

PROJECT IDEAS

Margarida Pinto

2nd General Assembly

Stakeholder Meeting

instituto de soldadura
e qualidade

About ISQ



- **Founded in 1965;**
- **Privately owned, being a non profit technical and scientific association;**
- **Headquarters / Delegations: Taguspark, Porto, Sines, Castelo Branco**
- **Two hundred company members;**
- **Around 800 staff teamed with customers and partners;**
- **Turnover: 87 M€ (2013);**
- **Operating in 20 countries worldwide**



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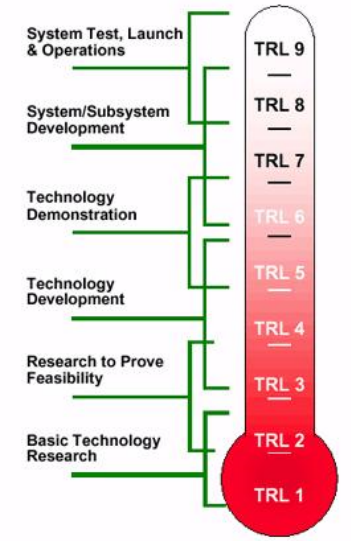
Research & Development

More than 400 projects

55 running projects

More 1000 partnerships

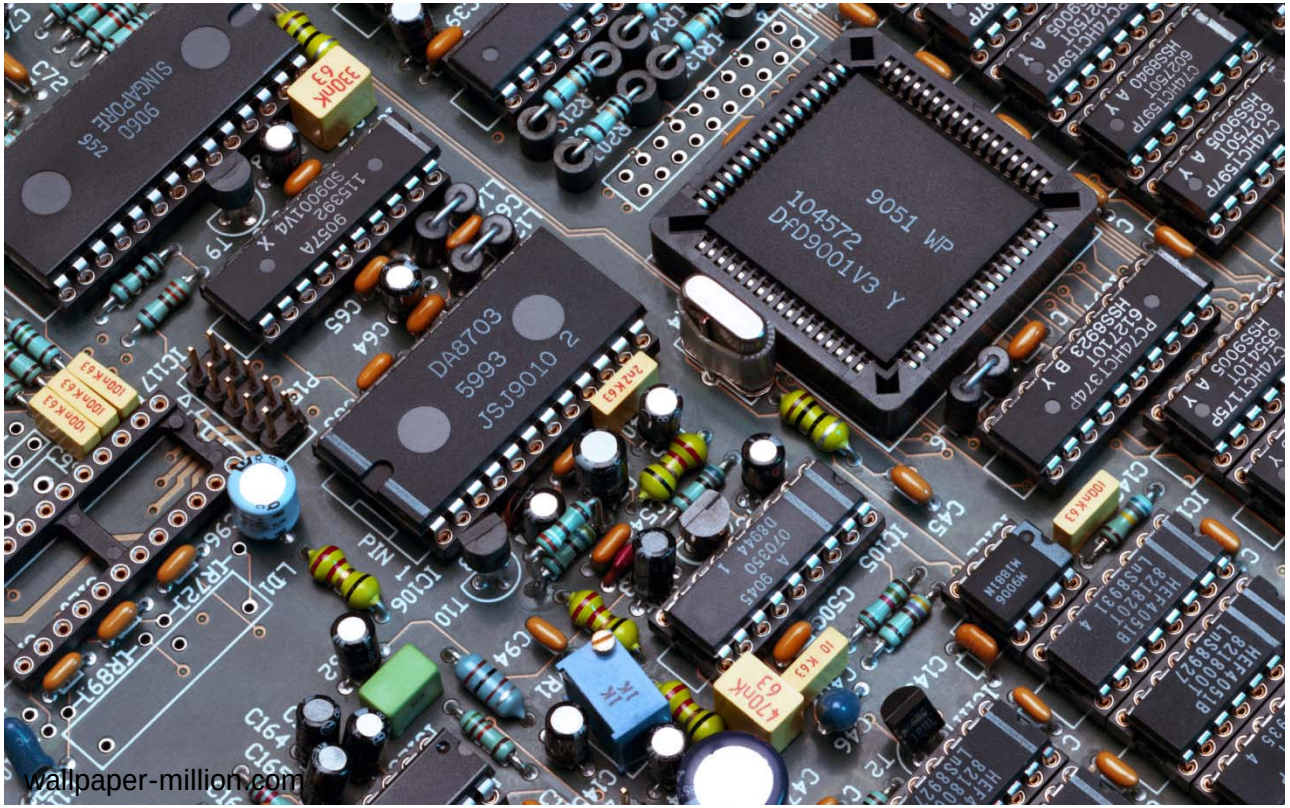




FoF 13 – 2015: Re-use and remanufacturing technologies and equipment for sustainable product lifecycle management

