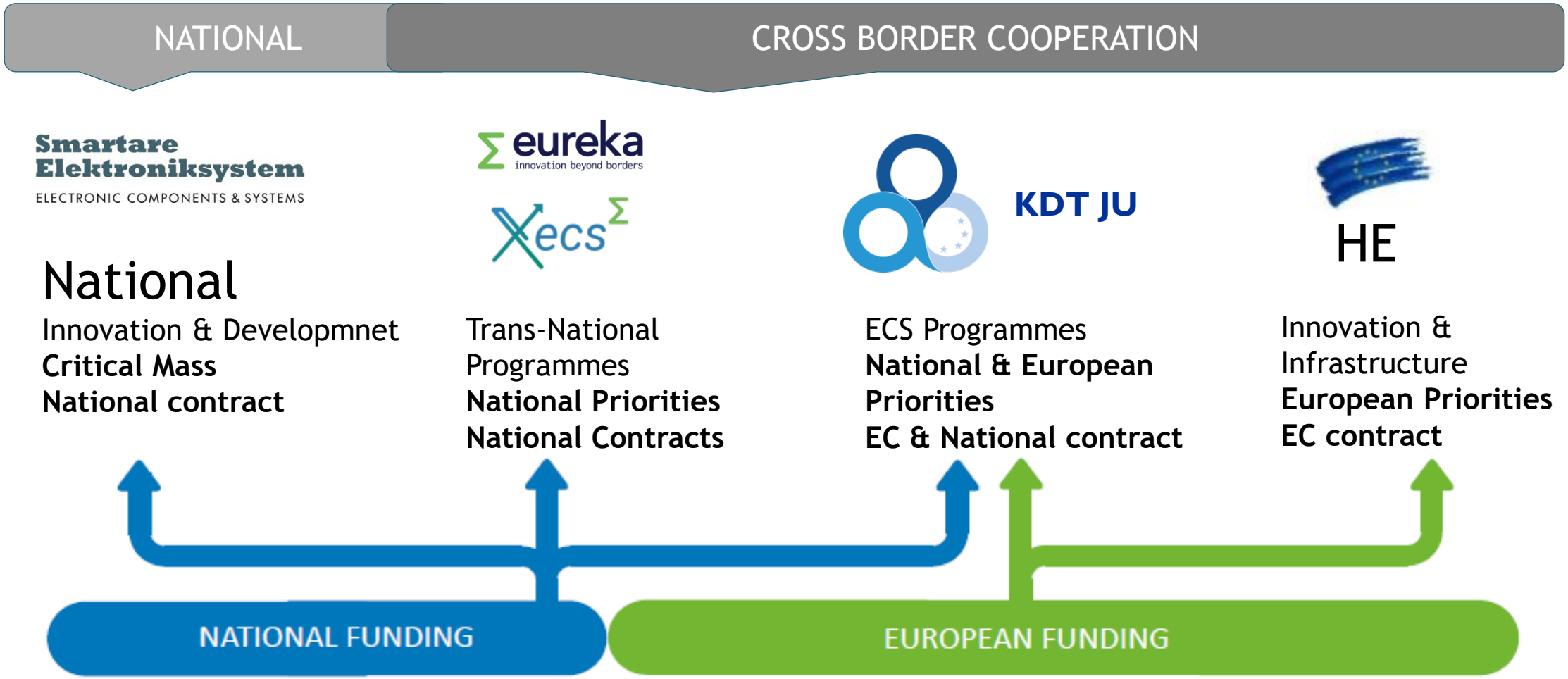
- **Sweden is 8th largest receiver of H2020 funds in EU corresponding to 3,5% of the H2020 budget (public data upto 2019)**
- **In the ICT Area Sweden's share dropped from 2,9% (2017) to 2,7% (2019) which is considerably less than average H2020 level**
- **A reasonable goal is to increase ICT share in HEU to the average Swedish H2020 level of ~3,5%,**
- **In the ECSEL JU 76 Swedish participants (3,3%) had a share of only 2,1% of the grants (17,1 M€) up till 2019. This has increased in 2018-21 with several new Swedish ECSEL consortia (5 +1 in the last ECSEL 2020 call).**

