Emerging Issues in Automobile Recycling after the Tohoku-Pacific Ocean Earthquake

4th AAEF in Malaysia

2011/11/9

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Introduction

- A huge amount of damaged cars has been generated by the big tsunami in March 11th.
- Complex Issues for the Proper Disposal

→ Confirmation of ownership, Collecting and proper disposal on the ELV recycling law.

- Keywords of recycling before the earthquake

→ Visualization, Urban mining, Reduction of hazardous material, CO_2 Reduction etc.

- The basic question we have to approach is how to make the waste-management policy and a proper method on emergency waste disposal and recycling.

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Waste Generation and Wetted Surface Area

	Miyagi Pref.	Iwate Pref.	Fukushima Pref.
Amount of Emergency Waste (10,000 ton)	1,600	583	290
Wetted Surface Area (km²)	327	58	112

Source：Estimate value by Each prefecture

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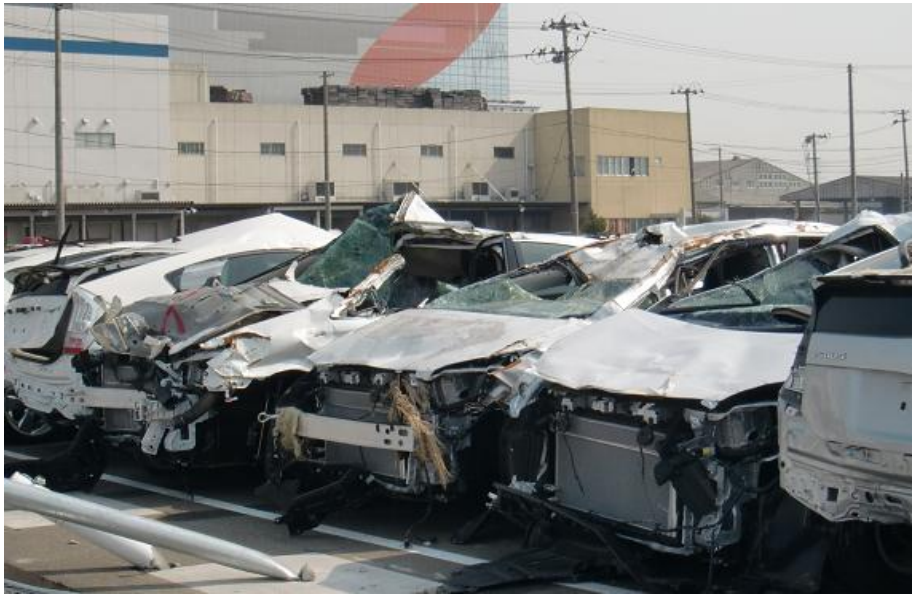


