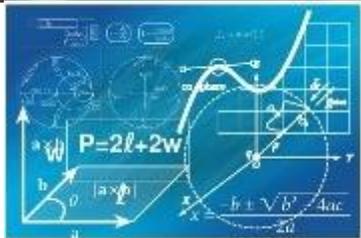
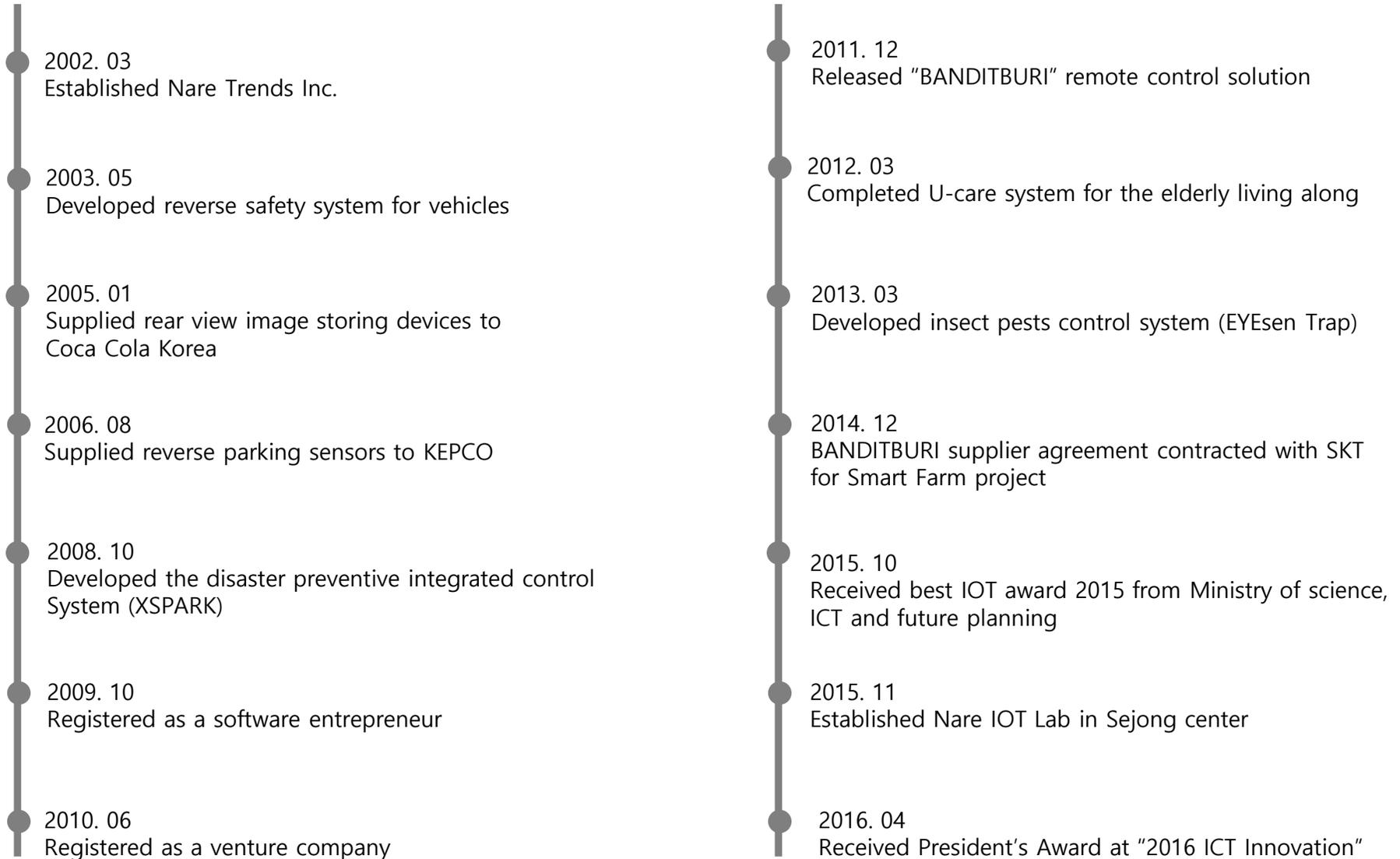