SOURCE: Vinnova – Horisont 2020 – årsbok 2019

Swedish ECS project ideas for Int'l collaborations

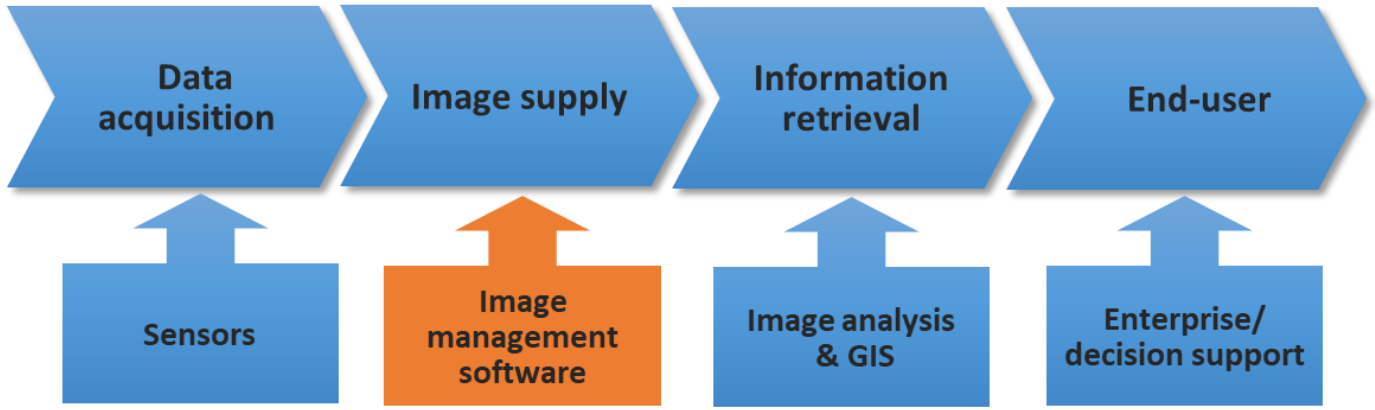
Int'l collaborations: Your Choices, we know the Swedish industry in – the Funding instrument landscape

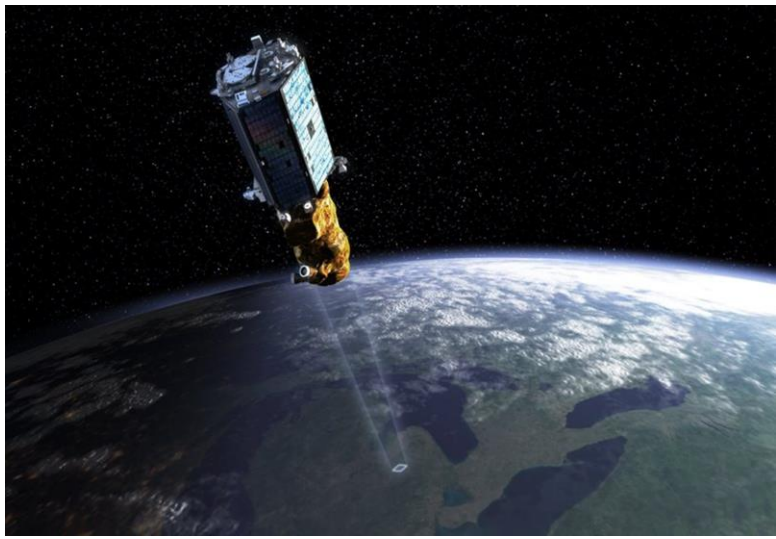
Positioning Smartare elektroniksystem, Xecs & KDT in the European Funding Landscape



Spacemetric – image data management

- Swedish SME specializing in image supply





- Clients: satellite operators, aerial integrators, UAV integrators
- Interested in projects where one or more of the following is needed:
  - Selecting on-board data for priority download (also video clips)
  - On-board edge computing de-selecting non-priority / selecting priority data
  - Handling image data in the cloud with low-cost entry costs and full scalability

We have helped entrepreneurs to:

- ✓ Reach the 33-list of Sweden's hottest tech companies… twice
- ✓ Find optimal technology and apply efficient processes
- ✓ Support the entire product life cycle
- ✓ Show real value of IoT – Splunk
- ✓ Scale resources on demand
- ✓ Secure patents and IPS protection
- ✓ Go from idea to market to IPO