Project Idea

Automated separation and recovery of Waste system from Electrical and Electronic Equipment for reuse



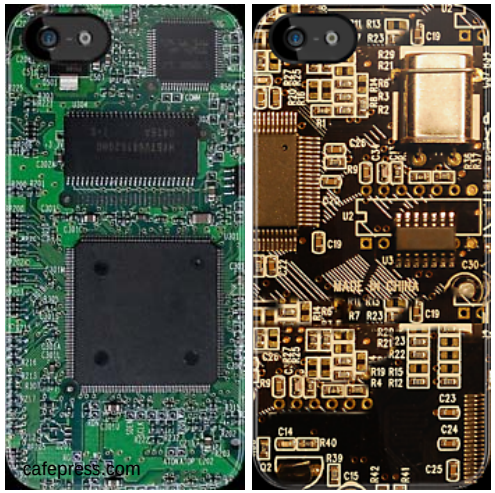
Motivation - EU WEEE Directive:

- The existing binding EU collection target is 4 kg of WEEE (Waste Electrical and Electronic Equipment) per capita, representing about 2 million tons per year, out of around 10 million tonnes of WEEE generated per year in the EU. By 2020, it is estimated that the volume of WEEE will increase to 12 million tons.
- Not only recycle but also reuse electrical waste
- Cut down illegal exports of WEEE

Project key issues to be adressed:

- Visual data base creation
- Fully automated system for removal and recovery of electrical components
- Visual quality control
- Innovative product design enabling easier component recovery
- New manufacturing/equipment concepts for re-manufacturing using recovered components
- Business model

Visual data base creation of high volume sales electronic equipment.



Some numbers:

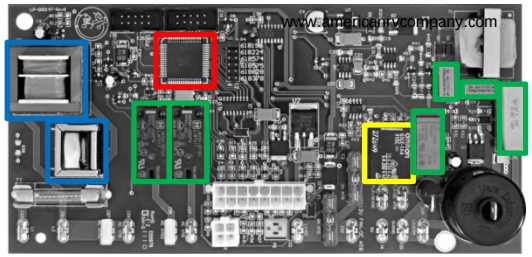
iPod, iPad, iPhone – Apple sold 300M devices in 2013.

300M Samsung Smartphones sold in 2013.

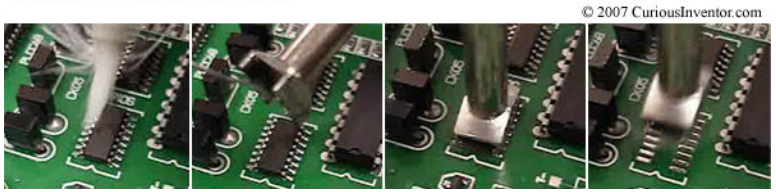
Lenovo, HP, Dell and Acer sold 43M PCs in the 3Q13.



Removal and recovery of components



Identify and label reusable electronic components.



Automated desoldering



Automated visual quality control



Robotic removal and manipulation

ISQ contribution

	Type	Country	Role
ISQ	RTD	Portugal	- Project coordination - Desoldering technology:development, optimization and testing (Welding Lab.) - Automated recovery robotic system: development and testing. (Robotics Lab.) - LCA

