



汽车产品回收利用产业技术创新战略联盟  
Alliance of Auto Recovery Technology Innovation

# Automotive Product Recycling Industry in China

The National Progress Report  
Prepared for 5<sup>th</sup> AAEF held in Australia

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# Status quo of the Chinese automotive product recycling system

- By the end of 2010, China's vehicle population reached 90.86 million, up 19.3% year-on-year, deregistered 3.6420 million, recycled 1.4787 million ELVs
- In China, there are 520 enterprises for dismantling ELVs, with 2,175 take-back stations and more than 30,000 employees
- The existing ELV management system, policy system, and technical standards fail to adapt to the requirements of the industry's development
- The recycling technology level of ELVs is low, and the reuse and remanufacturing of used parts has not reached a considerable scale
- The extended responsibility of car manufacturers is unclear

# Progress in China's auto product recycling

1. Pilot Project of ELV Dismantling & Recycling
2. Remanufacturing pilots of auto parts
3. China's automobile products recycling rate and banned materials management system
4. Consideration on China's Automobile Product Sustainable Recycling in 2020: Roadmap
5. Technology innovation developed by AARTI
6. Conclusive Remarks

# Pilot project of ELV dismantling & recycling

- 104 ELV recycling facilities technical upgrading from 2009, 2010
- Environmental protection measures of pilot enterprises of ELV green dismantling
- Dismantling technical measures of pilot enterprises
  - ELV entrance registration
  - Environment-friendly
  - Removal of reuse and remanufacturing parts
  - Dismantling of interior and exterior components, engine, and gearbox
  - Dismantling, cutting, and classification of ELV
  - Heat cleaning treatment of remanufacturing cores (Shanghai ECVD)
- Remanufacturing core processing and logistics pilot center of ELV used parts (innovation in business model in Shanghai ECVD)

# Remanufacturing pilots of automotive parts

- 14 pilot enterprises; remanufacturing capacity 250,000 units; more in approving
- Scope of automobile part products: engine, gearbox, generators, starter, and steering gear
- Three principles for remanufactured products
  - Remanufactured products shall not be used in new car production.
  - The technical performance, safety, and quality standards of remanufactured products shall comply with the relevant standard requirements of the original products.
  - A “Remanufactured” sign shall be indicated on an eye-catching spot outside remanufactured products and reserved permanently, and the packaging of remanufactured products should have a specific indication of “remanufactured products.”

