

Annex III

Results of the field surveys

1. Indonesia

(1) Schedule

Table 1. Schedule of field survey in Indonesia

DAY	TIME	INTERVIEWEES
March 30	9:00	Scrap trading company
	13:00	Insurance company
	16:00	Used parts market
March 31	11:00	Dismantling company
	15:00	Steel plant
April 1	11:00	Remanufacturing company
	15:00	Repair company
April 2		1 st Working Group meeting
April 3	10:00	Dismantling company
	11:00	Used parts market

(2) ELV Dismantling in Indonesia

The team visited some dismantling companies in Jakarta. These types of businesses are not registered in the municipality and are in the informal sector. The companies collect and buy ELVs by themselves. Sometimes, vehicle owners bring them to the dismantling company. ELVs are bought at Rp3,900 per kilogram. Based on the interview, the number of purchases of ELVs has decreased. In some cases, the companies do not buy any ELV for a month due to lack money.

The ELVs are used as used cars or sold as scrap. Before selling as scrap, parts such as engines, suspensions, and interiors, among others, are taken out from ELVs and sold to used parts shops, repair shops, and car owners. However, most of the auto parts are too old to be bought. Therefore, most of the parts are sent to scrap trading companies, recycling

companies, or a steel plant in Pulogadun. Aluminium is sold to companies in Jakarta. When an ELV is sold as scrap, it is first dismantled by a gas burner, divided into small parts and segregated by auto components/materials. Oftentimes, they request other dismantling companies to dismantle but, if the amount is small, the company may dismantle them by themselves. Working batteries are usually reused, while non-working batteries are sold to battery recyclers. Waste oil is disposed in junkyards. Tires can be sold, reused, or recycled as rubber products such as cushion materials and flip-flops, among others. Airbags of cars that have figured in accidents are destructed but airbags of non-accident cars can be reused or sold.

Recently, the price of steel scrap has decreased. Previously, steel scrap could be sold at Rp7,000 per kilogram. Currently, the price is Rp3,800 per kilogram. Due to this price decrease, the ELV is stored without being sold, waiting for the price of scrap to increase. Recently, used cars may be sold as second-hand cars. However, such cases have become rare.



Figure 12. Yard for ELV



Figure 13. Used parts taken from ELV



Figure 14. Used parts



Figure 15. Yard for ELV

(3) Small repair and parts shops

In some areas in Jakarta, several small repair and parts shops are located in one area. The shops sell new genuine parts as well as imitation parts, used parts, among others.



Figure 16. Small repair shops



Figure 17. Small parts shops



Figure 18. Used parts shops

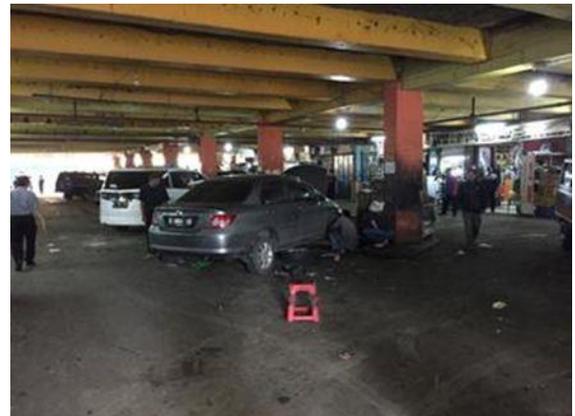


Figure 19. The area where many repair shop and parts shops gather

In other areas in Jakarta, there are markets where some shops sell used parts.



Figure 20. Market in Jakarta



Figure 21. Used parts shop



Figure 22. Used handle

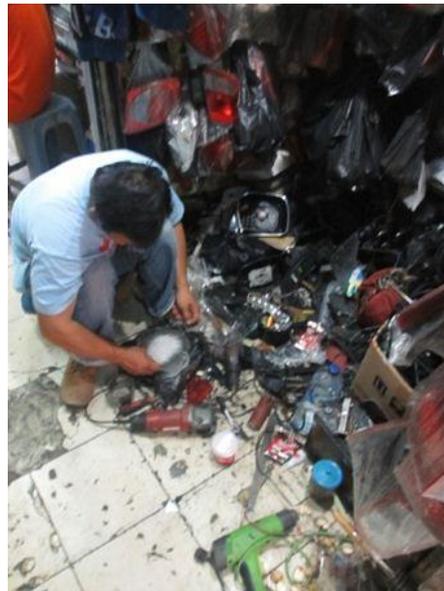


Figure 23. Repair of used part

(4) Steel plants

In Jakarta, there are many steel plants. One such plant is Pulogadun. This plants stores steel scraps and makes steel from steel scraps.



