



EUROPEAN RECYCLING INDUSTRIES'  
CONFEDERATION AISBL



## PLASTRONICS IMPACT ON WEEE MANAGEMENT

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# EURIC AT A GLANCE

The European Recycling Industries' Confederation  
brings together recycling federations from 20 EU and EFTA Member States  
and represents:

5,500+ companies including small and medium-sized enterprises

300,000 local jobs

Millions of tons of waste recycling every year (metals, plastics,  
glass, paper, **WEEE**, ELVs, Packaging, etc.)

An annual turnover of about €95 billion



# What if ALL objects, appliances, devices, products... became as « smart » as your smartphone ?



## Smartphone

- Independent source of energy (battery, PV cell...)
- Wireless connection to a network : antenna (wifi, Web ...)
- Data and memory processing (microprocessor...)
- A screen



## Results

→ Permanent flow of information: back and forth



RECYCLING: BRIDGING CIRCULAR ECONOMY & CLIMATE POLICY

European Recycling Industries' Confederation . Europäischer Bund der Recyclingindustrien . Confédération Européenne des Industries du Recyclage

Impact of Plastronics, and 5G, on IoT, Internet of Things,  
on EEE (market, use, composition...)  
and WEEE management



# What if ALL objects, appliances, devices, products... became as « smart » as your smartphone ?



## What are the consequences ?

- Permanent link between objects and their manufacturer
- Manufacturer shift to « service provider » for the customer
- Preventive maintenance, Control of the supply chain...
- End of « end of life » : the washing machine may break loose, but its « brain » is still alive
- The door of the Waste « Domain » suddenly close : the « abandoned » criteria became useless
- Collapse of collective waste scheme : individual responsibility of the manufacturer prevails
- Complete change in the recycling world : the property of the material is lost



# What if ALL objects, appliances, devices, products... became as « smart » as your smartphone ?



## How does it work ?

- You need a link: this what 5G is about: one million devices par square km
- You need basically: electronics, antenna and some energy source embedded (*you don't need a screen, you have already one...*)
- **This is** what Plastronics is about...



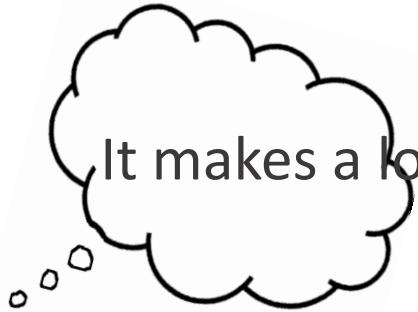
RECYCLING: BRIDGING CIRCULAR ECONOMY & CLIMATE POLICY

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# PLASTRONICS

**Main goals (at first):** suppress the wires, and suppress the printed circuit board (PCB), directly use the plastic parts of the object as support for conductor lines (metal thin layer deposit), same for the electronic parts...



It makes a lot of savings! It suppress also manual connections. Great!

Second thoughts (!): Hey! What if we engraved an antenna? And a PV cell?

Why these simple ideas didn't pop up long before?

Inertia, compartmentalization of activities, change in manufacturing process.