Remote Monitoring and Protection System of ARC Fire



Company	Nare Trends Co., Ltd.
Date Established	Mar. 20, 2002
CEO	Choi, Seoung Wook
Address	#507 Geumho Plaza B/D, 303-36 Buheung-ro, Wonmi-gu, Bucheon-si, Gyeonggi-do, Korea
URL	www.naretrends.com, www.nareiotlab.com
TEL/FAX	TEL +82-32-662-5000 FAX +82-32-223-7865
Business Area	ICT Convergence Environment Monitoring & Remote Control System..... BANDITBURI Irrigation Control System..... HAMA Insect Pests Control System..... EYEsEN TRAP ARC Detector & Breaker..... ARCLOW



Major Licenses and Registrations

-  Trade mark registered
- Software provider licensed
- Venture company certified
(by Korea Technology Finance Corporation)
- R&D Center established
- Green energy investments agreement with Naju city
- ICT convergence R&D center established in Naju City
- IOT Lab established in Sejoing Innovation Center

Patents and Awards

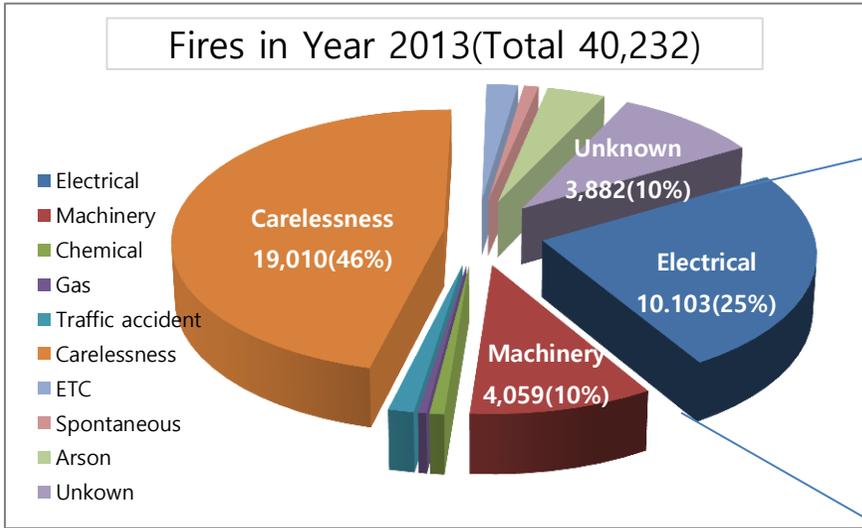
- President's Award for 2016 ICT Innovation.
- K-ICT IoT Awards by Korea Ministry of Science, ICT and Future Planning (2015)
- Patent acquired for electrical arc detector (2015)
- Patent applied for disaster & surveillance system by smart devices and CCTVs in 2013
- Patent acquired for operating methods of fire detection system and disaster monitoring system in 2012



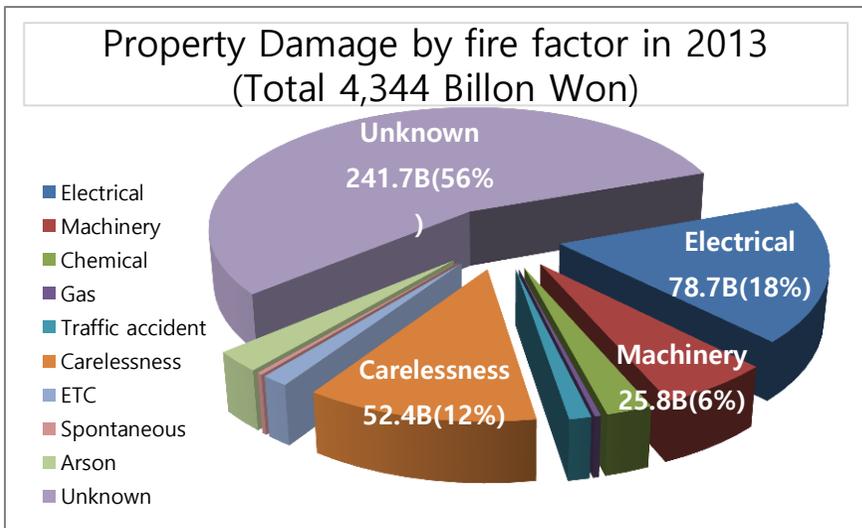
Connected to the world



Statistics of Fire and Factors(Year 2013)_Source(Korea Ministry of Public Safety and Security)