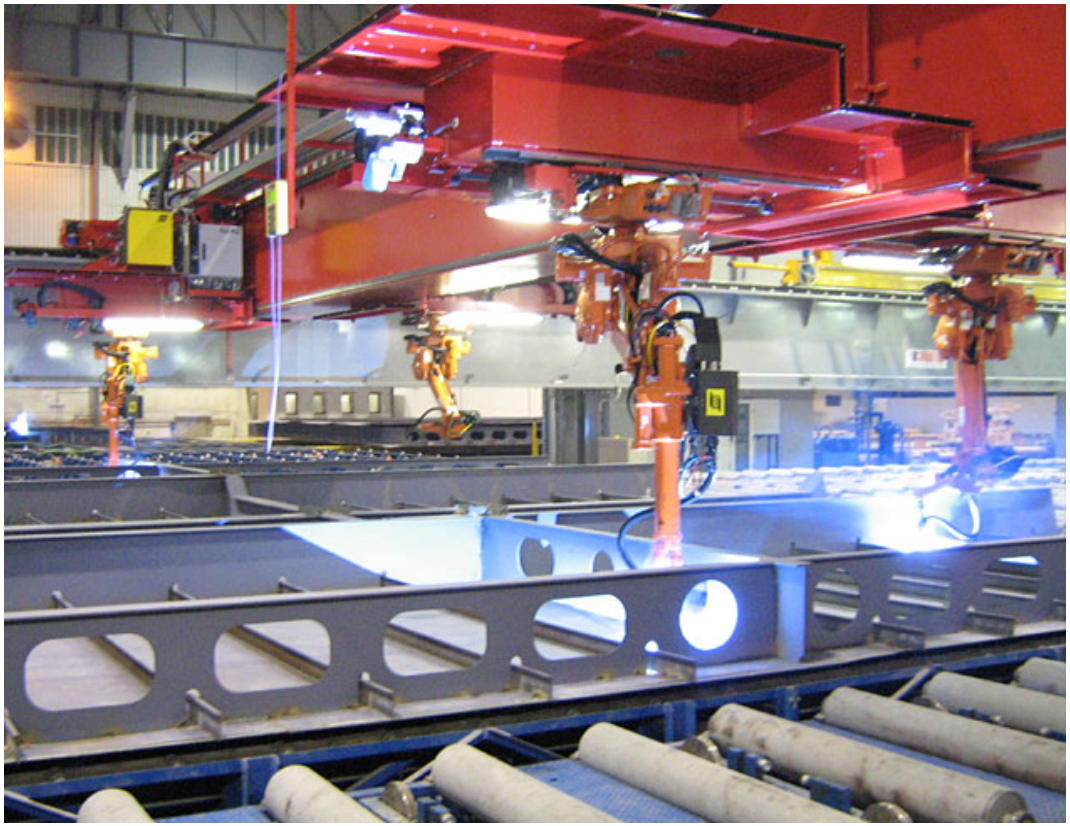
Required Partners

Profile	Type	Country	Role
Eco-Design	RTD		Product design enabling easier component recovery
Waste/components reuse	SME SME		New manufacturing/equipment concepts for re-manufacturing.
Business model developer	SME		Development of new business models to improve economical viability
Computer vision	RTD		Visual data base creation and quality control.

FoF 14 – 2015: Integrated design and management of production machinery and processes

Project Idea

Robotic welding system capable of dealing with standardized small batches and one-off productions of structural steel assemblies



Drawbacks of robotic arc welding

With large and thick-material assemblies, processed by robotic arc welding in small batches (and possibly one-off productions):

- Such applications are hardly compatible with using robotic welding jigs, which are often dedicated and quite expensive tools.
- Without jigs, dimensional inaccuracies introduced throughout the steel workflow during edge preparation and fit-up can only be dealt with by using sensor systems fully integrated with the welding robots.
- On-line and off-line programming may become very tedious and labour-intensive, making welding robots increasingly inflexible and uneconomic.





What we want to do: the general idea

- Development of a low-cost robotic welding system capable of dealing with frequent small batches and one-off productions through automatic off-line programming, minimizing input from robotic cell operators.
- Aimed at SMEs and limited to well-characterized and standardized non-generic product families (e.g. beams and columns for building structures, casings for medium- and high-voltage transformers, small assemblies for shipbuilding, etc.).





ISQ contribution

	Type	Country	Role
ISQ	RTD	Portugal	- Project coordination - Robotic welding technology

Required Partners

Profile	Type	Country	Role
Steel structures manufacturer	SME		End-user
Models developer	RTD		Simulation of models for control of production
Software developer	RTD		CAD API and off-line robot programming
System integrator	RTD		Integration of welding sensors in robot system
Business model developer	SME		Development of new business models to improve economical viability

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