# PLASTRONICS

PCB in a computer mouse



Component side



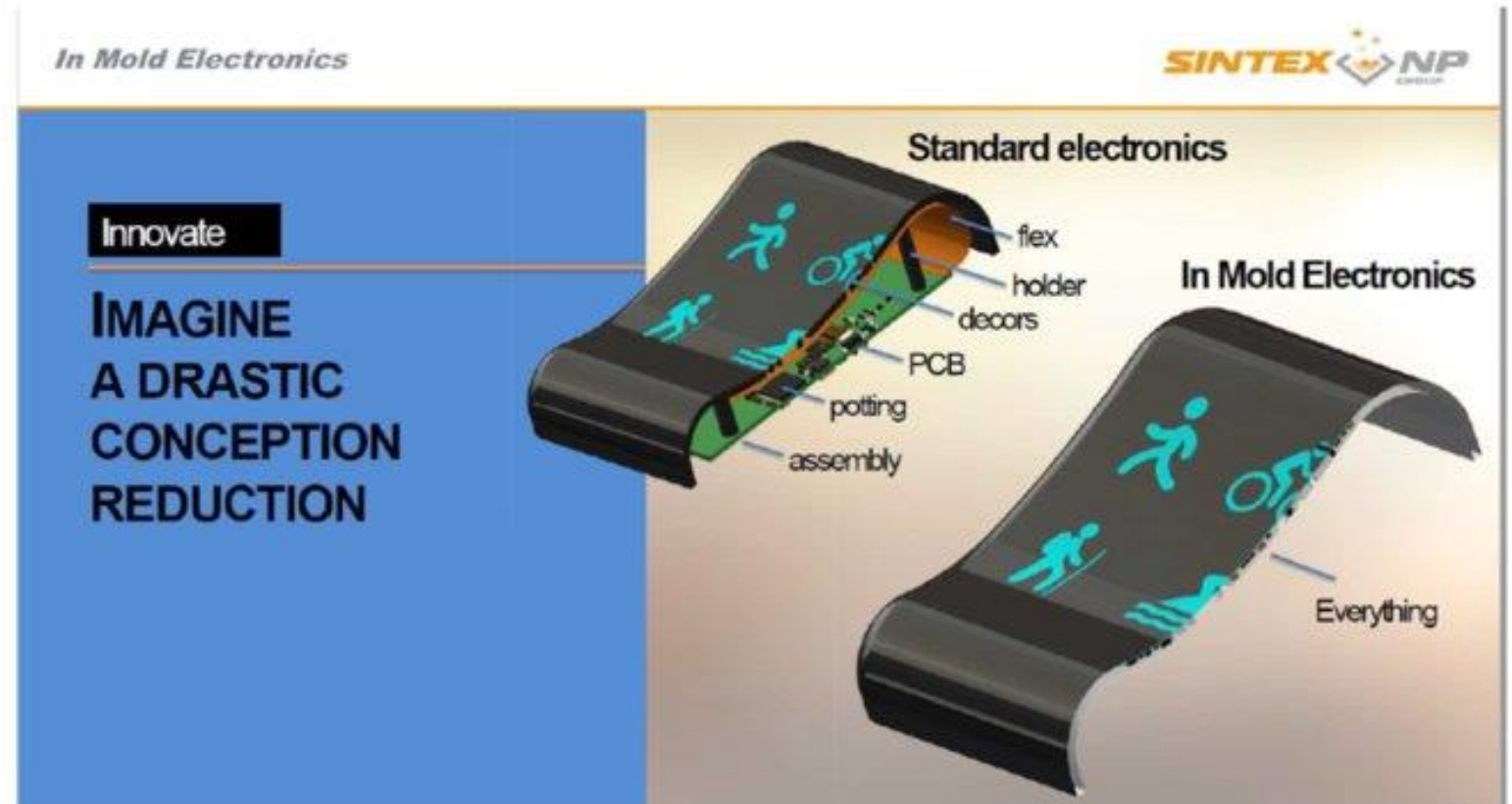
Printed side



# PLASTRONICS

Plastic is not any more  
« plastic »!

The plastic itself will change  
(chemically reactive polymer).