Factors of Electrical Fire		# of case	%
General Electrical Fire	Ground Leakage	415	25%
	Overload/Current	1,094	
	Partial disconnection	138	
	ETC	878	
Arc Fire	Poor connection(short)	981	75%
	Insulation deterioration(Short)	2,561	
	Pressure/Damage(Short)	670	
	Layer short	111	
	Tracking(short)	715	
	Unknown(short)	2,540	
합계		10,103	100%



√ Electrical fire takes 25% of total # of fires, 40,232

√ **Arc related fires, including unknown(short) take 75%(7,578) in electrical fires**

√ Property damage by electrical fire takes 78.7B Won(18%) followed by the largest damage, unknown(24.17B, 56%)

√ **Damage by Arc related fire presumed by 59B Won in 2013**

Arc fire?

- Arc is a kind of electric discharge with highest current density in the form of flame, spark
- Arc fire does not break out until the sustained arc meets with surrounding combustible materials

Cause of the arc fire



- Poor cable connection
- Damaged cable by worn-out or wild animals
- Deterioration and charring of the cable

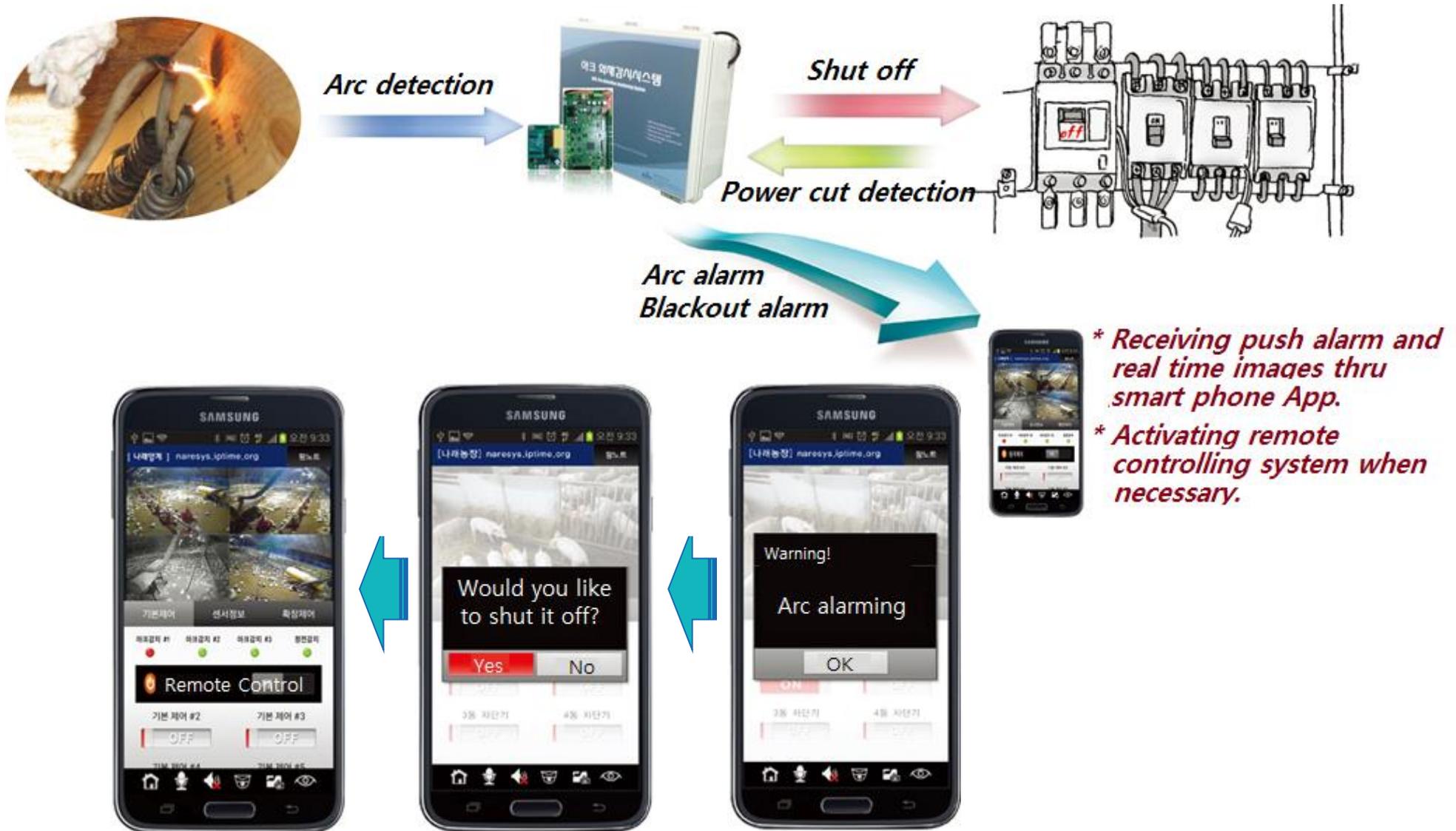


- Arc+combustible materials



Electrical fire can be prevented when it is detected at spark stage!

Diagram of Arc fire Detection System



KEY FEATURES

- ✓ Available both a stand-alone outlet type and a full system type(remote control communication with smart devices/PC).
- ✓ Thanks to advanced voltage type than typical current type, it is able to detect not only serial micro arc but also macro parallel arc.
- ✓ Covering not only the fore-end but also whole range of lower section of cable
- ✓ Able to distinguish harmless and dangerous arc.

SPECIFICATIONS

Classification	Specification
Rated Voltage	AC 110~240V(50/60Hz)
Frequency Detection	1KHz~1MHz
Type	Higher harmonic pulse counting method
Counting time	250ms after pulse count
Output type	Beep/RS485/RS232/Ethernet(System Type)
Response time	Arc pulse: Real time, Detection output: within 1sec