Figure 24. Store of steel scrap



Figure 25. Store of steel scrap

(5) Repair shop using used tires

The study team interviewed a shop that uses used tires in Jakarta. The used tires are sold to the shop by a trader. Used tires that cannot be utilised are sold to manufacturing companies like a cement company, which uses the tires as fuels in a cement rotary kiln. There are also manufacturers who make steel bars from used parts in Cikarang and Karawang. Repair shops in Jakarta consider retreaded tires unsafe, however they are widely used in the local area.

2. Malaysia

(1) Schedule

Table 2. Schedule of Field Survey in Malaysia

DAY	TIME	INTERVIEWEES
March 16	9:30	Department of Environment Ministry of Natural Resources and Environment (NRE)
	14:00	Malaysia Automotive Institute (MAI)
	16:00	Scrap trading companies
March 17	10:00 - 18:00	Malaysia Automotive Recyclers Association (MAARA) and member companies (4 used parts factories, 1 scrap trader, and used parts factory)
	March 18	AM
13:30		Car manufacturing company
16:00		Used parts factory
March 19	10:00	Steel plant
	PM	Car workshops in Kuala Lumpur

(2) MAARA and Used parts resellers

The Malaysia Automotive Recyclers Association (MAARA) consists of used parts sellers (70 percent) and scrap sellers (30 percent). Approximately 20 companies have the licence to dismantle ELVs. Around 30 to 40 used parts companies are located in Kepong. Every company is dealing with approximately one to two 40-foot containers per day. Approximately 5,000 containers are imported annually.



Figure 26. Inside of container



Figure 27. Taking used parts from a container



Figure 28. Transferring the body



Figure29. Warehouse

Used parts are stored in warehouses with roofs. Engines are stacked in warehouses. When the engine is being sold, the belt is checked if it can be rotated or not.

Suppliers are usually trusted because they provide warranty. Warranty of used parts depends on the shops. Generally, one- to three-month warranties are provided.

The shops sell various used parts such as engines, alternators, transmissions, lights, and so on. However, body parts are not good in terms of revenue. Imitation parts are imported from China, Taiwan, and Thailand, and price competition with them is very severe. The difference in price between used parts and imitation parts is 100:120. In some cases, imitation parts are cheaper than used parts.

Many traders come to the factories from Africa, Middle East, Pakistan, China, among others, to buy used parts, in particular engines and transmissions. Prior to the trade, the parts are cleaned in their own countries. The ratio of domestic use and re-export is 20:80.



Figure 30. Used engines



Figure 31. Used engines and transmissions



Figure 32. Used parts (speaker)



Figure 33. Used body parts

In case used parts are not working, the parts are dismantled into smaller parts. The disassembly shops also remanufacture gear boxes and others.



Figure 34. Dismantling used parts to smaller parts



Figure 35. Remanufacturing a gear box parts

(3) Scrap recycling companies

Among MAARA members, one used parts factory in Klang is conducting a scrap trading business. Scrap is collected from used parts factories in Klang and sold to domestic shops or exported.



Figure 36. Aluminium scrap



Figure 37. Plastic scrap

(4) Workshop in Klang using used parts

In north Klang, there is an area where many repair shops are located. In case cars are broken, car owners decide whether to use new genuine parts, new imitation parts, or used parts.



Figure 38. Repair shop (mainly repairs the engines)

Figure 39. Used engine parts

Cars that have figured in accidents are sent to repair shops that have special contracts with insurance companies. Accident cars may be repaired, however, when cars cannot be repaired, the ELV is sold to scrap trading companies.