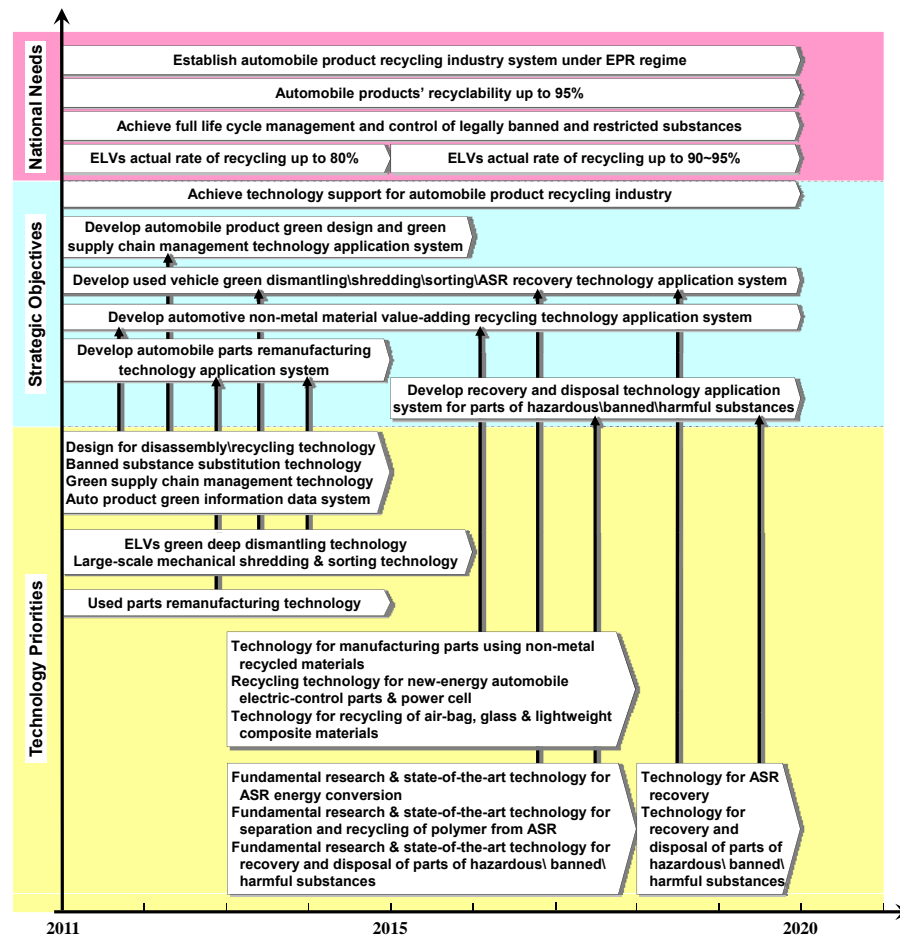


# China's auto product recycling rate and banned material management system

- Chinese practice of EPR
- Approaches for the management of recycling rate and banned materials of automobile products
- Exemption list of banned materials
- Relevant standards and norms
  - *Reusable and Recyclable Calculation Method of Road Vehicles (GB/T 19515-2004)*
  - **National standard:** *Auto Banned Materials Requirements and Auto Industry Standard Detection Method of Lead, Cadmium Content, Detection Method of Hexavalent Chromium, Detection Method of Mercury (Hg), Detection Method of PBB and PBDE, and other related detection methods*
- Supporting systems
  - Recycling rate and banned materials authentication are included in the requirements of market access, incorporated into automobile product announcement management, imported automobile management, CCC (China Compulsory Certification) certification, and other market access management systems.
  - China's automobile materials data system (CAMDS) is established.

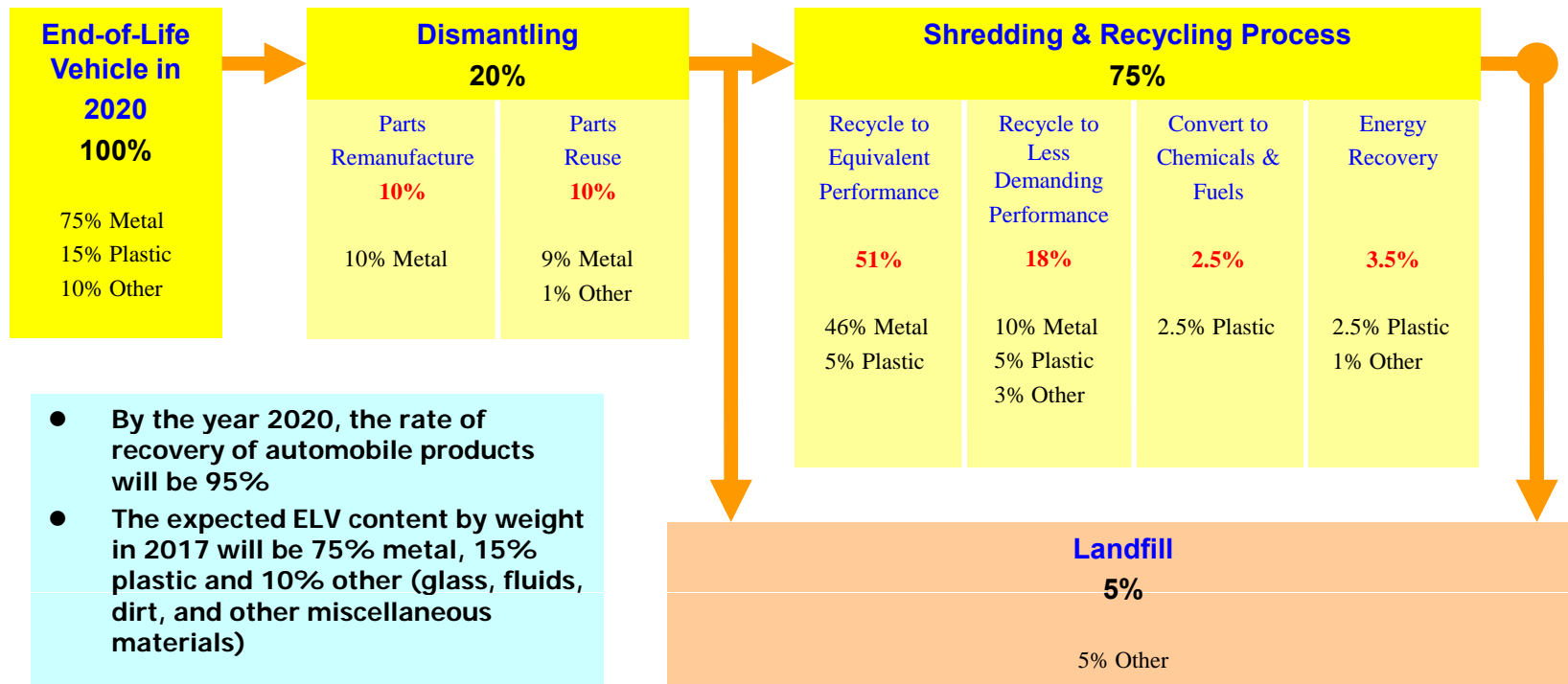
# Consideration on China's Automobile Product Sustainable Recycling in 2020