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SENSORS FOR DIGITAL ELECTRONICS AND PHOTONICS APPLICATIONS

QIN WANG AND MICHAEL SALTER

SMART HARDWARE DEPARTMENT
RISE/ICT
164 25 KISTA
STOCKHOLM
SWEDEN

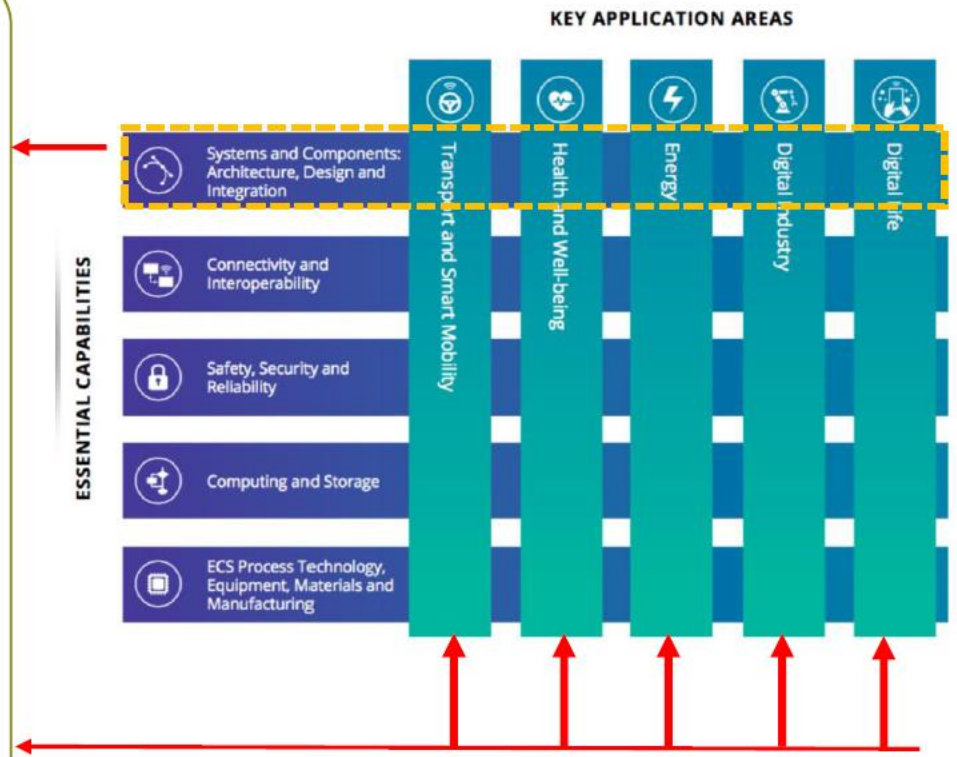
QIN.WANG@RI.SE AND MICHAEL.SALTER@RI.SE

Our offers/competence:

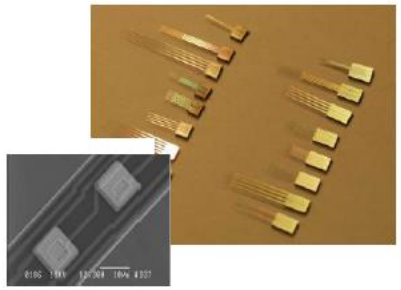
- We develop new materials, electronic and photonic devices and systems that create new functionalities and allow for further integration and miniaturization giving higher performance at reduced cost.
- We specialize in the areas of nano/micro fabrications, MEMS/NEMS nanoelectronics/photonics for applications for imaging, bio/life science, sensors and actuators, power electronics and high-speed communications.

Call partnership on:

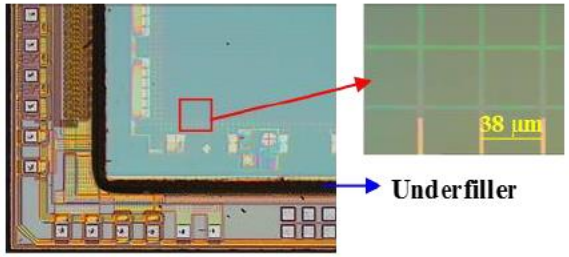
- Artificial Intelligent (AI) Empowered Sensor System for Neurodegenerative Disease Detection
- R&D of Wide Band Semiconductor for RF and Power Electronics
- Multiple Quantum Wells (QWs) based Large Format 2D Spatial Light Modulators (SLMs) for Optical Information Processing such as AI applications
- Development and Optimization of SiC based High Temperature and High Pressure Sensors for Industrial and Harsh Environment Applications



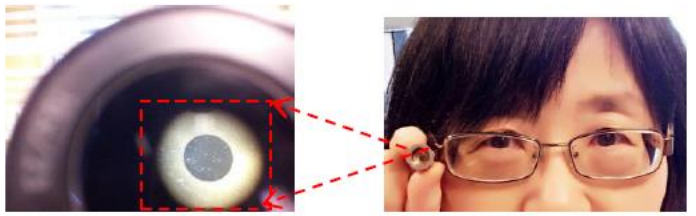
Wafer scale components/sensors design and fabrication at Electrum clean room facilities



Si based micro needles



MQW SLM flip-chip mounted on its electronic driver



SiC based all optical high pressure and high temperature sensors for auto industry

CONTACT:
WWW.SMARTAREELEKTRONIKSYSTEM.SE

Deputy program manager
responsibilities for Int'l activities:
Dr. Thorbjörn "TOBY" Ebefors
Thorbjorn.Ebefors@smartareelektroniksystems.se

Program manager:
Magnus Svensson
Magnus.Svensson@smartareelektroniksystem.se

Swedish ECS project portfolio examples and ideas for Int’l collaborations