Figure 41. Collection of CFC

Figure 40. CFC collector



Figure 42. Repair shop for accident cars



Figure 43. Repairing an accident car

(5) Steel plant and shredder

There are 10 steel manufacturing companies in Malaysia. Two of them are large steel manufacturing companies manufacturing approximately 30,000 tons per month. There are two shredders installed in Malaysia. One of them is Amsteel. Originally, the intention was to shred soft press imported from Japan. However, after the export of soft press was prohibited, the shredders have not been working at full capacity.



Figure 44. Shredder



Figure 45. Scrap for shredding



Figure 46. Automobile parts scrap

(6) Scrap traders

Some scraps (steel, non-ferrous, plastics) are sold to scrap traders who export scraps to China.



Figure 47. Scrap trading companies

Figure 48. Scraps for export

(7) Malaysia ELV policy

Malaysia revised its National Automotive Plan in 2014 (NAP 2014). Currently implementation measures are being discussed. ELV policy is part of NAP 2014.

In 2009, the prohibition on the importation of used parts was being discussed by the Malaysian Government as they considered used parts as having safety problems. In collaboration with universities, MAARA submitted a report to MAI, Ministry of Transport (MOT), and MITI proving that there is no safety problem with used parts. As a result, the prohibition on the importation of used parts was not implemented. Only the importation of batteries, tires, and brake pads were prohibited. On the other hand, the Malaysian Government requested MAARA to develop a quality standard. Currently, MAARA is trying to develop the standards. MAARA member companies are also providing a three-year warranty.

MAARA is considering the used parts control system, in particular recycle parts information system, in implementing NAP. Used parts import data are collected by Customs and sales data of used parts are also registered in the system. Under the system, technical support for repair shops is also considered.

The importation of used cars was prohibited before. However, it was allowed under the licence scheme. The problem in Malaysia is that there is no inspection scheme for private vehicles. Therefore, ELVs are seldom generated.

3. Myanmar

(1) Schedule

Table 3. Schedule of Field Survey in Myanmar

DAY	TIME	INTERVIEWEES
May 21	10:30	Myanmar Economic Corporation (MEC) factory (observed from outside of the facility)
	11:00	Steel processing factory
	14:15	Road Transport Administration Department (Yangon Region), Ministry of Rail Transport
	16:00	Steel product manufacturing and trading company
May 22	10:00	Japanese used parts dealer
	10:15	Yangon repair factory
	12:00	Car dismantling factory of Myanmar Economic Corporation (MEC) at Thilawa (observed from outside of the facility)
	15:00	Tamwe used cars market
	19:00	Meeting with a representative of JETRO, Yangon Office

(2) MEC's dismantling firm in Myanmar

Myanmar Economic Corporation (MEC), which is a corporation under the Myanmar Government, launched two ELV dismantling plants in Myanmar. Due to a replacement programme announced by the Myanmar Government in 2011, there is an overwhelming amount of cars, making a 3-kilometre queue, waiting to be scrapped in scrapped car plants. Brokers come to take off the used parts from the cars at this line to buy it from car owners.

According to the dealer in Yangon, there are used parts deals within the plant which make the process slower and not many cars are processed every day.

Scrapped cars brought to Myingyen are taken to the iron factory that is supervised by the Myanmar Ministry of Technology and put inside an electric furnace. This iron factory has temporarily stopped its work, but it is estimated that the factory can deal with about 20 tons of iron annually.

Nonetheless, although iron is recycled under the strict control of the ministry system, it seems many other valuable metals are not recycled at all. In fact, data shows that there are no government-related facilities for copper and aluminium recycling. Moreover, many people who were not aware that there are rare metals in mufflers and they put these mufflers inside the electric oven with the other scrapped parts as iron scraps. However, rare metals might not have been used in old models of cars made in Myanmar. If the same process were to be conducted in the future, this could become an enormous loss of resource.