## Technology Roadmap for Automotive Products Recycling Industry in China



# Development Goals for Auto Recycling Industry in China '2020

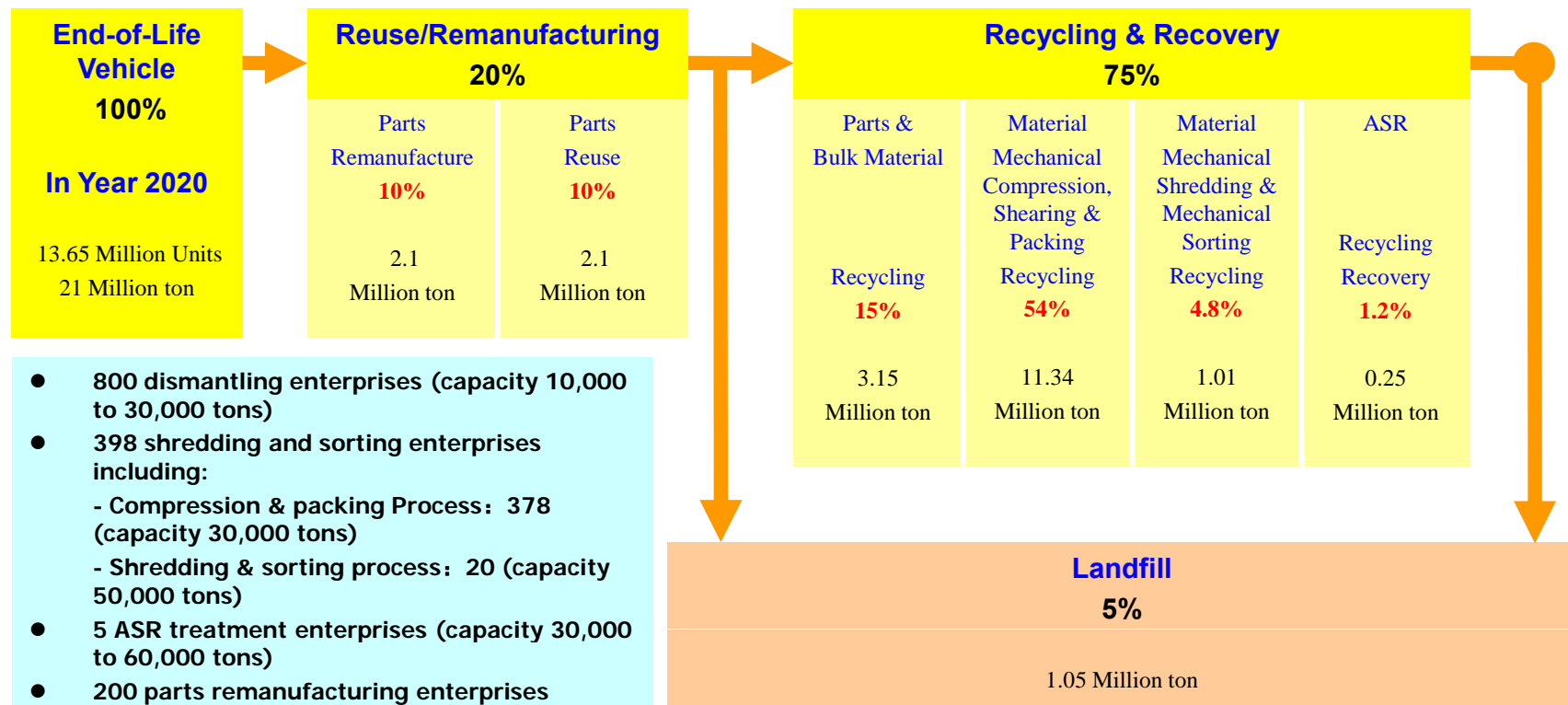
**Development goal:** to establish automobile product recycling industry system under extended producer responsibility regime, to make end-of-life vehicle's actual rate of recycling up to 95%, to achieve full life cycle management and control of legally banned and restricted substances, to disseminate used parts value-adding recycling technology in the industry, by 2020.