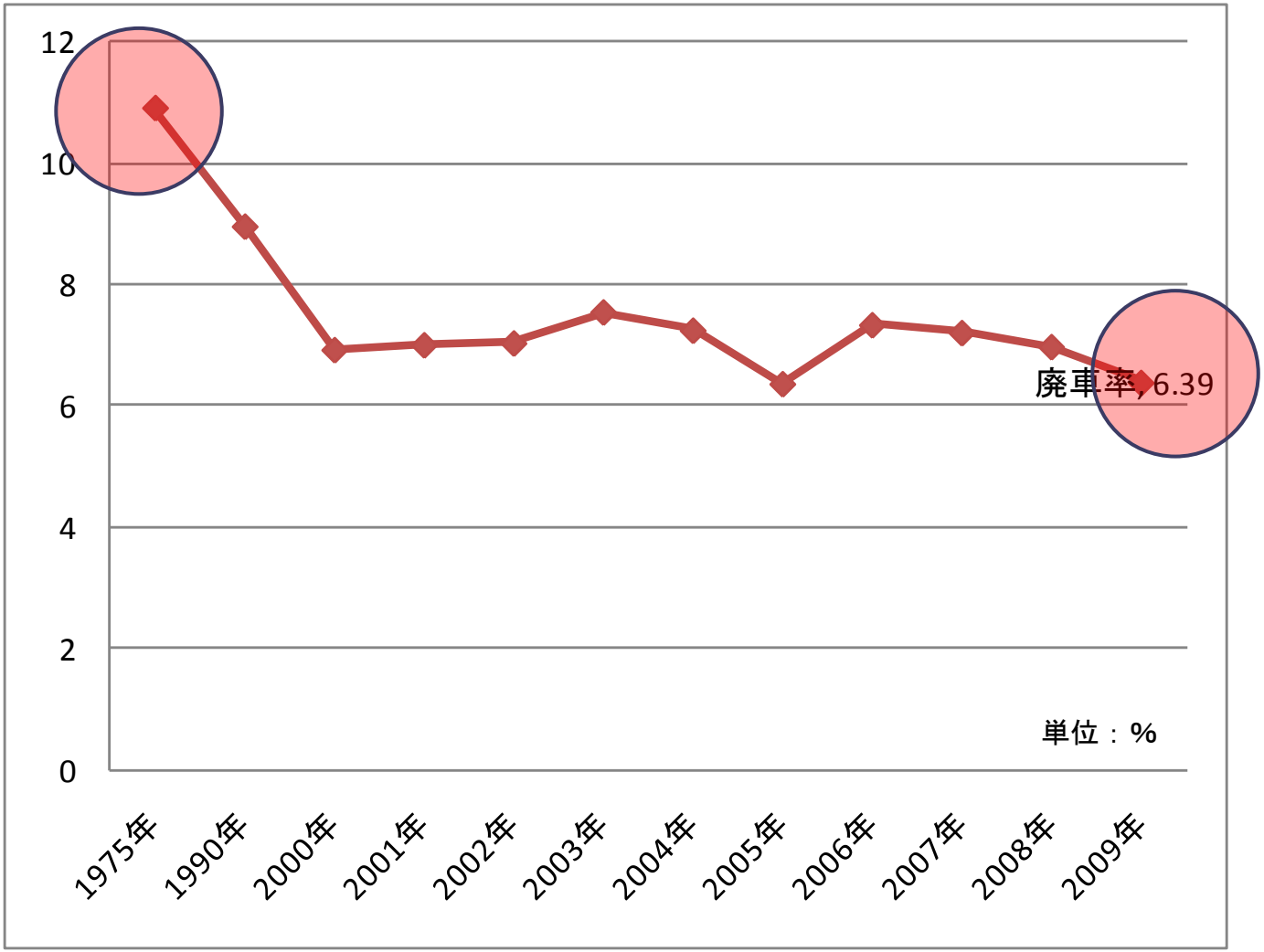

TOHOKU


災害時一時避難場所
Temporary Evacuation Site
桜木公園
Sakuragi Park
ここは災害時に避難場所・避難所になります。
Find Safty Area / Shelter Here.
多賀城市
Tagajo City


立入禁止
島
県
福
島

Car Ownerships and ELVs Generation

Ratio of ELVs



Generation of Damaged Cars

- 298,450 ELVs were generated from Tohoku Area in 2010
- Estimation of damaged cars are about 410,000 cars.

→　About 146,000 cars from Miyagi　It is difficult to estimate damaged cars from Fukushima area.

- Long-term possession（12.7years→14 years, -16%）, End of the ELVs subsidization (-15%), Damaged cars + ?
- Fortunately, There is a sufficient recycling capacity in Tohoku area now.

Issues on colleting damaged cars

- Each municipal has a different principal and policy.
- No guideline for forced deregistration
- Conformation of property rights, removal cost ; bad transport efficiency (transit vehicles, long distance)

- Tough removal action, lack of temporary storage area and burden of office work
- Difficult to dispose of proper pretreatment（small companies in the earthquake area)

Issues on handling of ELVs from the Disaster Area

- Salt damage(ELV and ASR)
- Disposal problems of sludge, fuel and liquid waste
- Disposal of Airbag and Freon gas
- Going down the value as a used part
- Checking the radiation materials and the reference stetting
- There are uncertain guidelines and final disposal method.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Radiation Measurement