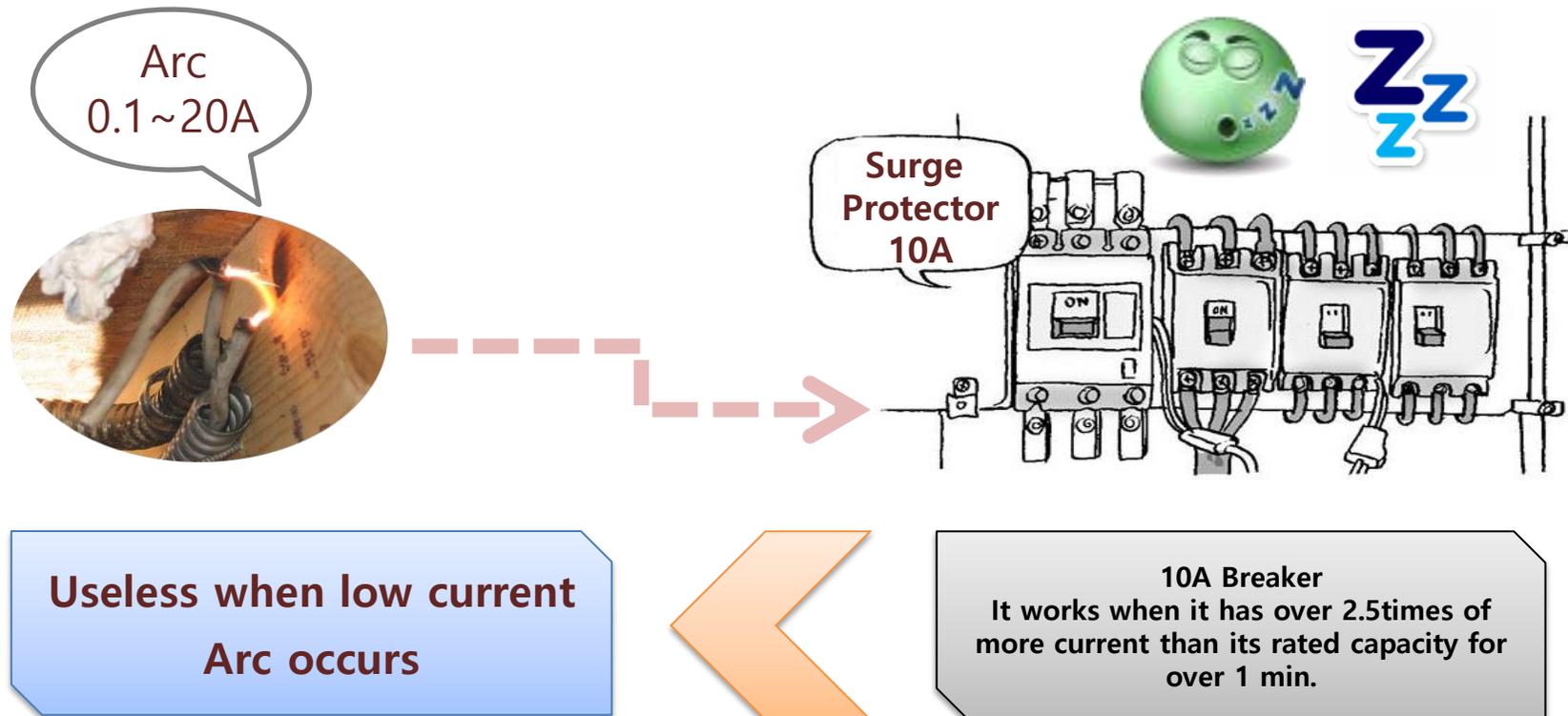


Compared to Competitor

<i>Voltage arc breaker by Nare</i>	Category	Current arc breaker by "H" company
<i>able to detect arc not only on the front end but, whole range of lower section from the breaker</i>	Arc detection range	able to detect arc on the front end of cable only from the breaker
<i>able to detect even micro arc with less than 5A</i>	Serial Arc	able to detect arc with more than 5A(based upon UL standard)
<i>No C.T necessary to detect mass arc without an error by saturated current</i>	Parallel Arc	able to detect it but when the current exceeds the C.T's capacity, not able to work properly for a while
<i>No additional C.T required → compact size</i>	C.T(Current Transformer)	Additional C.T required → bulky size

Why regular surge protectors do not work well?

- ✓ Basically designed to prevent short circuit, not fire
