



**Holst Centre**

Open Innovation Centre for Autonomous  
Microsystems and System-in-Foil Technologies  
Kivi 11 oct 2005      Marcel Tijdink

# Content

- **Scope Holst**
  - **Goals**
  - **Organisation**
  - **IP**
- **Program lines**
  - **P1: Wireless autonomous sensors IMEC**
  - **P2: Systems in Foil: TNO**

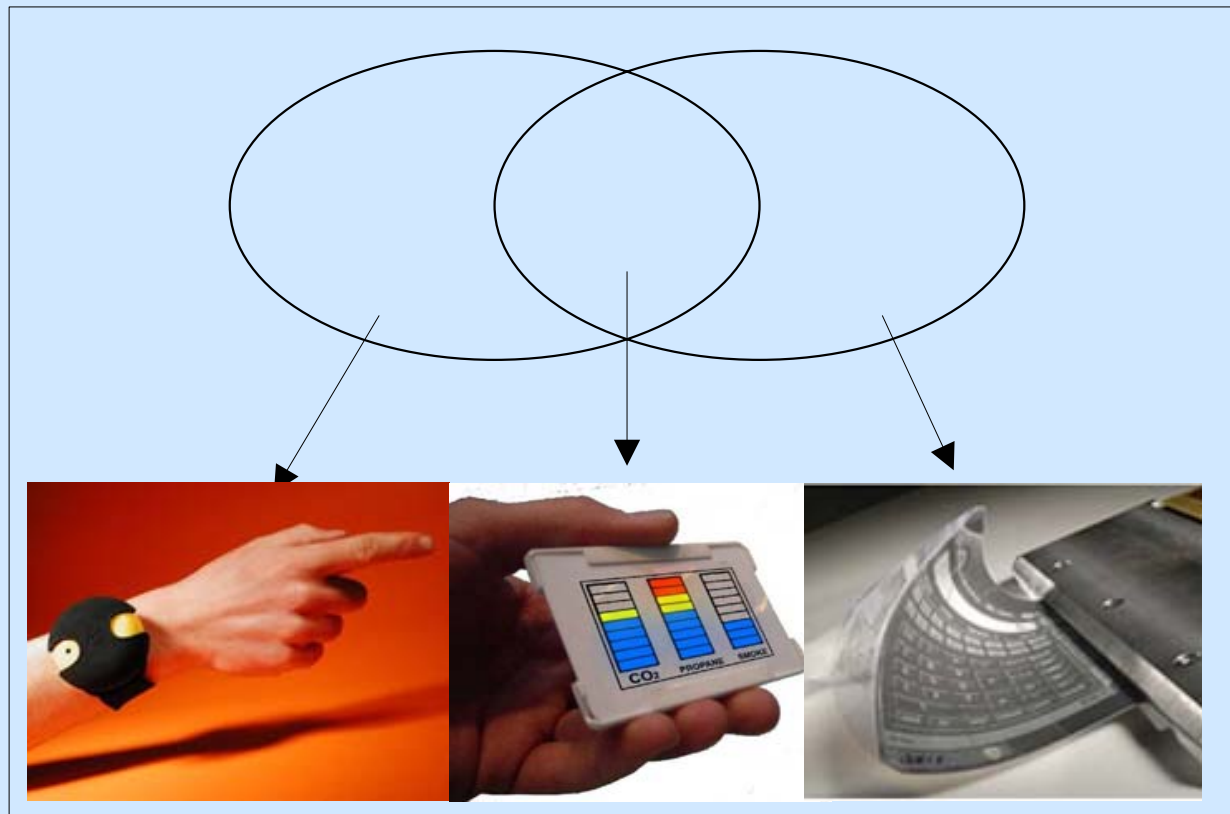
# Holst Centre announced

- Formal announcement made by Dutch and Flemish ministers of economic affairs on 25/05/05