Figure 49. Car dismantling factory of MEC at Thilawa (1)



Figure 50. Car dismantling factory of MEC at Thilawa (2)



Figure 51. Steel plant of MEC at Yangon



Figure 52. Steel plant of MEC at Yangon

(3) Informal sector's recycling in Myanmar

Due to the replacement programme announced by the Myanmar Government in 2011, there are overwhelming amounts of cars waiting to be scrapped in scrapped car plants. Before sending ELVs to dismantling facilities, car owners request the informal sector to take off the used parts. Brokers come to buy used parts from car owners.



Figure 53. Informal sector taking used parts from an ELV



Figure 54. Informal sector taking used parts from an ELV

(4) Used parts in Myanmar

Tamwe used car parts market are dealing with used parts, mainly imported ones. Half-cuts are prohibited to be imported, however, are illegally imported by some shops.



Figure 55. Used parts shop (body parts)



Figure 56. Area where many used parts shops gather



Figure 57. Used parts shop



Figure 58. Imitation parts



Figure 59. Area where many used parts shops gather

A Japanese used parts dealer has a local storage and shop in Yangon. Since the importation of half-cuts are not allowed, used parts such as used engines, transmissions, body parts, lumps, among others, are imported from Japan. Not a lot of engines and transmissions are sold compared to other countries.



Figure 60. Japanese used parts dealer's warehouse



Figure 61. Japanese used parts dealer's warehouse



Figure 62. Used body parts



Figure 63. Used steering rack



Figure 64. Used rear doors

4. Thailand

(1) Schedule

Table 4. Schedule of Field Survey in Thailand

DAY	TIME	INTERVIEWEES
May 18	10:30	Used auto parts markets—Worachak District at the centre of Bangkok old town; and at Pathum Wan at the centre of Bangkok (located behind the Chulalongkorn University)
	14:00	Iron and Steel Institute of Thailand
	16:00	Thailand Automotive Institute
	17:45	Tokio Marine Insurance (Thailand) Public Company Limited
	19:15	Toyota Tsusho (Thailand) Company Limited
May 19	10:00	King's diesel
	11:15	Passakorn Service
	13:45	Kaiho (Thailand) Company Limited
	16:15	KI-Ecotech Company Limited
	19:00	Dinner with Mr Hajime Yamamoto, an expert in the Asian auto industry (former employee of MRI)
May 20	10:00	Hidaka Yookoo Enterprises Company Limited
	11:30	Used car auction at Manheim
	13:30	Suksawass Taxi
	15:00	Bangna used cars parts market

(2) ELV Dismantling in Thailand

There is a huge hub of used parts trade in Thailand. Thailand imports many half-cuts and used parts from other countries, mainly from Japan. Many used parts recyclers/traders dismantle the half-cuts. Some of the used parts are domestically used and the others are exported.

Areas where used parts dealers gather are dotted in Thailand. Small scale dealers conduct their business in those areas. There are dealers that specialise in specific items. They deal with used parts from both inside and outside the country. Those dealers send their skilled staff to dismantling workplaces in Japan and then import used parts from Japanese dismantling sites where their staff work. In addition to automotive repairers and parts' brokers, end users sometimes purchase the parts directly.

Dismantlers and used parts traders that import half-cuts and used parts are located in specific areas such as Bang Na, Ptathumwang, and Phaholyothin Frontage Rd. Originally, such dismantlers and used parts traders were mainly located in Ptathumwang, real estate owned by Chulalongkon University. Chulalongkon University rents out apartments at very cheap prices in this area and, therefore, the informal sector gathers in this area. In 1990, the contract between the dismantlers and used parts traders and Chulalongkon University expired. In 2000, Chulalongkon University requested the dismantlers and used parts traders to leave the area. At first, the dismantlers and used parts traders opposed the relocation. Recently, the dismantlers left Ptathumwang and moved to Bang Na and Phaholyothin Frontage Road and other areas.