# Forecast for the Scale of Auto Recycling Industry in China '2020

**Development scale:** it is expected that by 2020, annual end-of-life vehicle processing capacity will be 13.65 million sets (about 21 million tons), enterprises above designated size in the industry will be more than 1,400, with total output value nearly 16 billion US\$.



# Technical Approaches of ELV Recycling in China '2020

for 6 to 10-year used vehicles and for dismantling enterprises with capacity of 10,000 tons or so per year

**environment-friendly pre-treating** → **parts dismantling deeply** → **mechanical compression, shearing, packing** → **electric furnace remelting**



for 10-year and older used vehicles and for dismantling enterprises with capacity 20,000 to 30,000 tons per year

**environment-friendly pre-treating** → **parts dismantling** → **mechanical shredding** → **mechanical sorting** → **ASR recycling**



# Strategies for the Development of Auto Recycling Industry in China '2020

- To improve the rate of recycling of China's automobile product from the source control: in design & production phases
- To properly solve two key issues in take-back, dismantling and recycling phases: **compliance with environmental protection standard** and **value-adding recycling** of used automobile product
- To properly control convergence and cooperation between **economic modulation mechanism** and **administrative control mechanism** of extended producer responsibility system
- The **Alliance of Auto Recovery Technology Innovation's** roles: work on R&D and industrialized demonstration of basic generic technology; dissemination over the entire industry

# Development Goals for Auto Recycling Technology in China

- To master advanced applicable technologies meeting market demand and achieving value-adding recycling of automobile product, improve resource recycling level in automobile manufacture
- To explore new system on enterprises-led, industry-academia-research-application collaborative innovation
- To boost development of the generic fundamental technology and major state-of-the-art technology for China's green automobile manufacture

# Main Tasks

- To develop five major generic technology supporting systems
  - auto product green design and green supply chain management
  - used vehicle green dismantling, shredding, sorting, ASR recovery
  - parts remanufacturing technology application system
  - automotive non-metal material value-adding recycling
  - recovery and disposal for parts of hazardous, banned, harmful substances
- To make automobile product **recyclability** up to **95%**, and realize full life cycle management and control of **legally banned and restricted substance** and **substances of concern**
- To realize the **rate of recycling** of **95%**, achieving technology innovation in
  - green and high-efficient dismantling
  - used parts remanufacturing
  - automotive non-metal materials value-adding recycling
  - mechanical shredding and sorting
  - ASR recovery
  - auto electronics and power cell battery recycling
  - recovery and disposal of parts of banned and restricted substances

# Technology innovation developed by AARTI (1)

- Study on environment-friendly pretreatment and depth dismantling equipment of used passenger cars
  - Integrated collection equipment of waste oil, waste liquid, fuel, and refrigerating fluid
  - Multi-modal detonating technology of airbags
  - ELV depth dismantling technology
  - Identification technology of parts made from banned materials
- Study of recycling technology and equipment with high added value for used automotive control electronic components
- Study of key recycling technologies and equipment with high added value for typical interior and exterior parts
  - Study of key technologies to efficiently remove the polymer coating of external parts
  - Study of efficient separation technology for interior part materials with lamellar compound structure

## Technology innovation developed by AARTI (2)

- Study of flexible automatic transfer, convey, depth dismantling system for used passenger vehicles
  - Establish the efficient depth dismantling production line for used passenger vehicles with the annual dismantling capacity of 100,000 unit
- Study of large-scale efficient shredding & sorting system for used passenger vehicles
  - Establish the efficient shredding & sorting production line for used passenger vehicles with the annual handling capacity of 50,000 tons
- Study of automobile shredder residues (ASR) pyrolysis & gasification mechanism and its recovery
- Contribution of material cascade utilization to sustainable resource management (a Deutsch-Sino collaboration)

## Conclusive Remarks

- Improving resource utilization efficiency is one of the major means for low-carbon development of automotive industry
- Economic value in the reutilization of used automotive materials and parts determines the future of the automobile recycling industry
- Consumer concept and attention serves as an important driving force for the automobile recycling industry to maximize economic and environmental benefits
- Promote the producer's extended responsibility regime in the Chinese automobile product recycling industry system, thereby creating opportunities for the development of the automobile product recycling industry in China in the future



谢谢！

Thank you for your attention!

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