# Concept

Holst Centre is an international open R&D centre of excellence creating generic leading-edge technologies for autonomous microsystems and systems-in-foil, in program partnership with industry and universities

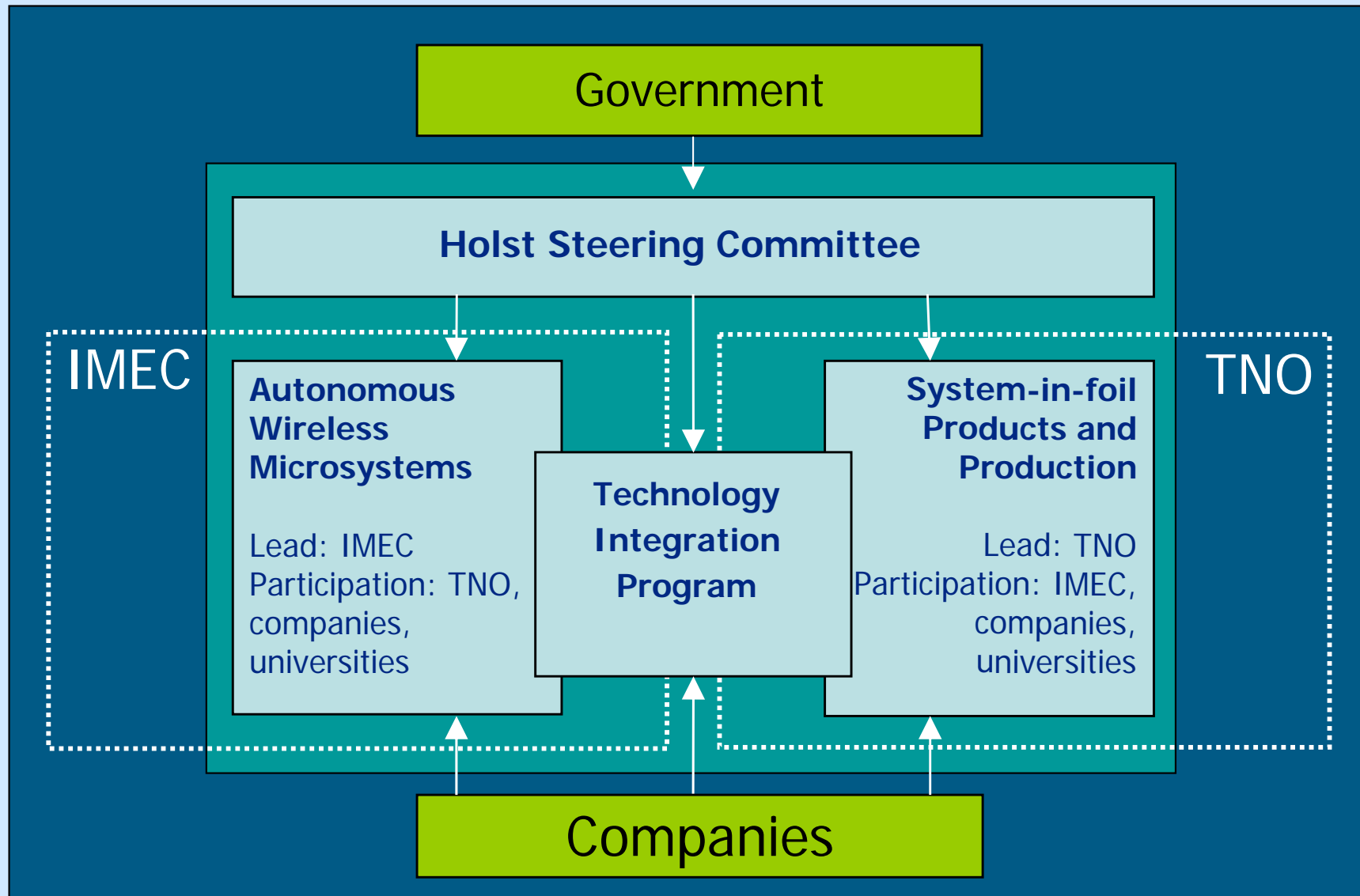


# Concept (2)

- Participation of international companies in the programs
- R&D on generic, re-usable building blocks (platforms) and manufacturing technologies
- Pre-competitive, to be applied by industrial partners
- Use of IMEC business model, IP model
- Use of IMEC, TNO and Philips networks
- Collaboration with academia for long term focus
- Location at High Tech Campus Eindhoven
- Use of MiPlaza facilities