Figure 65. Used parts shop in Ptathumwan



Figure 66. Road close to used parts shop in Ptathumwan (1)



Figure 67. Road close to used parts shop in Ptathumwan (2)



Figure 68. Used parts shop in Phaholyothin Frontage Road (1)



Figure 69. Used parts shop in Phaholyothin Frontage Road (2)



Figure 70. Used parts shop in Bang Na (1)



Figure 71. Used parts shop in Bang Na (2)



Figure 72. Used parts shop in Bang Na (3)

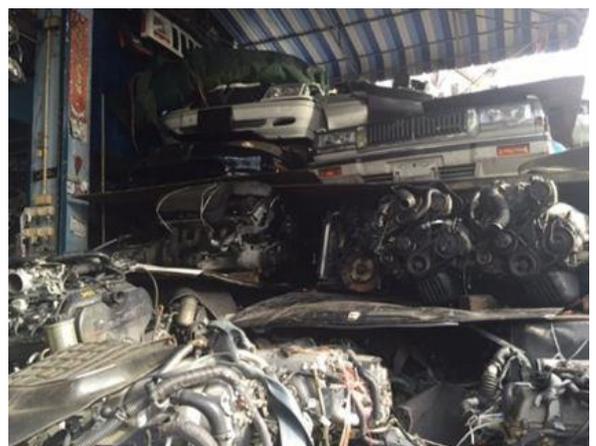


Figure 73. Used parts shop in Bang Na (4)



Figure 74. Imported engine



Figure 75. Imported half-cut

(3) Auction of accident cars/used cars

Accident cars and used cars are sold by auction. There are three major auctions in Bangkok: Manheim, Apple, and Union. Some of the used cars are actually moved and displayed in the auction area but some ELVs are unable to be moved and photos are shown to buyers.



Figure 76. Auction of motorcycles



Figure 77. Auction of ELVs



Figure 78. The number of vehicles auctioned in one day



Figure 79. Auction centre



Figure 80. Auction of used cars

(4) Taxi companies

Taxi companies maintain the taxi cabs by themselves. For repair, they select new genuine parts, imitation parts, or used parts after considering the quality and price. Used parts are used for expensive parts such as gear boxes, compressors, and so on. Imitation parts are made in China and Taiwan. If new genuine parts were sold at B100, imitation parts would be sold at B30 and used parts would be sold at B30. For engines, used parts are used. For newer car models, there are not so many used parts. Therefore, new genuine parts are used at first and, after one year, imitation parts are used. After 2 or 3 years, used parts start being used. Used parts shops provide a two-year warranty. Recently, used parts imported from Japan cannot be used as there is a minor difference in specification between the same model sold in Thailand and Japan.

Taxi cars are allowed to be used for a maximum of 9 years. After 9 years, two out of ten cars are stored for utilising parts for repair, and the others are sold to used car dealers. Sometimes, taxi drivers buy the parts at a low price. Taxi drivers either use the parts or sell them to the other owners. In addition, many parts are designed for automatic cars and, therefore, parts cannot be easily used as second hand.

Based on other information, used tires are sold to used tire dealers. Airbags started to be installed from 2014 following Thai regulations.



Figure 81. Maintenance at a taxi company



Figure 82. Used cars stocked in a taxi company

(5) Scrap trading companies in Thailand

Some of the industrial scrap trading companies are considering to introduce shredder and guillotine shears but the amount of generation is not enough to introduce shredders and guillotine shears for ELVs.



Figure 83. Guillotine shear



Figure 84. Shredder

5. Viet Nam

(1) Schedule

Table 5. Schedule of Field Survey in Viet Nam

DAY	TIME	INTERVIEWEES
June 15	11:00 - 11:30	Repair factory
	15:00	Remanufacturing Company in Hanoi
	22:00	Da Hoi Village
June 16	10:00	Vietnam Environment Administration (VEA)
	10:30	Cho Gioi used parts market at Hanoi
	15:30	Auto dismantling factory at Te Lo village
June 17	10:00	Waste oil collector
	11:30	Battery recycling companies
	14:30	Dismantler and aluminium scrap collector
	16:00	Aluminium recycle company
June 18	9:00	Scrap trade company
	10:30	Automobile inspection centre
	14:30	Collector/dismantler of used motorcycles at Te Lo Village
	15:30	Tire recycler at Te Lo Village
June 19	9:00	Scrap trade company

DAY	TIME	INTERVIEWEES
	11:15	Battery collector
	15:00	Insurance company

(2) Car recycling village in Viet Nam

In Te Lo Village, there are more than 200 used parts dismantlers and traders. The dismantlers mainly dismantle commercial vehicles. There are only two or three dismantlers for private vehicles.