- ✓ Generally, it shuts off when 2.5 times more current than its rated capacity for over 1 min.
 - ☞ **Too late to prevent fire**
- ✓ Serial Micro arc takes 70% of total electrical arc fire

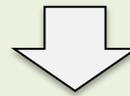


Best Practices in Overseas Market

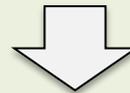
U.S.A

Canada

"Mandatory Arc-Breaker installation in the living room and bed room since 2002"



House fire reduced to **15%** from **40%**

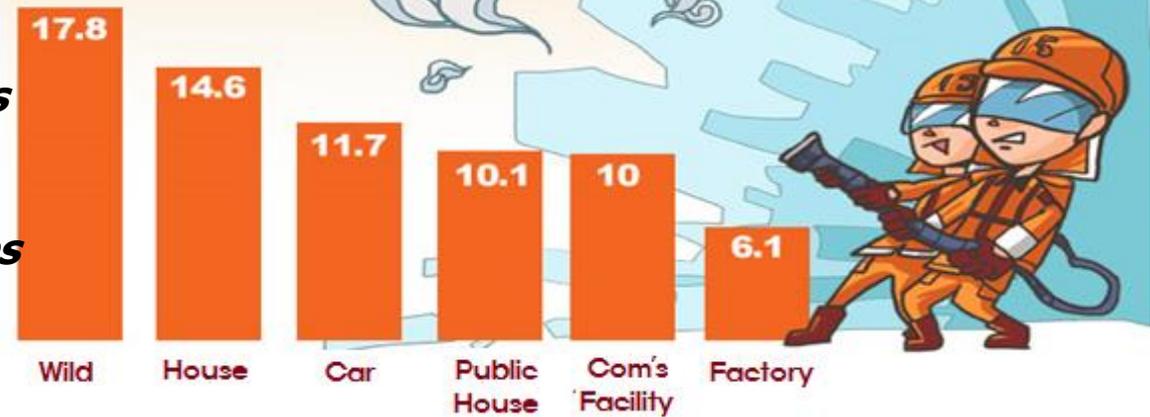


**Mandatory Arc-Breaker installation in all of the house,
Except bath room from 2014**

Industrial Fields of Application

- **Industrial Facilities**
 ex) factories, warehouses
- **Houses**
- **Power plants and base stations**
- **Cultural property facilities**
- **Agriculture & livestock facilities**
- **More**

Location of Fire in 2013, Korea



Arc Fire...could be predicted, prevented?

ARCLOW *is not optional, but*
Mandatory!

Thank you