# Organisation



# Key Performance Indicators (KPI's)

## **International impact**

- Level of total contract revenue
- # international publications, # invited papers
- # patent applications
- # PhD students within the programs

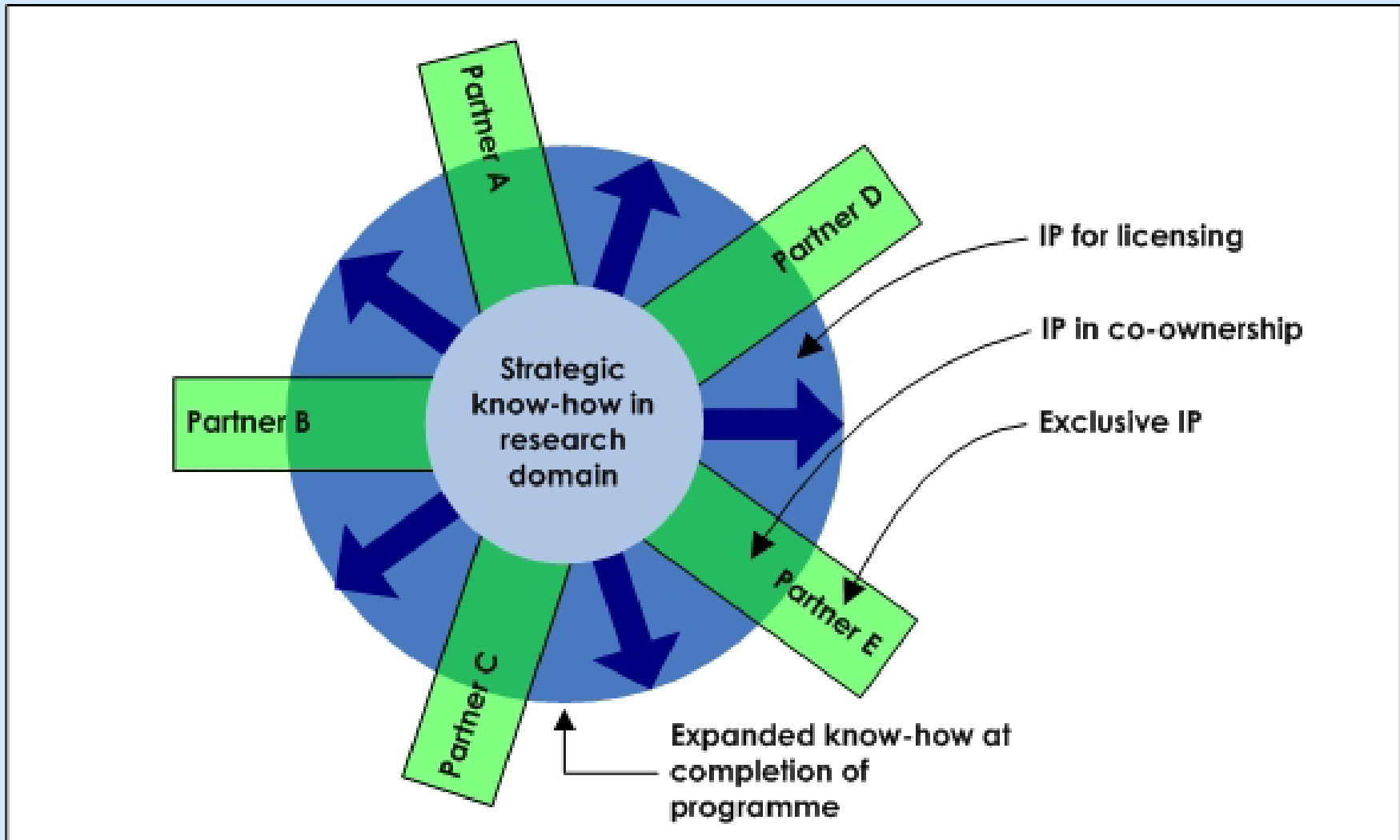
## **Collaboration with Dutch knowledge centres**