Figure 85. Dismantlers for private vehicles



Figure 86. Dismantlers for private vehicles



Figure 87. Dismantlers for passenger vehicles



Figure 88. Dismantlers for passenger vehicles

(3) Motorcycle recycling village in Viet Nam

In Te Lo Village, there are motorcycle dismantlers and traders. Used motorcycles are collected. Some are sold as second-hand motorcycles or dismantled by taking out the available parts, and the dismantlers sell the remaining parts as scrap.



Figure 89. Dismantlers for motorcycles



Figure 90. Dismantlers for motorcycles

(4) Scrap trading companies.

In Van Mon Village in Bac Ninh Province, there are scrap trading companies. The village collects various metals such as steel, copper, aluminium, among others. Vehicles are dismantled by gas burners. Most of the resources can be sold. However, some companies illegally dump valueless materials on the roadsides.



Figure 91. Junkyard of scrap



Figure 92. Gas burner



Figure 93. Dismantling manually



Figure 94. Future End-of-life vehicle to be dismantled



Figure 95. Dismantling manually

(5) Used parts shops

Many used parts shops are located in Cho Gioi. The shops mainly trade used parts imported from other countries. Used parts from Te Lo are too old to be utilised. Therefore, used parts shops do not often sell used parts from Te Lo.



Figure 96. Used parts shop: parts for engine



Figure 97. Used parts shop: starters and alternators



Figure 98. Used parts shop: body parts



Figure 99. Used parts shop

(6) Steel plants

There are many small-scale steel plants in Da Hoi Village. Most of the steel plants have steel for construction materials from steel scraps by small electronic furnaces. Small-scale steel plants do not have appropriate pollution prevention equipment, thus causing air pollution.



Figure 100. Small electronic furnace



Figure 101. Small electronic furnace

Recycling of non-ferrous metals is carried out in 'Craft Villages' which are specified for metals or resources. In the craft villages, there are also many household businesses that recycle non-ferrous metals such as aluminium. In Bac Giang, there is an area where many such businesses operate. Like other wastes, after being sorted out by recyclable collectors manually, the scrap

metal is refined for recycled material. Workers do not work with appropriate equipment or gears such as masks. Therefore, they face potential occupational health risks.



Figure 102. Scrap yard



Figure 103. Small furnance



Figure 104. Warehouse for recycled material



Figure 105. Small furnance



Figure 106. Recycled alminium



Figure 107. Scrap yard



Figure 108. Small furnance



Figure 109. Warehouse for recycled material

(7) Batteries

Batteries are collected and dismantled by small household businesses that mainly belong to the informal sector. Batteries are cut in spaces that have inappropriate pollution prevention measures. In many cases, sulfuric acid is discharged to rivers without treatment. Occupational health risk is a huge problem because workers cut batteries without masks and gloves. Workers face the risk of lead poisoning. Following an initiative of the Vietnamese Government, recycling facilities of batteries and lead were established in Chi Dao Village, Hung Yen Province. However, dismantling is still being conducted by the informal sector, while the reclamation of lead is conducted by companies.



Figure 110. Battery and lead recycling company

(8) Used tires

Used tires are collected by small companies that mainly belong to the informal sector. Used tires are cut manually. After being cut into small parts, used tires are sold to traders or companies that use them as fuels for manufacturing like cement companies.



Figure 111. Used tire (cut)



Figure 112. Stored used tires



Figure 113. Cutting used tire

(9) Waste Oils

Waste oils discharged from repair shops are collected by the informal sector. Waste oils are stored and sold to traders. Afterwards, traders sell waste oils to manufacturing companies or recycling companies. Waste oils may be recycled as lubricant oil or grease, among others.



Figure 114. Storage of waste oil



Figure 115. Storage of waste oil

(10) Car inspection facility

In Hanoi, there is car inspection facility. The facility was originally operated by the Vietnamese Government but now it is operated by a private company. The facility installed various equipment for inspections.



Figure 116. Car inspection facility



Figure 117. Explanation of the process of inspection