# PLASTRONICS - AFTER

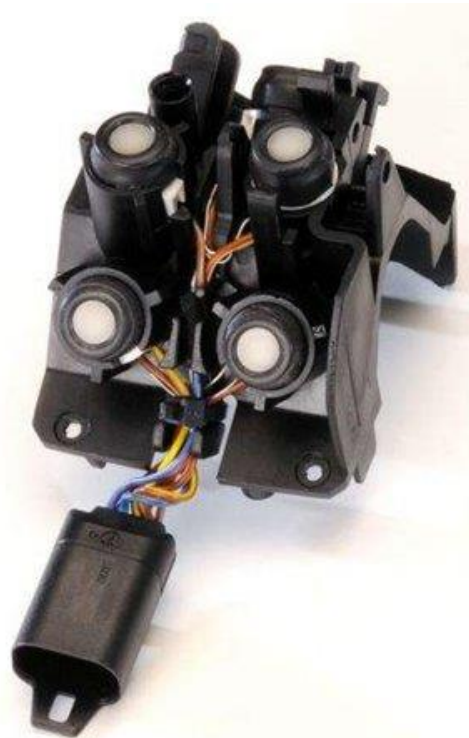


# PLASTRONICS - AFTER

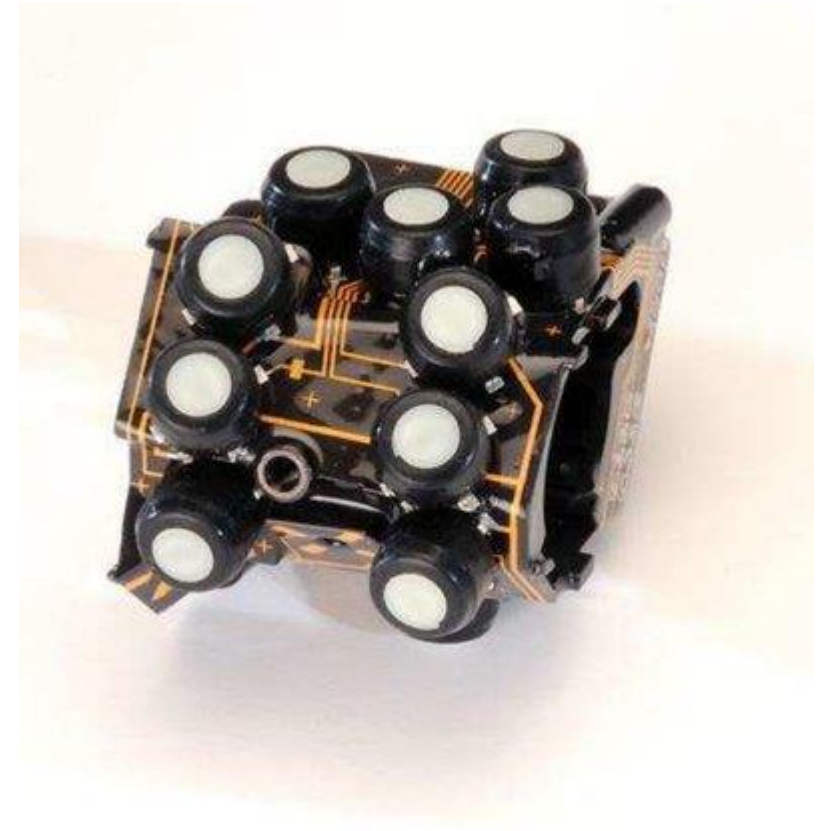
BMW Motorcycle handle



Before plastronics



After: no more wires, no manual assembly



# PLASTRONICS





# PLASTRONICS

## 3D-Printed Electronics Printed Functions on 3D-Parts

Printed 3D-electronics:

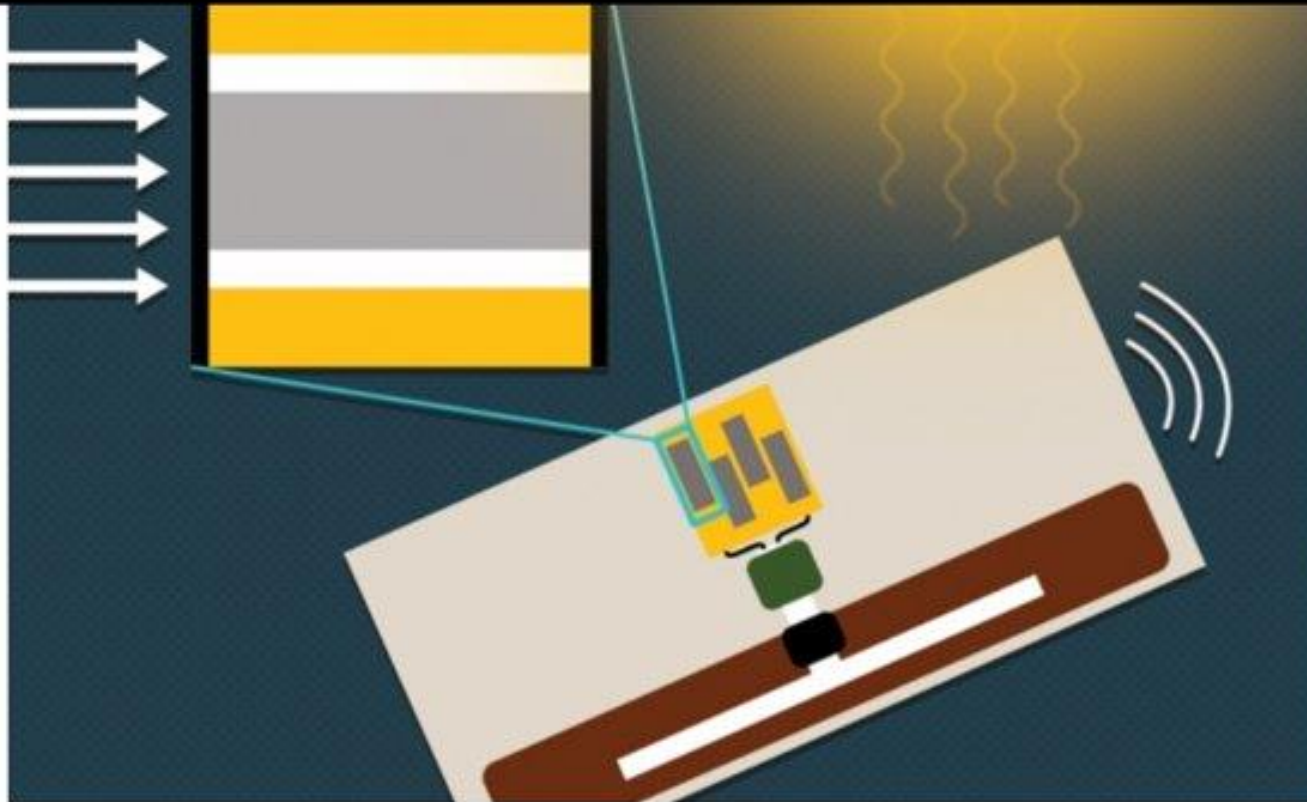
- Integration of antenna, sensors, actuators, heating structures: "3D-electronics"
- High design freedom of Functional Printing enables new possibilities of functionalization and product individualization



Printed capacitive filling sensor on 3D-Object

(in coop. mit Univ. Bremen, Prof. Krieger)





MIT researchers have designed low-cost, photovoltaic-powered sensors on RFID tags that work in sunlight and dimmer indoor lighting, and can transmit data for years before needing replacement.

Image courtesy of the researchers, edited by MIT News

## Photovoltaic-powered sensors for the “internet of things”

RFID-based devices work in indoor and outdoor lighting conditions, and communicate at greater distances.

# PLASTRONICS

Huge opportunity to relocalise EEE manufacturing in Europe:

- All PCB are « made in Asia »!
- Every manual assembly is in Asia...

Plastronics processes are booming:

- Chemistry is a major KEY! (Metal deposit, engravement, photochemistry)
- Imagination at work!



Défense et Sécurité



Domotique



Industrie Médicale



Cosmétique et Luxe

# PLASTRONICS



**The BIG change** is a permanent LINK between the device, the consumer and the manufacturer ...

- Collapse of collective waste scheme: individual responsibility of the manufacturer prevails
- Complete change in the recycling world: the property of the material is lost





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Thank you  
for your attention!

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