- # formal collaborations with Dutch universities and institutes
- # co-authored papers with Dutch universities and institutes
- % (financial) participation of Dutch universities in Holst

## **Impact on Dutch economy**

- Level of contract revenue with Dutch industry
- # formal Dutch industry collaborations
- # spin-offs
- Level of outsourced budget to Dutch industry

# IP model





# Staffing plan

	2006	2007	2008	2009	2010
FTE's program line 1	27	54	84	113	134
FTE's program line 2	45	57	69	80	90
FTE's Holst Centre	72	111	153	193	224

# Participation of industries: benefits

Participation in research programmes provides:

- Free use of program results within field of use to be agreed upon
- Co-ownership of co-inventions
- Collaboration with researchers of Holst Centre, other industries and universities
- Cooperation with other industries in value chain
- Remaining informed of newest developments
- Opportunities for recruitment of students participating in Holst Centre programmes
- Facility sharing

# Participation of industries (2)

Industry participates with (combinations) of:

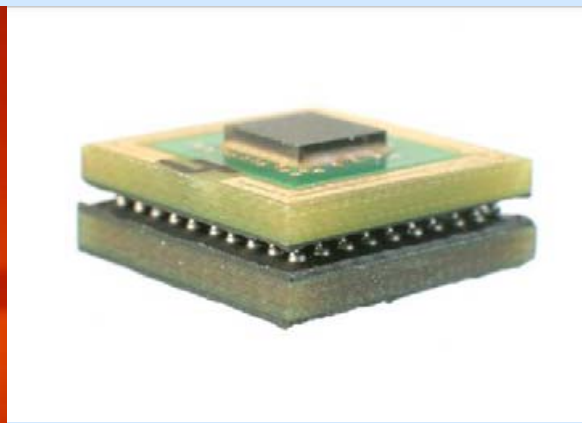
- Financial contributions
- Equipment
- Participating researchers (under Holst management)
- 'Industrial residents' (under management of industry, bridging between Holst and company-specific R&D)

# Participation of universities

- **Focus on long-term issues**
- **Integrating academic research into platforms and demonstrators linked to industry and industrialization**
- **Participation in programs with Master, PhD students**
- **Allocation of 10 % of government funding**
- **Holst senior researchers as part-time professor**
- **Joint participation in Dutch or EU projects**
- **Monitoring for potential Holst employment**
- **Holst Centre supporting valorisation of university IP**

# Autonomous microsystems: themes

- **Ultralow power digital signal processing**
- **Ultralow power radio for low data speed**
- **Micro power generation**
- **Power management**
- **Sensor and actuator technology**
- **Autonomous wireless sensor systems**



