



# Your finger your power !

Awards for  
« Best emerging technology » (F) in '06  
« Best technological development » (F) in '08  
« Best of Sensors Technology » (USA) in '10

[www.arveni.com](http://www.arveni.com)

# LET'S START WITH A GUESS

**253 000 000 000**

**→ What is that number?**

# 50 YEARS OF ABANDONNED BATTERIES

**253 billions**

is the sum in Europe of  
**not recycled batteries**

*Sales EU 190kt/y, only 19% recycling rate  
Source: Ebra yearly report '08*

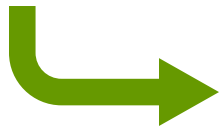


## Green power



**enhances perceived value / B2C**

## Zero maintenance



**decreases cost (TCO) / B2B**

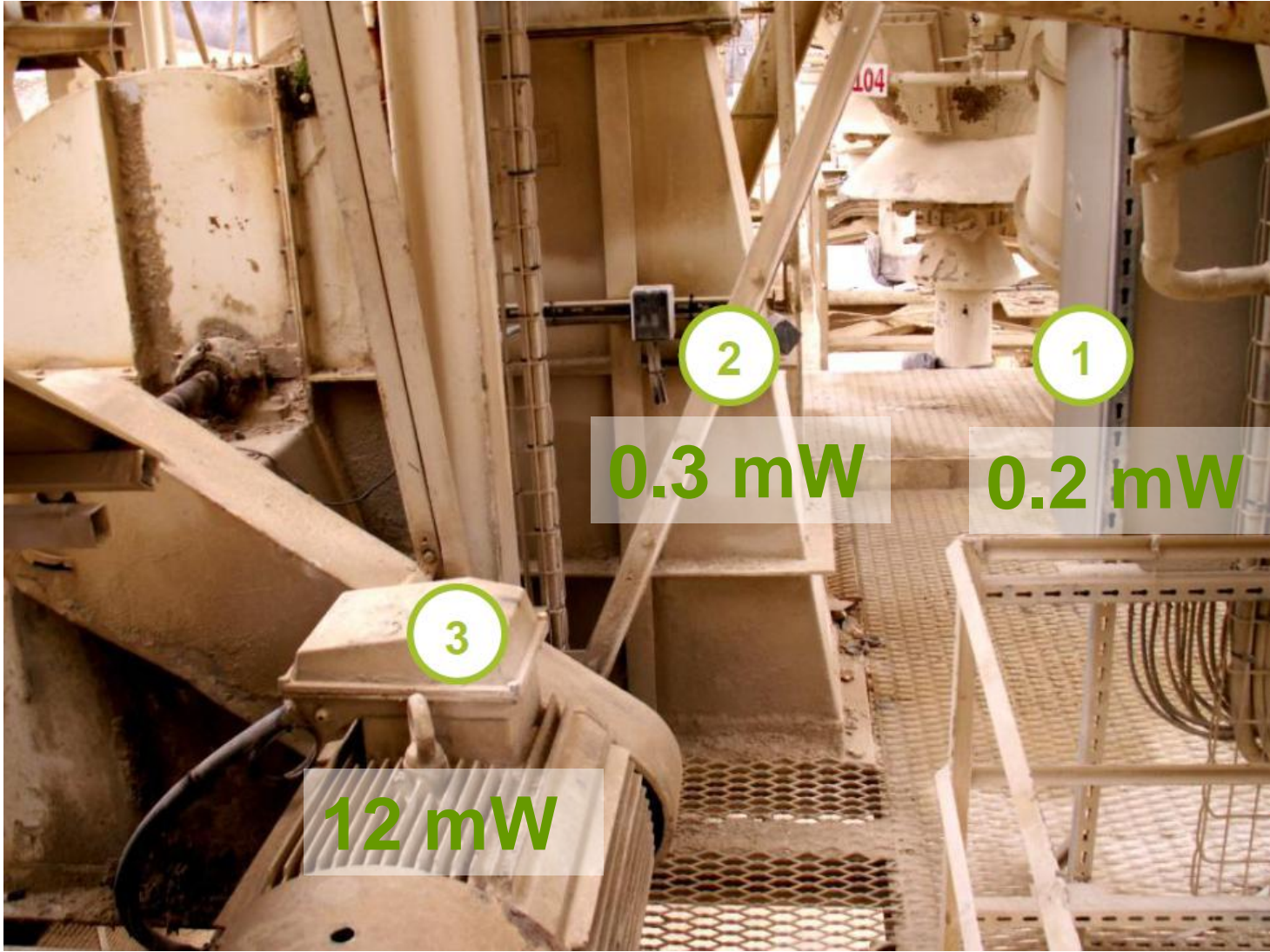
**ENERGY HARVESTING CREATES CUSTOMER VALUE  
ARVENI CREATES CUSTOMER VALUE.**

# INPUT & OUTPUT MECHANICAL ENERGY

Source	Main feature	Energy input (Ei)	Harvested power
Pedestrian	Sensitive	$E_i = W * \text{slab stroke}$	1 to 2 W (busy street)
Road/railway	Heavy	$E_i = W * \text{strain}$	100 W (busy lane)
Human movement	Ergonomic	$E_i = \frac{1}{2} M_h * v^2$	Lack data
Vibration	Wide frequency range	$E_i = \frac{1}{2} F a / 2 \pi f$ $= \frac{1}{4} M_d a^2 / \pi f$	0 to 50 mW, i.e. power up to 500mW
Pulse or button push	Predictible	$E_i = \frac{1}{2} F * \text{stroke}$	0.2 to 5 mJ , i.e. power up to 90 mW

**Wireless sensor networks**  
**Building & Home automation**  
**Transportation asset tracking**

# QUARY PILOT SITE



# TECHNICAL ACHIEVEMENTS

November 2009

- Single button harvesting
- Infrared communication



Proof of concept for  
TV remote control

May 2010

- Multikey harvesting
- Radio IEEE 802.15.4, with ack



Target applications:

- Membran switch → industry
- Digikey → home automation
- Multikey harvesting → remote control

# ARVENI SAS INDUSTRIAL START UP

Incorporated end 2007, located near Grenoble, **9 patents on piezo EH**

**Sales:** Jean-Frederic MARTIN, ME & MBA, president founder 15 years, successful european business experience (D, It, Si)

**Technical team:** Mechatronic Engineer, PhD Electronic ...

→ We are used to multiple partners project management

## Technically reknowned

- **3 prestigious awards France & USA**
- **Guest Speaker** at Sensor Expo (US), Hannover Fair, Mechatronic, EH Munich, IBS Paris, ...



## Growth strategy

- **World firsts : button powered RCU, conversion efficiency...**
- Finance: 1st round with BA in 09, Venture Capital early 2011
- **TECHNICAL LEADERSHIP & CUSTOMER SUPPORT**

# 2010 PROJECTS & IDEAS



# GREEN PROJECT DEPLOYMENT

Customer

Arveni

OEM

Customer launches a project (*brainstorming*)

- 1) Feasability, prototyping
- 2) Codesign
- 3) Industrialisation
- 4) Microgenerator production  
Arveni or licence
- 5) Integration: customer or OEM
- 6) Finished product



## **Arveni is an industrial start up**

- 1. Reliable, Green &  
Competitive products**
- 2. Clear focus on piezo EH**
- 3. Customer oriented**

# THANK YOU → QUESTIONS & ANSWERS



**ARVENI s.a.s.**  
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