（μSv/h）

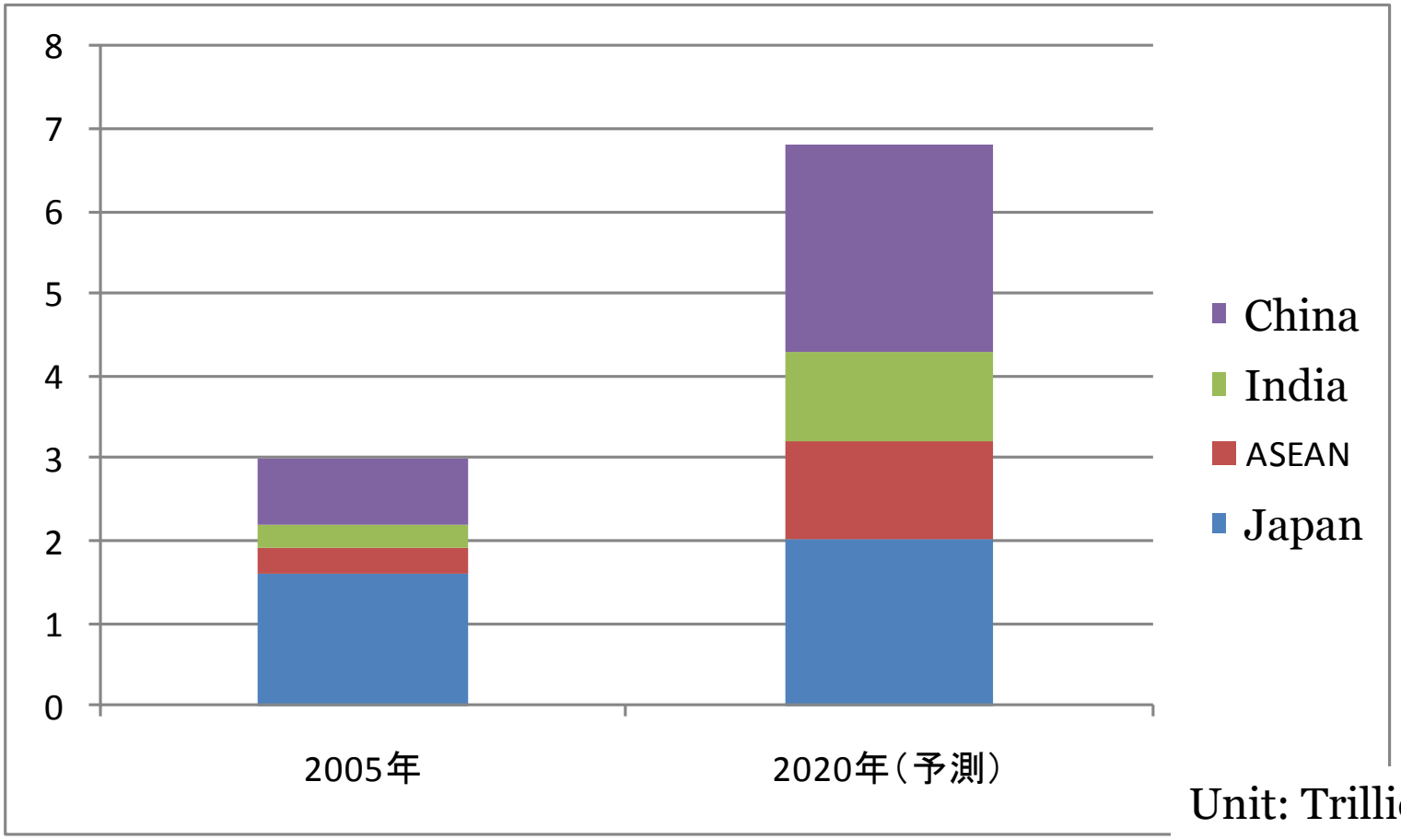
	Yamamoto	Watari	Iwanuma	Sendai	Tagajo	Ishinomaki
Damaged Car	0.30	0.22	0.11	0.06	0.08	0.08
Ground Surface	0.66	0.35	0.33	0.10	0.51	0.19
Wreckage	0.97	0.25	–	–	0.11	0.11
E-waste	–	–	–	0.06	0.07	–
Metal Scrap	–	0.18	0.12	–	0.07	0.10
Wood Waste	–	0.28	0.06	–	–	–
Soil	0.53	–	0.18	0.09	0.57	–
Average	0.62	0.25	0.16	0.08	0.24	0.12