# Autonomous Wireless Transducer Solutions: programs

**Strategic programs:** *windows on application areas, guiding choices in the technology programs*

**Technology programs:**  
*Development of key technologies*

Ultra Low Power Wireless

Ultra Low Power DSP

Micro Power

Sensors & Actuators

Integration and implementation

**Medical & Lifestyle**

**Process Automation**

**Agri-culture**

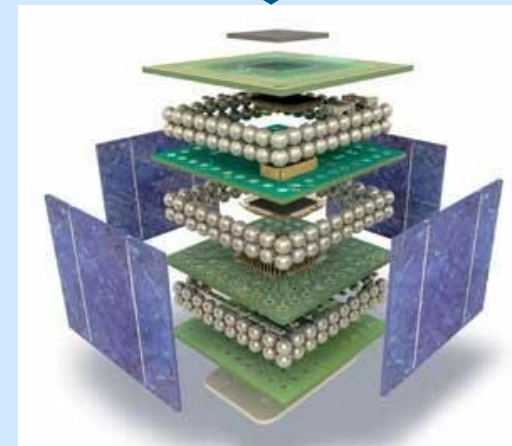
**Mobile Gaming**

# Illustrative demonstrator

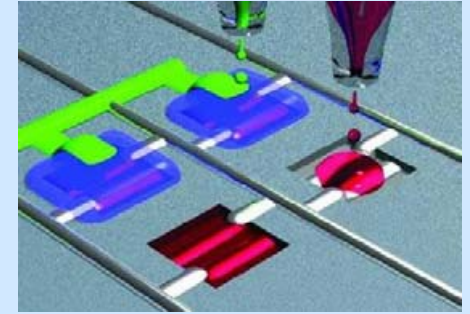
**Sensors**  
**Micro Systems**  
**3D Packaging**  
**Wireless Communication**  
**Solar Cells**  
**Chip Technology**



**Wireless, portable  
EEG-device of 1cm<sup>3</sup>  
Improving quality of life  
of epileptic patients**

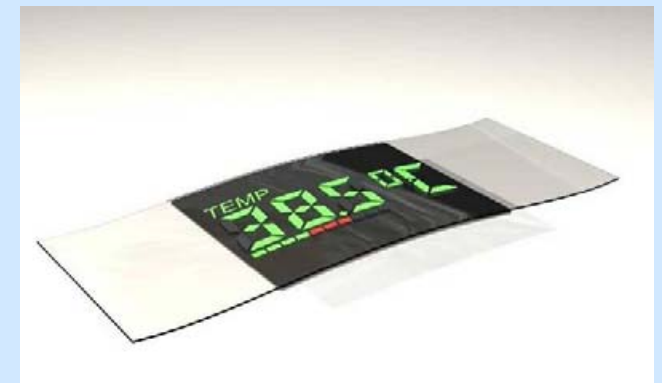
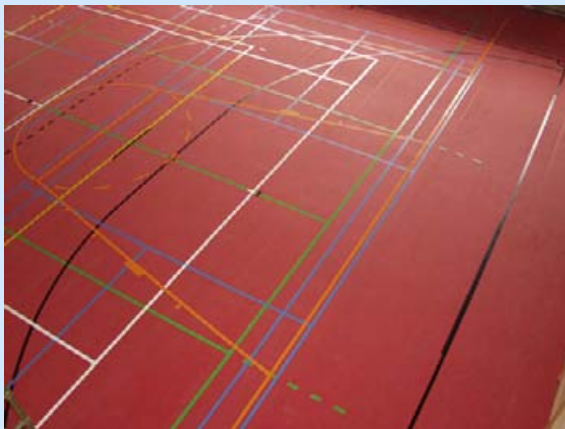


# System-in-foil





# Sensing / Acting Surfaces



# Targeted markets for SiF technologies

Leading markets	Estimated size in 5-10 years (B Euros)
Lighting & signage	15-30
Sensor tags and systems	50-75
Expansion markets	
Displays	10-20
Organic Solar	(performance; oil price)

# System-in-Foil Products and Production: programs

**Strategic programs:** *windows on application areas, guiding choices in the technology programs*

**Technology programs:**  
*Development of key technologies*

	Printed Organic Lighting & Signage	Sensor Tags & Systems
Large Area Printing	■ ■ ■	■
Transparent Electrodes	■ ■	■ ■
Laminated Interconnects	■ ■	■ ■
Printed 3D Structures on Foil	■	■ ■ ■
Organic Circuitry	■	■ ■ ■
Lithography on Foil	■	■ ■ ■