Topics of Waste Resources Recycling Policy -Case on ELV Recycling-

- Growth of recycling market in the developing countries
- Security of resources （Base metals and rare metals)
- Visualization

- Major change for disaster waste handling

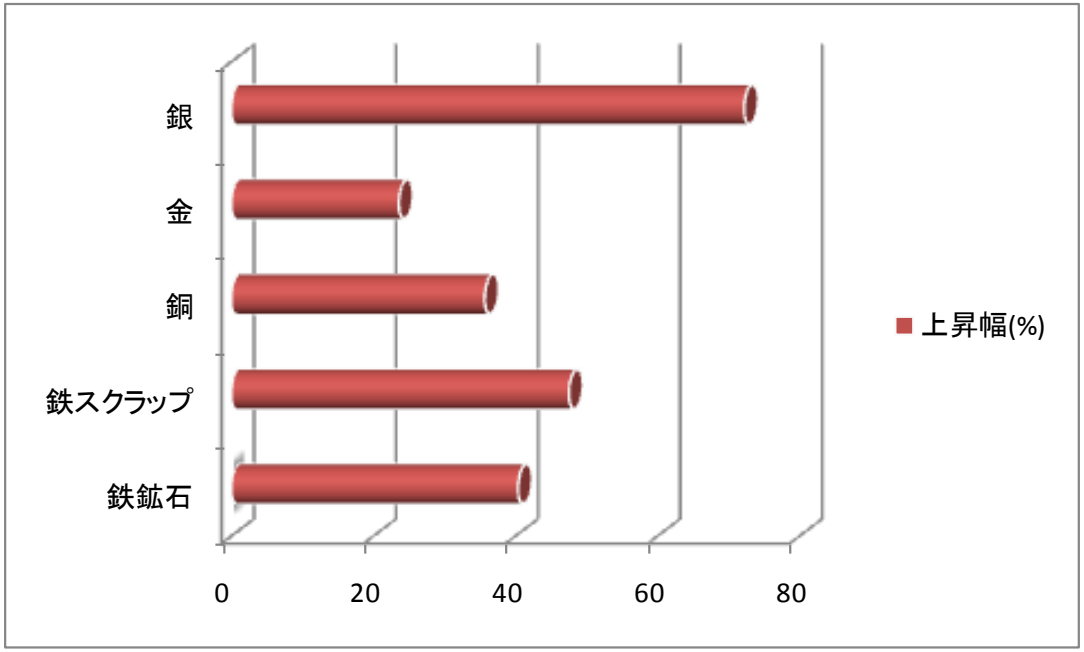
Recycling Market in Asia



Unit: Trillion YEN

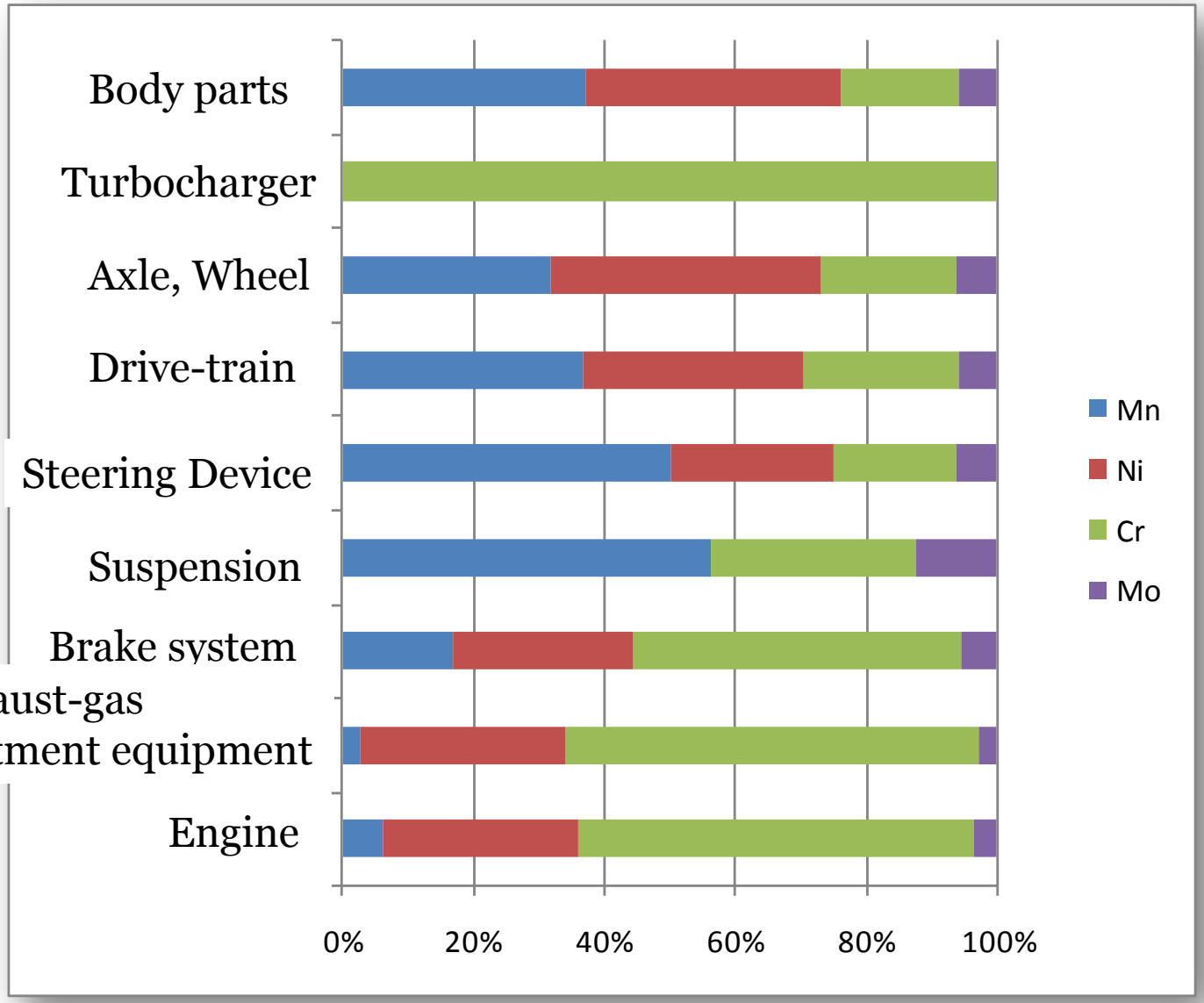
Fostering of Recycling Industries ← Japanese Government
Overseas Advance of Major company

Valuation of Resources Market



	2010.1	2011.1	上昇幅(%)
鉄鉱石（$/t)	135	189.5	40.37
鉄スクラップ($/t)	313.5	462.5	47.53
銅($/t)	7,065	9,585	35.67
金($/oz)	1,084.80	1,340.70	23.59
銀($/oz)	1,621.20	2,791.90	72.21

Rare metals in Auto-parts[17]



Visualization

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Low CO2 Emission ?
Dependency of Fossil Fuel?



1カバー（左）	2サイド	3	4	5
PP	PP+PE	PP＋PE	PP	PP
				
0.14	0.1	0.16	0.26	0.04

6カバー（右）	7サイド（後）	8サイド（後）	9シートサイド（左）	10センタービラ（右）
PP	PP	PP	PP	PP
				
0.12	0.32	0.32	0.32	0.04

Material	PP	PP+PE	PE	N/A	Complex Material	Total(kg)
Weight	19.5	2.90	2.72	0.52	0.8	26.44

Dismantling Experiment：Yu's Lab.（2010.03）

Conclusions and Recommendations

- Due to delayed decision making, damaged cars still have remained in the stock yard.
- Bad sales performance of new car, high yen and protracted economic recession would disturb the ELV recycling market after the reconstruction in Tohoku Area.
- Promoting the urban mining technology

→ Job opportunities in the disaster site

- Urban mining with manual recovery is driving ELV recycling into sustainable waste management.
- Store up a know-how and new technology on the emergency waste
- International Partnership through information, technology and people to people exchange for the reconstruction.